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EPI REPORT

AD-A220 406

ELECTRONIC PRINCIPLES INVENTORY

LOWRY TECHNICAL TRAINING CENTER

AFPT 90-EPI-825

MARCH 1990

OCCUPATIONAL ANALYSIS PROGRAM
USAF OCCUPATIONAL MEASUREMENT CENTER
AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS 78150-5000

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TABLE OF CONTENTS

	PAGE NUMBER
PREFACE	iii
REPORT SUMMARY	iv
INTRODUCTION	1
BACKGROUND	1
EXAMPLE EPI QUESTIONS	2
SURVEY ADMINISTRATION	4
RESULTS	8
DISCUSSION AND IMPLICATIONS	8

PREFACE

This report presents the results of an Air Force Electronic Principles survey of 37 selected Air Force specialties. Authority for conducting Electronic Principles (EP) surveys is contained in AFR 35-2.

Results presented in this report are part of an EP survey of 81 Air Force specialties. This survey was requested by the Chief, Common Electronics Training Program (CETP) Program Management Team (PMT) in October 1985.

The Electronic Principles Inventory (EPI) used to collect EP survey data was originally developed in 1976 by Dr Hendrick Ruck and Major Thomas O'Connor. Mr Theodore Wilcox revised and validated the EPI in 1986 as part of this survey project.

First Lieutenant Robert Hampel analyzed the data and wrote the final report. Computer programming support was provided by Ms Olga Velez and Mr Wayne Fruge, and Ms Raquel A. Soliz provided administrative support. This report was reviewed and approved by Mr Gerald Clow, Chief, Management Applications Branch, Occupational Analysis Divisi .., USAF Occupational Measurement Center.

This report is distributed to Air Staff sections, major commands, and other training and management personnel. Requests for additional copies should be sent to: Chief, Occupational Analysis Division (OMY) USAF Occupational Measurement Center, Randolph AFB, Texas 78150-5000.

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REPORT SUMMARY

1. BACKGROUND: This report provides data on the electronic principles (EP) used by airmen in 37 Air Force specialties (AFSs) with initial training at Lowry Technical Training Center (TTC).

2. METHODOLOGY: The USAF Electronic Principles Inventory (AFPT 90-EPI-825) was administered to random samples of fully qualified job incumbents representing the 37 AFSs in this report. The data were collected from March 1987 to March 1989. Some AFSCs have been affected by RIVET Workforce changes. Details are enumerated in the SURVEY ADMINISTRATION section.

3. RESULTS: Complete survey data is provided in two appendices:

Appendix A: Lowry TTC AFSCs EP data in EPI job inventory order

Appendix B: Lowry TTC AFSCs EP data matched to Electronic Fundamentals/Applications (EF/A) STS

NOTE: A "generic" version of the Electronic Fundamentals/Applications (EF/A) is used in Appendix B--complete analysis requires the use of AFSC-specific proficiency codes, rather than the generic set used in the appendix.

4. DISCUSSION AND IMPLICATIONS: Although there is no specific regulatory guidance on the use of EPI data, the survey data lends itself to the use of cutoff scores for deciding which EPI items to include in centralized training for each AFSC. Once the training needs of the individual AFSCs have been determined, the possibility for consolidated EP training can be considered.

Survey data showed that AFSC 40450 personnel use as many or more EPI items than nine of the 32 AFSCs in this report which currently attend the Lowry EP course. AFSC 404X0 personnel should be considered for enrollment in the course.

There was no match of EPI survey data to the Lowry EP course POI, because the POI was undergoing major revisions. This match should be accomplished once the new POI is complete, to determine whether or not the survey data support the new POI objectives.

ELECTRONIC PRINCIPLES SURVEY REPORT
LOWRY TECHNICAL TRAINING CENTER

INTRODUCTION

From missile systems maintainers to telephone switching specialists, from avionics technicians to biomedical equipment personnel, the US Air Force employs more than 50,000 worker-level (primarily 5-skill level) personnel who require electronic principles (EP) training. These highly skilled, technically trained airmen work in over 80 Air Force specialties (AFSs) spanning 11 career fields. Furthermore, the depth and breadth of required EP training varies based on specialty needs. In short, the USAF spends vast amounts of money, manpower, and time to ensure that airmen are properly trained in electronic principles.

To make the best use of these resources, the USAF Common Electronics Training Program (CETP) was designed to consolidate and standardize Air Force EP training where possible and practical. This is primarily accomplished through special EP courses taught at four USAF Technical Training Centers (TTCs). These EP courses teach the electronic principles common to two or more AFSs. Another part of the CETP is the development of common training modules. Specific blocks of EP instruction are developed by one TTC, then shared with the other TTCs which teach that EP subject. By selectively combining and standardizing Air Force EP training, the USAF makes best use of limited training resources. (SDC)

Not all Air Force electronic principles training is conducted in special EP courses, however. For example, some EP subjects are used in only one AFS. Students learn these generally advanced topics in AFSC-awarding courses, building on the more basic EP subjects from the common EP course. Also, some AFSs require very few electronic principles, and airmen in these specialties receive EP training only in their AFSC-awarding courses.

As with other Air Force technical training, EP training programs can profit from objective analysis of specific training requirements. These requirements can be analyzed objectively using occupational survey data. This EP survey provides data which can be used to analyze the specific EP training requirements in CETP courses and AFSC-awarding courses alike. The instrument used to collect EP survey data is the Electronic Principles Inventory (EPI).

BACKGROUND

The USAF Electronic Principles Inventory (EPI) is a knowledge- and skills-based job inventory which identifies the electronic principles, skills, and equipment an airman uses in the performance of his or her job.

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The EPI was originally developed by Dr Hendrick Ruck and Major Thomas O'Connor in 1976. An in-depth discussion of the original concept, development, and validation of the EPI can be found in USAFOMC Technical Note 77-02, "The Development and Application of the Electronic Principles Job Inventory". Mr Theodore Wilcox revised and validated the EPI in 1986 for this survey.

The EPI contains two sections. First is a background section containing demographic and job satisfaction questions. The second section contains 712 electronic principles, skills, and equipment questions covering 39 EP subject areas. Below are some example questions taken from the EPI. The 39 EPI subject areas are listed in Table 1.

After completing the background section, job incumbents respond "Yes" or "No" to the 712 EPI questions. The result is a "profile" of electronic principles, skills, and equipment used by the incumbent in his or her present job. This electronic principles "profile" can be combined with the "profiles" of other job incumbents to produce a "profile" for the entire AFS.

EXAMPLE EPI QUESTIONS

Example Principles Questions

A4-4 Do you use electron tube characteristic curves?
G1-20 Do you use parity bit codes?
H4-33 Do you use "FM" modulation principles?

Example Skills Questions

C1-8 Do you calculate values of transistor amplifier voltage, current, or power gain?
E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters?
I1-4 Do you measure RF effective power?

Example Equipment Questions

B4-2 Do you use spectrum analyzers?
D3-5 Do you perform tasks on variable resistor voltage regulators?
J1-8 Do you work on dynamic microphones?

TABLE 1

EPI SUBJECT AREAS

SUBJECT AREA NUMBER	SUBJECT AREA TITLE
A1	Direct/Alternating Current
A2	Electro/Mechanical Devices
A3	Solid-State Circuits and Devices
A4	Tubes
A5	Soldering or Solderless Connections
B1	Multimeters
B2	Oscilloscopes
B3	Signal (Function) Generators
B4	Test Equipment
C1	Transistor Amplifier Circuits
C2	Transistor Amplifier Stabilization Circuits
C3	Coupling Circuits
C4	Electron Tube Amplifier Circuits
C5	Operational Amplifiers
C6	Magnetic Amplifiers
D1	Power Supply Circuits
D2	Power Supply Filters
D3	Power Supply Voltage Regulators
E1	Resistive Capacitive Inductive Circuits
E2	Frequency Sensitive Filters
F1	Oscillators
F2	Multivibrators
F3	Waveshaping Circuits
F4	Limiter/Clamper Circuits
G1	Digital Logic Numbering Systems and Functions
G2	Computers
G3	Digital Circuits
G4	Digital to Analog (D/A) and Analog to Digital (A/D) Converters
H1	Connections (Transmission Lines and Waveshaping Circuits)
H2	Microwave Oscillators and Amplifiers
H3	Resonant Cavities
H4	Transmitters and Receivers
H5	Antennas
I1	Radio Frequency Measurements
I2	Radio Frequency Calculations
J1	Microphones and Speakers
J2	Photosensitive Devices
J3	Storage Type Display Tubes
J4	Television, Laser, and Infrared Systems

SURVEY ADMINISTRATION

As mentioned in the PREF[illegible] data were collected for this survey from over 80 AFSs (78 AFSs, 3 Reporting Identifiers). Survey data were collected in four increments, from March 1987 through March 1989. A total of 24,651 EPI booklets were mailed to active duty airmen worldwide. After each of the first three increments, interim survey reports were published by the USAF Occupational Measurement Center (USAFOMC). These reports are all numbered AFPT 90-EPI-825, and are dated July 1988 (EPI-1), January 1989 (EPI-2), and February 1989 (EPI-3). There was no separate report of data collected in EPI-4. Results were combined with those of the first three increments to produce the final reports. There are a total of five final EPI reports, one for each of the following: Chanute TTC, Keesler TTC, Lowry TTC, Sheppard TTC, and the Air Force Military Training Center (AFMTC), located at Lackland AFB. This report presents results only for AFSCs with technical training courses at Lowry Technical Training Center.

A discussion about data collection and reporting procedures is necessary at this point. Some of the AFSCs included in this EP survey have been affected by RIVET Workforce (RWF) changes during various phases of the survey process. We have tried to keep up with these changes and adapt accordingly to provide the best, most useful survey data possible. Fortunately, not all AFSCs were affected by RWF, and some AFSCs were changed by RWF before survey mailout. These AFSCs did not require any special consideration.

Unfortunately, some AFSCs changed after survey data collection, which presented a challenge. Personnel from various AFSCs were reorganized and redistributed into new AFSCs as a result of RWF changes. These redistributed groups can be easily identified in this report because they carry the generic "X" for the skill-level designation. Using survey data collected from the 'old' AFSCs, we were able to create new data sets representing these 'new' AFSCs, allowing analysis of the data under the 'new' specialty structure.

For example, we collected survey data from the following AFSCs which no longer exist due to RWF changes: 32150, 32151E, 32151G, 32152, 32152Q, 32351, 32352, 32353, 32550, 32551, 32850, 32851, 32852, 32853, 32854, and 32855. These 'old' AFSCs were redistributed among several 'new' AFSCs as a result of RWF changes. The 'new' AFSCs which have initial training at Lowry TTC (and included in this report) include 451X7, 455X3A, 456X0, 456X2A, 456X2B, 457X3A, and 457X3C. As mentioned above, we recombined the survey data provided by airmen in the 'old' AFSCs to make new data sets which match the 'new' AFSCs, making analysis of EP training needs possible.

First, we placed all survey respondents from the 'old' AFSCs into a single group. Next, using the Uniform Airmen Record (UAR), we created a group which included all assigned personnel in the 'new' AFSCs. We then matched individuals by Social Security Account Number (SSAN), linking their 'old' AFSC to their 'new' AFSC. Finally, we created new data sets based on the results of the match, and these data sets represent the EP use of the personnel in the 'new' AFSCs. (NOTE: It was necessary to include 7-skill level personnel in the 'new' AFSC groups for matching purposes, because some of the personnel in

the 'old' AFSCs had upgraded to 7-level since taking the survey. However, the survey data are still useful, because the data were collected while the respondents were still 5-levels.)

After we performed the match of the 'old' AFSCs to 'new' AFSCs, we found that some of the 'new' AFSCs had sample sizes that were too small to be reliable. The following AFSCs are NOT reported here because of inadequate sample sizes: 455X3B, 455X3C, 455X5A, 455X5B, and 457X3B. However, most of the 'new' AFSC samples were sufficient for use, and are included in this report.

Here is a summary of all AFSCs included in this report:

AFSC	TITLE
30455	Television Equipment
30950	Space Systems Equipment Maintenance
31653	Instrumentation
32450	Precision Measurement Equipment Laboratory
40450	Visual Information Equipment Maintenance
45154A	F-15 Avionics Test Station and Component (Automatic Test Stations)
45154B	F-15 Avionics Test Station and Component (Manual and EW Test Stations and Consoles)
45155	F-16/A-10 Avionics Test Station and Component
45156A	F/FB-111 Avionics Test Station and Component (Automatic Equipment)
45156B	F/FB-111 Avionics Test Station and Component (Manual and EW Equipment)
451X7	B-1B Avionics Test Station and Component
45251A	F-15 Avionic Systems (Attack Control Systems)
45251B	F-15 Avionic Systems (Instrument and Flight Control Systems)
45251C	F-15 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45252A	F-16 Avionic Systems (Attack Control Systems)
45252B	F-16 Avionic Systems (Instrument and Flight Control Systems)
45252C	F-16 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45253A	F/FB-111 Avionic Systems (Attack Control Systems)
45253B	F/FB-111 Avionic Systems (Instrument and Flight Control Systems)
45253C	F/FB-111 Avionic Systems (Communication, Navigation, and Penetration Aids Systems)
45271	F-15 Avionic Systems Technician
45272	F-16 Avionic Systems Technician
45273	F/FB-111 Avionic Systems Technician
45550A	Photographic and Sensors Maintenance (Tac/Recon Electronic Sensors)

45550B	Photographic and Sensors Maintenance (Recon/Electro-optical Sensors)
455X3A	Weapon Control Systems (F-4E/G, AC-130, F-5E)
456X0	Bomb-Navigation Systems
456X2A	Defensive Fire Control Systems (AN/ASG-15)
456X2B	Defensive Fire Control Systems (AN/ASG-21, AN/ASG-33)
457X3A	B-1B Avionics Systems (Offensive Avionics Systems, CITS and Doppler Radar Systems)
457X3C	B-1B Avionics Systems (Communication, Navigation, and Defensive Avionic Systems)
46150	Munitions Systems
46250	Aircraft Armament Systems
46350	Nuclear Weapons
99104	Systems Repair Technician
99105	Scientific Measurements Technician
99106	Applied Sciences Technician

The survey administration for these 37 AFSCs was spread over all four increments of the EPI, from March 1987 through March 1989. To be eligible for the survey, airmen in these specialties had to have at least 4 weeks' experience in their job, could not be within 90 days of retirement nor expecting reassignment within 60 days. A random sample of survey eligible personnel was selected, and booklets were mailed to airmen worldwide. All useable EPI booklets that were returned to USAFOMC were included in the final samples. Table 2 shows the number of assigned personnel at the time of survey, as well as final sample size, for each AFSC in this report.

TABLE 2

SPECIALTY REPRESENTATION OF SURVEY SAMPLES

DUTY AFSC	TOTAL ASSIGNED	SURVEY SAMPLE
30455	287	208
30950	270	199
31653	288	237
32450	1,204	300
40450	193	114
45154A	314	141
45154B	325	164
45155	356	186
45156A	413	168
45156B	314	146
*451X7	127	34
45251A	329	125
45251B	219	82
45251C	249	92
45252A	281	85
45252B	302	105
45252C	303	98
45253A	323	97
45253B	210	61
45253C	261	68
45271	295	227
45272	307	271
45273	258	147
45550A	337	149
45550B	376	146
*455X3A	236	108
*456X0	348	111
*456X2A	93	29
*456X2B	58	19
*457X3A	111	28
*457X3C	116	19
46150	4,037	1,034
46250	5,640	1,616
46350	565	347
99104	238	144
99105	299	206
99106	171	119

* Denotes AFSCs affected by RIVET Workforce changes. For a complete description of these changes, refer to the SURVEY ADMINISTRATION section of this report.

RESULTS

Each completed EPI survey booklet shows which electronic principles the respondent uses in his or her present job. When the responses of all survey respondents from a specific group are combined, the results are shown as percent of group members using each of the 712 EP items. This listing of all EPI items and the percent of group members responding "Yes" is the EP "profile" of that group. Appendix A shows percent group members responding "Yes" information for all 712 EPI items, listed in EPI job inventory order.

To facilitate development of Specialty Training Standards (STSs), subject-matter experts (SMEs) matched EPI items to appropriate block(s) of the Electronic Fundamentals/Applications (EF/A) part of the STS, also known as the STS Attachment 2. For this study, a "generic" version of the EF/A STS was used for the match. All blocks of the EF/A were matched, and the proficiency codes are NOT specific to individual AFSCs. Still, this information (located in Appendix B) can be used to determine which blocks of the STS Attachment 2 should be included in individual STSs.

Subject-matter experts also matched EPI items to the objectives from Plans of Instruction (POIs) for Air Force courses which teach electronic principles. This match of EPI items to appropriate POI objective(s), when combined with survey data, shows how well the POI objectives are supported. For example, if many group members respond "Yes" to the EPI items matched to an objective, then that objective is considered well supported by survey data. If, however, few group members respond "Yes", the objective is not well supported.

For this EPI survey, however, no POI match was accomplished, because the Lowry EP POI was undergoing major revisions. This match of EPI items to the Lowry EP course POI objectives should be accomplished once the POI changes are complete. This match will show whether or not the new POI is supported by EPI survey data.

Following is a summary of the Appendices, which show the survey results:

Appendix A: Lowry TTC AFSCs EP data in EPI job inventory order

Appendix B: Lowry AFSCs EP data matched to Electronic Fundamentals/Applications (EF/A) STS

DISCUSSION AND IMPLICATIONS

We collect EPI data to assess the use of electronic principles by different Air Force specialties. For each AFSC surveyed, this data shows the percent members responding "Yes" to each of the 712 EPI items. We can use this data to select for each AFSC the items we wish to include in centralized

training. Once we've selected for each AFSC the EPI items we wish to include in centralized training, we can look for commonalities among those items for the possibility of combined electronic principles training.

How should we use the EPI data to select the items we wish to include in centralized training? Currently, there is no regulatory guidance on the use of EPI data for the development of centralized training programs (or STSs). ATC Regulation 52-22 states only that "EPI studies provide valuable information for curriculum development or validation in terms of percent members requiring a range of electronics principles knowledge in the performance of their job." Lacking direction from regulations, we must devise an intelligent method for using this data.

The EPI percent members responding "Yes" data lends itself to the use of a cutoff score for selecting items to teach in centralized training. For each AFSC, EPI items at or above the cutoff score are selected for centralized training, while items with scores below the cutoff (in percent members responding "Yes") are left for other training methods, such as on-the-job training (OJT). This cutoff score can theoretically be anything from 1 to 100 percent members responding "Yes". If we select 1 percent as our cutoff, we must train all airmen in all EPI items used throughout the AFSC. If 100 percent is selected, we will only train the EPI items used by every airmen within the AFSC. These cutoffs are the extremes, and we should find some middle ground for our cutoff score.

For example, if we select a cutoff score of 50 percent, it means that the EPI items we train will be used by at least every other student. Similarly, if we select items with 20 percent members responding "Yes" as our cutoff, we know that at least every fifth student will need to know those items. The task is to select a cutoff which provides training that is effective without being excessive. Therefore, the practical upper limit for this cutoff score should be 50 percent members responding "Yes" (any higher, and training would be ineffective). Twenty percent should be considered the practical lower limit (any lower, and training would be excessive).

Table 3 shows the total number of EPI items and the number of EPI items used by 30 percent of members for each AFSC in this report. This cutoff of 30 percent is only an example, but serves to show the trend of EP use among the AFSCs. Table 3 alsc shows which AFSCs currently attend the Lowry EP course. These data show that 40450 personnel report using more EPI items than nine of the 32 AFSCs in this report which currently attend the course. Management and training personnel for AFSC 404X0 should strongly consider sending their personnel through the Lowry EP course.

Because there was no match to the course POI, no comments can be made concerning the content of the Lowry EP course at this time. However, once the POI revisions are complete, the match should be done to see how well the new POI objectives are supported by the survey data for the AFSCs which attend the course. Such a review, using survey data, will provide the foundation for selection of EPI items to include in centralized training. Of course, other considerations will be important, such as whether or not the 404X0 personnel attend the course, scheduling considerations, and financial constraints. A

complete review and revision of the Lowry EP course, based on the EPI survey data and modified by these other considerations, should result in a plan for training which is mindful of each specialty's needs, while avoiding excesses that waste precious Air Force resources.

TABLE 3

NUMBER OF TOTAL EPI ITEMS USED/
NUMBER OF EPI ITEMS USED BY 30 PERCENT OF GROUP MEMBERS
(BY AFSC)

DUTY AFSC	ITEMS USED BY 30 PERCENT	TOTAL USED
*30455	324	691
*30950	399	703
*31653	138	681
*32450	498	707
40450	102	598
*45154A	311	704
*45154B	281	708
*45155	232	709
*45156A	277	698
*45156B	416	704
*451X7	405	675
*45251A	77	643
*45251B	54	487
*45251C	57	591
*45252A	51	670
*45252B	65	650
*45252C	62	653
*45253A	88	648
*45253B	79	570
*45253C	86	546
*45550A	202	710
*45550B	106	627
*455X3A	159	680
*456X0	170	669
*456X2A	143	495
*456X2B	106	389
*457X3A	78	486
*457X3C	112	410
46150	3	132
46250	20	220
46350	10	181
*99104	329	697
*99105	24	497
99106	15	292

* Denotes AFSCs which currently attend the Lowry EP course

TABLE OF CONTENTS

Report	Element	Program	Title		
1.	RP0028	PRTMOD	Lowry TTC AFSCs (Inventory Order - 1 of 3)	PM0027	1
2.	RP0029	PRTMOD	Lowry TTC AFSCs (Inventory Order -2 of 3)	PM0028	31
3.	RP0030	PRTMOD	Lowry TTC AFSCs (Inventory Order - 3 of 3)	PM0029	61
4.	RP0040	PRTMOD	Lowry TTC AFSCs matched to EF/A STS (1 of 3)	PM0036	90
5.	RP0041	PRTMOD	Lowry TTC AFSCs matched to EF/A STS (2 of 3)	PM0037	144
6.	RP0039	PRTMOD	Lowry TTC AFSCs matched to EF/A STS (3 of 3)	PM0038	198

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0042	GP0045/PMP	All DAFSC 30455	208	33.99	27.55	92.79	.00	712
3	F0043	GP0046/PMP	All DAFSC 30950	199	36.46	25.01	95.48	.00	712
4	F0044	GP0047/PMP	All DAFSC 31653	237	18.65	19.18	94.09	.00	712
5	F0054	GP0057/PMP	All DAFSC 32450	500	48.25	28.91	100.00	.00	712
6	F0056	GP0059/PMP	All DAFSC 40450	114	13.53	21.57	99.12	.00	712
7	F0057	GP0060/PMP	All DAFSC 45154A	141	31.26	27.72	99.29	.00	712
8	F0058	GP0061/PMP	All DAFSC 45154B	164	28.96	23.92	100.00	.00	712
9	F0059	GP0062/PMP	All DAFSC 45155	186	25.55	22.99	97.31	.00	712
10	F0060	GP0063/PMP	All DAFSC 45156A	168	28.61	26.02	100.00	.00	712
11	F0061	GP0064/PMP	All DAFSC 45156B	146	37.38	25.47	99.32	.00	712
12	F0087	GP0110/PMP	All DAFSC 451X7	34	35.18	22.40	100.00	.00	712

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
13	F0062	GP0065/PMP	All DAFSC 45251A	125	11.24	17.77	98.46	.00	712
14	F0063	GP0066/PMP	All DAFSC 45251B	32	7.95	16.95	98.78	.00	712
15	F0064	GP0067/PMP	All DAFSC 45251C	92	9.26	15.97	92.39	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0001	EPI Electronic Principles Inventory														
	0002	I. General Electronic/Electricity														
	0003	I 1. A1 Direct/Alternating Current														
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	79	89	77	98	68	84	82	79	85	80	91	60	71	60
A	2	A1-2 Do you use basic DC electrical/electronic terms	93	95	94	100	98	98	96	97	98	99	100	87	99	88
A	3	A1-3 Do you use basic AC electrical/electronic terms	91	95	91	100	96	96	96	97	99	97	100	86	98	87
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	89	93	86	99	95	99	99	94	99	98	97	90	99	79
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	91	90	85	98	96	96	96	87	98	96	94	76	99	75
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	61	56	54	91	39	69	63	48	64	70	74	24	16	20
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	57	56	47	87	30	67	63	48	71	67	74	21	9	13
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	61	63	48	86	23	68	65	48	76	77	74	22	7	14
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	90	92	79	98	88	95	95	85	98	97	91	30	61	32
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	89	81	70	98	82	77	74	60	91	90	76	13	33	10
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	88	87	74	98	73	88	91	84	92	92	82	8	34	12
A	12	A1-12 Do you calculate the value of a resistor required for a circuit	53	45	45	87	46	45	34	30	44	51	53	6	12	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	88	72	73	96	76	74	62	47	79	88	74	6	12	7
A	14	A1-14 Do you ohm check resistors	90	85	80	98	86	90	90	80	95	92	88	15	39	20
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	72	82	68	92	88	99	98	91	99	99	88	84	95	82
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	71	76	61	90	90	96	98	78	99	99	91	77	94	75
A	17	A1-17 Do you adjust relays	37	34	26	52	53	27	23	17	36	29	35	20	12	11
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	55	41	26	64	73	38	32	17	34	39	35	20	17	11
A	19	A1-19 Do you continuity check relays	67	71	60	90	85	94	93	75	96	95	76	63	83	66
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	83	83	41	87	41	63	62	48	68	70	65	18	16	16
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	80	74	31	82	35	42	48	26	54	62	53	7	11	5
A	22	A1-22 Do you calculate values of circuit total inductance	24	26	14	48	11	17	18	8	15	23	21	5	2	1
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	25	23	15	49	10	16	16	8	14	19	24	5	2	1
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	33	31	17	60	11	18	22	11	20	25	24	4	2	2
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	72	52	22	79	18	37	37	17	28	51	38	5	4	1
A	26	A1-26 Do you ohm check inductors	78	66	30	74	35	46	43	29	52	53	50	7	12	5
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	91	89	69	97	83	91	88	82	97	94	79	26	62	28
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	91	80	61	96	82	64	70	49	90	86	71	10	49	9
A	29	A1-29 Do you calculate values of circuit total capacitance	32	27	25	58	27	25	23	13	24	27	26	6	12	3
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	27	25	24	55	22	23	20	11	20	22	24	6	12	2
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	37	32	25	68	26	27	27	15	26	27	24	4	12	2
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	76	56	35	94	31	52	55	27	31	66	47	2	35	2
A	33	A1-33 Do you ohm check capacitors	84	73	46	84	70	65	63	45	77	74	56	11	44	10
A	34	A1-34 Do you use capacitor color codes in your present job	25	21	18	48	25	18	18	9	16	18	24	6	5	2
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	89	81	61	96	85	86	84	76	97	86	82	27	41	24
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	88	74	51	94	82	75	73	53	96	82	82	16	27	5
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	37	31	24	67	42	34	29	17	39	32	32	6	4	1
A	38	A1-38 Do you calculate impedance of transformers	24	17	16	42	19	23	16	11	20	16	24	7	2	1
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	44	39	16	68	35	35	33	22	42	47	35	4	7	2
A	40	A1-40 Do you ohm check transformers	83	61	43	84	69	55	55	41	75	61	68	14	20	5
A	41	A1-41 Do you measure transformer output voltage	86	66	51	93	77	75	69	55	85	75	65	13	24	7
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	31	55	27	55	37	67	59	46	71	64	68	17	18	9

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	27	49	24	50	32	58	51	33	67	58	62	11	13	5
A	44	A1-44 Do you adjust three phase transformers	17	24	11	36	18	33	23	23	43	37	41	4	4	1
0004		T 2. A2 Electro/Mechanical Devices														
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	70	66	27	44	83	50	39	34	46	51	50	18	46	5
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	70	61	24	42	85	48	37	33	45	49	53	12	39	4
A	47	A2-3 Do you troubleshoot DC motor component parts	39	33	12	25	61	14	15	11	20	21	32	5	11	1
A	48	A2-4 Do you perform tasks on DC motor component parts	36	33	14	24	58	12	15	12	15	18	29	4	5	1
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	52	63	24	38	79	53	45	37	52	51	59	16	43	5
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	54	60	20	36	82	48	45	35	52	48	59	9	34	4
A	51	A2-7 Do you troubleshoot AC motor component parts	30	29	11	20	58	15	15	9	21	18	38	4	9	1
A	52	A2-8 Do you perform tasks on AC motor component parts	29	29	11	20	58	12	16	10	16	18	32	5	5	1
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	17	20	14	43	11	31	30	20	22	29	47	14	18	5
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	18	19	12	39	10	30	26	18	22	27	50	9	12	3
A	55	A2-11 Do you troubleshoot DC generator component parts	15	14	8	38	7	12	12	7	13	22	21	4	4	1
A	56	A2-12 Do you perform tasks on component parts of DC generators	15	13	6	37	6	9	10	6	11	19	18	3	4	1
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	13	23	12	46	8	30	29	18	21	25	53	14	20	5
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	13	20	9	42	7	28	26	16	23	21	53	10	12	3
A	59	A2-15 Do you troubleshoot AC generator component parts	11	15	6	41	4	11	11	6	13	19	18	4	1	1
A	60	A2-16 Do you perform tasks on component parts of AC generators	11	16	6	40	4	9	10	7	11	17	18	2	2	1
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	3	6	3	5	4	5	7	8	5	4	6	6	12	3
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	3	4	2	4	4	4	5	5	5	4	3	2	12	2
A	63	A2-19 Do you troubleshoot alternator component parts	3	3	1	4	4	2	2	3	2	3	3	1	2	1
A	64	A2-20 Do you perform tasks on component parts of alternators	3	3	1	4	4	1	2	2	2	3	3	1	1	1
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	57	65	23	60	12	60	62	61	83	49	68	49	89	21
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	57	62	21	56	11	55	62	48	82	49	65	38	83	18
A	67	A2-23 Do you troubleshoot synchro or servo component parts	43	41	14	43	6	18	25	17	42	20	47	15	38	7
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	44	39	15	40	6	14	18	14	37	18	47	13	12	7
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	11	8	7	48	7	22	9	13	14	18	32	10	12	3
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	11	6	6	48	5	16	7	8	12	16	29	6	13	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	71	A2-27 Do you measure chopper coil excitation frequency	8	4	3	38	2	9	1	4	5	8	9	3	7	1
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	6	3	3	23	2	9	1	3	6	5	9	3	7	1
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	18	18	32	45	4	38	22	48	17	23	41	16	74	8
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	18	17	33	44	4	30	20	40	17	21	38	11	67	3
A	75	A2-31 Do you calibrate or adjust transducers	13	14	27	44	4	14	8	31	11	10	38	5	62	2
A	76	A2-32 Do you repair, clean or lubricate transducers	17	15	24	32	4	12	10	19	10	8	32	5	21	1
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	61	55	20	29	75	43	47	30	25	33	38	13	48	4
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	61	50	20	29	80	38	42	23	24	30	38	9	39	3
A	79	A2-35 Do you perform maintenance on solenoid component parts	41	27	13	15	58	19	21	10	11	12	26	5	2	0
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	59	60	36	91	38	46	55	39	52	49	56	16	26	11
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	57	53	32	90	38	36	45	30	49	47	53	11	23	9
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	34	28	16	69	27	10	18	10	20	19	26	5	4	4
0005		I 3. A3 Solid State Circuits and Devices														
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	89	89	68	97	67	94	92	82	95	95	88	34	70	38
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	89	82	63	96	65	77	80	56	94	92	85	21	49	18
A	85	A3-3 Do you check diodes using an ohmmeter	89	82	65	96	69	79	85	64	92	93	79	18	48	21
A	86	A3-4 Do you use diode characteristic curves	26	21	16	62	15	11	9	8	18	25	21	3	0	1
A	87	A3-5 Do you use diode substitution information	67	47	34	81	20	16	19	12	39	45	56	4	1	1
A	88	A3-6 Do you use diode color codes	24	18	13	35	18	13	12	8	14	23	26	8	2	4
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	90	88	70	97	73	91	93	80	98	97	82	26	40	32
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	90	81	62	97	70	74	79	54	96	91	79	13	16	5
A	91	A3-9 Do you check transistors using an ohmmeter	90	80	59	96	69	67	74	53	92	90	68	10	13	5
A	92	A3-10 Do you check transistors using transistor testers	82	46	32	89	38	28	27	15	48	45	47	6	1	1
A	93	A3-11 Do you use transistor characteristic curves	28	19	18	62	12	11	11	4	15	21	21	3	0	1
A	94	A3-12 Do you use transistor substitution information	78	56	41	87	26	21	20	12	39	50	44	5	0	1
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	88	89	66	95	55	95	87	81	86	94	88	34	50	30
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	89	79	61	95	47	77	70	46	82	87	79	13	24	8
A	97	A3-15 Do you use IC substitution information	77	68	52	84	25	33	34	16	36	51	44	6	2	4
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	70	74	46	86	36	60	60	51	55	74	62	26	16	15
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	70	70	42	85	32	50	51	29	52	69	62	13	9	5
A	100	A3-18 Do you perform tasks on varactors/varicaps	50	42	13	67	11	21	29	11	18	33	32	6	1	3
	101	A3-19 Do you perform tasks on tunnel diodes	20	37	7	83	11	18	26	5	21	37	26	2	1	2

D T Y	Tsk Nbr	Task Title	304 55	309 [illegible]	316 [illegible]	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	[illegible]	[illegible]	[illegible]	90	30	50	41	21	48	69	50	11	2	3
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	56	46	19	82	20	34	34	13	39	63	44	7	1	3
A	104	A3-22 Do you perform tasks on zener diodes	83	73	51	93	45	60	60	33	67	79	47	11	13	8
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	44	43	33	82	25	38	37	23	40	41	47	13	7	5
A	106	A3-24 Do you perform tasks on pin diodes	19	27	18	72	18	17	35	12	12	55	29	6	2	2
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	72	76	53	89	45	58	52	44	50	66	56	24	13	9
A	108	A3-26 Do you perform tasks on fantail transistors	16	17	4	38	9	11	11	4	8	15	12	3	1	2
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	70	71	23	83	34	26	34	11	40	49	50	9	1	4
A	110	A3-28 Do you perform tasks on triacs	25	24	9	45	29	11	18	5	16	21	18	9	2	3
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	11	11	3	33	9	10	11	2	5	8	24	4	1	3
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	23	25	9	42	14	12	13	6	13	21	32	5	2	3
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	11	8	3	25	8	10	7	3	5	8	21	4	1	2
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	9	14	2	31	9	11	14	3	6	10	12	2	2	2
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	25	28	13	44	15	23	23	9	21	28	35	5	2	2
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	7	12	3	29	8	9	15	4	7	15	15	2	0	2
A	117	A3-35 Do you perform tasks on varistors	52	45	18	71	27	24	22	19	27	38	21	5	1	3
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	12	15	5	31	8	9	7	2	5	10	12	2	0	2
A	119	A3-37 Do you perform tasks on schottky diodes	16	29	16	60	11	30	26	8	24	41	29	3	1	2
0006		I 4. A4 Tubes														
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	55	26	9	84	28	25	40	22	38	72	26	8	2	7
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	54	24	9	83	26	21	34	14	35	65	26	4	1	2
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	55	25	9	83	25	24	36	19	34	68	29	2	2	3
A	123	A4-4 Do you use electron tube characteristic curves	6	6	2	25	4	4	7	2	4	17	6	1	0	0
A	124	A4-5 Do you use electron tube substitution manuals or charts	39	8	2	64	8	4	7	2	7	14	6	1	0	0
A	125	A4-6 Do you perform tasks on diode tubes	19	4	4	68	15	6	10	5	11	22	6	2	0	2
A	126	A4-7 Do you perform tasks on triode tubes	23	3	4	69	10	4	13	2	8	24	9	0	1	1
A	127	A4-8 Do you perform tasks on tetrode tubes	21	4	2	59	6	4	4	1	5	21	6	1	1	1
A	128	A4-9 Do you perform tasks on pentode tubes	22	2	2	61	7	4	5	1	5	18	6	2	1	0
A	129	A4-10 Do you perform tasks on beam power tubes	13	13	0	33	6	5	15	4	4	17	6	2	0	0
A	130	A4-11 Do you perform tasks on gas tubes	10	4	3	56	10	6	3	2	8	16	6	1	0	0
A	131	A4-12 Do you perform tasks on phantastrons	2	1	0	18	4	4	2	2	2	3	6	1	0	0
A	132	A4-13 Do you perform tasks on neon tubes	7	8	3	46	12	2	2	2	5	9	0	1	0	2
A	133	A4-14 Do you perform tasks on xenon tubes	4	2	2	24	14	1	2	1	4	7	0	0	0	0
A	134	A4-15 Do you perform tasks on nixie tubes	6	22	9	75	8	13	7	3	48	32	0	2	1	1
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	80	52	13	80	37	65	41	56	39	50	56	45	11	28
A	136	A4-17 Do you trace schematic diagrams of CRT circuits	79	45	12	77	37	52	33	47	35	44	56	33	5	8

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A 137	A4-18 Do you troubleshoot to isolate a faulty CRT	81	47	12	77	35	62	39	51	35	50	56	37	9	18
A 138	A4-19 Do you adjust or calibrate circuits that control CRT operations	80	48	15	80	32	58	38	48	32	45	53	9	2	1
A 139	A4-20 Do you perform tasks on electrostatic CRT	51	22	4	49	12	26	12	19	15	19	35	6	2	2
A 140	A4-21 Do you perform tasks on electromagnetic CRT	61	26	8	54	24	34	26	37	21	30	35	15	4	4
0007	I 5. A5 Soldering or Solderless Connections														
A 141	A5-1 Do you solder or desolder hardwire connections	91	84	89	99	97	99	96	97	98	98	85	84	76	61
A 142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	91	83	84	98	96	93	93	81	97	95	85	13	20	12
A 143	A5-3 Do you solder or desolder printed circuit board connections	86	77	71	95	77	78	73	66	86	85	59	11	5	5
A 144	A5-4 Do you solder or desolder multi-layer circuit board connections	53	46	37	70	38	33	33	27	39	39	32	10	5	4
A 145	A5-5 Do you perform high reliability soldering	73	70	61	85	70	86	85	71	84	88	74	46	35	32
A 146	A5-6 Do you use crimping tool to repair or make connections	86	83	89	89	92	97	96	97	99	96	88	98	95	91
A 147	A5-7 Do you use wire wrap tool to make connections	33	67	52	38	35	83	57	55	44	49	62	38	29	28
A 148	A5-8 Do you use punch-on tool to make connections	34	29	22	28	32	39	24	21	21	28	50	30	18	16
A 149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	80	60	81	63	37	77	70	80	69	62	85	62	62	57
A 150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	91	82	89	82	49	99	96	94	95	96	88	98	44	92
A 151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	31	28	35	44	16	91	65	64	25	40	68	98	38	68
A 152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	38	45	56	51	27	25	46	52	30	46	71	12	6	7
0008	II. Test Equipment														
0009	II 1. B1 Multimeters														
B 153	B1-1 Do you use the multimeter to measure DC voltage values	93	92	92	99	98	99	99	97	99	99	91	95	96	89
B 154	B1-2 Do you use the multimeter to measure AC voltage values	92	90	91	99	99	96	98	95	100	96	91	90	95	83
B 155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	27	25	22	78	21	35	23	18	25	42	44	18	11	11
B 156	B1-4 Do you use the multimeter to measure DC current values	72	77	78	96	81	76	68	73	77	75	71	63	54	59
B 157	B1-5 Do you use the multimeter to measure AC current values	64	66	67	92	82	74	66	70	77	71	71	62	52	54
B 158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	19	17	20	74	18	26	16	13	16	29	44	13	9	10
B 159	B1-7 Do you use the multimeter to measure circuit resistance	79	80	75	92	88	89	85	83	90	87	79	78	90	78
B 160	B1-8 Do you use the multimeter to measure component resistance	90	87	82	98	91	93	93	88	96	92	88	57	84	64

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0010		II 2. B2 Oscilloscopes														
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	84	84	68	94	12	89	85	78	95	97	85	3	1	3
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	85	87	64	95	14	90	98	81	95	98	82	3	1	3
B	163	B2-3 Do you use the oscilloscope to measure AC voltage	80	82	68	94	17	96	98	78	98	96	79	3	2	1
B	164	B2-4 Do you use the oscilloscope to measure DC voltage	88	88	78	92	17	96	98	78	98	97	79	2	2	1
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	67	77	37	91	9	56	74	46	76	89	65	2	0	0
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	38	50	21	73	1	48	68	25	51	47	56	2	1	0
B	167	B2-7 Do you use the oscilloscope to observe signal/data patterns	78	83	63	81	10	84	76	52	68	73	62	2	1	1
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	18	22	8	50	1	17	10	14	17	13	32	2	0	0
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	73	78	54	84	12	89	88	59	88	81	79	2	1	2
B	170	B2-10 Do you use attenuator probes with oscilloscopes	71	72	51	94	8	86	83	67	82	85	65	2	2	3
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	30	35	22	81	7	71	76	37	43	49	50	1	0	2
0011		II 3. B3 Signal (Function) Generators														
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	83	79	62	93	4	72	83	2	63	90	74	11	2	7
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	82	79	54	95	4	51	60	72	58	88	71	4	4	2
B	174	B3-3 Do you use SG to troubleshoot circuits	76	75	49	84	3	44	57	58	53	77	71	10	4	4
B	175	B3-4 Do you use audio sine-wave signal generators	62	31	37	88	3	30	46	46	21	48	44	1	1	2
B	176	B3-5 Do you use audio non-sinusoidal signal generators	17	21	21	74	1	22	22	16	13	16	38	1	0	1
B	177	B3-6 Do you use RF less than 1,000MH signal generators	27	56	35	85	3	41	47	59	21	58	59	10	2	7
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	15	54	31	79	2	35	48	47	26	66	53	7	1	3
B	179	B3-8 Do you use white noise signal generators	12	13	8	24	1	4	6	5	2	14	29	1	0	3
B	180	B3-9 Do you use pattern signal generators	60	26	16	30	3	9	16	5	8	15	38	1	0	1
B	181	B3-10 Do you use pseudo-random signal generators	2	30	11	18	0	6	7	5	4	3	35	2	0	1
B	182	B3-11 Do you use time mark signal generators	10	21	8	89	2	11	16	8	5	14	32	1	0	1
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	30	66	55	92	4	57	71	30	51	53	56	2	0	0
B	184	B3-13 Do you use TV signal signal generators	81	3	7	20	0	9	4	13	2	5	15	1	0	0
0012		II 4. B4 Test Equipment Types														
B	185	B4-1 Do you use frequency counters	74	87	70	97	12	99	100	89	85	96	71	10	1	7
B	186	B4-2 Do you use spectrum analyzers	36	75	52	85	4	94	99	61	63	87	68	9	1	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
B	187	B4-3 Do you use field strength testers	22	8	8	24	3	8	9	5	5	6	15	19	2	5
B	188	B4-4 Do you use digital multimeters	91	91	89	99	70	99	99	94	96	99	91	82	83	83
B	189	B4-5 Do you use digital logic probes	40	61	35	77	13	45	25	24	28	22	50	6	1	2
B	190	B4-6 Do you use capacitance testers	77	57	31	80	10	13	13	8	26	45	29	6	12	2
B	191	B4-7 Do you use capacitor substitution boxes	15	3	11	59	4	5	7	3	8	8	21	6	7	2
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	64	3	3	18	3	7	5	2	2	3	24	6	0	2
B	193	B4-9 Do you use logic current tracers	17	26	16	66	6	9	13	5	8	7	21	5	0	2
B	194	B4-10 Do you use tube testers	50	3	3	56	9	5	9	1	4	15	15	4	0	2
B	195	B4-11 Do you use logic pulsers	24	36	18	74	5	13	12	5	7	5	24	5	0	2
B	196	B4-12 Do you use logic analyzers	16	49	29	60	4	13	15	8	9	14	41	6	1	2
B	197	B4-13 Do you use signature analyzers	8	14	11	59	3	11	9	5	8	6	26	5	0	2
B	198	B4-14 Do you use reflectometers	5	18	14	40	2	67	31	11	21	7	35	50	26	61
0013		III. Amplifier Circuits														
0014		III 1. C1 Transistor Amplifier Circuits														
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	85	81	41	90	26	72	64	53	69	86	71	21	18	27
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	85	77	40	90	26	65	56	42	68	86	65	13	13	16
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	85	72	37	89	22	49	47	28	64	79	47	2	4	7
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	83	68	31	86	16	35	32	15	50	65	38	2	1	3
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	61	50	15	69	5	21	20	10	29	44	32	2	0	2
C	204	C1-6 Do you adjust or align transistor amplifiers	67	60	21	79	6	28	32	18	35	61	44	1	1	2
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	70	62	29	80	11	35	35	21	41	58	44	2	1	3
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	33	37	18	59	6	18	20	7	17	28	26	1	0	2
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	56	50	13	76	10	16	12	11	21	30	29	2	0	1
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	38	37	12	72	10	23	22	10	25	45	38	2	0	1
C	209	C1-11 Do you work on paraphase transistor amplifiers	15	16	2	49	4	9	7	4	5	8	32	1	0	2
C	210	C1-12 Do you work on push-pull transistor amplifiers	69	50	22	83	12	33	28	16	38	56	38	2	0	5
C	211	C1-13 Do you work on audio transistor amplifiers	74	32	20	72	20	21	30	27	21	51	47	4	1	12
C	212	C1-14 Do you work on wideband transistor amplifiers	38	53	26	77	3	37	32	30	16	51	47	2	1	12
C	213	C1-15 Do you work on IF transistor amplifiers	67	64	20	73	9	49	45	34	39	77	56	8	1	12
C	214	C1-16 Do you work on RF transistor amplifiers	63	66	21	78	7	50	57	38	42	82	56	11	2	14
C	215	C1-17 Do you work on buffer transistor amplifiers	53	53	22	74	5	53	26	19	38	49	41	5	5	3
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	50	16	4	53	6	11	8	5	13	23	29	1	0	1
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	65	51	30	72	16	43	34	23	49	58	41	2	7	7

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0015	III 2. C2 Transistor Amplifier Stabilization Circuits														
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	63	49	14	65	11	30	29	19	29	38	41	2	7	4
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	62	47	13	63	9	18	20	9	24	38	35	2	2	1
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	64	44	9	61	11	24	27	15	26	40	35	1	2	2
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	41	34	8	60	7	18	20	11	21	26	38	2	2	3
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	54	34	7	61	12	27	30	15	29	34	38	2	9	3
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	65	46	15	68	15	30	29	18	33	42	35	2	5	3
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	48	24	5	51	6	21	18	11	22	29	35	1	1	2
	0016	III 3. C3 Coupling Circuits														
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	72	68	26	75	11	42	38	32	35	50	53	14	5	8
C	226	C3-2 Do you trace schematic diagrams of coupling circuits	70	67	24	75	11	36	35	25	32	47	50	8	4	2
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	68	62	19	73	11	24	26	15	30	46	44	4	0	1
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components	66	57	16	72	10	17	17	7	26	38	29	4	1	1
C	229	C3-5 Do you perform tasks on direct coupling circuits	68	62	18	71	9	28	30	18	31	47	47	3	4	1
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	64	54	16	71	10	23	22	13	26	40	38	4	4	0
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	60	52	12	67	9	21	18	13	23	37	38	2	1	0
C	232	C3-8 Do you perform tasks on transformer coupling circuits	64	56	20	67	10	21	21	18	26	35	44	4	1	1
C	233	C3-9 Do you perform tasks on optical coupling circuits	20	20	9	29	4	6	7	6	6	7	15	1	0	0
	0017	III 4. C4 Electron Tube Amplifier Circuits														
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	28	15	3	69	6	16	34	13	13	55	9	6	1	5
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	28	15	3	69	7	11	28	8	11	52	6	2	1	2
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	28	13	3	68	4	9	29	6	11	55	9	0	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	25	10	2	66	4	4	11	2	7	36	6	0	0	0
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	20	9	1	52	3	7	12	2	4	34	6	0	0	0
C	239	C4-6 Do you adjust or align electron tube amplifiers	24	14	2	63	2	8	21	6	8	50	6	0	0	0
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	24	13	1	57	3	6	26	5	5	44	6	0	0	0
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	9	7	0	39	3	2	19	3	3	25	3	0	0	0
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	6	1	1	40	0	2	3	0	3	5	6	0	0	0
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	14	3	0	58	3	3	5	0	4	20	6	0	0	0
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	12	2	1	55	2	1	4	2	2	16	6	0	0	1
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	20	6	2	65	2	6	8	3	7	24	6	0	1	0
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	20	4	2	62	1	4	16	4	6	29	6	0	0	0
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	17	5	2	62	2	7	15	4	7	32	6	1	1	0
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	17	4	2	62	0	4	10	2	5	18	6	0	0	0
0018		III 5. C5 Operational Amplifiers														
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	73	77	47	88	20	70	51	48	72	74	38	16	9	14
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	71	70	41	87	18	48	40	29	63	68	29	2	4	2
C	251	C5-3 Do you calculate op amp gain	29	34	20	61	5	21	11	10	17	23	15	0	0	0
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	52	64	33	80	7	28	17	15	31	47	29	0	0	0
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	63	68	40	79	11	47	35	33	56	64	29	2	2	3
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	56	63	31	78	8	49	31	28	42	57	26	3	2	4
C	255	C5-7 Do you use or apply operational amplifiers for summing	37	55	23	68	6	38	21	27	38	56	24	4	2	7
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	48	53	27	74	5	38	21	19	29	38	24	4	2	3
C	257	C5-9 Do you use or apply operational amplifiers as active filters	29	43	24	52	4	32	20	15	24	25	18	1	0	1
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	50	51	23	70	9	41	34	23	42	53	24	6	2	10
C	259	C5-11 Do you use or apply operational amplifiers as integrators	43	44	12	61	6	37	20	18	31	33	24	1	1	3
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	47	50	18	59	7	31	16	16	28	38	24	1	1	0
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	62	64	33	78	13	45	40	35	57	62	29	10	1	12

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	38	64	30	74	10	57	43	37	54	59	32	13	2	10
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	47	44	14	70	13	43	35	17	34	47	29	5	4	10
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	44	58	18	67	4	31	29	22	30	42	21	5	1	8
0019		III 6. C6 Magnetic Amplifiers														
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	5	6	5	8	3	10	13	4	5	2	12	4	2	2
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	5	6	4	8	3	9	10	3	5	1	9	2	1	0
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	5	4	3	7	4	6	10	3	3	1	6	0	2	0
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	5	3	1	8	3	4	3	2	2	2	9	0	1	0
C	269	C6-5 Do you adjust magnetic amplifiers or components	5	3	1	8	3	4	3	2	4	2	6	0	1	0
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	1	2	0	5	0	5	5	2	4	3	6	3	0	0
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	1	2	0	5	0	5	5	2	3	3	6	1	0	0
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	1	1	0	5	0	4	4	2	4	3	6	0	0	0
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	1	1	0	5	0	3	2	1	4	3	6	0	0	0
C	274	C6-10 Do you adjust saturable reactor circuits or components	1	1	0	4	0	4	2	1	4	3	6	0	0	0
0020		IV. Power Supplies														
0021		IV 1. D1 Power Supply Circuits														
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	89	63	93	75	94	91	82	93	95	76	61	51	58
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	86	84	57	94	72	89	84	71	94	90	71	42	44	25
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	87	85	59	93	73	89	88	80	96	94	79	39	37	36
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	85	70	41	92	55	48	45	34	67	71	44	7	10	7
D	279	D1-5 Do you align or adjust power supplies	85	85	56	94	54	82	88	76	93	94	68	3	2	3
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	68	50	27	89	35	42	41	28	51	59	56	6	9	9

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	75	55	32	90	41	44	46	31	57	68	56	7	7	9
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	81	59	35	89	43	45	46	30	55	71	53	6	12	11
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	16	34	13	47	15	30	34	25	30	41	44	6	2	7
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	65	38	20	77	18	33	32	26	34	44	35	8	1	4
D	285	D1-11 Do you perform tasks on DC to DC converters	55	41	32	73	20	47	48	26	45	51	32	10	4	5
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	37	32	22	73	25	46	47	33	56	47	47	8	6	7
D	287	D1-13 Do you perform tasks on switching power supplies	47	44	25	62	27	26	18	14	22	23	15	7	5	8
0022		IV 2. D2 Power Supply Filters														
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	68	65	28	80	19	68	61	45	57	65	56	12	7	21
D	289	D2-2 Do you trace schematic diagrams of power supply filters	68	63	27	79	20	57	54	34	55	60	50	8	4	7
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66	58	23	78	18	54	48	26	52	59	50	2	2	11
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	63	55	20	75	16	30	20	12	34	47	32	2	0	3
D	292	D2-5 Do you perform tasks on capacitive power supply filters	65	58	25	78	21	43	43	23	38	56	38	3	2	4
D	293	D2-6 Do you perform tasks on inductive power supply filters	50	48	17	69	16	38	36	19	32	52	38	2	2	4
D	294	D2-7 Do you perform tasks on L-type power supply filters	28	39	9	46	8	29	25	12	22	35	38	2	0	1
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29	36	11	40	8	23	18	10	15	35	29	3	1	1
D	296	D2-9 Do you perform tasks on T-type power supply filters	20	28	8	39	4	20	13	8	13	27	26	2	0	0
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59	56	23	77	18	38	40	23	36	53	38	4	4	3
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54	51	14	70	16	36	38	19	29	49	38	3	4	3
0023		IV 3. D3 Power Supply Voltage Regulators														
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	78	75	40	91	32	74	68	69	71	74	68	20	16	17
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	77	72	40	90	32	64	59	55	73	74	62	9	10	5
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	78	68	37	90	31	60	54	58	68	74	68	3	6	4
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	75	60	30	86	24	28	24	13	49	60	35	1	1	2
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	72	59	27	84	29	50	52	35	60	67	47	2	7	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	67	63	27	87	23	48	48	26	54	63	50	3	7	4
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	67	53	23	84	19	35	32	27	45	51	41	2	2	4
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	58	51	25	75	13	28	26	19	27	43	24	2	0	2
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	25	25	6	45	4	22	19	15	21	32	38	3	2	4
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	43	43	13	71	11	30	23	14	25	40	32	2	0	1
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	11	45	9	61	4	38	30	12	19	25	38	4	0	3
0024		V. Reactive Circuits														
0025		V 1. E1 Resistive Capacitive Inductive Circuits														
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	59	64	19	73	13	43	35	24	32	47	41	16	13	7
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	57	57	15	71	11	21	21	10	27	41	26	2	9	1
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	53	56	15	68	11	35	32	19	24	42	32	11	9	5
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	50	50	12	65	9	15	20	7	18	36	15	1	6	1
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	15	17	8	44	4	11	10	6	13	14	9	2	2	1
E	315	E1-6 Do you calculate phase angle of RCL circuits	10	12	4	31	2	6	7	4	9	12	9	1	1	1
E	316	E1-7 Do you calculate values of power in RCL circuits	10	14	5	36	3	6	9	5	9	12	9	1	1	1
0026		V 2. E2 Frequency Sensitive Filters														
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	46	60	22	70	7	31	37	34	20	65	47	14	5	22
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	44	53	19	68	6	23	29	27	20	64	44	3	1	8
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	42	47	13	64	4	11	13	13	15	40	18	1	0	4
E	320	E2-4 Do you align or adjust frequency sensitive filters	42	45	16	67	5	19	19	18	15	36	21	1	1	3
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	13	15	6	39	2	6	5	5	5	12	12	1	0	3
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters	48	50	23	72	4	32	32	29	18	51	35	5	1	11

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	48	48	22	72	3	31	31	30	17	49	35	4	1	7
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	49	57	27	72	3	30	34	31	16	77	35	4	1	8
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	34	43	14	64	2	15	15	18	10	35	32	2	0	2
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	29	14	2	37	1	7	11	5	5	14	26	2	0	2
0027		VI. Waveshaping/Generating Circuits														
0028		VI 1. F1 Oscillators														
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	73	76	36	84	15	58	63	45	51	82	50	34	10	36
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	74	71	32	84	14	49	55	34	48	77	41	21	6	12
F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	73	68	27	83	11	45	51	32	48	75	41	15	4	7
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	70	59	21	80	6	21	26	11	32	49	26	3	0	0
F	331	F1-5 Do you align or adjust oscillator circuits	72	64	28	84	7	35	40	30	39	71	41	2	0	0
F	332	F1-6 Do the oscillators you work with use LC tank circuits	60	50	17	77	10	29	37	18	35	49	35	3	2	1
F	333	F1-7 Do the oscillators you work with use RC networ s	60	49	21	81	7	30	35	20	32	53	32	8	2	1
F	334	F1-8 Do the oscillators you work with use crystals	66	72	33	81	5	35	45	35	36	61	35	10	1	4
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	41	64	25	63	2	19	38	33	10	49	32	10	1	4
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	36	26	5	58	3	12	10	6	12	20	24	1	0	0
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	35	25	6	53	4	13	10	6	14	21	24	2	0	0
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	34	26	5	61	4	9	12	4	8	26	24	2	0	0
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	9	13	0	33	2	6	7	4	6	9	12	1	0	0
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	49	53	29	75	4	23	40	26	14	64	35	6	2	1
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	62	61	24	78	4	28	30	24	27	51	32	6	0	2
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	20	16	4	73	1	9	9	3	10	21	24	1	1	0
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	41	30	10	62	5	23	25	16	20	36	35	8	2	3
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	30	13	1	36	2	9	7	3	7	10	26	0	0	0
F	345	F1-19 Do you perform tasks on burst generators	48	6	1	39	1	6	8	4	11	13	26	2	0	1
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	30	22	6	51	3	20	21	10	15	31	29	5	2	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0029		VI 2. F2 Multivibrators														
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	59	53	21	77	12	49	41	27	45	58	44	15	18	14
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	59	49	19	76	13	40	37	18	43	55	38	9	9	5
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	57	45	16	75	10	30	26	14	38	52	32	2	2	3
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	56	40	11	71	7	12	12	7	26	39	15	2	0	1
F	351	F2-5 Do you adjust or align multivibrator circuits	51	37	11	71	4	20	20	11	25	40	15	1	0	1
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	55	39	11	65	9	24	26	13	31	38	29	2	2	2
F	353	F2-7 Do the multivibrators you work with use RC networks	56	43	16	73	11	26	29	15	30	47	29	5	4	4
F	354	F2-8 Do the multivibrators you work with use Crystals	53	46	18	70	4	20	27	17	23	40	32	2	2	5
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	55	42	17	77	11	34	29	14	35	51	35	2	4	7
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	51	44	17	74	11	35	29	15	38	54	32	3	5	7
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	54	46	19	75	11	37	32	15	39	53	32	3	6	8
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	42	33	9	64	8	28	26	11	27	45	29	2	4	2
0030		VI 3. F3 Waveshaping Circuits														
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	62	51	11	73	8	45	37	27	43	52	44	11	4	4
F	360	F3-2 Do you trace schematic diagrams of WSC	62	49	11	72	9	38	30	18	40	47	38	6	2	1
F	361	F3-3 Do you troubleshoot to isolate a faulty WSC	60	45	11	70	6	34	25	17	39	47	35	2	1	0
F	362	F3-4 Do you troubleshoot WSC to circuit level components	60	41	8	67	3	13	10	6	30	37	15	2	0	0
F	363	F3-5 Do you adjust or calibrate WSC	57	43	9	72	4	25	15	15	34	38	29	0	0	0
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	60	39	10	73	8	35	33	16	39	47	35	3	1	1
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	50	38	5	65	5	21	16	12	23	33	32	3	1	0
F	366	F3-8 Do you perform tasks on RC differentiating WSC	46	24	5	50	4	18	11	8	14	21	26	2	0	0
F	367	F3-9 Do you perform tasks on RL differentiating WSC	41	23	3	45	3	17	10	7	13	21	26	2	0	0
F	368	F3-10 Do you perform tasks on RC integrating WSC	43	24	5	53	5	19	12	9	13	23	26	2	0	0
F	369	F3-11 Do you perform tasks on RL integrating WSC	40	23	4	45	4	19	10	8	13	21	26	2	0	0
F	370	F3-12 Do you perform tasks on square wave generator WSC	58	48	16	73	10	40	36	17	39	51	38	3	1	1
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	39	34	8	63	5	35	27	10	31	36	29	2	1	0
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	50	34	11	69	7	26	19	11	21	38	29	1	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0031		VI 4. F4 Limiter/Clamper Circuits														
F	373	F4-1 Do you trace block diagrams of circuits containing limiters	62	53	8	71	8	53	35	28	39	51	44	8	5	2
F	374	F4-2 Do you trace schematic diagrams of limiter circuits	63	50	8	69	8	45	30	19	37	48	35	5	4	0
F	375	F4-3 Do you trace block diagrams of circuits containing clampers	62	49	6	68	8	43	23	20	35	47	38	2	1	0
F	376	F4-4 Do you trace schematic diagrams of clamper circuits	64	46	6	67	6	40	22	16	35	44	35	2	0	0
F	377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	60	43	7	67	5	33	20	13	33	45	32	1	2	0
F	378	F4-6 Do you troubleshoot limiters to circuit level components	58	40	5	66	4	13	10	6	26	38	15	1	1	0
F	379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	62	41	4	65	5	28	14	9	30	40	26	1	0	0
F	380	F4-8 Do you troubleshoot clampers to circuit level components	60	39	3	64	3	12	9	5	24	36	15	0	0	0
F	381	F4-9 Do you perform tasks on series diode limiter circuits	54	34	5	65	5	35	22	14	30	40	26	0	1	0
F	382	F4-10 Do you perform tasks on shunt diode limiter circuits	48	36	4	65	4	35	20	15	27	40	26	1	0	0
F	383	F4-11 Do you perform tasks on bias limiter circuits	40	30	3	55	3	30	13	11	24	33	26	0	0	0
F	384	F4-12 Do you perform tasks on zener diode circuits	62	46	9	70	7	37	28	16	35	48	35	1	2	0
F	385	F4-13 Do you perform tasks on transistor limiter circuits	57	32	6	64	5	29	19	12	26	34	26	1	1	0
F	386	F4-14 Do you perform tasks on triode limiter circuits	22	13	2	43	0	16	7	7	13	21	12	0	0	0
F	387	F4-15 Do you perform tasks on diode clamper circuits	61	43	5	63	5	33	18	15	27	42	29	0	0	0
F	388	F4-16 Do you perform tasks on bias clamper circuits	39	26	1	54	3	26	13	12	22	34	24	0	0	0
0032		VII. Computers, Digital Circuits, and Devices														
0033		VII 1. G1 Digital Logic Numbering Systems and Functions														
G	389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	26	64	37	47	8	91	63	67	60	51	62	66	21	32
G	390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	13	44	25	37	4	91	50	66	49	49	59	62	18	20
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	17	53	24	38	3	92	41	62	56	42	56	38	12	12
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	13	44	24	36	3	88	43	61	46	45	56	42	15	14
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	16	50	24	37	3	89	37	61	57	41	56	35	9	12
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	12	36	17	32	2	90	36	57	41	38	56	35	10	10
G	395	G1-7 Do you convert base number fractions to another base numbering system	11	28	11	31	3	48	23	28	30	27	29	26	7	9
G	396	G1-8 Do you add binary numbers	17	41	22	38	6	78	41	49	45	44	38	26	9	18

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	397	G1-9 Do you subtract binary numbers	17	39	21	38	6	71	37	47	40	42	38	20	10	14
G	398	G1-10 Do you multiply binary numbers	13	25	12	27	4	48	23	27	25	27	29	12	5	8
G	399	G1-11 Do you divide binary numbers	13	23	11	26	3	45	22	26	23	27	26	11	5	7
G	400	G1-12 Do you add octal numbers	10	31	14	28	3	76	29	45	30	36	29	17	6	7
G	401	G1-13 Do you subtract octal numbers	10	30	12	28	3	70	27	42	30	36	29	16	6	5
G	402	G1-14 Do you add hexadecimal numbers	11	32	16	27	1	65	20	38	34	30	21	14	6	4
G	403	G1-15 Do you subtract hexadecimal numbers	10	30	14	27	1	59	20	35	35	30	21	14	6	4
G	404	G1-16 Do you use binary coded decimal (BCD)	20	57	32	53	6	84	58	62	52	60	56	51	13	21
G	405	G1-17 Do you use gray codes	4	7	3	14	1	7	2	8	16	9	44	5	0	1
G	406	G1-18 Do you use ICAO codes	1	2	1	8	0	4	2	3	3	1	9	4	0	1
G	407	G1-19 Do you use excess-3 (XS3) codes	3	2	0	8	0	4	2	6	7	2	24	5	0	1
G	408	G1-20 Do you use parity bit codes	6	34	12	19	3	54	19	34	36	33	50	16	2	4
G	409	G1-21 Do you use biquinary codes	2	2	1	7	2	5	1	4	7	2	9	7	0	1
G	410	G1-22 Do you use ASCII codes	11	33	17	36	3	65	20	45	21	15	56	5	0	3
G	411	G1-23 Do you use EBCDI codes	2	4	4	11	0	4	1	3	5	1	12	3	0	1
G	412	G1-24 Do you trace data flow through logic symbol diagrams	42	76	31	68	11	86	63	55	78	75	62	57	27	33
G	413	G1-25 Do you trace data flow through logic schematic diagrams	44	77	32	68	11	84	60	50	77	75	59	51	27	27
G	414	G1-26 Do you troubleshoot digital systems to major units	41	78	29	64	11	76	52	56	70	71	59	51	22	23
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	43	78	29	66	11	70	45	45	71	72	47	7	1	2
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	42	72	26	65	7	48	31	18	55	64	41	6	1	1
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	40	74	28	65	6	74	50	36	68	71	47	25	17	9
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	33	53	21	60	6	65	43	33	64	66	47	22	16	13
G	419	G1-31 Do you perform tasks related to AND gates	55	78	38	72	15	84	62	54	85	79	62	26	34	27
G	420	G1-32 Do you perform tasks related to OR gates	54	78	38	72	15	84	62	54	84	79	62	26	34	28
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	49	72	24	68	6	73	53	48	80	77	50	24	24	20
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	53	76	35	71	13	81	60	52	83	79	62	26	32	27
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	50	73	30	67	9	79	52	49	76	75	62	23	18	17
G	424	G1-36 Do you perform tasks related to RS flip flops	41	63	16	59	5	74	43	42	74	65	50	8	5	5
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	37	65	21	59	7	70	32	34	57	54	50	9	2	8
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	37	60	17	59	7	62	35	33	60	55	44	7	2	10
G	427	G1-39 Do you perform tasks related to JK flip flops	45	71	24	63	5	77	48	38	77	69	50	7	0	2
G	428	G1-40 Do you perform tasks related to Schmidt triggers	39	52	21	64	7	46	33	25	46	53	50	5	0	3
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	33	53	21	58	6	43	34	33	44	54	47	8	7	7
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	28	55	16	47	3	40	23	19	32	43	41	7	6	3
G	431	G1-43 Do you perform tasks related to buffers	44	68	28	66	4	65	38	35	54	64	59	10	10	8
G	432	G1-44 Do you perform tasks related to inverters	49	72	31	68	7	67	46	38	66	71	59	10	15	11
G	433	G1-45 Do you perform tasks related to complemented flip flops	25	36	11	43	3	37	21	20	30	34	41	6	0	3
G	434	G1-46 Do you perform tasks related to complementing flip flops	25	36	10	43	3	36	22	20	30	34	41	5	0	3

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	9	24	9	25	3	30	17	13	26	27	21	10	5	5
G	436	G1-48 Do you develop logic diagrams from Boolean equations	8	17	8	22	3	26	16	12	21	23	21	8	4	4
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	9	21	8	23	3	23	18	15	21	25	21	10	5	4
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	23	36	11	45	4	30	15	16	26	33	32	3	0	3
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	30	33	11	48	5	36	17	18	29	33	32	3	0	2
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	38	68	31	67	8	57	30	32	38	54	53	3	0	2
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	13	18	6	35	4	26	12	22	20	27	38	1	0	1
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	7	10	3	25	2	14	5	6	8	12	26	2	0	1
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	29	39	24	49	7	30	25	21	21	39	35	1	0	2
G	444	G1-56 Do you perform tasks on positive MOS ICs	14	23	4	27	2	17	11	11	13	25	26	2	0	1
G	445	G1-57 Do you perform tasks on negative MOS ICs	13	16	4	27	0	16	9	10	13	20	26	3	0	1
G	446	G1-58 Do you perform tasks on vertical MOS ICs	6	7	2	18	0	14	5	6	10	10	15	2	0	1
0034		VII 2. G2 Computers														
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	19	61	25	35	3	82	43	75	48	46	68	62	32	32
G	448	G2-2 Do you load programs	21	58	43	42	11	85	44	82	42	42	71	60	9	27
G	449	G2-3 Do you write or debug programs	9	12	19	18	7	23	11	57	15	16	41	7	0	3
G	450	G2-4 Do you troubleshoot computers to a major unit	17	55	21	20	4	83	41	80	43	38	59	45	22	15
G	451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	13	56	15	18	3	82	42	81	49	37	59	7	1	2
G	452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	12	41	8	14	2	38	17	20	26	18	26	5	0	1
G	453	G2-7 Do you use computer flow charts or diagrams	11	52	17	27	4	65	41	70	35	33	65	46	11	7
G	454	G2-8 Do you perform tasks on analog computers	8	21	7	19	3	57	24	27	41	32	18	33	22	21
G	455	G2-9 Do you perform tasks on digital computers	21	65	47	35	6	87	45	82	54	47	68	55	24	30
G	456	G2-10 Do you use Basic computer language	16	24	29	35	11	33	12	9	11	16	44	9	5	7
G	457	G2-11 Do you use COBOL computer language	0	2	4	4	1	3	2	2	4	1	3	2	0	4
G	458	G2-12 Do you use FORTRAN computer language	0	8	14	4	3	4	4	4	3	3	6	2	0	2
G	459	G2-13 Do you use ADA computer language	0	1	1	2	1	1	2	3	2	1	3	1	0	1
G	460	G2-14 Do you use ATLAS computer language	0	0	0	5	2	68	41	88	21	31	68	2	0	1
G	461	G2-15 Do you use ELAN computer language	0	0	0	3	1	2	34	1	2	1	3	1	0	1
G	462	G2-16 Do you use PASCAL computer language	0	1	6	4	2	4	2	2	6	2	6	2	0	2
G	463	G2-17 Do you use RPG computer language	0	0	0	2	1	1	1	3	1	1	3	1	0	2
G	464	G2-18 Do you use Machine computer language	5	19	8	16	2	36	15	16	18	7	44	3	0	3
G	465	G2-19 Do you use C computer language	1	1	5	2	2	1	1	2	2	1	3	2	0	1
G	466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	25	58	43	27	7	89	45	81	42	49	71	24	9	16
G	467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	22	55	27	29	4	70	32	68	28	44	59	21	7	15

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	2	20	10	9	1	58	40	42	27	39	15	6	0	12
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	4	4	3	3	1	6	1	4	4	10	3	4	0	1
G	470	G2-24 Do you perform tasks on computer keyboards	29	67	52	35	9	48	46	85	45	43	74	41	16	8
G	471	G2-25 Do you perform tasks on computer character printers	18	50	35	21	7	73	32	65	24	25	65	10	6	5
G	472	G2-26 Do you perform tasks on magnetic tape drives	14	47	31	16	2	83	26	67	33	26	50	11	5	3
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	10	34	32	19	2	18	10	42	21	19	53	10	4	4
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	24	44	33	18	3	57	25	65	22	29	62	29	7	10
G	475	G2-29 Do you perform tasks on paper tape readers/punches	1	20	5	4	1	64	38	39	19	45	9	6	0	5
G	476	G2-30 Do you perform tasks on paper card readers/punches	1	4	5	4	1	8	3	8	14	6	3	4	0	2
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	11	34	15	14	3	66	27	43	29	40	38	24	9	5
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	14	42	16	26	3	57	15	38	35	34	41	28	5	5
G	479	G2-33 Do you perform tasks on modems	7	40	14	5	3	4	2	4	6	7	47	4	1	4
G	480	G2-34 Do you perform tasks on line printers	10	44	37	11	4	29	27	41	21	19	59	8	4	7
G	481	G2-35 Do you perform tasks on floppy disc drives	17	49	43	18	5	11	7	6	14	13	26	8	1	3
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	7	15	17	10	1	7	38	78	10	20	59	5	0	3
G	483	G2-37 Do you perform tasks on removable pack disc drives	2	21	14	3	1	5	4	10	4	7	41	5	0	2
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	7	21	24	7	3	5	10	10	9	8	21	4	0	4
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	17	49	17	43	4	35	24	53	20	29	53	13	2	13
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	16	48	13	42	4	34	24	48	21	28	44	2	0	3
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	15	43	9	39	2	24	12	17	15	18	24	2	1	3
0035		VII S. G3 Digital Circuits														
G	488	G3-1 Do you trace data flow through circuits containing counters	31	66	22	61	11	62	45	36	52	54	56	12	15	4
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	29	59	19	61	12	46	35	22	47	50	41	3	12	1
G	490	G3-3 Do you troubleshoot counters to circuit level components	27	54	17	59	8	28	16	8	36	42	12	1	4	0
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	29	55	21	55	9	58	38	28	49	51	38	4	2	1
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	28	50	19	52	9	59	38	28	48	49	38	2	0	0
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	17	38	15	57	5	48	24	19	38	37	29	1	0	0
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	9	28	4	28	1	14	11	6	14	14	26	2	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	10	23	2	16	1	11	7	8	12	10	12	0	0	0
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	17	46	14	45	4	45	29	25	33	34	38	2	1	1
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	18	47	13	45	4	45	28	23	33	36	38	2	1	1
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	23	61	17	36	4	62	40	34	45	44	50	5	2	3
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	22	53	16	33	3	45	34	17	44	39	41	1	0	1
G	500	G3-13 Do you troubleshoot registers to circuit level components	21	46	14	30	2	28	15	5	30	31	15	0	0	1
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	22	54	19	33	2	53	33	32	46	44	44	1	1	1
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	22	52	15	33	2	55	32	30	43	42	44	2	1	1
G	503	G3-16 Do you trace data flow through combinational logic circuits	26	54	16	33	1	43	29	25	35	47	50	9	1	5
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	25	50	15	32	1	34	24	16	34	43	41	2	0	0
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	24	43	11	30	0	23	10	6	27	34	15	2	0	0
G	506	G3-19 Do you perform tasks on encoders	36	55	16	36	3	45	26	23	41	53	56	5	0	5
G	507	G3-20 Do you perform tasks on decoders	35	57	15	36	4	45	26	24	43	55	56	5	0	5
G	508	G3-21 Do you perform tasks on multiplexers	26	50	18	33	1	50	27	26	40	44	53	7	1	2
G	509	G3-22 Do you perform tasks on demultiplexers	18	46	16	26	1	43	23	23	30	38	47	4	0	1
G	510	G3-23 Do you perform tasks on comparators	23	55	12	33	1	46	26	24	27	46	53	3	1	2
G	511	G3-24 Do you perform tasks on parity generators or checkers	10	34	7	20	0	43	15	16	22	27	53	2	0	2
G	512	G3-25 Do you perform tasks on code converters	9	29	8	18	0	23	11	9	17	21	32	1	0	0
G	513	G3-26 Do you perform tasks on adders	18	37	5	30	1	36	18	13	26	25	44	5	0	2
G	514	G3-27 Do you perform tasks on subtractors	13	31	5	28	1	33	16	12	24	23	44	5	0	2
G	515	G3-28 Do you perform tasks on count detect circuits	11	21	3	17	0	25	10	6	11	10	18	0	0	1
0036		VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/ Converters														
G	516	G4-1 Do you trace data flow through A/D converters	27	60	26	63	3	67	42	50	57	52	53	42	17	26
G	517	G4-2 Do you trace data flow through D/A converters	27	66	23	61	3	68	40	47	54	53	50	34	17	22
G	518	G4-3 Do you troubleshoot A/D converter circuits	26	55	20	61	2	52	36	48	52	48	38	18	5	9
G	519	G4-4 Do you troubleshoot D/A converter circuits	26	61	18	60	2	51	33	44	49	48	38	15	4	5
G	520	G4-5 Do the converters you perform tasks on use flash conversion	4	4	3	12	0	4	2	3	5	6	9	2	1	3
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	7	15	5	27	1	14	4	9	10	12	18	2	0	3
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	9	25	8	42	1	16	10	10	12	21	24	4	1	2
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	3	7	2	16	0	6	5	5	5	6	0	1	0	2

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0037	VIII. Transmission/Reception Circuits, Devices, and Systems														
	0038	VIII 1. H1 Connections														
H	524	H1-1 Do you measure electrical length on transmission lines	12	18	17	20	0	16	9	6	4	5	15	20	2	23
H	525	H1-2 Do you measure physical length on transmission lines	26	25	31	21	1	22	10	6	7	8	21	33	2	36
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	13	24	14	43	0	9	18	18	7	18	32	22	1	54
H	527	H1-4 Do you construct transmission lines	21	26	28	19	0	16	13	10	7	10	15	28	0	27
H	528	H1-5 Do you match transmission line impedance with loads	28	24	18	38	0	11	9	10	5	16	29	12	1	21
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	9	8	6	24	0	6	4	4	4	3	12	9	2	14
H	530	H1-7 Do you troubleshoot transmission lines	34	36	30	25	0	21	20	15	13	22	26	42	9	59
H	531	H1-8 Do you perform tasks on open-wire transmission lines	5	13	13	19	0	13	8	9	7	9	32	23	7	23
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	13	31	33	17	0	26	13	12	14	14	41	62	11	46
H	533	H1-10 Do you perform tasks on twin lead transmission lines	20	14	15	18	0	13	8	12	7	8	29	14	0	21
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	47	46	50	38	1	40	35	28	21	37	56	68	9	66
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	18	33	23	34	0	34	30	16	10	27	47	46	4	39
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	8	8	11	4	0	16	3	1	4	2	3	4	0	4
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	7	26	8	45	2	78	85	46	41	34	53	87	21	67
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	4	23	4	41	1	74	80	44	39	32	50	82	18	64
H	539	H1-16 Do you pressurize or purge waveguide assemblies	4	15	2	12	1	62	63	42	38	10	44	92	21	78
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	1	11	3	42	1	21	38	28	17	18	35	26	4	30
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	5	19	6	47	1	72	78	49	40	34	44	92	20	83
	0039	VIII 2. H2 Microwave Oscillators and Amplifiers														
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	6	30	6	57	1	59	63	34	34	48	53	41	6	27
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	4	27	5	56	1	54	57	28	33	47	41	30	4	17
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	8	23	4	57	1	46	45	19	32	45	41	6	0	2
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0	2	0	37	0	2	4	2	13	3	6	2	0	0

DTY	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0	10	0	28	0	1	4	1	7	3	0	3	0	0
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0	3	0	44	0	6	6	2	24	7	9	4	0	0
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	15	2	44	0	27	54	27	26	45	38	19	4	2
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0	2	0	28	0	9	20	9	35	5	29	11	2	2
H	550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	36	0	5	8	2	27	37	3	2	0	0
H	551	H2-10 Do you perform tasks on parametric amplifiers	0	3	4	13	0	23	4	2	4	6	0	7	0	0
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	2	1	48	1	3	34	23	12	39	29	3	2	3
	0040	VIII 3. H3 Resonant Cavities														
H	553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	4	19	2	40	0	9	14	12	17	30	21	3	0	1
H	554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	3	15	1	38	0	6	12	5	14	25	15	0	0	0
H	555	H3-3 Do you tune or adjust resonant cavities electrically	5	10	1	37	0	3	12	6	14	21	18	0	0	0
H	556	H3-4 Do you tune or adjust resonant cavities physically	3	13	3	37	0	3	14	4	15	16	15	0	0	0
H	557	H3-5 Do you measure frequency of resonant cavities	3	14	2	39	0	4	10	5	14	18	15	0	0	0
H	558	H3-6 Do you perform tasks on probe resonant cavities	3	10	1	26	0	3	4	3	6	10	3	0	1	0
H	559	H3-7 Do you perform tasks on loop resonant cavities	2	4	2	18	0	0	3	3	5	10	3	0	0	0
H	560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	2	7	0	7	0	3	5	3	4	4	6	0	0	0
	0041	VIII 4. H4 Transmitters and Receivers														
H	561	H4-1 Do you use "AM" modulation principles	14	25	8	61	1	13	38	49	12	53	44	8	0	21
H	562	H4-2 Do you trace block diagrams of AM transmitters	12	21	5	50	1	10	41	52	10	55	38	8	2	25
H	563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	13	18	3	48	1	10	38	49	10	55	38	3	2	7
H	564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	13	15	2	44	1	9	34	35	9	51	32	2	1	3
H	565	H4-5 Do you troubleshoot AM transmitters to major units	12	18	5	46	1	8	32	49	8	51	35	6	1	15
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	12	16	3	46	1	9	34	50	8	51	38	1	1	2
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	11	14	2	44	1	6	12	14	5	39	24	1	1	2
H	568	H4-8 Do you align or adjust AM transmitters or circuits	12	15	3	52	1	6	37	51	8	52	29	2	1	3
H	569	H4-9 Do you calculate percentage of modulation for AM transmitters	8	10	5	61	1	4	26	44	4	46	18	1	1	3
H	570	H4-10 Do you use "AM" demodulation principles	16	40	10	35	0	5	19	33	4	36	35	2	0	15
H	571	H4-11 Do you trace block diagrams of AM receivers	18	42	8	33	0	9	34	48	4	45	35	6	2	32

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	18	39	7	31	0	9	32	47	5	45	35	1	1	11
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	19	36	6	30	0	8	29	36	4	45	32	0	1	4
H	574	H4-14 Do you troubleshoot AM receivers to major units	19	38	7	29	0	6	30	46	4	44	32	2	1	16
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	19	34	6	29	0	6	30	45	4	45	35	0	0	3
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	18	30	4	29	0	4	9	10	2	36	24	0	1	3
H	577	H4-17 Do you align or adjust AM receivers or circuits	19	34	9	34	0	6	29	43	5	45	26	1	1	5
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	4	8	2	8	0	4	13	10	5	38	18	2	2	11
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	12	9	4	38	18	1	1	3
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	8	8	4	38	18	1	1	3
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	4	8	1	8	0	3	9	9	5	36	18	1	1	7
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	4	8	1	7	0	3	10	9	4	38	18	0	0	1
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	3	8	1	7	0	1	2	3	4	32	12	0	0	1
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	4	6	2	7	0	4	11	8	6	38	18	0	0	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	3	3	1	9	0	2	7	8	2	36	9	0	0	1
H	586	H4-26 Do you trace block diagrams of SSB receivers	5	8	3	6	0	5	17	8	5	38	18	2	1	10
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	15	7	5	38	18	1	0	3
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	11	6	4	38	18	0	0	1
H	589	H4-29 Do you troubleshoot SSB receivers to major units	5	7	2	6	0	4	13	8	4	35	18	0	0	5
H	590	H4-30 Do you troubleshoot SSB receivers to subassemblies or circuit cards	5	6	2	6	0	4	12	8	4	38	18	0	0	1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	5	6	1	6	0	4	5	3	4	34	9	0	0	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	5	7	2	6	0	4	11	8	5	36	18	0	0	1
H	593	H4-33 Do you use "FM" modulation principles	25	25	22	58	1	14	37	48	13	42	53	18	4	27
H	594	H4-34 Do you trace block diagrams of FM transmitters	21	25	17	46	1	16	38	53	12	41	50	30	4	39
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	19	24	11	46	1	12	35	52	12	41	47	7	1	8
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	19	21	9	43	1	9	30	39	11	38	41	2	0	7
H	597	H4-37 Do you troubleshoot FM transmitters to major units	20	24	13	42	1	9	30	49	11	39	44	15	2	29
H	598	H4-38 Do you troubleshoot FM transmitters to subassemblies or circuit cards	19	20	7	43	1	9	29	50	12	40	47	2	0	1
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	18	18	6	42	1	4	7	13	7	31	29	2	0	1
H	600	H4-40 Do you align or adjust FM transmitters or circuits	22	21	12	48	1	8	25	49	10	36	44	2	0	2
H	601	H4-41 Do you calculate modulation index for FM transmitters	8	12	8	41	1	4	7	24	2	24	15	1	0	0
H	602	H4-42 Do you measure frequency deviation for FM transmitters	16	16	12	54	1	6	20	46	7	32	26	2	0	3
H	603	H4-43 Do you use "FM" demodulation principles	22	47	24	35	0	11	22	37	9	28	47	14	2	16

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	604	H4-44 Do you trace block diagrams of FM receivers	25	48	22	32	0	15	33	49	8	32	47	20	4	33
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	25	47	16	31	0	14	30	49	8	32	44	6	1	9
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	25	44	14	30	0	12	27	37	8	30	41	2	0	4
H	607	H4-47 Do you troubleshoot FM receivers to major units	26	47	18	29	0	14	28	46	8	30	41	12	2	25
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	25	42	13	29	0	14	24	48	10	31	44	2	0	3
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	24	38	10	29	0	7	7	13	5	25	26	1	0	1
H	610	H4-50 Do you align or adjust FM receivers or circuits	25	43	18	33	0	11	26	48	9	29	44	1	0	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	5	17	7	15	0	4	5	6	3	14	9	1	0	0
H	612	H4-52 Do you use "PM" modulation principles	2	22	11	44	2	10	23	31	15	33	50	19	4	13
H	613	H4-53 Do you trace block diagrams of PM transmitters	2	21	6	36	1	13	24	29	17	36	47	30	5	20
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2	20	4	36	0	12	22	27	16	33	44	8	2	2
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	2	18	4	34	0	9	21	22	15	32	44	3	2	2
H	616	H4-56 Do you troubleshoot PM transmitters to major units	2	19	4	33	1	8	23	24	15	33	47	16	5	13
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	18	3	32	1	9	20	25	14	33	47	0	2	0
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	16	2	31	0	3	7	9	7	27	26	0	2	0
H	619	H4-59 Do you align or adjust PM transmitters or circuits	2	17	3	38	0	5	21	22	14	30	44	0	1	3
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	2	13	3	42	1	6	18	17	11	29	35	3	2	5
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	2	15	5	44	1	9	25	22	15	34	41	5	2	7
H	622	H4-62 Do you use "PM" demodulation principles	2	41	12	28	1	5	13	23	10	25	47	15	4	9
H	623	H4-63 Do you trace block diagrams of PM receivers	2	42	10	24	0	8	18	25	11	27	44	24	5	16
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2	41	8	23	0	6	17	23	11	27	41	4	2	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2	38	8	23	0	5	16	19	10	26	41	2	2	1
H	626	H4-66 Do you troubleshoot PM receivers to major units	2	39	8	23	0	5	16	22	11	26	41	14	5	10
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2	35	7	23	0	6	15	22	11	26	41	0	2	0
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	2	31	5	22	0	3	6	7	7	22	24	0	2	0
H	629	H4-69 Do you align or adjust PM receivers or circuits	2	37	9	25	0	5	15	19	11	25	38	0	2	2
0042		VIII 5. H5 Antennas														
H	630	H5-1 Do you physically align antennas	15	46	21	5	0	8	46	27	27	12	44	34	4	20
H	631	H5-2 Do you electrically align antennas	10	48	10	6	0	6	46	35	35	12	50	18	1	8
H	632	H5-3 Do you troubleshoot loading of antennas	7	21	10	5	0	6	15	20	10	14	35	10	5	21
H	633	H5-4 Do you troubleshoot coupling of antennas	6	25	10	5	0	3	20	20	13	14	47	14	6	17

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	634	H5-5 Do you plot graph radiation patterns	1	5	3	1	0	1	4	5	4	4	21	4	0	3
H	635	H5-6 Do you troubleshoot antenna components	7	52	13	4	0	5	42	40	26	10	50	40	12	35
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	8	21	12	10	0	1	20	29	7	17	35	13	1	39
H	637	H5-8 Do you work with Yagi antennas	12	2	3	0	0	0	2	1	1	0	3	2	0	1
H	638	H5-9 Do you work with dipole antennas	11	36	17	7	0	1	50	16	7	19	35	51	9	58
H	639	H5-10 Do you work with slotted antennas	1	0	3	2	0	1	21	15	1	3	9	18	1	1
H	640	H5-11 Do you work with rotary antennas	1	2	2	4	0	1	6	4	4	5	12	15	0	10
H	641	H5-12 Do you work with hertz antennas	0	2	1	1	0	0	2	1	2	2	0	2	0	10
H	642	H5-13 Do you work with marconi antennas	0	2	0	2	0	1	2	3	2	1	0	3	0	7
H	643	H5-14 Do you work with rhombic antennas	0	1	0	1	0	0	2	1	1	2	0	3	0	5
H	644	H5-15 Do you work with scimitar antennas	0	0	0	1	0	1	2	1	1	0	0	2	0	2
H	645	H5-16 Do you work with parabolic antennas	6	54	11	2	0	1	4	8	20	7	18	9	1	10
H	646	H5-17 Do you work with ground plane antennas	2	7	8	5	0	1	3	11	4	13	12	8	1	11
H	647	H5-18 Do you perform tasks on rotary antenna arrays	0	4	2	2	0	1	4	3	3	2	9	10	1	7
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	1	1	0	0	0	0	3	1	1	1	9	2	0	1
H	649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	1	0	0	2	1	1	1	3	4	0	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	1	1	1	0	0	0	2	4	1	3	3	4	4	37
H	651	H5-22 Do you perform tasks on collinear antenna arrays	1	1	0	1	0	1	2	2	1	0	3	2	0	1
H	652	H5-23 Do you perform tasks on phase antenna arrays	2	19	4	2	0	0	13	20	7	7	53	17	1	12
H	653	H5-24 Do you perform tasks on planar antenna arrays	2	7	3	1	0	2	41	13	7	2	9	54	6	8
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	7	14	13	3	1	2	19	16	14	8	38	36	5	13
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	7	17	10	3	1	3	20	15	14	5	38	35	5	9
H	656	H5-27 Do you perform tasks on antennas with circular polarization	2	34	14	3	1	1	18	11	14	5	47	21	2	12
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	9	36	14	5	1	1	16	24	9	11	50	38	6	37
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	6	13	7	4	1	1	15	14	13	9	47	17	5	17
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	11	22	15	6	1	4	30	23	10	18	41	29	9	64
0043		IX. Radio Frequency (RF) Measurements or Calculations														
0044		IX 1. I1 RF Measurements														
I	660	I1-1 Do you measure RF power	22	58	27	79	1	73	90	76	43	95	65	42	7	51
I	661	I1-2 Do you measure RF peak power	17	39	19	75	1	67	80	59	36	86	59	18	2	28
I	662	I1-3 Do you measure RF average power	17	38	16	69	1	55	77	48	28	73	56	15	0	14
I	663	I1-4 Do you measure RF effective power	14	30	13	60	1	43	41	38	18	45	53	18	0	16
I	664	I1-5 Do you measure RF output power using wattmeters	20	37	22	68	1	54	76	63	25	67	50	30	9	62

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0045	IX 2. I2 RF Calculations														
I 665	I2-1 Do you calculate RF apparent power	3	18	5	45	2	19	29	17	11	25	26	1	0	5
I 666	I2-2 Do you calculate RF true power	3	20	8	55	2	22	29	19	13	30	32	1	0	8
I 667	I2-3 Do you calculate RF power loss or gain in db	8	44	17	73	2	54	74	53	24	75	50	10	2	14
0046	X. Additional Circuits, Devices, Systems, or Items														
0047	X 1. J1 Microphones and Speakers														
J 668	J1-1 Do you trace block diagrams of circuits containing microphones	57	6	11	7	25	1	4	18	2	17	3	9	6	43
J 669	J1-2 Do you trace schematic diagrams of microphone circuits	56	6	8	7	25	1	3	16	2	16	3	6	6	18
J 670	J1-3 Do you troubleshoot to isolate a faulty microphone	61	7	12	7	27	1	5	19	2	18	6	6	7	35
J 671	J1-4 Do you troubleshoot microphones	58	3	7	7	23	1	1	13	1	13	3	0	1	11
J 672	J1-5 Do you work on carbon microphones	45	3	6	3	16	1	1	18	1	16	3	2	1	20
J 673	J1-6 Do you work on capacitor microphones	32	0	3	4	10	1	1	2	0	2	3	0	0	2
J 674	J1-7 Do you work on crystal microphones	28	3	5	6	11	1	1	5	0	3	0	0	1	7
J 675	J1-8 Do you work on dynamic microphones	56	4	10	6	13	1	2	10	1	11	6	2	1	7
J 676	J1-9 Do you work on velocity ribbon microphones	13	0	0	1	3	1	0	1	0	1	0	0	0	0
J 677	J1-10 Do you trace block diagrams of circuits containing speakers	62	19	10	14	33	3	7	16	1	14	6	4	4	27
J 678	J1-11 Do you trace schematic diagrams of speaker circuits	60	16	8	13	34	3	5	13	1	13	3	3	4	14
J 679	J1-12 Do you troubleshoot to isolate a faulty speaker	63	17	11	12	36	3	6	17	1	13	3	2	2	21
J 680	J1-13 Do you troubleshoot speakers	50	7	8	8	26	3	3	9	0	8	3	0	0	7
0048	X 2. J2 Photosensitive Devices														
J 681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	46	55	14	32	43	29	23	23	5	25	21	10	2	13
J 682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	46	52	13	32	44	26	22	18	4	23	9	3	1	1
J 683	J2-3 Do you troubleshoot to isolate a faulty photosensitive device	46	52	14	30	44	23	23	19	4	23	9	4	1	4
J 684	J2-4 Do you adjust or calibrate photosensitive devices	35	42	11	29	35	15	10	16	3	16	6	0	0	0
J 685	J2-5 Do you work on photodiodes	30	42	11	24	32	13	13	10	4	23	3	2	0	1
J 686	J2-6 Do you work on phototransistors	31	13	8	21	22	8	11	4	3	8	6	2	0	0
J 687	J2-7 Do you work on phototubes	12	2	2	19	25	6	2	6	1	1	0	1	0	1
J 688	J2-8 Do you work on photo-SCRs	9	4	1	16	15	8	5	1	1	3	0	0	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	17	30	10	24	38	13	8	8	3	7	6	2	0	2
0049		X 3. J3 Storage Type Display Tubes														
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	5	5	1	26	2	6	6	8	11	11	0	13	1	7
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	5	5	1	26	2	6	5	7	11	10	0	8	1	1
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	5	5	0	25	1	5	5	7	12	11	0	6	1	3
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	4	4	0	27	2	4	4	7	10	10	0	1	0	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	3	1	1	15	1	1	2	2	11	10	0	3	0	1
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	1	1	0	8	1	1	1	1	1	2	0	2	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	1	1	0	7	1	1	1	0	1	1	0	2	0	0
0050		X 4. J4 Television, Laser, and Infrared Systems														
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	78	6	9	1	8	3	0	17	0	3	0	2	1	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	77	6	4	1	7	2	0	17	0	3	0	2	1	0
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	78	5	6	1	8	2	0	20	0	3	0	3	1	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	78	3	3	1	4	4	2	10	0	3	0	0	0	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	79	4	6	1	6	4	2	19	0	3	0	1	0	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	7	19	5	2	4	2	2	1	0	0	0	2	2	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	7	19	5	2	4	2	2	1	0	0	0	2	1	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	6	19	5	2	4	2	2	1	0	0	0	2	1	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	6	18	5	2	4	2	2	1	0	0	0	0	0	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	6	19	5	2	4	2	2	1	0	0	0	0	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	5	2	4	1	2	2	2	1	1	7	0	1	0	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	5	2	5	0	2	2	2	1	1	8	0	0	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	6	2	5	0	3	3	2	1	1	8	0	1	0	1
J	712	J4-16 Do you adjust or calibrate infrared systems or components	4	2	5	1	2	2	2	1	1	8	0	1	0	0

0051 Tasks not referenced

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0065	GP0068/PMP	All DAFSC 45252A	85	9.47	15.40	92.94	.00	712
3	F0066	GP0069/PMP	All DAFSC 45252B	105	9.93	17.32	100.00	.00	712
4	F0067	GP0070/PMP	All DAFSC 45252C	98	9.40	15.91	97.96	.00	712
5	F0068	GP0071/PMP	All DAFSC 45253A	97	13.32	18.18	98.97	.00	712
6	F0069	GP0072/PMP	All DAFSC 45253B	61	10.57	18.77	100.00	.00	712
7	F0070	GP0073/PMP	All DAFSC 45253C	68	11.83	18.71	100.00	.00	712
8	F0071	GP0074/PMP	All DAFSC 45271	227	11.70	16.59	95.15	.00	712
9	F0072	GP0075/PMP	All DAFSC 45272	271	11.35	15.98	94.46	.00	712
10	F0073	GP0076/PMP	All DAFSC 45273	147	13.57	17.56	98.64	.00	712
11	F0074	GP0077/PMP	All DAFSC 45550A	149	22.92	22.87	97.32	.00	712
12	F0075	GP0078/PMP	All DAFSC 45550B	146	16.07	19.03	98.63	.00	712

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
13	F0094	GP0117/PMP	All DAFSC 455X3A	108	20.25	20.98	98.15	.00	712
14	F0099	GP0139/PMP	All DAFSC 456X0	111	21.07	23.35	97.30	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0001	EPI Electronic Principles Inventory													
	0002	I. General Electronic/Electricity													
	0003	I 1. A1 Direct/Alternating Current													
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	54	67	52	75	85	71	67	60	79	72	58	76	88
A	2	A1-2 Do you use basic DC electrical/electronic terms	88	97	95	97	97	93	93	94	97	94	97	96	97
A	3	A1-3 Do you use basic AC electrical/electronic terms	88	97	94	96	97	91	93	94	97	93	97	95	97
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	86	100	96	96	97	91	92	93	99	97	95	96	97
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	84	95	93	87	97	84	86	89	95	95	92	94	95
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	31	25	19	44	46	25	21	26	27	50	28	43	59
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	14	17	17	39	38	18	16	19	22	49	27	44	55
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	14	17	15	40	33	22	16	18	20	55	27	46	58
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	52	53	63	67	75	40	48	63	65	89	78	84	85
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	27	30	46	29	41	13	23	39	31	73	63	55	59
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	21	25	18	32	49	18	21	26	38	81	63	71	71
A	12	A1-12 Do you calculate the value of a resistor required for a circuit	13	15	14	14	18	7	13	17	16	32	28	31	26

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	12	20	17	15	16	10	15	21	21	60	58	54	50
A	14	A1-14 Do you ohm check resistors	36	31	43	28	41	22	27	44	39	79	71	69	78
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	93	99	92	85	97	75	89	91	92	95	86	98	94
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	89	97	87	73	90	69	84	90	85	87	85	96	92
A	17	A1-17 Do you adjust relays	18	20	18	18	18	15	20	18	20	20	26	17	21
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	19	30	21	21	21	18	23	21	24	28	34	26	23
A	19	A1-19 Do you continuity check relays	76	89	65	62	80	65	77	76	80	83	77	89	81
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	31	21	22	42	16	19	26	32	27	56	54	47	48
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	13	12	9	12	8	3	13	19	15	45	45	30	26
A	22	A1-22 Do you calculate values of circuit total inductance	4	4	3	5	5	0	5	7	8	10	17	10	6
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	4	4	2	2	7	1	5	7	7	9	16	6	6
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	4	4	3	5	7	1	6	6	6	15	17	12	8
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	6	6	2	8	7	1	4	6	12	25	29	22	20
A	26	A1-26 Do you ohm check inductors	11	13	9	11	11	3	12	20	14	38	40	32	23
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	40	66	44	62	84	44	48	48	67	87	72	76	77
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	24	53	27	27	66	28	32	36	49	70	60	52	53
A	29	A1-29 Do you calculate values of circuit total capacitance	13	37	10	18	64	12	12	20	39	18	21	16	11
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	12	26	7	13	43	13	10	16	29	17	18	13	10
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	12	22	7	13	34	12	11	13	22	23	21	17	12
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	12	33	8	13	44	10	17	18	31	25	32	23	37
A	33	A1-33 Do you ohm check capacitors	21	36	22	21	48	22	24	24	37	61	55	53	43
A	34	A1-34 Do you use capacitor color codes in your present job	9	16	8	8	7	9	9	9	13	12	19	11	9
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	62	54	59	65	70	34	37	70	70	76	60	86	83
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	49	42	43	30	52	12	23	60	48	68	52	71	71
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	16	11	13	7	16	6	5	15	18	17	21	21	15
A	38	A1-38 Do you calculate impedance of transformers	13	9	9	4	7	3	4	13	14	13	16	14	9
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	8	11	7	3	11	4	7	14	17	22	23	16	35
A	40	A1-40 Do you ohm check transformers	35	30	33	16	39	10	16	46	39	54	49	48	43
A	41	A1-41 Do you measure transformer output voltage	34	31	33	24	51	19	19	44	44	64	52	57	66
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	32	28	15	27	39	18	15	33	34	52	38	56	53

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	29	22	12	12	30	7	11	28	24	46	35	49	46
A	44	A1-44 Do you adjust three phase transformers	11	12	6	5	8	3	5	11	14	17	20	15	28
0004		I 2. A2 Electro/Mechanical Devices													
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	25	31	18	42	62	21	26	30	53	69	70	42	55
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	12	28	12	20	46	12	20	22	36	65	65	37	53
A	47	A2-3 Do you troubleshoot DC motor component parts	1	11	7	3	23	1	7	10	12	28	27	11	11
A	48	A2-4 Do you perform tasks on DC motor component parts	4	9	6	4	13	1	5	8	13	23	28	11	13
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	21	25	14	42	59	16	20	25	56	52	51	33	55
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	11	23	10	15	48	10	15	20	39	49	45	31	54
A	51	A2-7 Do you troubleshoot AC motor component parts	5	7	6	4	23	1	6	9	12	16	19	12	7
A	52	A2-8 Do you perform tasks on AC motor component parts	5	8	5	4	13	1	5	7	12	15	22	8	9
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	15	38	14	16	31	9	15	21	20	15	17	16	20
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	6	31	7	6	25	1	9	16	13	13	15	12	19
A	55	A2-11 Do you troubleshoot DC generator component parts	5	14	4	0	15	0	4	7	7	4	10	5	7
A	56	A2-12 Do you perform tasks on component parts of DC generators	5	12	3	0	8	0	3	6	7	4	9	4	9
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	12	36	12	14	28	9	11	25	24	13	14	18	14
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	6	32	9	5	23	1	7	21	16	11	13	12	13
A	59	A2-15 Do you troubleshoot AC generator component parts	5	13	5	0	15	0	3	8	7	4	7	3	4
A	60	A2-16 Do you perform tasks on component parts of AC generators	5	11	3	0	8	0	2	7	7	3	7	3	5
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	7	5	3	8	5	7	6	5	5	3	5	2	2
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	1	5	1	2	5	1	4	3	3	2	3	2	1
A	63	A2-19 Do you troubleshoot alternator component parts	1	3	1	0	3	0	1	1	3	1	3	1	0
A	64	A2-20 Do you perform tasks on component parts of alternators	0	5	1	0	5	0	1	1	3	1	3	1	0
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	41	92	30	71	98	40	62	62	80	74	42	74	86
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	29	88	23	42	90	28	51	55	69	72	38	68	82
A	67	A2-23 Do you troubleshoot synchro or servo component parts	9	48	8	14	49	9	22	23	25	35	21	29	28
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	5	31	5	10	23	9	18	17	18	28	21	21	31
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	11	13	7	18	15	0	11	9	8	7	13	13	14
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	5	13	3	6	11	0	7	5	7	7	13	10	7

D T	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	71	A2-27 Do you measure chopper coil excitation frequency	4	8	2	1	5	0	4	2	5	1	8	3	3
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	2	4	2	1	5	0	4	2	5	2	9	6	3
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	18	41	13	25	66	9	34	29	41	15	10	24	57
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	13	38	8	13	52	9	30	24	38	13	10	22	54
A	75	A2-31 Do you calibrate or adjust transducers	5	13	5	6	18	4	22	10	20	6	8	14	21
A	76	A2-32 Do you repair, clean or lubricate transducers	5	10	5	4	11	1	11	8	11	5	7	9	23
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	21	32	8	24	59	13	28	21	46	64	54	17	23
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	13	30	6	15	44	6	22	17	39	62	54	14	23
A	79	A2-35 Do you perform maintenance on solenoid component parts	2	10	2	5	10	0	7	5	11	30	31	6	6
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	16	26	9	46	33	15	26	22	39	26	17	52	56
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	11	21	7	31	30	13	22	18	30	23	17	50	50
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	4	10	3	13	10	1	7	6	12	13	9	19	16
0005		I 3. A3 Solid State Circuits and Devices													
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	47	55	59	67	75	49	62	62	70	85	75	85	78
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	25	45	45	37	44	22	46	46	48	77	67	69	71
A	85	A3-3 Do you check diodes using an ohmmeter	21	41	38	33	46	26	44	42	48	73	71	73	69
A	86	A3-4 Do you use diode characteristic curves	6	8	5	2	8	6	7	6	11	10	14	6	8
A	87	A3-5 Do you use diode substitution information	7	10	8	0	5	3	8	6	13	19	22	14	19
A	88	A3-6 Do you use diode color codes	8	10	7	1	3	9	7	7	13	16	24	15	17
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	35	28	33	47	64	34	37	39	54	85	7.	74	59
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	12	14	18	11	26	9	14	16	29	77	61	49	42
A	91	A3-9 Do you check transistors using an ohmmeter	11	12	17	7	25	9	11	11	24	72	58	50	34
A	92	A3-10 Do you check transistors using transistor testers	7	9	9	0	8	9	6	5	14	20	32	6	5
A	93	A3-11 Do you use transistor characteristic curves	6	5	4	1	3	7	3	4	10	6	12	5	4
A	94	A3-12 Do you use transistor substitution information	8	6	5	1	2	7	4	3	10	21	18	11	11
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	40	38	30	39	51	29	44	42	37	83	54	69	60
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	15	23	10	10	23	6	14	15	16	63	47	26	38
A	97	A3-15 Do you use IC substitution information	5	10	6	5	7	4	9	7	6	19	19	9	22
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	19	15	9	20	18	13	23	19	19	50	37	37	37
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	11	9	2	3	7	4	10	10	9	43	34	28	25
A	100	A3-18 Do you perform tasks on varactors/varicaps	7	5	2	3	2	4	4	6	5	10	7	7	3
A	101	A3-19 Do you perform tasks on tunnel diodes	6	4	1	2	0	1	4	3	3	8	7	5	3

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	7	6	1	2	0	1	7	6	6	41	24	33	17
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	8	7	3	3	3	1	5	6	4	33	29	23	13
A	104	A3-22 Do you perform tasks on zener diodes	9	19	5	7	18	4	8	13	12	52	38	45	29
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	9	9	3	6	0	4	8	8	7	29	21	13	16
A	106	A3-24 Do you perform tasks on pin diodes	9	4	3	2	2	3	6	5	5	12	8	8	7
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	14	12	5	15	7	10	18	14	12	58	34	21	39
A	108	A3-26 Do you perform tasks on fantail transistors	8	4	2	1	0	0	4	3	3	7	4	5	3
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	6	7	1	4	3	0	6	5	7	29	21	37	15
A	110	A3-28 Do you perform tasks on triacs	7	5	2	2	0	1	6	4	4	9	6	5	7
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	8	4	2	1	0	0	4	4	3	4	5	4	3
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	6	4	2	1	2	1	4	4	3	13	7	3	5
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	7	4	2	1	0	1	4	3	3	3	5	1	2
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	5	5	2	1	0	1	4	3	3	4	3	3	3
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	6	7	2	1	0	0	5	4	4	10	15	13	11
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	6	5	2	1	0	0	4	4	3	3	3	2	2
A	117	A3-35 Do you perform tasks on varistors	8	6	2	6	11	1	5	5	6	19	10	15	4
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	7	4	1	1	2	3	4	3	4	4	3	2	1
A	119	A3-37 Do you perform tasks on schottky diodes	7	7	2	1	0	1	4	4	3	14	6	8	9
0006		I 4. A4 Tubes													
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	11	1	2	13	0	9	7	7	10	23	12	44	40
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	6	1	1	5	0	4	3	3	7	21	10	39	33
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	2	1	1	4	0	4	2	3	5	20	10	37	32
A	123	A4-4 Do you use electron tube characteristic curves	2	2	0	0	0	3	0	1	1	3	1	4	4
A	124	A4-5 Do you use electron tube substitution manuals or charts	2	2	0	1	0	3	0	1	2	3	1	6	6
A	125	A4-6 Do you perform tasks on diode tubes	1	2	0	2	0	0	0	2	2	3	2	10	11
A	126	A4-7 Do you perform tasks on triode tubes	0	1	0	1	0	0	0	2	2	1	1	10	5
A	127	A4-8 Do you perform tasks on tetrode tubes	0	1	1	0	0	0	0	1	1	1	1	6	4
A	128	A4-9 Do you perform tasks on pentode tubes	0	1	1	0	0	0	0	1	2	1	1	4	3
A	129	A4-10 Do you perform tasks on beam power tubes	1	1	0	0	0	0	1	1	3	6	3	11	3
A	130	A4-11 Do you perform tasks on gas tubes	4	1	1	2	0	3	0	1	2	3	2	4	4
A	131	A4-12 Do you perform tasks on phantastrons	1	1	1	0	0	0	0	1	1	0	2	2	0
A	132	A4-13 Do you perform tasks on neon tubes	0	1	1	1	0	3	0	1	2	1	1	2	1
A	133	A4-14 Do you perform tasks on xenon tubes	0	1	0	2	0	1	0	1	2	6	0	1	1
A	134	A4-15 Do you perform tasks on nixie tubes	1	3	1	6	0	3	4	2	4	3	0	3	2
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	40	6	20	46	8	28	32	30	29	45	29	71	71
A	136	A4-17 Do you trace schematic diagrams of CRT circuits	22	4	12	20	3	12	19	17	16	40	23	57	59

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	137	A4-18 Do you troubleshoot to isolate a faulty CRT	24	6	17	26	3	22	18	17	16	41	25	55	65
A	138	A4-19 Do you adjust or calibrate circuits that control CRT operations	6	3	3	19	2	13	4	4	12	39	26	46	53
A	139	A4-20 Do you perform tasks on electrostatic CRT	4	2	3	9	2	3	6	4	7	17	14	19	43
A	140	A4-21 Do you perform tasks on electromagnetic CRT	12	2	4	15	0	4	9	6	10	32	15	34	23
0007		I 5. A5 Soldering or Solderless Connections													
A	141	A5-1 Do you solder or desolder hardwire connections	68	75	91	91	97	91	73	79	91	89	84	84	92
A	142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	24	25	24	20	18	16	22	22	26	83	73	60	72
A	143	A5-3 Do you solder or desolder printed circuit board connections	12	20	13	9	13	9	12	12	15	64	57	40	42
A	144	A5-4 Do you solder or desolder multi-layer circuit board connections	11	21	15	10	8	9	11	13	14	33	26	13	21
A	145	A5-5 Do you perform high reliability soldering	47	54	47	61	48	53	33	48	44	72	67	45	51
A	146	A5-6 Do you use crimping tool to repair or make connections	81	94	98	98	97	100	95	90	95	94	93	94	95
A	147	A5-7 Do you use wire wrap tool to make connections	28	34	39	25	33	21	30	25	31	30	29	22	29
A	148	A5-8 Do you use punch-on tool to make connections	19	29	29	20	20	15	21	23	24	18	18	8	16
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	54	57	51	62	48	60	67	59	68	68	58	59	62
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	71	45	88	96	89	96	88	76	93	86	65	87	95
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	44	19	38	31	20	60	78	41	52	62	27	15	68
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	20	20	14	12	10	12	13	20	16	23	15	4	22
0008		II. Test Equipment													
0009		II 1. B1 Multimeters													
B	153	B1-1 Do you use the multimeter to measure DC voltage values	88	97	88	99	100	99	92	89	96	97	99	93	97
B	154	B1-2 Do you use the multimeter to measure AC voltage values	87	94	87	97	98	99	92	87	96	95	95	92	96
B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	15	21	12	16	16	18	18	16	24	28	32	26	29
B	156	B1-4 Do you use the multimeter to measure DC current values	64	61	48	70	61	68	50	48	53	71	68	59	69
B	157	B1-5 Do you use the multimeter to measure AC current values	61	59	49	70	61	66	48	47	51	68	62	58	68
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	15	15	10	12	15	21	19	13	16	23	24	13	19
B	159	B1-7 Do you use the multimeter to measure circuit resistance	86	90	78	70	93	76	78	85	86	85	77	84	79
B	160	B1-8 Do you use the multimeter to measure component resistance	66	79	52	53	80	56	65	63	65	80	71	80	78

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0010	II 2.	B2 Oscilloscopes													
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	6	2	3	46	20	28	3	5	22	82	54	62	75
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	6	2	4	43	16	25	4	5	25	83	55	61	90
B	163	B2-3 Do you use the oscilloscope to measure AC voltage	7	3	5	46	34	37	5	7	33	83	56	61	87
B	164	B2-4 Do you use the oscilloscope to measure DC voltage	7	3	5	45	33	35	5	8	35	84	60	56	88
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	2	1	1	13	5	12	3	4	14	57	24	57	66
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	4	1	1	16	7	13	2	2	14	38	19	26	43
B	167	B2-7 Do you use the oscilloscope to observe signal/data patterns	8	2	1	23	11	19	4	6	22	59	46	43	75
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	4	2	0	6	3	3	0	2	9	13	20	6	48
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	4	2	3	30	13	19	3	7	21	79	47	68	82
B	170	B2-10 Do you use attenuator probes with oscilloscopes	6	2	2	21	10	19	2	6	21	64	39	46	64
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	4	2	2	13	5	7	1	2	11	44	26	16	40
0011	II 3.	B3 Signal (Function) Generators													
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	5	4	11	12	10	19	7	7	5	67	40	31	59
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	2	2	6	6	5	0	2	2	5	62	37	27	59
B	174	B3-3 Do you use SG to troubleshoot circuits	5	4	8	9	11	15	5	6	6	52	32	29	36
B	175	B3-4 Do you use audio sine-wave signal generators	0	2	4	4	2	3	2	2	5	14	29	5	5
B	176	B3-5 Do you use audio non-sinusoidal signal generators	0	1	2	4	2	1	1	1	3	2	5	3	6
B	177	B3-6 Do you use RF less than 1,000MH signal generators	1	1	5	9	7	10	4	4	6	10	10	15	23
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	2	1	2	9	2	10	5	3	5	6	5	18	32
B	179	B3-8 Do you use white noise signal generators	0	1	2	3	2	1	1	0	3	3	8	3	1
B	180	B3-9 Do you use pattern signal generators	0	1	1	2	2	3	1	0	3	24	24	12	5
B	181	B3-10 Do you use pseudo-random signal generators	0	1	2	3	2	1	1	0	2	3	3	4	1
B	182	B3-11 Do you use time mark signal generators	0	1	1	3	2	3	2	0	3	9	5	5	6
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	1	1	2	6	2	6	2	2	3	42	17	11	30
B	184	B3-13 Do you use TV signal signal generators	0	1	2	3	2	1	2	1	3	40	38	22	4
0012	II 4.	B4 Test Equipment Types													
B	185	B4-1 Do you use frequency counters	5	6	5	7	7	4	9	8	9	72	62	49	69
B	186	B4-2 Do you use spectrum analyzers	4	5	4	7	5	15	11	9	12	13	8	6	74

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
B	187	B4-3 Do you use field strength testers	5	6	9	5	16	29	13	7	24	5	6	5	5
B	188	B4-4 Do you use digital multimeters	76	74	73	82	92	91	80	75	84	93	90	87	93
B	189	B4-5 Do you use digital logic probes	6	5	4	4	7	6	8	8	12	13	30	6	31
B	190	B4-6 Do you use capacitance testers	20	62	14	16	62	7	15	34	40	5	10	2	5
B	191	B4-7 Do you use capacitor substitution boxes	7	22	4	4	11	9	11	11	12	3	5	2	3
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	6	5	4	4	5	6	7	6	9	6	6	2	13
B	193	B4-9 Do you use logic current tracers	4	5	4	4	7	4	7	6	10	5	12	3	2
B	194	B4-10 Do you use tube testers	5	6	3	4	5	4	7	6	8	5	6	2	11
B	195	B4-11 Do you use logic pulsers	5	5	4	4	5	4	7	6	10	4	14	3	5
B	196	B4-12 Do you use logic analyzers	5	6	5	4	5	6	8	7	10	9	12	2	5
B	197	B4-13 Do you use signature analyzers	5	5	4	5	7	6	8	6	8	4	5	2	4
B	198	B4-14 Do you use reflectometers	41	42	64	55	39	60	57	62	59	54	22	27	14
0013		III. Amplifier Circuits													
0014		III 1. C1 Transistor Amplifier Circuits													
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	20	10	31	31	38	31	26	26	35	66	44	51	36
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	15	10	18	18	31	13	19	14	21	64	42	42	24
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	6	3	15	6	21	1	7	7	10	55	40	27	21
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	5	2	7	3	5	1	4	3	5	36	32	19	7
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	2	2	3	2	3	1	4	1	3	15	20	6	5
C	204	C1-6 Do you adjust or align transistor amplifiers	2	2	3	2	5	0	3	1	3	26	21	20	12
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	2	2	4	4	11	3	4	3	6	35	29	21	12
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	4	2	2	2	5	1	3	2	4	13	10	7	4
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	4	2	4	1	5	0	3	1	3	30	21	6	3
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	4	2	3	1	2	0	3	1	5	19	23	19	6
C	209	C1-11 Do you work on paraphase transistor amplifiers	2	2	2	1	2	1	2	1	3	7	5	5	2
C	210	C1-12 Do you work on push-pull transistor amplifiers	4	4	6	2	3	3	3	3	6	42	34	31	14
C	211	C1-13 Do you work on audio transistor amplifiers	6	7	22	6	5	15	5	13	8	7	28	6	2
C	212	C1-14 Do you work on wideband transistor amplifiers	6	4	7	4	2	10	6	6	5	10	14	11	2
C	213	C1-15 Do you work on IF transistor amplifiers	6	5	10	10	5	16	7	10	7	17	17	32	28
C	214	C1-16 Do you work on RF transistor amplifiers	9	6	16	13	7	16	10	12	13	21	23	44	21
C	215	C1-17 Do you work on buffer transistor amplifiers	6	5	5	7	7	4	6	4	7	39	27	19	7
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	2	3	2	1	3	1	1	1	3	12	14	2	2
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	7	7	4	10	15	4	5	5	12	43	32	30	14

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0015	III 2. C2 Transistor Amplifier Stabilization Circuits													
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	5	4	4	9	11	3	7	4	9	37	26	20	12
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	4	2	1	0	7	0	4	0	5	28	24	9	5
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	1	3	1	3	3	0	2	2	6	22	26	13	5
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	1	2	1	3	2	0	2	1	5	15	21	6	2
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	5	4	1	5	16	1	3	2	9	23	23	22	7
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	4	3	1	5	8	3	3	2	7	29	26	20	9
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	1	1	1	3	2	0	2	1	4	9	18	8	4
	0016	III 3. C3 Coupling Circuits													
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	16	10	19	12	10	18	13	15	14	45	25	24	21
C	226	C3-2 Do you trace schematic diagrams of coupling circuits	12	10	12	5	7	7	9	10	9	42	25	21	17
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	7	4	10	4	7	3	2	7	6	29	23	16	14
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components	4	3	2	3	3	1	2	3	5	21	19	7	8
C	229	C3-5 Do you perform tasks on direct coupling circuits	4	8	9	7	5	4	4	5	8	30	21	14	16
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	2	8	3	3	7	3	2	2	8	31	20	13	8
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	2	9	4	3	3	0	2	3	8	27	16	12	7
C	232	C3-8 Do you perform tasks on transformer coupling circuits	7	7	9	2	5	3	6	10	7	26	15	12	13
C	233	C3-9 Do you perform tasks on optical coupling circuits	2	4	1	3	2	1	1	2	4	25	9	2	5
	0017	III 4. C4 Electron Tube Amplifier Circuits													
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	6	2	2	7	0	3	3	1	2	9	5	23	17
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	4	2	1	3	0	0	1	1	1	9	4	24	14
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	1	1	1	2	0	0	1	0	1	8	3	19	11

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	0	1	0	0	0	0	1	0	1	3	2	12	5
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	0	1	1	0	0	0	0	0	0	4	1	7	5
C	239	C4-6 Do you adjust or align electron tube amplifiers	0	1	0	1	0	0	1	0	0	5	1	16	10
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	0	1	1	0	0	0	1	0	1	5	3	13	10
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	0	1	1	0	0	0	1	0	1	2	1	6	3
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	0	1	1	0	0	0	0	0	0	0	1	1	2
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	0	1	1	0	0	0	0	0	0	1	2	6	1
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	0	1	1	0	0	0	0	0	0	1	1	2	1
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	0	2	0	2	0	0	1	0	1	4	3	6	10
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	0	1	1	1	0	0	1	0	1	5	2	9	7
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	0	1	1	2	0	0	0	0	1	5	3	8	7
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	0	1	1	1	0	0	0	0	1	3	2	6	5
0018		III 5. C5 Operational Amplifiers													
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	12	6	9	15	30	16	16	13	18	58	32	47	35
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	5	2	5	3	18	7	4	5	9	50	29	23	23
C	251	C5-3 Do you calculate op amp gain	1	2	1	0	3	1	1	1	4	16	7	6	5
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	1	2	1	2	2	1	2	1	4	30	14	14	11
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	5	1	5	5	13	4	6	3	10	44	23	19	17
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	5	3	3	3	10	1	5	3	8	42	22	17	16
C	255	C5-7 Do you use or apply operational amplifiers for summing	4	3	4	7	18	1	6	3	12	37	18	19	19
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	2	2	2	5	8	3	4	2	6	31	18	11	12
C	257	C5-9 Do you use or apply operational amplifiers as active filters	5	1	1	3	5	0	2	3	5	26	18	10	7
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	7	3	2	9	5	6	4	4	10	32	24	30	19
C	259	C5-11 Do you use or apply operational amplifiers as integrators	6	2	3	5	5	3	2	2	8	28	12	24	10
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	5	1	3	3	3	1	3	3	5	27	18	13	9
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	6	6	4	11	16	6	6	8	13	44	29	39	23

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	11	10	11	18	15	18	12	13	14	37	23	47	30
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	7	5	3	11	15	1	4	5	10	37	26	29	17
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	7	4	5	11	15	6	4	4	10	30	15	21	15
0019		III 6. C6 Magnetic Amplifiers													
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	5	5	0	7	7	1	2	3	3	2	1	8	11
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	4	3	1	3	7	0	1	1	3	2	1	7	9
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	2	3	1	1	3	0	0	0	1	2	1	6	7
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	0	1	1	0	2	0	0	0	1	1	1	4	5
C	269	C6-5 Do you adjust magnetic amplifiers or components	0	1	1	1	3	0	0	0	1	1	1	6	7
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	2	3	1	3	0	1	1	1	1	3	1	7	3
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	2	1	1	3	0	0	0	0	1	3	1	6	3
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	0	1	1	0	0	0	0	0	1	2	1	6	3
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	0	1	1	0	0	0	0	0	1	2	1	3	2
C	274	C6-10 Do you adjust saturable reactor circuits or components	0	1	2	0	0	0	0	0	1	2	1	3	2
0020		IV. Power Supplies													
0021		IV 1. D1 Power Supply Circuits													
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	59	88	37	68	51	51	54	56	56	83	62	85	79
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	40	79	28	54	41	28	41	42	41	79	51	76	71
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	41	85	27	47	38	37	33	38	34	77	53	71	76
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	15	31	7	13	8	7	9	10	12	52	36	34	25
D	279	D1-5 Do you align or adjust power supplies	8	19	3	9	8	7	6	8	12	68	39	56	67
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	6	14	3	11	7	10	8	10	14	38	29	28	15

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
D 281	D1-7 Do you perform tasks on full-wave rectifier power supplies	7	15	2	12	7	9	9	11	14	43	32	29	23
D 282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	6	15	3	13	11	10	10	12	16	46	32	32	22
D 283	D1-9 Do you perform tasks on three-phase rectifier power supplies	7	12	3	11	5	4	6	10	11	28	24	22	21
D 284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	7	13	1	14	3	1	5	7	11	37	21	25	20
D 285	D1-11 Do you perform tasks on DC to DC converters	9	35	5	12	5	4	9	14	14	35	19	24	27
D 286	D1-12 Do you perform tasks on inverters (DC to AC converters)	18	73	12	12	7	6	10	30	14	32	20	32	27
D 287	D1-13 Do you perform tasks on switching power supplies	9	34	7	13	8	3	6	14	12	17	8	4	3
0022	IV 2. D2 Power Supply Filters													
D 288	D2-1 Do you trace block diagrams of circuits containing power supply filters	14	10	5	32	13	18	15	13	24	42	31	38	43
D 289	D2-2 Do you trace schematic diagrams of power supply filters	9	8	2	14	10	6	8	8	16	39	27	33	41
D 290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	4	5	4	14	3	4	3	4	8	38	25	28	38
D 291	D2-4 Do you troubleshoot power supply filters to circuit level components	2	4	1	7	0	0	2	1	4	24	21	14	10
D 292	D2-5 Do you perform tasks on capacitive power supply filters	2	6	1	7	3	1	4	5	9	32	21	25	18
D 293	D2-6 Do you perform tasks on inductive power supply filters	2	6	0	7	3	0	5	4	8	24	16	22	14
D 294	D2-7 Do you perform tasks on L-type power supply filters	1	6	1	5	3	0	1	3	5	17	16	16	4
D 295	D2-8 Do you perform tasks on Pi-type power supply filters	1	5	1	6	3	0	2	4	5	14	13	7	5
D 296	D2-9 Do you perform tasks on T-type power supply filters	1	5	0	3	2	0	1	3	4	12	10	7	4
D 297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	1	7	3	7	3	0	4	4	10	29	20	20	13
D 298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	1	7	2	7	3	0	3	4	9	23	14	17	12
0023	IV 3. D3 Power Supply Voltage Regulators													
D 299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	20	44	15	30	23	19	19	24	23	57	36	56	68
D 300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	15	37	8	14	16	7	12	18	13	54	34	48	55
D 301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	7	38	7	7	11	1	6	13	7	50	32	39	59
D 302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	5	14	1	4	5	0	3	4	4	32	27	14	13
D 303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	4	11	2	10	8	0	5	7	12	38	27	31	33

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	5	12	4	7	7	0	5	7	10	31	22	25	16
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	2	10	2	6	5	0	4	6	7	29	23	18	9
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	2	10	2	5	5	0	3	6	7	26	16	15	10
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	4	8	2	7	3	0	3	4	5	17	8	16	8
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	2	7	1	3	3	0	2	4	6	19	10	11	9
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	2	5	1	2	3	0	3	3	3	9	4	3	28
0024		V. Reactive Circuits													
0025		V 1. E1 Resistive Capacitive Inductive Circuits													
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	14	14	8	20	18	10	11	14	15	32	29	22	10
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	2	6	2	2	5	1	4	5	4	17	23	8	5
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	11	12	4	9	13	7	7	8	10	28	24	17	9
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	2	4	2	2	3	1	3	2	4	14	18	5	5
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	2	7	1	2	7	1	3	3	3	8	8	3	3
E	315	E1-6 Do you calculate phase angle of RCL circuits	2	4	1	1	2	0	1	1	2	6	8	3	3
E	316	E1-7 Do you calculate values of power in RCL circuits	2	6	1	1	3	1	2	1	3	7	8	2	2
0026		V 2. E2 Frequency Sensitive Filters													
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	11	8	9	8	11	16	11	10	10	18	13	16	8
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	2	2	4	1	5	7	5	5	5	15	11	11	4
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	1	1	1	0	2	3	2	2	4	13	8	3	1
E	320	E2-4 Do you align or adjust frequency sensitive filters	1	2	1	2	0	1	2	1	4	13	8	7	3
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	1	2	1	0	2	3	2	1	3	5	3	3	2
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters	1	4	3	1	3	6	6	4	4	15	13	10	6

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	1	4	3	1	3	6	3	4	5	15	13	10	6
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	2	2	5	2	2	9	4	6	6	15	8	12	5
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	2	1	2	0	2	1	3	3	5	10	1	6	4
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	1	1	1	0	2	1	1	1	2	7	3	6	3
0027		VI. Waveshaping/Generating Circuits													
0028		VI 1. F1 Oscillators													
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	19	8	8	35	10	16	25	17	20	42	27	50	38
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	11	5	2	13	3	7	15	6	11	40	24	44	30
F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	6	3	3	10	5	3	6	6	8	32	21	34	27
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	5	1	1	3	0	1	1	1	5	18	19	15	10
F	331	F1-5 Do you align or adjust oscillator circuits	1	2	1	11	2	1	2	1	6	23	16	33	20
F	332	F1-6 Do the oscillators you work with use LC tank circuits	4	3	3	7	5	4	6	5	5	21	17	21	10
F	333	F1-7 Do the oscillators you work with use RC networks	5	5	2	9	2	4	7	7	7	24	21	22	15
F	334	F1-8 Do the oscillators you work with use crystals	6	3	2	20	2	9	10	7	7	20	10	40	28
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	6	3	3	6	2	6	7	8	7	21	12	9	14
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	1	1	1	3	2	3	1	3	3	7	6	7	2
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	1	1	1	3	0	3	1	3	3	9	9	7	3
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	1	1	0	4	2	3	2	3	2	10	3	6	2
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	1	1	1	3	0	3	1	2	2	5	3	0	2
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	1	3	1	7	2	1	6	5	4	14	11	20	23
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	1	1	2	8	2	4	4	5	4	15	12	30	20
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	1	1	1	2	2	1	1	2	1	11	4	5	3
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	1	4	1	6	2	4	2	4	3	22	15	25	7
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	1	2	1	3	0	3	1	3	2	8	13	5	4
F	345	F1-19 Do you perform tasks on burst generators	1	1	1	3	2	4	2	2	1	6	4	0	5
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	1	2	1	5	2	3	2	4	3	13	12	6	5

D T Y	Tsk Nb-	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0029		VI 2. F2 Multivibrators													
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	16	10	9	25	20	15	17	14	18	44	34	44	26
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	11	7	2	8	10	6	8	8	10	40	33	31	19
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	6	2	1	4	5	3	3	4	5	33	29	19	14
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	5	1	1	2	2	1	2	1	2	18	23	11	6
F	351	F2-5 Do you adjust or align multivibrator circuits	2	1	1	1	3	1	1	1	2	19	16	19	6
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	5	5	3	3	5	6	5	6	4	29	18	20	6
F	353	F2-7 Do the multivibrators you work with use RC networks	6	6	5	8	3	6	4	7	4	30	26	23	9
F	354	F2-8 Do the multivibrators you work with use Crystals	6	2	4	6	3	6	4	5	3	18	10	31	15
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	5	5	3	8	8	1	4	6	5	32	23	22	12
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	4	5	3	10	8	1	3	6	7	36	25	24	21
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	4	5	2	10	10	1	3	6	7	38	29	29	22
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	4	4	2	6	3	0	2	5	4	26	14	19	12
0030		VI 3. F3 Waveshaping Circuits													
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	7	7	4	18	3	6	9	7	5	44	27	33	15
F	360	F3-2 Do you trace schematic diagrams of WSC	6	3	2	9	2	0	4	3	3	42	25	24	13
F	361	F3-3 Do you troubleshoot to isolate a faulty WSC	4	3	1	5	0	0	2	2	3	30	23	16	11
F	362	F3-4 Do you troubleshoot WSC to circuit level components	2	1	1	1	0	0	1	0	1	20	20	9	5
F	363	F3-5 Do you adjust or calibrate WSC	1	1	1	0	0	0	1	0	1	30	18	16	13
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	2	3	1	7	3	0	3	3	2	38	25	21	14
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	1	1	1	4	3	0	1	1	2	31	19	10	9
F	366	F3-8 Do you perform tasks on RC differentiating WSC	1	2	0	2	3	0	0	1	1	19	14	8	5
F	367	F3-9 Do you perform tasks on RL differentiating WSC	1	1	0	2	3	0	1	1	1	16	12	7	4
F	368	F3-10 Do you perform tasks on RC integrating WSC	1	2	1	4	3	0	0	1	1	20	15	6	6
F	369	F3-11 Do you perform tasks on RL integrating WSC	1	1	1	3	3	0	0	1	1	17	12	6	4
F	370	F3-12 Do you perform tasks on square wave generator WSC	2	4	1	11	3	0	3	3	3	37	24	18	16
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	1	2	1	5	0	0	1	2	1	30	14	8	13
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	1	1	1	4	2	0	1	2	1	25	16	8	8

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0031		VI 4. F4 Limiter/Clamper Circuits													
F	373	F4-1 Do you trace block diagrams of circuits containing limiters	9	6	4	11	5	4	11	7	3	41	24	22	14
F	374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	3	4	3	0	4	3	2	40	24	17	10
F	375	F4-3 Do you trace block diagrams of circuits containing clampers	6	2	4	5	2	0	3	2	1	36	23	13	10
F	376	F4-4 Do you trace schematic diagrams of clamper circuits	6	2	3	2	2	1	2	1	1	32	21	14	10
F	377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	4	2	2	3	2	0	1	1	0	23	21	12	7
F	378	F4-6 Do you troubleshoot limiters to circuit level components	2	2	2	0	0	0	1	1	0	14	18	6	5
F	379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	2	2	2	1	0	0	1	1	0	22	20	8	6
F	380	F4-8 Do you troubleshoot clampers to circuit level components	2	2	2	0	0	0	1	1	0	13	19	6	5
F	381	F4-9 Do you perform tasks on series diode limiter circuits	2	1	1	1	2	0	1	2	0	23	19	10	8
F	382	F4-10 Do you perform tasks on shunt diode limiter circuits	2	2	2	3	0	0	1	3	0	25	20	9	6
F	383	F4-11 Do you perform tasks on bias limiter circuits	2	2	1	2	2	0	1	1	0	18	12	8	5
F	384	F4-12 Do you perform tasks on zener diode circuits	2	2	2	4	2	0	2	3	1	32	22	17	12
F	385	F4-13 Do you perform tasks on transistor limiter circuits	2	2	2	2	2	0	1	1	1	19	16	7	7
F	386	F4-14 Do you perform tasks on triode limiter circuits	2	1	2	0	0	0	1	0	0	5	8	4	3
F	387	F4-15 Do you perform tasks on diode clamper circuits	2	1	2	1	0	0	1	2	0	23	19	10	9
F	388	F4-16 Do you perform tasks on bias clamper circuits	2	1	1	1	0	0	1	1	0	16	12	6	5
0032		VII. Computers, Digital Circuits, and Devices													
0033		VII A. G1 Digital Logic Numbering Systems and Functions													
G	389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	12	18	6	41	33	18	52	19	30	29	23	30	43
G	390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	11	14	5	39	15	16	46	13	26	23	12	24	38
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	7	14	4	28	13	12	31	14	20	26	15	24	42
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	15	12	6	38	16	15	37	11	24	23	10	21	33
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	7	14	5	25	11	15	28	15	22	24	14	25	35
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	8	11	4	22	10	12	26	9	21	21	10	18	28
G	395	G1-7 Do you convert base number fractions to another base numbering system	7	10	6	14	10	12	15	8	12	17	12	14	17
G	396	G1-8 Do you add binary numbers	7	6	3	22	20	10	22	11	17	25	20	24	23

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	397	G1-9 Do you subtract binary numbers	6	5	3	21	18	12	19	10	16	24	19	22	21
G	398	G1-10 Do you multiply binary numbers	7	4	3	12	3	7	9	6	9	21	14	18	6
G	399	G1-11 Do you divide binary numbers	6	4	3	13	3	7	8	5	8	20	14	18	6
G	400	G1-12 Do you add octal numbers	6	4	3	27	3	10	15	7	14	20	9	19	13
G	401	G1-13 Do you subtract octal numbers	7	4	3	25	3	10	14	7	14	20	9	19	12
G	402	G1-14 Do you add hexadecimal numbers	6	5	3	13	5	10	10	7	11	20	12	17	14
G	403	G1-15 Do you subtract hexadecimal numbers	6	5	3	13	5	9	10	7	11	20	12	17	12
G	404	G1-16 Do you use binary coded decimal (BCD)	7	9	5	28	25	15	43	14	20	28	21	22	38
G	405	G1-17 Do you use gray codes	2	2	1	5	0	0	5	5	6	3	3	6	5
G	406	G1-18 Do you use ICAO codes	2	2	0	4	0	0	5	3	3	3	1	0	2
G	407	G1-19 Do you use excess-3 (XS3) codes	2	2	2	5	0	0	5	4	3	9	10	7	3
G	408	G1-20 Do you use parity bit codes	6	8	2	20	8	0	11	8	8	19	7	11	23
G	409	G1-21 Do you use biquinary codes	4	2	1	4	0	0	4	3	4	3	1	2	3
G	410	G1-22 Do you use ASCII codes	6	3	1	5	0	1	8	6	5	11	5	15	31
G	411	G1-23 Do you use ERCDI codes	5	2	1	4	0	0	4	3	4	3	1	1	3
G	412	G1-24 Do you trace data flow through logic symbol diagrams	16	26	11	39	41	21	52	31	39	47	23	48	50
G	413	G1-25 Do you trace data flow through logic schematic diagrams	15	23	13	38	38	13	46	25	35	46	24	45	45
G	414	G1-26 Do you troubleshoot digital systems to major units	16	19	12	42	25	19	41	28	33	44	23	50	53
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	4	4	1	6	2	0	7	4	7	41	22	28	32
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	2	2	1	6	0	0	6	4	6	26	18	8	22
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	7	12	0	21	18	10	24	12	21	38	19	21	31
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	8	11	1	21	16	9	19	11	20	30	18	17	27
G	419	G1-31 Do you perform tasks related to AND gates	7	27	9	28	39	16	36	26	31	53	30	39	38
G	420	G1-32 Do you perform tasks related to OR gates	7	28	8	29	39	18	36	26	30	53	30	39	37
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	5	18	6	24	20	10	26	17	19	50	25	34	31
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	5	26	7	27	39	13	35	23	29	52	28	39	36
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	5	23	5	22	15	12	26	16	20	50	23	33	32
G	424	G1-36 Do you perform tasks related to RS flip flops	2	11	0	15	5	4	10	8	9	25	17	19	23
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	2	9	1	10	5	4	11	8	10	26	17	19	23
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	2	10	0	9	7	1	11	8	10	24	18	17	23
G	427	G1-39 Do you perform tasks related to JK flip flops	2	7	0	6	5	1	7	7	7	36	18	12	28
G	428	G1-40 Do you perform tasks related to Schmidt triggers	1	7	1	10	3	1	8	6	6	26	16	19	23
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	2	10	1	13	3	4	12	8	10	28	14	17	23
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	4	5	0	7	7	3	8	6	9	20	17	12	16
G	431	G1-43 Do you perform tasks related to buffers	5	9	2	18	3	6	14	10	12	33	18	22	27
G	432	G1-44 Do you perform tasks related to inverters	6	16	6	15	10	4	17	16	16	38	21	29	29
G	433	G1-45 Do you perform tasks related to complemented flip flops	2	5	2	10	5	3	8	6	7	20	14	13	17
G	434	G1-46 Do you perform tasks related to complementing flip flops	2	5	2	11	5	3	8	6	7	23	14	13	17

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	4	5	2	9	5	1	8	9	10	15	12	8	6
G	436	G1-48 Do you develop logic diagrams from Boolean equations	1	5	1	9	3	1	7	7	7	14	11	8	5
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	4	5	1	11	2	1	7	8	8	15	12	6	4
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	1	3	2	4	5	0	4	4	5	10	8	3	6
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	1	3	3	6	5	0	5	4	5	8	8	3	5
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	4	3	4	5	5	0	5	6	6	21	17	6	23
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	2	3	1	4	2	0	4	4	5	11	3	5	5
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	2	2	1	4	0	0	4	3	5	5	3	1	3
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	1	2	2	5	0	0	4	4	6	16	14	5	12
G	444	G1-56 Do you perform tasks on positive MOS ICs	2	2	1	5	0	0	4	3	5	8	8	2	6
G	445	G1-57 Do you perform tasks on negative MOS ICs	2	2	1	5	0	1	4	3	5	7	7	2	6
G	446	G1-58 Do you perform tasks on vertical MOS ICs	2	2	1	5	0	0	4	3	5	4	2	1	5
0034		VII 2. G2 Computers													
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	44	37	17	62	33	37	51	40	41	33	4	67	67
G	448	G2-2 Do you load programs	38	10	20	53	10	29	43	30	35	40	2	61	69
G	449	G2-3 Do you write or debug programs	5	6	4	3	2	1	7	6	6	5	1	3	7
G	450	G2-4 Do you troubleshoot computers to a major unit	27	20	15	48	18	26	32	24	31	28	3	47	61
G	451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	6	8	3	6	3	3	4	6	5	28	3	48	41
G	452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	5	7	3	5	2	0	4	4	5	12	2	6	14
G	453	G2-7 Do you use computer flow charts or diagrams	16	14	4	29	16	13	32	13	21	17	1	38	43
G	454	G2-8 Do you perform tasks on analog computers	11	29	11	44	33	22	28	18	31	13	5	13	37
G	455	G2-9 Do you perform tasks on digital computers	32	31	19	58	34	35	52	35	47	41	5	81	77
G	456	G2-10 Do you use Basic computer language	8	6	5	9	3	4	10	8	10	9	2	11	13
G	457	G2-11 Do you use COBOL computer language	2	4	2	5	2	1	3	4	5	1	0	1	1
G	458	G2-12 Do you use FORTRAN computer language	2	4	3	4	2	1	4	4	5	5	0	4	4
G	459	G2-13 Do you use ADA computer language	1	4	2	3	2	0	3	3	5	3	0	0	0
G	460	G2-14 Do you use ATLAS computer language	1	4	3	4	2	3	3	3	4	2	0	0	1
G	461	G2-15 Do you use ELAN computer language	1	4	2	3	2	1	3	3	3	3	0	0	0
G	462	G2-16 Do you use PASCAL computer language	1	4	3	3	2	0	4	4	5	2	1	0	0
G	463	G2-17 Do you use RPG computer language	1	4	2	4	2	1	3	3	5	2	0	0	0
G	464	G2-18 Do you use Machine computer language	1	4	3	4	2	0	4	4	5	9	1	6	8
G	465	G2-19 Do you use C computer language	2	4	3	3	2	1	4	4	5	2	0	0	0
G	466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	9	10	3	29	15	21	22	16	18	34	3	59	60
G	467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	13	16	9	25	10	7	19	21	16	19	5	31	40

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	2	5	4	7	2	1	9	8	5	3	0	21	5
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	2	5	1	6	7	0	5	5	4	3	1	3	3
G	470	G2-24 Do you perform tasks on computer keyboards	16	16	9	27	10	24	28	22	29	19	10	23	74
G	471	G2-25 Do you perform tasks on computer character printers	4	9	3	12	2	6	8	11	13	11	7	22	39
G	472	G2-26 Do you perform tasks on magnetic tape drives	2	7	2	12	3	1	8	6	5	13	1	24	43
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	4	8	4	9	3	4	8	10	7	11	3	8	29
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	5	9	5	25	10	16	16	15	16	24	8	13	69
G	475	G2-29 Do you perform tasks on paper tape readers/punches	2	5	4	11	2	3	6	5	6	3	0	16	3
G	476	G2-30 Do you perform tasks on paper card readers/punches	1	5	3	4	2	3	3	4	3	3	0	2	3
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	9	13	9	28	18	9	11	10	16	13	1	24	39
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	8	8	4	22	5	7	15	11	12	19	3	19	36
G	479	G2-33 Do you perform tasks on modems	2	6	3	7	2	6	6	6	10	5	1	5	13
G	480	G2-34 Do you perform tasks on line printers	4	6	3	5	3	3	11	9	9	10	5	11	33
G	481	G2-35 Do you perform tasks on floppy disc drives	2	5	3	3	2	4	11	8	9	11	3	6	8
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	2	5	2	5	2	0	4	5	3	6	1	6	38
G	483	G2-37 Do you perform tasks on removable pack disc drives	2	5	3	4	2	0	4	4	3	3	0	2	24
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	1	5	4	4	2	1	7	6	5	6	2	4	14
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	11	7	6	10	7	12	14	15	9	9	2	13	36
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	5	5	2	3	2	3	4	4	4	9	2	8	23
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	4	5	3	3	3	6	4	4	4	7	1	3	14
0035		VII 3. G3 Digital Circuits													
G	488	G3-1 Do you trace data flow through circuits containing counters	7	4	5	13	10	7	14	7	7	35	18	19	25
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	5	1	2	4	7	3	5	3	4	24	17	11	19
G	490	G3-3 Do you troubleshoot counters to circuit level components	2	1	2	1	3	1	1	1	1	13	12	3	8
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	2	1	1	3	5	0	4	2	2	27	14	7	15
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	2	1	0	6	3	1	3	2	2	26	14	7	15
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	1	1	0	1	2	0	2	1	1	19	9	6	14
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	1	2	0	3	3	1	1	2	1	13	4	3	6

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	1	1	0	2	2	0	1	1	1	7	3	1	6
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	2	1	0	6	3	0	2	2	2	19	7	4	16
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	2	1	1	6	3	0	2	2	2	19	6	5	15
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	4	5	1	3	3	6	8	4	5	23	12	16	23
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	2	2	1	1	0	1	1	1	1	17	8	10	15
G	500	G3-13 Do you troubleshoot registers to circuit level components	2	2	0	1	0	0	0	1	0	7	7	1	6
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	2	3	0	3	2	1	0	2	0	19	9	11	21
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	2	5	0	4	2	0	1	3	1	17	8	9	20
G	503	G3-16 Do you trace data flow through combinational logic circuits	9	6	1	9	3	9	8	5	4	22	10	13	27
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	6	2	0	4	3	1	3	2	1	20	9	10	18
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	2	1	0	1	0	1	2	1	0	14	6	3	7
G	506	G3-19 Do you perform tasks on encoders	1	5	6	5	2	9	4	6	2	19	10	10	23
G	507	G3-20 Do you perform tasks on decoders	1	5	7	7	2	7	4	6	2	22	8	10	23
G	508	G3-21 Do you perform tasks on multiplexers	1	6	1	9	3	3	4	7	2	18	8	11	27
G	509	G3-22 Do you perform tasks on demultiplexers	1	1	1	1	2	3	3	2	1	13	5	9	15
G	510	G3-23 Do you perform tasks on comparators	4	5	1	7	3	1	4	4	2	19	8	9	21
G	511	G3-24 Do you perform tasks on parity generators or checkers	1	2	3	3	2	1	3	4	1	14	3	7	15
G	512	G3-25 Do you perform tasks on code converters	1	3	2	1	2	3	2	4	1	13	3	5	10
G	513	G3-26 Do you perform tasks on adders	1	4	1	4	2	0	2	3	1	15	6	8	13
G	514	G3-27 Do you perform tasks on subtractors	1	4	1	5	2	1	2	3	1	15	5	8	10
G	515	G3-28 Do you perform tasks on count detect circuits	1	2	1	1	0	1	1	1	1	9	3	4	7
0036		VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/ Converters													
G	516	G4-1 Do you trace data flow through A/D converters	27	24	16	27	13	21	32	26	23	26	11	48	43
G	517	G4-2 Do you trace data flow through D/A converters	27	23	34	27	11	21	28	31	22	26	10	33	43
G	518	G4-3 Do you troubleshoot A/D converter circuits	9	18	11	9	8	7	12	15	12	21	9	30	32
G	519	G4-4 Do you troubleshoot D/A converter circuits	9	18	13	9	8	6	11	18	11	21	9	25	32
G	520	G4-5 Do the converters you perform tasks on use flash conversion	2	2	2	1	2	1	2	2	1	6	2	2	2
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	1	2	2	2	5	3	4	4	4	9	4	4	9
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	1	2	1	3	3	0	6	3	2	11	3	4	10
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	1	3	1	2	2	1	2	2	1	5	1	3	5

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0037	VIII. Transmission/Reception Circuits, Devices, and Systems													
	0038	VIII 1. H1 Connections													
H	524	H1-1 Do you measure electrical length on transmission lines	9	4	16	15	3	38	21	12	18	6	0	6	17
H	525	H1-2 Do you measure physical length on transmission lines	12	4	19	33	3	49	34	15	26	11	3	5	20
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	8	3	47	13	5	62	27	25	35	5	0	5	25
H	527	H1-4 Do you construct transmission lines	8	3	16	26	3	38	30	13	22	10	1	4	14
H	528	H1-5 Do you match transmission line impedance with loads	7	2	16	6	2	26	12	7	12	3	1	5	14
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	6	2	7	3	0	16	9	6	7	3	0	2	2
H	530	H1-7 Do you troubleshoot transmission lines	28	7	50	35	10	76	43	33	35	14	3	13	16
H	531	H1-8 Do you perform tasks on open-wire transmission lines	20	4	10	18	8	26	24	19	19	7	1	7	5
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	35	9	19	24	8	29	52	34	33	11	1	12	16
H	533	H1-10 Do you perform tasks on twin lead transmission lines	13	3	10	10	3	10	19	11	13	9	1	3	4
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	47	7	56	58	15	78	59	49	52	17	4	25	29
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	33	5	41	23	3	63	38	34	41	7	1	18	9
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	5	1	4	2	0	6	7	6	4	5	0	0	3
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	78	13	20	77	15	66	66	52	58	8	1	73	68
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	76	11	18	75	10	57	63	48	52	8	0	70	59
H	539	H1-16 Do you pressurize or purge waveguide assemblies	81	10	16	78	11	57	69	50	58	7	1	69	72
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	12	7	6	18	2	47	22	12	19	3	0	14	29
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	86	14	15	78	10	60	68	52	56	8	2	72	75
	0039	VIII 2. H2 Microwave Oscillators and Amplifiers													
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	21	5	4	33	11	10	33	14	16	6	0	52	32
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	12	3	2	15	5	3	19	5	6	6	0	46	25
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	2	1	2	26	5	1	4	2	7	5	0	49	23
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	1	1	0	9	0	1	2	1	6	3	0	30	7

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	1	2	0	3	0	0	2	1	3	2	0	18	1
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	1	1	0	23	2	0	2	1	8	4	0	23	5
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	13	2	2	22	3	4	11	10	7	5	0	8	4
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	5	1	1	31	5	1	6	4	12	5	0	60	30
H	550	H2-9 Do you perform tasks on backward wave oscillator	1	1	1	3	0	0	2	1	1	2	0	5	1
H	551	H2-10 Do you perform tasks on parametric amplifiers	1	1	1	2	0	1	2	1	1	2	0	15	1
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	1	1	1	4	0	0	4	1	0	3	0	1	1
0040		VIII 3. H3 Resonant Cavities													
H	553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	2	3	0	9	5	1	6	4	3	11	1	37	21
H	554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	0	3	0	4	3	0	3	1	0	10	1	29	14
H	555	H3-3 Do you tune or adjust resonant cavities electrically	1	1	1	5	2	0	0	0	3	10	1	31	14
H	556	H3-4 Do you tune or adjust resonant cavities physically	0	1	0	11	2	0	0	0	1	7	1	38	7
H	557	H3-5 Do you measure frequency of resonant cavities	1	1	1	4	2	0	1	0	0	11	1	30	14
H	558	H3-6 Do you perform tasks on probe resonant cavities	1	3	0	3	3	0	0	1	1	2	0	5	7
H	559	H3-7 Do you perform tasks on loop resonant cavities	0	1	0	4	0	0	1	2	1	3	1	4	2
H	560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	0	1	0	3	2	0	1	1	0	6	1	5	5
0041		VIII 4. H4 Transmitters and Receivers													
H	561	H4-1 Do you use "AM" modulation principles	8	8	35	20	7	47	10	24	27	5	0	25	2
H	562	H4-2 Do you trace block diagrams of AM transmitters	15	9	53	19	8	59	15	34	29	4	1	27	2
H	563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	6	4	13	6	3	15	6	11	9	4	1	22	2
H	564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	4	3	10	4	3	7	4	6	7	3	1	18	2
H	565	H4-5 Do you troubleshoot AM transmitters to major units	11	8	38	18	7	50	12	23	23	3	1	23	3
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	4	2	6	0	2	4	3	3	3	4	1	17	2
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2	2	6	0	2	3	3	3	1	3	1	6	2
H	568	H4-8 Do you align or adjust AM transmitters or circuits	1	1	8	6	2	7	3	4	3	3	1	19	2
H	569	H4-9 Do you calculate percentage of modulation for AM transmitters	2	3	15	4	2	4	3	7	5	3	1	8	1
H	570	H4-10 Do you use "AM" demodulation principles	7	7	23	16	5	41	9	21	21	3	0	6	2
H	571	H4-11 Do you trace block diagrams of AM receivers	15	9	48	18	7	63	15	33	27	3	0	13	2

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	45o XO
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	5	4	11	4	3	13	5	8	7	3	0	9	1
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2	3	8	3	3	9	4	4	4	3	0	8	1
H	574	H4-14 Do you troubleshoot AM receivers to major units	9	8	37	16	5	53	10	24	22	2	0	10	1
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2	2	6	0	2	4	3	3	3	2	0	7	1
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	2	2	5	0	0	3	3	3	2	2	0	6	1
H	577	H4-17 Do you align or adjust AM receivers or circuits	5	1	11	3	2	9	4	6	6	2	0	9	1
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	1	1	7	9	7	62	6	9	28	1	0	1	2
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	2	1	1	4	3	7	3	3	9	1	0	1	1
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	2	1	1	3	3	6	1	2	7	1	0	1	0
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	2	0	6	10	5	53	2	7	25	1	0	1	1
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	2	0	1	0	0	6	0	1	3	1	0	1	0
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1	0	1	0	0	4	0	1	2	1	0	1	0
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	1	0	2	3	2	10	1	1	4	1	1	1	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	1	0	2	0	3	6	0	3	3	1	1	1	0
H	586	H4-26 Do you trace block diagrams of SSB receivers	1	0	7	9	7	59	7	8	26	1	1	1	0
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	1	3	3	10	2	3	8	1	1	1	0
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1	0	0	3	3	4	1	2	6	1	1	1	0
H	589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	4	9	5	54	2	7	24	1	1	1	0
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	0	0	1	0	0	4	1	1	2	1	1	1	0
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuil level components	0	0	0	0	0	3	1	1	3	1	1	1	0
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1	0	1	2	2	12	1	2	5	1	1	1	0
H	593	H4-33 Do you use "FM" modulation principles	11	8	41	20	5	41	18	31	20	4	4	23	7
H	594	H4-34 Do you trace block diagrams of FM transmitters	20	12	51	26	5	47	24	39	21	4	3	31	10
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	6	5	13	3	3	4	9	12	5	4	3	27	6
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	4	4	9	4	3	4	5	6	5	3	3	22	5
H	597	H4-37 Do you troubleshoot FM transmitters to major units	12	10	36	19	5	38	15	25	17	3	3	27	7
H	598	H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	4	3	7	1	0	3	4	3	1	3	3	19	6
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	2	3	6	0	0	1	3	2	1	3	2	9	3
H	600	H4-40 Do you align or adjust FM transmitters or circuits	2	3	8	4	2	4	4	5	5	3	3	24	6
H	601	H4-41 Do you calculate modulation index for FM transmitters	1	2	8	0	2	1	4	5	2	1	1	6	2
H	602	H4-42 Do you measure frequency deviation for FM transmitters	4	4	13	3	2	4	4	7	4	3	5	24	7
H	603	H4-43 Do you use "FM" demodulation principles	8	8	29	18	5	35	15	28	17	3	3	7	3

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
H	604	H4-44 Do you trace block diagrams of FM receivers	18	10	42	20	7	44	22	36	20	4	3	10	6
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	4	3	11	3	3	4	8	10	5	4	3	8	5
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	4	4	8	1	3	3	4	6	3	4	3	7	4
H	607	H4-47 Do you troubleshoot FM receivers to major units	11	8	32	16	7	35	14	25	16	4	3	10	5
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	2	2	4	0	0	1	3	3	1	3	3	7	4
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	2	2	5	1	0	1	3	3	1	3	2	5	2
H	610	H4-50 Do you align or adjust FM receivers or circuits	2	2	8	3	2	4	4	5	4	3	3	10	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	1	1	6	1	0	1	3	3	1	1	1	2	2
H	612	H4-52 Do you use "PM" modulation principles	11	1	9	24	3	25	11	12	16	6	1	22	11
H	613	H4-53 Do you trace block diagrams of PM transmitters	21	1	6	33	7	24	19	14	19	8	1	33	21
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	4	0	2	8	2	1	5	5	4	9	1	24	15
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	4	0	3	7	2	0	4	3	3	8	1	20	15
H	616	H4-56 Do you troubleshoot PM transmitters to major units	15	1	5	23	7	19	11	12	16	7	1	28	22
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	0	2	4	0	0	2	1	1	8	1	18	14
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	0	2	4	0	0	2	1	1	5	1	9	6
H	619	H4-59 Do you align or adjust PM transmitters or circuits	1	0	3	5	2	0	2	1	5	7	1	28	15
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	4	0	3	5	0	3	4	3	2	7	1	13	17
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	4	0	2	14	0	4	6	3	5	8	1	25	21
H	622	H4-62 Do you use "PM" demodulation principles	5	2	8	20	2	24	10	14	14	5	1	15	9
H	623	H4-63 Do you trace block diagrams of PM receivers	12	2	9	25	7	21	15	15	18	7	1	22	17
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	1	1	2	5	2	1	4	5	4	7	1	16	14
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	1	1	3	4	2	0	4	3	3	7	1	15	14
H	626	H4-66 Do you troubleshoot PM receivers to major units	9	2	8	21	7	19	9	11	16	7	1	21	18
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	1	0	1	3	0	0	2	1	0	5	1	13	14
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1	0	0	4	0	0	2	1	0	4	1	7	7
H	629	H4-69 Do you align or adjust PM receivers or circuits	1	0	2	5	2	0	2	1	5	6	1	19	16
0042		VIII 5. H5 Antennas													
H	630	H5-1 Do you physically align antennas	22	8	18	60	3	25	21	15	28	7	1	65	66
H	631	H5-2 Do you electrically align antennas	14	3	5	55	5	18	14	6	20	6	1	72	68
H	632	H5-3 Do you troubleshoot loading of antennas	9	6	17	18	3	38	11	14	18	5	0	19	14
H	633	H5-4 Do you troubleshoot coupling of antennas	13	5	19	23	5	47	16	18	27	5	0	20	15

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
H	634	H5-5 Do you plot graph radiation patterns	5	1	5	3	0	3	5	4	6	3	0	4	3
H	635	H5-6 Do you troubleshoot antenna components	19	7	27	24	7	51	30	25	30	7	0	47	55
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	7	3	41	9	5	51	19	27	29	3	0	5	10
H	637	H5-8 Do you work with Yagi antennas	2	0	5	3	0	4	4	4	2	2	0	1	0
H	638	H5-9 Do you work with dipole antennas	11	5	29	32	7	60	45	22	35	3	0	33	3
H	639	H5-10 Do you work with slotted antennas	18	0	7	5	2	19	8	11	13	4	0	1	0
H	640	H5-11 Do you work with rotary antennas	2	0	8	12	2	22	12	5	10	2	0	13	32
H	641	H5-12 Do you work with hertz antennas	4	0	8	3	0	21	7	8	4	2	0	1	0
H	642	H5-13 Do you work with marconi antennas	2	0	9	2	0	18	7	7	7	2	0	1	1
H	643	H5-14 Do you work with rhombic antennas	2	0	7	6	2	34	11	6	14	2	0	2	0
H	644	H5-15 Do you work with scimitar antennas	2	0	4	4	0	6	4	4	3	2	0	1	0
H	645	H5-16 Do you work with parabolic antennas	9	1	10	57	5	18	14	10	33	3	0	50	67
H	646	H5-17 Do you work with ground plane antennas	5	0	11	6	2	12	12	11	14	3	0	1	1
H	647	H5-18 Do you perform tasks on rotary antenna arrays	2	0	6	11	0	18	7	5	9	2	0	10	25
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	2	0	5	2	0	4	4	4	2	2	0	1	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	2	0	5	2	0	4	4	4	3	3	0	2	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	2	0	12	7	0	38	11	10	13	3	0	2	2
H	651	H5-22 Do you perform tasks on collinear antenna arrays	5	0	5	5	0	6	4	4	6	2	0	1	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	15	2	11	12	2	13	15	14	7	4	0	16	10
H	653	H5-24 Do you perform tasks on planar antenna arrays	34	3	9	34	2	10	27	19	12	3	0	1	1
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	9	3	13	55	7	31	15	14	34	3	0	17	13
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	11	0	9	52	7	31	16	13	35	4	0	19	15
H	656	H5-27 Do you perform tasks on antennas with circular polarization	11	0	9	69	7	32	11	15	38	4	0	51	11
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	19	6	29	43	5	51	26	26	29	7	0	19	25
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	16	6	18	31	3	40	17	14	21	5	0	19	22
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	20	9	59	35	8	79	34	36	41	4	0	21	11
0043		IX. Radio Frequency (RF) Measurements or Calculations													
0044		IX 1. I1 RF Measurements													
I	660	I1-1 Do you measure RF power	6	7	49	20	7	75	36	28	31	8	3	69	50
I	661	I1-2 Do you measure RF peak power	4	3	26	16	2	40	15	11	14	8	3	49	45
I	662	I1-3 Do you measure RF average power	4	3	18	10	2	32	13	13	12	7	3	36	32
I	663	I1-4 Do you measure RF effective power	4	4	20	11	3	34	13	11	12	7	3	25	19
I	664	I1-5 Do you measure RF output power using wattmeters	7	8	60	20	7	87	37	39	39	6	0	24	26

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0045		IX 2. I2 RF Calculations													
I	665	I2-1 Do you calculate RF apparent power	1	2	9	2	2	10	5	6	5	5	0	13	14
I	666	I2-2 Do you calculate RF true power	1	2	9	2	2	9	5	6	7	5	0	12	21
I	667	I2-3 Do you calculate RF power loss or gain in db	2	2	18	7	3	26	9	10	13	7	0	30	28
0046		X. Additional Circuits, Devices, Systems, or Items													
0047		X 1. J1 Microphones and Speakers													
J	668	J1-1 Do you trace block diagrams of circuits containing microphones	8	10	45	13	2	62	26	29	23	3	1	0	0
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	7	8	30	9	2	29	20	20	14	3	1	0	0
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	5	10	32	11	2	50	21	23	21	3	1	0	0
J	671	J1-4 Do you troubleshoot microphones	4	5	15	3	2	18	7	7	10	3	1	0	1
J	672	J1-5 Do you work on carbon microphones	0	1	15	4	2	43	10	6	12	3	0	0	0
J	673	J1-6 Do you work on capacitor microphones	0	1	5	1	2	4	3	3	2	2	0	0	0
J	674	J1-7 Do you work on crystal microphones	2	2	5	2	0	15	4	4	1	2	0	0	0
J	675	J1-8 Do you work on dynamic microphones	1	3	13	2	2	29	8	11	11	3	1	0	1
J	676	J1-9 Do you work on velocity ribbon microphones	0	1	2	0	0	6	3	1	1	2	0	0	0
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	1	5	30	7	3	40	17	21	16	3	4	0	0
J	678	J1-11 Do you trace schematic diagrams of speaker circuits	1	4	18	6	3	25	13	15	10	3	3	0	0
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker	2	4	24	7	3	34	14	15	16	4	3	0	0
J	680	J1-13 Do you troubleshoot speakers	0	2	12	2	3	9	6	5	5	3	2	0	0
0048		X 2. J2 Photosensitive Devices													
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	9	2	0	9	0	3	14	6	4	44	49	1	19
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	2	1	0	2	0	1	7	3	3	45	42	1	14
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device	6	1	0	5	0	1	7	3	3	38	47	0	12
J	684	J2-4 Do you adjust or calibrate photosensitive devices	1	0	0	2	0	0	1	1	0	29	21	2	7
J	685	J2-5 Do you work on photodiodes	1	1	0	0	0	1	2	1	1	38	23	0	9
J	686	J2-6 Do you work on phototransistors	1	0	0	0	0	0	1	1	0	21	12	0	5
J	687	J2-7 Do you work on phototubes	1	0	1	0	0	0	1	1	0	12	3	0	9
J	688	J2-8 Do you work on photo-SCRs	1	0	0	0	0	0	2	1	0	10	3	0	2

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	6	0	1	0	0	1	4	1	1	21	37	0	2
0049		X 3. J3 Storage Type Display Tubes													
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	12	2	8	31	2	3	13	8	13	4	2	29	19
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	7	1	3	10	2	1	7	4	4	4	2	24	14
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	8	1	6	20	0	3	8	4	3	3	3	25	14
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	4	0	3	5	2	0	3	1	2	3	0	19	12
J	694	J3-5 Do you work on direct view storage tubes (DVST)	7	0	4	21	3	0	5	3	8	3	1	27	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	7	0	3	2	0	0	7	2	3	2	0	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	4	0	4	8	0	0	2	3	2	1	0	16	19
0050		X 4. J4 Television, Laser, and Infrared Systems													
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	9	0	0	4	0	4	5	5	5	62	28	33	68
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	7	0	0	3	0	1	3	4	2	61	29	26	64
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	5	0	1	2	0	3	3	3	2	60	29	28	66
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	1	0	1	0	0	0	0	1	0	53	27	11	29
J	701	J4-5 Do you adjust or calibrate TV systems or components	1	0	0	0	0	0	0	1	0	58	28	21	47
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	4	0	0	0	2	0	4	2	0	63	5	2	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	2	0	0	0	0	0	3	2	0	60	5	1	1
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	4	0	0	0	0	0	3	1	0	63	6	1	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	1	0	0	0	0	0	0	1	0	42	4	1	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	1	0	1	0	2	0	0	1	0	59	4	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	5	0	1	2	0	12	4	4	7	63	34	1	81
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	4	0	0	0	0	7	3	3	3	62	29	1	75
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	5	0	2	0	0	9	2	3	6	64	32	3	82
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	1	0	1	0	0	1	0	1	1	57	12	1	35

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	1	0	1	0	0	7	2	1	3	62	32	2	79
J	712	J4-16 Do you adjust or calibrate infrared systems or components	2	0	2	0	0	0	1	1	1	60	16	0	56

0051 Tasks not referenced

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	valid
1	TITLE		Task Statement						
2	F0102	GP0142/PMP	All DAFSC 456X2A	29	18.16	26.31	100.00	.00	712
3	F0106	GP0149/PMP	All DAFSC 456X2B	19	12.69	20.08	100.00	.00	712
4	F0103	GP0144/PMP	All DAFSC 457X3A	28	12.36	17.57	92.86	.00	712
5	F0105	GP0146/PMP	All DAFSC 457X3C	19	12.43	19.01	100.00	.00	712
6	F0076	GP0079/PMP	All DAFSC 46150	1034	.82	3.24	34.82	.00	712
7	F0077	GP0080/PMP	All DAFSC 46250	1616	2.59	8.68	69.99	.00	712
8	F0078	GP0081/PMP	All DAFSC 46350	347	1.58	5.96	53.89	.00	712
9	F0079	GP0082/PMP	All Reporting Identifier 99104	144	29.41	22.62	93.75	.00	712
10	F0080	GP0083/PMP	All Reporting Identifier 99105	206	4.18	9.32	81.55	.00	712
11	F0081	GP0084/PMP	All Reporting Identifier 99106	119	2.47	7.29	75.63	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in job inventory order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	99? 05	991
0001		EPI Electronic Principles Inventory										
0002		I. General Electronic/Electricity										
0003		I 1. A1 Direct/Alternating Current										
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	55	53	68	89	17	19	45	87	82	76
A	2	A1-2 Do you use basic DC electrical/electronic terms	100	95	89	100	32	70	54	93	44	45
A	3	A1-3 Do you use basic AC electrical/electronic terms	100	95	86	100	30	61	52	94	43	45
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries	97	100	89	68	10	60	38	85	16	20
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries	97	100	79	58	16	62	39	80	11	18
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power	38	47	29	16	12	16	8	61	8	8
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage	48	47	29	16	3	11	3	59	6	6
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length	48	58	21	26	1	5	2	55	15	5
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors	93	84	46	16	2	38	11	82	11	7
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	59	42	29	5	2	32	10	69	4	6
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	72	74	11	0	1	8	6	72	6	5
A	12	A1-12 Do you calculate the value of a resistor required for a circuit	21	11	4	0	2	9	2	41	2	5

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	55	32	18	0	1	15	3	69	3	5
A	14	A1-14 Do you ohm check resistors	79	74	32	5	9	29	14	72	4	8
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	97	79	93	42	2	50	13	74	10	9
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	76	68	93	37	2	49	15	65	5	7
A	17	A1-17 Do you adjust relays	31	32	4	0	1	7	6	28	1	2
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	24	32	14	11	2	9	6	40	2	3
A	19	A1-19 Do you continuity check relays	83	79	57	26	4	42	19	60	3	3
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils	48	32	18	16	0	4	1	71	5	5
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil	31	11	14	0	0	3	0	60	1	3
A	22	A1-22 Do you calculate values of circuit total inductance	3	0	4	0	0	1	0	26	0	1
A	23	A1-23 Do you calculate values of circuit or component inductive reactance	3	0	4	0	0	1	0	24	1	1
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors	3	0	4	0	0	1	0	30	1	1
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors	7	11	4	0	0	1	0	34	1	2
A	26	A1-26 Do you ohm check inductors	24	21	14	5	1	3	1	56	1	3
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	69	58	32	11	0	17	5	80	8	10
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	41	32	18	0	0	13	4	67	3	6
A	29	A1-29 Do you calculate values of circuit total capacitance	10	0	4	0	0	3	2	26	1	1
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	3	0	4	0	0	2	1	23	0	1
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	10	5	4	0	0	2	1	28	1	2
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	21	0	4	0	0	2	2	40	1	2
A	33	A1-33 Do you ohm check capacitors	41	32	21	0	1	10	5	60	3	3
A	34	A1-34 Do you use capacitor color codes in your present job	3	0	7	0	0	3	1	19	0	1
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	97	68	79	53	1	10	3	78	8	9
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	76	47	79	47	1	9	2	67	3	4
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	28	16	29	5	0	2	0	41	1	2
A	38	A1-38 Do you calculate impedance of transformers	10	5	18	0	0	1	0	21	0	2
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	17	11	7	5	0	1	1	31	0	3
A	40	A1-40 Do you ohm check transformers	52	42	50	37	1	6	2	61	2	3
A	41	A1-41 Do you measure transformer output voltage	86	47	64	42	1	6	2	65	3	4
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	59	42	57	21	0	3	1	35	0	3

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	55	32	57	26	0	3	1	31	0	3
A	44	A1-44 Do you adjust three phase transformers	21	21	11	5	0	1	1	15	0	2
0004		I 2. A2 Electro/Mechanical Devices										
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	90	42	32	5	1	4	1	60	4	4
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	83	42	29	5	1	4	1	56	2	3
A	47	A2-3 Do you troubleshoot DC motor component parts	31	11	4	0	1	2	1	25	0	2
A	48	A2-4 Do you perform tasks on DC motor component parts	17	0	4	0	1	2	1	28	0	2
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	97	42	25	0	1	3	1	62	5	4
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	93	37	21	0	1	3	1	56	2	2
A	51	A2-7 Do you troubleshoot AC motor component parts	28	16	7	0	1	1	1	24	0	3
A	52	A2-8 Do you perform tasks on AC motor component parts	21	0	4	0	1	1	1	28	0	3
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	45	26	4	0	0	1	1	15	2	1
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	38	26	0	0	0	1	2	14	0	0
A	55	A2-11 Do you troubleshoot DC generator component parts	14	21	0	0	0	1	1	11	0	0
A	56	A2-12 Do you perform tasks on component parts of DC generators	14	5	0	0	0	1	1	11	0	0
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	59	16	7	0	0	1	1	22	3	1
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	52	16	4	0	0	1	1	21	1	0
A	59	A2-15 Do you troubleshoot AC generator component parts	21	11	0	0	0	0	1	15	0	0
A	60	A2-16 Do you perform tasks on component parts of AC generators	21	11	0	0	0	1	1	16	1	0
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	0	0	0	0	0	0	0	8	1	0
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	0	0	0	0	0	0	0	8	0	0
A	63	A2-19 Do you troubleshoot alternator component parts	0	0	0	0	0	0	0	6	0	0
A	64	A2-20 Do you perform tasks on component parts of alternators	0	0	0	0	0	0	0	6	0	0
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	100	79	39	11	0	1	1	30	3	1
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	100	95	32	11	1	1	1	28	0	1
A	67	A2-23 Do you troubleshoot synchro or servo component parts	41	58	14	0	0	1	1	20	0	0
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	38	32	14	0	1	1	1	19	0	0
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	3	0	7	0	0	0	0	8	2	0
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	3	0	11	0	0	0	0	6	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	71	A2-27 Do you measure chopper coil excitation frequency	3	0	4	0	0	0	0	6	0	0
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	3	0	4	0	0	0	0	4	0	0
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	7	37	29	0	0	1	0	40	2	1
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	10	37	14	0	1	1	0	37	0	1
A	75	A2-31 Do you calibrate or adjust transducers	3	11	7	0	2	1	0	37	0	3
A	76	A2-32 Do you repair, clean or lubricate transducers	7	16	7	0	1	1	0	38	0	1
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	79	47	29	0	1	36	13	49	4	9
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid	76	47	21	0	1	37	17	44	2	10
A	79	A2-35 Do you perform maintenance on solenoid component parts	38	11	4	0	1	16	9	35	1	6
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	17	11	18	0	1	7	4	54	4	6
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	17	11	18	5	2	8	6	49	2	5
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	7	16	11	0	1	4	4	22	1	3
0005		I .5. A3 Solid State Circuits and Devices										
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	66	68	61	21	1	20	2	77	11	8
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	31	42	46	5	1	19	1	67	3	5
A	85	A3-3 Do you check diodes using an ohmmeter	34	53	43	0	1	18	1	70	2	4
A	86	A3-4 Do you use diode characteristic curves	3	11	4	0	0	1	0	35	1	1
A	87	A3-5 Do you use diode substitution information	3	5	7	0	0	2	0	49	2	3
A	88	A3-6 Do you use diode color codes	3	11	18	0	0	6	0	19	0	1
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors	55	63	29	16	1	9	2	78	10	4
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor	14	26	18	0	0	8	2	67	3	3
A	91	A3-9 Do you check transistors using an ohmmeter	14	32	11	0	1	6	3	64	2	2
A	92	A3-10 Do you check transistors using transistor testers	3	11	4	0	0	2	1	56	2	2
A	93	A3-11 Do you use transistor characteristic curves	0	5	4	0	0	0	0	35	1	1
A	94	A3-12 Do you use transistor substitution information	0	5	7	0	0	1	0	54	2	3
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)	48	37	46	16	1	10	2	81	10	5
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	17	26	14	0	1	8	2	67	3	4
A	97	A3-15 Do you use IC substitution information	7	21	11	0	0	2	1	60	3	4
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	24	26	29	16	0	4	2	67	9	3
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	14	16	25	0	0	3	2	60	2	3
A	100	A3-18 Do you perform tasks on varactors/varicaps	3	5	0	0	0	0	0	20	2	2
A	101	A3-19 Do you perform tasks on tunnel diodes	3	0	4	0	0	0	0	24	1	1

D Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	3	5	14	0	0	0	0	57	4	3
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	3	0	4	0	0	0	0	38	1	2
A	104	A3-22 Do you perform tasks on zener diodes	17	11	25	0	0	2	0	68	3	3
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	7	0	14	0	0	1	1	42	2	2
A	106	A3-24 Do you perform tasks on pin diodes	3	11	18	0	0	1	0	16	1	1
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	7	47	36	5	0	2	1	68	5	3
A	108	A3-26 Do you perform tasks on fantail transistors	0	0	7	0	0	0	0	13	1	0
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	0	11	7	0	0	1	0	65	2	1
A	110	A3-28 Do you perform tasks on triacs	0	0	0	0	0	0	0	36	2	1
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	0	0	7	0	0	0	0	5	1	0
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	3	0	0	0	0	0		17	2	1
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	3	0	0	0	0	0	0	6	1	0
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	3	0	7	0	0	0	0	1	1	0
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	3	0	14	0	0	0	0	13	1	0
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	3	0	0	0	0	0	0	14	2	0
A	117	A3-35 Do you perform tasks on varistors	7	21	4	0	0	1	0	33	2	0
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	3	0	0	0	0	0	0	20	1	0
A	119	A3-37 Do you perform tasks on schottky diodes	3	0	18	0	0	0	0	26	1	0
0006		I 4. A4 Tubes										
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	97	21	11	5	0	0	0	13	2	1
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	86	11	7	0	0	0	0	12	1	1
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	86	11	11	0	0	0	0	12	0	1
A	123	A4-4 Do you use electron tube characteristic curves	3	0	4	0	0	0	0	6	0	2
A	124	A4-5 Do you use electron tube substitution manuals or charts	17	0	4	0	0	0	0	8	0	0
A	125	A4-6 Do you perform tasks on diode tubes	28	0	4	0	0	1	0	10	0	0
A	126	A4-7 Do you perform tasks on triode tubes	21	0	4	0	0	0	0	9	0	0
A	127	A4-8 Do you perform tasks on tetrode tubes	10	0	4	0	0	0	0	8	0	0
A	128	A4-9 Do you perform tasks on pentode tubes	24	0	0	0	0	0	0	8	0	0
A	129	A4-10 Do you perform tasks on beam power tubes	14	0	0	0	0	0	0	4	0	1
A	130	A4-11 Do you perform tasks on gas tubes	24	0	4	0	0	0	0	7	0	3
A	131	A4-12 Do you perform tasks on phantastrons	10	0	0	0	0	0	0	1	0	0
A	132	A4-13 Do you perform tasks on neon tubes	7	0	0	0	0	0	0	3	0	0
A	133	A4-14 Do you perform tasks on xenon tubes	7	0	0	0	0	0	0	2	0	3
A	134	A4-15 Do you perform tasks on nixie tubes	3	0	4	0	0	0	0	5	0	0
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	90	58	25	26	0	0	0	22	3	0
A	136	A4-17 Do you trace schematic diagrams of CRT circuits	93	42	18	11	0	0	0	21	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	137	A4-18 Do you troubleshoot to isolate a faulty CRT	86	77	21	21	0	0	0	20	1	1
A	138	A4-19 Do you adjust or calibrate circuits that control CRT operations	90	47	7	0	0	0	0	19	1	1
A	139	A4-20 Do you perform tasks on electrostatic CRT	28	26	7	5	0	0	0	11	1	0
A	140	A4-21 Do you perform tasks on electromagnetic CRT	14	11	11	11	0	0	0	12	2	1
0007		II 5. A5 Soldering or Solderless Connections										
A	141	A5-1 Do you solder or desolder hardwire connections	100	84	39	68	6	44	27	78	5	9
A	142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	59	58	25	0	2	27	8	76	4	8
A	143	A5-3 Do you solder or desolder printed circuit board connections	14	32	18	0	1	10	2	69	2	5
A	144	A5-4 Do you solder or desolder multi-layer circuit board connections	10	11	14	0	0	5	1	38	1	3
A	145	A5-5 Do you perform high reliability soldering	31	42	25	26	2	25	10	63	1	3
A	146	A5-6 Do you use crimping tool to repair or make connections	97	95	79	79	11	51	19	79	4	9
A	147	A5-7 Do you use wire wrap tool to make connections	31	32	25	5	3	19	7	69	4	4
A	148	A5-8 Do you use punch-on tool to make connections	21	11	11	5	1	12	4	31	1	2
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	66	26	57	68	3	16	15	69	4	3
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	100	100	54	74	2	22	21	65	4	6
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	10	5	21	32	1	7	7	19	0	1
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	3	16	7	5	1	2	5	61	4	5
0008		II. Test Equipment										
0009		II 1. B1 Multimeters										
B	153	B1-1 Do you use the multimeter to measure DC voltage values	100	100	71	74	27	68	44	81	4	11
B	154	B1-2 Do you use the multimeter to measure AC voltage values	100	100	68	74	18	58	34	81	4	9
B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	59	26	11	26	7	12	9	26	0	5
B	156	B1-4 Do you use the multimeter to measure DC current values	100	84	43	42	23	47	33	70	3	8
B	157	B1-5 Do you use the multimeter to measure AC current values	90	84	43	42	15	41	26	71	3	6
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	28	0	7	21	5	7	7	23	0	2
B	159	B1-7 Do you use the multimeter to measure circuit resistance	100	74	75	53	35	48	53	69	4	10
B	160	B1-8 Do you use the multimeter to measure component resistance	97	74	64	21	26	40	47	75	3	8

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0010	II 2.	B2 Oscilloscopes										
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	79	79	21	68	0	3	0	69	16	3
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	100	74	29	79	0	4	1	71	24	4
B	163	B2-3 Do you use the oscilloscope to measure AC voltage	97	63	29	53	1	4	0	68	4	7
B	164	B2-4 Do you use the oscilloscope to measure DC voltage	90	63	29	53	1	4	0	72	8	8
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	48	37	21	53	0	2	0	63	3	3
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	17	58	21	21	0	0	0	35	0	2
B	167	B2-7 Do you use the oscilloscope to observe signal/data patterns	66	53	25	58	0	1	0	65	15	8
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	14	0	11	5	0	0	0	15	1	1
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	55	58	21	32	0	1	0	63	10	2
B	170	B2-10 Do you use attenuator probes with oscilloscopes	66	32	21	68	0	1	0	51	3	4
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	14	32	18	11	0	1	0	24	5	1
0011	II 3.	B3 Signal (Function) Generators										
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	48	37	11	47	2	1	1	65	14	1
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	48	37	14	16	1	1	0	66	16	0
B	174	B3-3 Do you use SG to troubleshoot circuits	45	16	11	37	1	1	0	58	5	0
B	175	B3-4 Do you use audio sine-wave signal generators	7	0	7	12	0	0	0	43	4	1
B	176	B3-5 Do you use audio non-sinusoidal signal generators	7	0	4	11	0	0	0	31	0	0
B	177	B3-6 Do you use RF less than 1,000MH signal generators	24	16	7	42	0	0	0	40	2	1
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	24	16	11	47	0	0	0	16	2	0
B	179	B3-8 Do you use white noise signal generators	0	0	0	21	0	0	0	8	0	0
B	180	B3-9 Do you use pattern signal generators	3	0	0	32	1	0	0	10	1	0
B	181	B3-10 Do you use pseudo-random signal generators	3	0	0	26	0	0	0	6	1	0
B	182	B3-11 Do you use time mark signal generators	3	0	0	5	0	0	0	17	3	0
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	3	32	4	32	0	0	0	62	10	1
B	184	B3-13 Do you use TV signal signal generators	3	0	0	0	1	0	0	1	0	0
0012	II 4.	B4 Test Equipment Types										
B	185	B4-1 Do you use frequency counters	93	58	18	26	1	2	2	69	3	3
B	186	B4-2 Do you use spectrum analyzers	48	53	18	84	0	0	1	36	4	5

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
B	187	B4-3 Do you use field strength testers	7	0	0	5	0	1	0	12	1	3
B	188	B4-4 Do you use digital multimeters	100	79	68	79	9	33	28	79	5	11
B	189	B4-5 Do you use digital logic probes	3	11	4	16	0	1	1	57	2	0
B	190	B4-6 Do you use capacitance testers	10	0	4	0	0	1	9	41	0	1
B	191	B4-7 Do you use capacitor substitution boxes	3	0	0	0	0	0	0	16	0	0
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	0	0	0	0	0	0	0	1	0	0
B	193	B4-9 Do you use logic current tracers	0	0	0	21	0	0	0	33	0	1
B	194	B4-10 Do you use tube testers	48	0	7	5	0	0	0	7	0	0
B	195	B4-11 Do you use logic pulsers	3	0	0	11	0	0	1	46	1	0
B	196	B4-12 Do you use logic analyzers	3	11	0	47	0	0	1	33	2	0
B	197	B4-13 Do you use signature analyzers	10	0	0	5	0	0	0	15	0	0
B	198	B4-14 Do you use reflectometers	34	5	14	47	0	1	0	15	0	0
0013		III. Amplifier Circuits										
0014		III 1. C1 Transistor Amplifier Circuits										
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	28	42	14	16	0	1	0	64	7	2
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	24	21	11	5	0	0	0	65	6	1
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	21	11	11	5	0	1	0	60	3	1
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	3	5	11	0	0	0	0	51	1	1
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	3	5	4	0	0	0	0	38	1	1
C	204	C1-6 Do you adjust or align transistor amplifiers	7	16	7	0	0	0	0	47	2	1
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	7	16	7	0	0	0	0	44	3	1
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	3	5	4	0	0	0	0	34	1	1
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	3	16	0	5	0	0	0	45	2	1
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	3	16	4	5	0	0	0	41	2	0
C	209	C1-11 Do you work on paraphase transistor amplifiers	3	11	0	0	0	0	0	13	1	0
C	210	C1-12 Do you work on push-pull transistor amplifiers	7	16	7	0	0	0	0	53	2	1
C	211	C1-13 Do you work on audio transistor amplifiers	0	11	0	0	0	0	0	35	2	0
C	212	C1-14 Do you work on wideband transistor amplifiers	3	11	0	5	0	0	0	32	2	0
C	213	C1-15 Do you work on IF transistor amplifiers	21	37	7	11	0	0	0	26	2	0
C	214	C1-16 Do you work on RF transistor amplifiers	17	37	11	11	0	0	0	28	2	0
C	215	C1-17 Do you work on buffer transistor amplifiers	7	16	7	5	0	0	0	49	1	0
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	3	16	0	0	0	0	0	29	2	0
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	7	21	11	5	0	0	0	42	3	1

D T Tsk Y Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0015	III 2. C2 Transistor Amplifier Stabilization Circuits										
C 218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	3	5	7	0	0	0	0	42	3	0
C 219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	3	0	4	0	0	0	0	33	1	0
C 220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	3	11	0	0	0	0	0	42	0	0
C 221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	7	0	0	0	0	0	0	36	0	0
C 222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	0	11	4	0	0	0	0	28	0	0
C 223	C2-6 Do you perform tasks on diode stabilization amplifiers	7	11	4	0	0	0	0	38	0	0
C 224	C2-7 Do you perform tasks on double diode stabilization amplifiers	3	0	4	0	0	0	0	21	0	0
0016	III 3. C3 Coupling Circuits										
C 225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	10	21	14	16	0	1	0	57	3	1
C 226	C3-2 Do you trace schematic diagrams of coupling circuits	10	21	14	5	0	1	0	52	2	0
C 227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	10	11	7	0	0	0	1	42	1	0
C 228	C3-4 Do you troubleshoot coupling circuits to circuit level components	3	5	0	0	0	0	0	40	1	0
C 229	C3-5 Do you perform tasks on direct coupling circuits	10	21	4	0	0	0	0	55	1	1
C 230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	7	11	4	0	0	0	0	47	1	1
C 231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	3	11	4	0	0	0	0	42	0	0
C 232	C3-8 Do you perform tasks on transformer coupling circuits	10	16	11	0	0	0	0	48	0	1
C 233	C3-9 Do you perform tasks on optical coupling circuits	0	11	0	0	0	0	0	20	0	0
0017	III 4. C4 Electron Tube Amplifier Circuits										
C 234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	76	5	4	5	0	0	0	6	0	0
C 235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	66	5	4	0	0	0	0	6	0	0
C 236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	62	5	4	0	0	0	0	5	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	31	0	0	0	0	0	0	5	0	0
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	7	5	0	0	0	0	0	4	0	0
C	239	C4-6 Do you adjust or align electron tube amplifiers	17	5	0	0	0	0	0	4	0	0
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	41	0	0	0	0	0	0	4	0	0
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	3	0	0	0	0	0	0	4	0	0
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	7	0	0	0	0	0	0	3	0	0
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	10	0	0	0	0	0	0	3	0	0
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	3	0	0	0	0	0	0	2	0	0
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	48	0	4	0	0	0	0	3	0	0
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	21	0	0	0	0	0	0	3	0	0
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	28	0	0	0	0	0	0	3	0	0
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	31	0	0	0	0	0	0	3	0	0
0018		III 5. C5 Operational Amplifiers										
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	21	26	14	21	0	0	0	69	7	3
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	17	0	7	0	0	0	0	58	2	2
C	251	C5-3 Do you calculate op amp gain	0	0	0	0	0	0	0	33	1	0
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	3	5	4	0	0	0	0	47	2	0
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	21	16	7	11	0	0	0	58	4	0
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	7	16	4	11	0	0	0	52	3	0
C	255	C5-7 Do you use or apply operational amplifiers for summing	3	5	4	11	0	0	0	42	2	0
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	3	16	4	11	0	0	0	45	3	0
C	257	C5-9 Do you use or apply operational amplifiers as active filters	3	0	0	16	0	0	0	44	2	0
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	7	21	4	16	0	0	0	42	2	0
C	259	C5-11 Do you use or apply operational amplifiers as integrators	3	16	4	11	0	0	0	28	1	0
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	3	16	0	5	0	0	0	39	1	0
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	24	16	11	5	1	0	1	54	4	2

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	28	11	14	21	0	0	0	54	9	3
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	14	11	7	5	0	0	0	39	1	0
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	17	11	7	5	0	0	0	37	1	0
0019		III 6. C6 Magnetic Amplifiers										
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	48	0	0	0	0	0	0	3	0	0
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	59	0	0	0	0	0	0	3	0	0
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	55	0	0	0	0	0	0	3	0	0
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	10	0	0	0	0	0	0	3	0	0
C	269	C6-5 Do you adjust magnetic amplifiers or components	7	0	0	0	0	0	0	3	0	0
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	0	5	0	0	0	0	0	1	0	0
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	0	5	0	0	0	0	0	1	0	0
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	0	5	0	0	0	0	0	1	0	0
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	0	5	0	0	0	0	0	1	0	0
C	274	C6-10 Do you adjust saturable reactor circuits or components	0	5	0	0	0	0	0	1	0	0
0020		IV. Power Supplies										
0021		IV 1. D1 Power Supply Circuits										
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	68	61	53	1	16	8	78	9	8
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	100	63	54	21	1	13	7	74	6	8
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	100	68	54	21	1	18	12	66	4	7
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	55	16	14	5	1	5	5	55	1	2
D	279	D1-5 Do you align or adjust power supplies	93	53	18	0	1	3	12	72	3	6
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	14	11	7	5	0	1	0	47	2	3

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	24	16	11	5	0	1	0	53	2	2
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	28	16	14	5	0	1	0	61	2	3
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	17	16	7	5	0	1	1	25	1	1
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	14	11	21	11	0	1	1	31	3	3
D	285	D1-11 Do you perform tasks on DC to DC converters	28	11	21	5	0	1	1	65	3	3
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	55	16	29	11	1	2	2	49	4	2
D	287	D1-13 Do you perform tasks on switching power supplies	3	0	7	5	0	3	3	44	3	2
0022		IV 2. D2 Power Supply Filters										
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	28	26	11	5	0	1	0	56	5	1
D	289	D2-2 Do you trace schematic diagrams of power supply filters	24	16	11	0	0	1	0	56	3	1
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	17	16	11	0	0	1	0	47	1	2
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	7	5	4	0	0	1	0	40	1	1
D	292	D2-5 Do you perform tasks on capacitive power supply filters	14	5	7	5	0	0	0	51	2	1
D	293	D2-6 Do you perform tasks on inductive power supply filters	7	0	7	5	0	0	0	40	1	0
D	294	D2-7 Do you perform tasks on L-type power supply filters	3	0	4	5	0	0	0	24	1	0
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	3	0	0	5	0	0	0	22	1	0
D	296	D2-9 Do you perform tasks on T-type power supply filters	3	0	0	5	0	0	0	19	1	0
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	14	0	7	5	0	0	0	46	2	1
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	7	0	7	5	0	0	0	42	1	0
0023		IV 3. D3 Power Supply Voltage Regulators										
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	69	32	25	5	0	2	1	69	5	3
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	62	21	25	0	0	2	1	66	4	1
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	69	16	25	0	0	2	1	58	2	1
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	24	5	7	0	0	1	0	50	1	0
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	59	11	4	5	0	1	1	53	2	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	17	5	7	5	0	1	0	56	2	0
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	7	5	0	5	0	0	0	54	2	0
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	3	11	7	5	0	0	0	49	2	1
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	7	11	0	5	0	0	0	29	1	0
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	3	11	4	5	0	0	0	40	1	1
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	0	0	7	0	0	0	1	50	2	1
0024		V. Reactive Circuits										
0025		V 1. E1 Resistive Capacitive Inductive Circuits										
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	7	16	0	11	0	0	1	40	3	1
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	7	0	0	0	0	0	1	33	0	0
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	7	11	0	11	0	0	0	32	2	0
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	7	0	0	0	0	0	0	28	0	0
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits	0	0	0	0	0	0	3	17	1	1
E	315	E1-6 Do you calculate phase angle of RCL circuits	0	0	0	0	0	0	0	13	1	0
E	316	E1-7 Do you calculate values of power in RCL circuits	0	0	0	0	0	0	2	13	1	0
0026		V 2. E2 Frequency Sensitive Filters										
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters	10	5	0	21	0	0	0	53	5	0
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter	10	5	0	5	0	0	0	46	2	0
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components	7	0	0	0	0	0	0	32	1	0
E	320	E2-4 Do you align or adjust frequency sensitive filters	0	0	0	0	0	0	0	42	3	0
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	0	0	0	0	0	0	0	19	1	0
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters	3	5	4	11	0	0	0	45	5	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters	3	5	4	11	0	0	0	41	4	0
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters	7	0	4	11	0	0	0	51	4	0
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters	3	0	4	11	0	0	0	29	2	0
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters	3	0	0	5	0	0	0	8	1	0
0027		VI. Waveshaping/Generating Circuits										
0028		VI 1. F1 Oscillators										
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	55	32	11	16	0	0	0	56	4	0
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	38	16	11	11	0	0	0	54	2	0
F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	45	16	11	0	0	0	0	47	1	0
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	24	0	4	0	0	0	0	35	1	0
F	331	F1-5 Do you align or adjust oscillator circuits	41	16	7	0	0	0	0	52	2	0
F	332	F1-6 Do the oscillators you work with use LC tank circuits	3	0	4	5	0	0	0	33	2	0
F	333	F1-7 Do the oscillators you work with use RC networks	21	0	7	5	0	0	0	40	2	0
F	334	F1-8 Do the oscillators you work with use crystals	66	26	7	5	0	0	0	52	2	1
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	3	0	4	5	0	0	0	38	2	0
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	0	0	4	0	0	0	0	21	1	0
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	0	0	4	0	0	0	0	22	2	0
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	3	0	0	0	0	0	0	21	2	0
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	0	0	0	5	0	0	0	15	1	0
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	10	16	11	16	0	0	0	42	2	0
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	45	16	4	0	0	0	0	46	2	0
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	0	0	0	5	0	0	0	13	1	0
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	24	0	0	5	0	0	0	22	2	0
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	17	0	0	5	0	0	0	7	1	0
F	345	F1-19 Do you perform tasks on burst generators	[illegible]	0	0	0	0	0	0	5	1	0
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	1[illegible]	0	0	5	0	0	0	15	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0029		VI 2. F2 Multivibrators										
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	45	16	4	11	0	0	0	42	3	0
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	45	5	4	0	0	0	0	42	2	0
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	41	0	0	0	0	0	0	38	1	0
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	10	0	0	0	0	0	0	31	1	0
F	351	F2-5 Do you adjust or align multivibrator circuits	21	5	4	0	0	0	0	35	0	0
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	10	0	0	5	0	0	0	25	1	0
F	353	F2-7 Do the multivibrators you work with use RC networks	17	0	4	5	0	0	0	36	2	0
F	354	F2-8 Do the multivibrators you work with use Crystals	17	11	4	5	0	0	0	31	1	0
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	24	0	0	5	0	0	0	34	2	0
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	10	11	4	5	0	0	0	35	2	0
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	10	5	4	5	0	0	0	38	3	0
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	7	5	4	5	0	0	0	28	2	0
0030		VI 3. F3 Waveshaping Circuits										
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	24	16	4	21	0	0	0	31	2	0
F	360	F3-2 Do you trace schematic diagrams of WSC	17	11	4	5	0	0	0	32	1	0
F	361	F3-3 Do you troubleshoot to isolate a faulty WSC	24	11	0	0	0	0	0	26	0	0
F	362	F3-4 Do you troubleshoot WSC to circuit level components	10	0	0	0	0	0	0	22	0	0
F	363	F3-5 Do you adjust or calibrate WSC	21	16	0	0	0	0	0	25	1	0
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	24	11	4	11	0	0	0	24	2	0
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	7	0	0	11	0	0	0	24	1	0
F	366	F3-8 Do you perform tasks on RC differentiating WSC	3	0	0	5	0	0	0	21	1	0
F	367	F3-9 Do you perform tasks on RL differentiating WSC	3	0	0	5	0	0	0	14	1	0
F	368	F3-10 Do you perform tasks on RC integrating WSC	3	0	0	5	0	0	0	20	1	0
F	369	F3-11 Do you perform tasks on RL integrating WSC	3	0	0	5	0	0	0	14	1	0
F	370	F3-12 Do you perform tasks on square wave generator WSC	28	11	4	11	0	0	0	30	1	0
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	10	5	0	11	0	0	0	22	1	0
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	14	0	4	5	0	0	0	31	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0031		VI 4. F4 Limiter/Clamper Circuits										
F	373	F4-1 Do you trace block diagrams of circuits containing limiters	10	11	0	16	0	0	0	35	2	0
F	374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	0	5	0	0	0	35	2	0
F	375	F4-3 Do you trace block diagrams of circuits containing clampers	7	5	0	11	0	0	0	32	2	0
F	376	F4-4 Do you trace schematic diagrams of clamper circuits	0	5	0	0	0	0	0	31	2	0
F	377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	10	0	0	5	0	0	0	31	0	0
F	378	F4-6 Do you troubleshoot limiters to circuit level components	3	0	0	0	0	0	0	25	0	0
F	379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit	3	0	0	0	0	0	0	29	0	0
F	380	F4-8 Do you troubleshoot clampers to circuit level components	0	0	0	0	0	0	0	23	0	0
F	381	F4-9 Do you perform tasks on series diode limiter circuits	7	0	0	5	0	0	0	25	1	0
F	382	F4-10 Do you perform tasks on shunt diode limiter circuits	0	0	0	5	0	0	0	26	1	0
F	383	F4-11 Do you perform tasks on bias limiter circuits	3	0	0	5	0	0	0	21	1	0
F	384	F4-12 Do you perform tasks on zener diode circuits	10	11	0	5	0	0	0	30	1	1
F	385	F4-13 Do you perform tasks on transistor limiter circuits	10	0	0	5	0	0	0	26	1	0
F	386	F4-14 Do you perform tasks on triode limiter circuits	7	0	0	5	0	0	0	10	0	0
F	387	F4-15 Do you perform tasks on diode clamper circuits	7	0	0	5	0	0	0	28	0	0
F	388	F4-16 Do you perform tasks on bias clamper circuits	0	5	0	5	0	0	0	19	1	0
0032		VII. Computers, Digital Circuits, and Devices										
0033		VII 1. G1 Digital Logic Numbering Systems and Functions										
G	389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal	0	26	50	42	0	2	1	56	32	11
G	390	G1-2 Do you convert octal numbers to binary or binary numbers to octal	0	11	29	32	0	1	0	39	24	6
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	0	16	50	47	1	1	0	53	32	9
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	0	11	25	32	0	1	0	37	24	6
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	0	21	54	42	0	1	0	52	35	9
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	0	11	25	32	0	0	0	33	19	5
G	395	G1-7 Do you convert base number fractions to another base numbering system	0	11	18	26	0	1	1	27	14	6
G	396	G1-8 Do you add binary numbers	0	11	29	26	0	2	1	47	21	10

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	397	G1-9 Do you subtract binary numbers	0	11	25	26	0	2	1	43	20	8
G	398	G1-10 Do you multiply binary numbers	0	5	21	26	0	1	1	31	13	5
G	399	G1-11 Do you divide binary numbers	0	5	21	26	0	1	1	31	12	5
G	400	G1-12 Do you add octal numbers	0	0	21	26	0	1	0	28	17	5
G	401	G1-13 Do you subtract octal numbers	0	0	21	26	0	1	0	28	17	5
G	402	G1-14 Do you add hexadecimal numbers	0	5	25	26	0	0	0	43	18	8
G	403	G1-15 Do you subtract hexadecimal numbers	0	5	25	26	0	0	0	42	19	8
G	404	G1-16 Do you use binary coded decimal (BCD)	0	5	32	32	0	1	0	52	27	9
G	405	G1-17 Do you use gray codes	0	0	14	26	0	0	0	19	6	2
G	406	G1-18 Do you use ICAO codes	0	0	0	11	0	0	0	3	1	0
G	407	G1-19 Do you use excess-3 (XS3) codes	0	0	14	11	0	0	0	6	1	0
G	408	G1-20 Do you use parity bit codes	0	0	32	32	0	0	0	35	11	7
G	409	G1-21 Do you use biquinary codes	0	0	4	5	0	0	0	6	1	0
G	410	G1-22 Do you use ASCII codes	0	16	36	11	1	0	1	51	29	14
G	411	G1-23 Do you use EBCDI codes	0	0	4	5	0	0	0	9	13	10
G	412	G1-24 Do you trace data flow through logic symbol diagrams	7	21	71	53	0	2	0	63	16	6
G	413	G1-25 Do you trace data flow through logic schematic diagrams	14	21	75	37	0	2	0	60	12	4
G	414	G1-26 Do you troubleshoot digital systems to major units	10	16	79	53	0	1	0	58	6	2
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	7	16	25	0	0	1	0	58	4	1
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	0	0	4	0	0	1	0	47	3	1
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	0	16	54	32	0	1	0	53	6	2
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	0	16	43	26	0	1	0	47	5	1
G	419	G1-31 Do you perform tasks related to AND gates	3	21	54	26	0	3	1	62	9	2
G	420	G1-32 Do you perform tasks related to OR gates	3	21	54	26	0	4	1	62	9	2
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	0	11	43	26	0	2	0	48	5	1
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	0	21	54	26	0	3	1	60	8	2
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	0	5	39	26	0	2	1	55	7	0
G	424	G1-36 Do you perform tasks related to RS flip flops	0	16	18	11	0	1	0	51	4	0
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	0	5	21	21	0	1	0	50	4	0
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	0	11	18	21	0	1	0	47	2	0
G	427	G1-39 Do you perform tasks related to JK flip flops	0	11	18	21	0	0	0	56	5	0
G	428	G1-40 Do you perform tasks related to Schmidt triggers	0	0	18	21	0	0	0	47	2	0
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	3	21	21	21	0	0	0	41	2	0
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	0	0	21	21	0	0	0	40	2	0
G	431	G1-43 Do you perform tasks related to buffers	0	16	29	21	0	0	0	60	5	1
G	432	G1-44 Do you perform tasks related to inverters	0	21	36	21	0	0	0	59	5	0
G	433	G1-45 Do you perform tasks related to complemented flip flops	0	5	18	21	0	0	0	33	3	0
G	434	G1-46 Do you perform tasks related to complementing flip flops	0	5	18	21	0	0	0	31	3	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams	0	0	14	0	0	0	0	26	2	0
G	436	G1-48 Do you develop logic diagrams from Boolean equations	0	0	14	0	0	0	0	24	1	0
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra	0	0	11	0	0	0	0	24	2	1
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	0	0	7	5	0	0	0	25	2	0
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	0	0	7	5	0	0	0	31	2	0
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)	3	5	14	5	0	0	0	58	3	0
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)	0	0	11	5	0	0	0	18	2	0
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)	0	0	0	5	0	0	0	14	1	0
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)	0	0	11	5	0	0	0	53	2	0
G	444	G1-56 Do you perform tasks on positive MOS ICs	0	0	4	5	0	0	0	17	1	0
G	445	G1-57 Do you perform tasks on negative MOS ICs	0	0	4	5	0	0	0	17	1	0
G	446	G1-58 Do you perform tasks on vertical MOS ICs	0	0	0	5	0	0	0	8	1	0
0034		VII 2. G2 Computers										
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems	14	16	68	63	1	2	1	65	18	10
G	448	G2-2 Do you load programs	0	21	82	79	8	5	9	71	65	48
G	449	G2-3 Do you write or debug programs	0	5	11	0	2	1	3	36	30	26
G	450	G2-4 Do you troubleshoot computers to a major unit	10	16	64	68	1	1	2	63	23	13
G	451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	17	21	36	0	0	1	1	62	7	3
G	452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	3	5	4	0	0	0	1	42	2	1
G	453	G2-7 Do you use computer flow charts or diagrams	0	11	54	32	2	2	3	56	27	18
G	454	G2-8 Do you perform tasks on analog computers	38	5	14	21	3	2	3	20	19	6
G	455	G2-9 Do you perform tasks on digital computers	24	16	89	68	3	3	3	74	67	39
G	456	G2-10 Do you use Basic computer language	3	0	18	0	9	4	9	31	32	35
G	457	G2-11 Do you use COBOL computer language	0	0	4	0	1	0	0	2	1	3
G	458	G2-12 Do you use FORTRAN computer language	0	0	11	0	1	0	1	8	24	30
G	459	G2-13 Do you use ADA computer language	0	0	0	0	0	0	0	2	10	6
G	460	G2-14 Do you use ATLAS computer language	0	0	0	11	0	0	1	0	0	0
G	461	G2-15 Do you use ELAN computer language	0	0	0	0	0	0	0	0	0	0
G	462	G2-16 Do you use PASCAL computer language	0	0	0	5	1	0	0	3	9	9
G	463	G2-17 Do you use RPG computer language	0	0	0	0	0	0	0	0	1	1
G	464	G2-18 Do you use Machine computer language	0	0	4	11	1	0	2	37	12	8
G	465	G2-19 Do you use C computer language	0	0	0	0	1	0	0	2	13	4
G	466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	0	16	68	53	9	4	6	67	67	47
G	467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	0	0	54	42	3	1	3	65	35	24

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	0	16	21	5	2	1	1	13	28	9
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	0	0	7	5	0	0	1	24	7	2
G	470	G2-24 Do you perform tasks on computer keyboards	0	16	61	58	15	9	14	70	72	61
G	471	G2-25 Do you perform tasks on computer character printers	0	5	39	5	9	4	10	58	46	43
G	472	G2-26 Do you perform tasks on magnetic tape drives	0	5	46	16	3	1	2	65	54	36
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	0	5	29	5	6	1	5	49	52	45
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	0	5	43	47	8	4	7	39	50	42
G	475	G2-29 Do you perform tasks on paper tape readers/punches	0	5	14	5	1	0	1	8	31	3
G	476	G2-30 Do you perform tasks on paper card readers/punches	0	0	4	0	0	0	0	3	7	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	0	0	39	32	2	2	3	47	34	9
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	0	5	36	11	1	1	1	42	19	8
G	479	G2-33 Do you perform tasks on modems	0	0	14	11	4	2	4	41	36	13
G	480	G2-34 Do you perform tasks on line printers	0	0	21	5	9	4	9	44	45	42
G	481	G2-35 Do you perform tasks on floppy disc drives	0	0	21	5	12	4	10	39	59	53
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	0	0	18	0	3	1	3	18	32	24
G	483	G2-37 Do you perform tasks on removable pack disc drives	0	0	4	0	2	0	1	43	33	14
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	0	0	7	0	4	1	2	28	23	23
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	0	5	29	21	0	0	0	53	7	3
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	0	5	11	0	0	0	0	47	4	3
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	0	0	4	0	0	0	0	35	1	2
0035		VII 3. G3 Digital Circuits										
G	488	G3-1 Do you trace data flow through circuits containing counters	3	5	18	5	0	0	0	50	6	0
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	3	5	14	0	0	1	0	43	2	0
G	490	G3-3 Do you troubleshoot counters to circuit level components	0	0	4	0	0	0	0	36	2	0
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	3	5	11	5	0	0	0	42	5	0
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	3	5	11	5	0	0	0	40	4	0
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	0	0	11	5	0	0	0	39	3	0
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	0	0	11	5	0	0	0	22	2	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	0	0	4	0	0	0	0	13	2	0
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	3	0	4	5	0	0	0	38	2	0
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	3	0	4	5	0	0	0	39	2	0
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	0	0	21	5	0	0	0	48	5	0
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	0	0	18	0	0	0	0	38	1	0
G	500	G3-13 Do you troubleshoot registers to circuit level components	0	0	4	0	0	0	0	31	1	0
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	0	0	21	5	0	0	0	42	4	0
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	0	0	14	5	0	0	0	44	5	0
G	503	G3-16 Do you trace data flow through combinational logic circuits	3	11	29	5	0	0	0	44	4	1
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	3	11	25	0	0	0	0	39	1	0
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	0	5	4	0	0	0	0	33	0	0
G	506	G3-19 Do you perform tasks on encoders	0	0	21	5	1	0	1	40	2	0
G	507	G3-20 Do you perform tasks on decoders	0	0	21	5	1	0	1	39	2	0
G	508	G3-21 Do you perform tasks on multiplexers	0	11	32	5	0	0	0	45	3	1
G	509	G3-22 Do you perform tasks on demultiplexers	0	5	29	5	0	0	0	40	2	1
G	510	G3-23 Do you perform tasks on comparators	3	5	21	5	0	0	0	40	2	0
G	511	G3-24 Do you perform tasks on parity generators or checkers	0	5	25	5	0	0	0	37	2	0
G	512	G3-25 Do you perform tasks on code converters	0	0	11	5	0	0	0	21	1	0
G	513	G3-26 Do you perform tasks on adders	0	5	14	5	0	0	0	32	1	0
G	514	G3-27 Do you perform tasks on subtractors	0	5	14	5	0	0	0	30	1	0
G	515	G3-28 Do you perform tasks on count detect circuits	0	0	11	5	0	0	0	26	2	1
0036		VII 4. G4 Digital to Analog (D/A) and Analog to Digital (A/ Converters										
G	516	G4-1 Do you trace data flow through A/D converters	7	11	36	11	0	0	0	57	11	3
G	517	G4-2 Do you trace data flow through D/A converters	7	11	36	11	0	0	0	57	8	2
G	518	G4-3 Do you troubleshoot A/D converter circuits	10	5	29	0	0	0	0	49	2	1
G	519	G4-4 Do you troubleshoot D/A converter circuits	10	5	29	0	0	0	0	51	2	1
G	520	G4-5 Do the converters you perform tasks on use flash conversion	0	0	7	0	0	0	0	5	1	2
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	0	0	7	0	0	0	0	44	3	3
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	3	0	7	5	0	0	0	31	3	1
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	0	5	11	0	0	0	0	15	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 5[illegible]	991 04	991 05	991 06
	0037	VIII. Transmission/Reception Circuits, Devices, and Systems										
	0038	VIII 1. H1 Connections										
H	524	H1-1 Do you measure electrical length on transmission lines	3	0	18	26	0	0	0	15	1	0
H	525	H1-2 Do you measure physical length on transmission lines	7	0	7	47	0	0	0	22	2	0
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	0	0	14	32	0	0	0	15	0	0
H	527	H1-4 Do you construct transmission lines	7	0	7	26	0	0	0	15	1	0
H	528	H1-5 Do you match transmission line impedance with loads	10	0	7	26	0	0	0	15	0	0
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	0	0	7	0	0	0	0	10	0	0
H	530	H1-7 Do you troubleshoot transmission lines	21	0	21	63	0	0	0	38	3	1
H	531	H1-8 Do you perform tasks on open-wire transmission lines	7	5	11	32	0	0	0	17	2	0
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	14	5	36	37	0	1	0	29	2	0
H	533	H1-10 Do you perform tasks on twin lead transmission lines	3	5	0	32	0	0	0	9	2	0
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	21	5	25	74	0	1	1	33	2	0
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	3	5	7	53	0	0	0	11	1	0
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	0	0	0	5	0	0	1	8	2	0
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	86	53	32	74	0	0	0	4	1	0
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	86	63	32	74	0	0	0	3	0	0
H	539	H1-16 Do you pressurize or purge waveguide assemblies	76	63	32	63	0	0	0	2	0	0
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	7	5	14	37	0	0	0	3	0	0
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	90	42	39	84	2	0	0	3	0	0
	0039	VIII 2. H2 Microwave Oscillators and Amplifiers										
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	55	32	7	21	0	0	0	4	2	0
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	48	32	7	5	0	0	0	4	0	0
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	48	32	4	0	0	0	0	5	0	0
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	14	5	0	0	0	0	0	0	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	10	9	4	0	0	0	0	0	0	0
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	41	0	0	0	0	0	0	1	0	0
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	0	7	5	0	0	0	1	0	0
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	55	32	7	0	0	0	0	1	0	0
H	550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	0	0	0	0	1	0	0
H	551	H2-10 Do you perform tasks on parametric amplifiers	0	5	0	5	0	0	0	0	0	0
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	0	0	5	0	0	0	0	0	0
0040		VIII 3. H3 Resonant Cavities										
H	553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	48	21	11	11	0	0	0	5	0	0
H	554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	41	21	11	0	0	0	0	3	0	0
H	555	H3-3 Do you tune or adjust resonant cavities electrically	34	16	11	0	0	0	0	4	0	0
H	556	H3-4 Do you tune or adjust resonant cavities physically	59	16	4	0	0	0	0	4	0	0
H	557	H3-5 Do you measure frequency of resonant cavities	34	21	7	5	0	0	0	3	0	0
H	558	H3-6 Do you perform tasks on probe resonant cavities	7	5	4	5	0	0	0	1	0	0
H	559	H3-7 Do you perform tasks on loop resonant cavities	3	0	0	5	0	0	0	1	0	0
H	560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	10	0	4	5	0	0	0	1	0	0
0041		VIII 4. H4 Transmitters and Receivers										
H	561	H4-1 Do you use "AM" modulation principles	3	0	0	26	0	0	0	6	2	0
H	562	H4-2 Do you trace block diagrams of AM transmitters	3	0	0	37	0	0	0	7	1	0
H	563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	7	0	0	5	0	0	0	7	0	0
H	564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	7	0	0	5	0	0	0	8	0	0
H	565	H4-5 Do you troubleshoot AM transmitters to major units	3	0	0	32	0	0	0	4	0	0
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	3	0	0	0	0	0	0	5	0	0
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	3	0	0	0	0	0	0	4	0	0
H	568	H4-8 Do you align or adjust AM transmitters or circuits	3	0	0	0	0	0	0	5	0	0
H	569	H4-9 Do you calculate percentage of modulation for AM transmitters	3	0	0	0	0	0	0	6	0	0
H	570	H4-10 Do you use "AM" demodulation principles	3	0	0	32	0	0	0	10	2	0
H	571	H4-11 Do you trace block diagrams of AM receivers	3	0	0	37	0	0	0	13	2	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	13	1	0
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	12	1	0
H	574	H4-14 Do you troubleshoot AM receivers to major units	3	0	0	26	0	0	0	9	0	0
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	3	0	0	0	0	0	0	8	0	0
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	3	0	0	0	0	0	0	6	0	0
H	577	H4-17 Do you align or adjust AM receivers or circuits	3	0	0	0	0	0	0	12	2	0
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	0	0	0	16	0	0	0	2	0	0
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	0	0	0	16	0	0	0	1	0	0
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	0	0	0	0	0	0	0	1	0	0
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	0	0	0	11	0	0	0	1	0	0
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	0	0	0	0	0	0	0	2	0	0
H	586	H4-26 Do you trace block diagrams of SSB receivers	0	0	0	16	0	0	0	3	1	0
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H	589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	0	16	0	0	0	2	0	0
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	0	0	0	0	0	0	0	2	0	0
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H	592	H4-32 Do you align or adjust SSB receivers or circuits	0	0	0	0	0	0	0	2	1	0
H	593	H4-33 Do you use "FM" modulation principles	17	0	0	37	0	0	1	23	2	0
H	594	H4-34 Do you trace block diagrams of FM transmitters	24	11	4	37	0	0	0	23	2	0
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	24	0	4	5	0	0	0	17	0	0
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	17	0	4	0	0	0	0	17	0	0
H	597	H4-37 Do you troubleshoot FM transmitters to major units	24	0	4	37	0	0	0	21	0	0
H	598	H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	7	0	4	0	0	0	0	11	0	0
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	3	0	4	0	0	0	0	10	0	0
H	600	H4-40 Do you align or adjust FM transmitters or circuits	17	0	4	0	0	0	0	21	0	0
H	601	H4-41 Do you calculate modulation index for FM transmitters	3	0	0	5	0	0	0	8	0	0
H	602	H4-42 Do you measure frequency deviation for FM transmitters	14	0	4	26	0	0	0	22	0	0
H	603	H4-43 Do you use "FM" demodulation principles	17	0	0	42	1	1	1	24	3	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	604	H4-44 Do you trace block diagrams of FM receivers	21	5	4	37	0	0	0	26	4	0
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	21	0	4	5	0	0	0	19	1	0
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	7	0	4	0	0	0	0	19	1	0
H	607	H4-47 Do you troubleshoot FM receivers to major units	14	0	4	37	0	0	0	23	1	0
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	3	0	4	0	0	0	0	14	1	0
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	11	0	0
H	610	H4-50 Do you align or adjust FM receivers or circuits	10	0	4	0	0	0	0	26	2	0
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	7	0	0	11	0	0	0	8	0	0
H	612	H4-52 Do you use "PM" modulation principles	17	11	7	37	0	0	0	9	1	0
H	613	H4-53 Do you trace block diagrams of PM transmitters	21	21	14	37	0	0	0	9	2	0
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	24	11	11	5	0	0	0	8	0	0
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	10	11	11	0	0	0	0	8	0	0
H	616	H4-56 Do you troubleshoot PM transmitters to major units	17	11	14	37	0	0	0	7	0	0
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	14	11	4	0	0	0	0	7	0	0
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	5	0	0
H	619	H4-59 Do you align or adjust PM transmitters or circuits	28	11	7	0	0	0	0	7	0	0
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	24	5	11	21	0	0	0	8	0	0
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	31	11	14	37	0	0	0	8	0	0
H	622	H4-62 Do you use "PM" demodulation principles	7	0	4	37	0	0	0	9	1	0
H	623	H4-63 Do you trace block diagrams of PM receivers	17	5	14	37	0	0	0	10	2	0
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	17	5	11	5	0	0	0	9	0	0
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	14	0	7	0	0	0	0	9	0	0
H	626	H4-66 Do you troubleshoot PM receivers to major units	14	0	11	37	0	0	0	8	0	0
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	14	0	7	5	0	0	0	8	0	0
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	10	0	4	0	0	0	0	5	0	0
H	629	H4-69 Do you align or adjust PM receivers or circuits	17	5	7	0	0	0	0	7	0	0
0042		VIII 5. H5 Antennas										
H	630	H5-1 Do you physically align antennas	76	42	18	37	1	0	1	24	3	0
H	631	H5-2 Do you electrically align antennas	41	53	18	16	0	0	0	13	3	0
H	632	H5-3 Do you troubleshoot loading of antennas	14	11	0	42	0	0	0	10	1	0
H	633	H5-4 Do you troubleshoot coupling of antennas	31	32	0	47	0	0	0	16	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	634	H5-5 Do you plot graph radiation patterns	7	5	0	5	0	0	0	3	0	0
H	635	H5-6 Do you troubleshoot antenna components	31	42	18	58	0	0	0	14	0	0
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	0	5	7	37	0	0	0	15	0	0
H	637	H5-8 Do you work with Yagi antennas	3	0	0	11	0	0	0	10	1	0
H	638	H5-9 Do you work with dipole antennas	79	26	7	37	0	0	0	24	2	0
H	639	H5-10 Do you work with slotted antennas	3	0	0	11	0	0	0	1	1	0
H	640	H5-11 Do you work with rotary antennas	52	11	0	5	0	0	0	1	1	0
H	641	H5-12 Do you work with hertz antennas	3	0	0	0	0	0	0	2	1	0
H	642	H5-13 Do you work with marconi antennas	0	0	0	0	0	0	0	3	1	0
H	643	H5-14 Do you work with rhombic antennas	0	0	0	0	0	0	0	3	1	0
H	644	H5-15 Do you work with scimitar antennas	0	0	0	26	0	0	0	0	1	0
H	645	H5-16 Do you work with parabolic antennas	86	5	11	21	0	0	0	8	1	0
H	646	H5-17 Do you work with ground plane antennas	3	0	0	5	0	0	0	8	1	0
H	647	H5-18 Do you perform tasks on rotary antenna arrays	38	16	0	0	0	0	0	0	0	0
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	0	0	0	0	0	0	0	8	0	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	0	0	0	0	1	0	0
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	0	0	0	0	0	0	0	2	0	0
H	651	H5-22 Do you perform tasks on collinear antenna arrays	0	0	0	5	0	0	0	5	0	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	24	0	29	84	0	0	0	1	1	0
H	653	H5-24 Do you perform tasks on planar antenna arrays	7	0	0	5	0	0	0	1	0	0
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	17	5	14	58	0	0	0	12	2	0
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	24	5	14	58	0	0	0	13	2	0
H	656	H5-27 Do you perform tasks on antennas with circular polarization	21	21	25	68	0	0	0	4	1	0
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	24	0	4	68	0	0	0	21	2	0
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	34	21	14	58	0	0	0	9	1	0
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	21	16	14	74	0	0	0	18	2	0

0043 IX. Radio Frequency (RF) Measurements or Calculations

0044 IX 1. I1 RF Measurements

I	660	I1-1 Do you measure RF power	76	47	14	47	1	0	0	20	1	1
I	661	I1-2 Do you measure RF peak power	52	42	14	47	0	0	0	10	1	0
I	662	I1-3 Do you measure RF average power	24	47	7	47	0	0	0	11	1	0
I	663	I1-4 Do you measure RF effective power	10	26	7	47	0	0	0	10	0	0
I	664	I1-5 Do you measure RF output power using wattmeters	10	42	0	32	0	0	0	20	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0045		IX 2. I2 RF Calculations										
I	665	I2-1 Do you calculate RF apparent power	7	21	0	32	0	0	0	8	1	0
I	666	I2-2 Do you calculate RF true power	10	21	0	26	0	0	0	9	0	0
I	667	I2-3 Do you calculate RF power loss or gain in db	52	37	7	42	0	0	1	15	1	0
0046		X. Additional Circuits, Devices, Systems, or Items										
0047		X 1. J1 Microphones and Speakers										
J	668	J1-1 Do you trace block diagrams of circuits containing microphones	0	0	0	16	0	0	0	9	0	0
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	0	0	0	5	0	0	0	8	0	0
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	0	0	0	16	0	0	1	9	0	1
J	671	J1-4 Do you troubleshoot microphones	0	0	0	0	0	0	0	7	0	1
J	672	J1-5 Do you work on carbon microphones	0	0	0	0	0	0	0	1	0	0
J	673	J1-6 Do you work on capacitor microphones	0	0	0	11	0	0	0	1	0	0
J	674	J1-7 Do you work on crystal microphones	0	0	0	11	0	0	0	2	0	0
J	675	J1-8 Do you work on dynamic microphones	0	0	0	11	0	0	0	6	0	1
J	676	J1-9 Do you work on velocity ribbon microphones	0	0	0	0	0	0	0	1	0	0
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	0	0	0	5	0	0	0	24	1	0
J	678	J1-11 Do you trace schematic diagrams of speaker circuits	0	0	0	0	0	0	0	22	0	0
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker	0	0	0	5	0	0	1	23	1	2
J	680	J1-13 Do you troubleshoot speakers	0	0	0	0	0	0	0	13	0	0
0048		X 2. J2 Photosensitive Devices										
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	0	0	0	0	0	0	0	33	8	2
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	0	0	0	0	0	0	0	32	4	2
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device	0	0	0	0	0	0	0	29	2	2
J	684	J2-4 Do you adjust or calibrate photosensitive devices	0	0	4	0	0	0	0	22	2	3
J	685	J2-5 Do you work on photodiodes	0	0	0	0	0	0	0	25	5	0
J	686	J2-6 Do you work on phototransistors	0	0	0	0	0	0	0	22	1	0
J	687	J2-7 Do you work on phototubes	0	0	0	0	0	0	0	8	1	3
J	688	J2-8 Do you work on photo-SCRs	0	0	0	0	0	0	0	3	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	0	0	0	0	0	0	0	19	1	1
0049		X 3. J3 Storage Type Display Tubes										
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	0	0	0	5	0	0	0	2	1	0
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0	0	0	0	0	0	0	2	0	0
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	0	0	0	0	0	0	0	2	0	0
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	0	0	0	0	0	0	0	3	0	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	0	5	0	0	0	0	0	0	0	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	0	0	0	0	0	0	0	0	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	0	0	0	0	0	0	0	0	0	0
0050		X 4. J4 Television, Laser, and Infrared Systems										
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	0	0	7	5	0	1	0	1	1	1
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	0	0	7	0	0	1	0	1	0	1
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	0	0	7	5	2	1	0	1	0	1
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	0	0	0	0	1	0	0	1	0	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	0	0	4	0	0	0	0	0	0	3
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	0	0	0	0	0	0	0	1	1	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	0	0	0	0	0	0	0	1	0	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	0	0	0	0	1	0	1	1	0	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	0	0	0	0	0	0	0	0	0	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	0	0	0	0	1	0	1	1	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	0	0	7	0	0	0	0	1	1	0
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0	0	7	0	0	0	0	1	0	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	0	0	7	0	2	0	0	1	0	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	0	0	0	0	1	0	0	0	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	0	0	7	0	3	0	0	1	0	0
J	712	J4-16 Do you adjust or calibrate infrared systems or components	0	0	4	0	1	0	0	1	0	0

0051 Tasks not referenced

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0042	GP0045/PMP	All DAFSC 30455	208	33.99	27.55	92.79	.00	712
3	F0043	GP0046/PMP	All DAFSC 30950	199	36.46	25.01	95.48	.00	712
4	F0044	GP0047/PMP	All DAFSC 31653	237	18.65	19.18	94.09	.00	712
5	F0054	GP0057/PMP	All DAFSC 32450	300	48.25	28.91	100.00	.00	712
6	F0056	GP0059/PMP	All DAFSC 40450	114	13.53	21.57	99.12	.00	712
7	F0057	GP0060/PMP	All DAFSC 45154A	141	31.26	27.72	99.29	.00	712
8	F0058	GP0061/PMP	All DAFSC 45154B	164	28.96	23.92	100.00	.00	712
9	F0059	GP0062/PMP	All DAFSC 45155	186	25.55	22.99	97.31	.00	712
10	F0060	GP0063/PMP	All DAFSC 45156A	168	28.61	26.02	100.00	.00	712
11	F0061	GP0064/PMP	All DAFSC 45156B	146	37.38	25.47	99.32	.00	712
12	F0087	GP0110/PMP	All DAFSC 451X7	34	35.18	22.40	100.00	.00	712

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
13	F0062	GP0065/PMP	All DAFSC 45251A	125	11.24	17.77	98.40	.00	712
14	F0063	GP0066/PMP	All DAFSC 45251B	82	7.95	16.95	98.78	.00	712
15	F0064	GP0067/PMP	All DAFSC 45251C	92	9.26	15.97	92.39	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applications order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0001	STS 1 Electronic Fundamentals/ Applications dated 20 Feb 1987															
	0002	1. Basic Terms															
	0003	1a. Metric Notation	B														
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)		79	89	77	98	68	84	82	79	85	80	91	60	71	60
	0004	1b. DC Terms	B														
A	2	A1-2 Do you use basic DC electrical/electronic terms		93	95	94	100	98	98	96	97	98	99	100	87	99	88
	0005	1c. AC Terms	B														
A	3	A1-3 Do you use basic AC electrical/electronic terms		91	95	91	100	96	96	96	97	99	97	100	86	98	87
	0006	2. Basic Circuits															

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0007	2a. Theory of operation	B														
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries		89	93	86	99	95	99	99	94	99	98	97	90	99	79
	0008	2b. Troubleshoot circuits	2b														
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries		91	90	85	98	96	96	96	87	98	96	94	76	99	75
	0009	3. Basic Circuit Calculations															
	0010	3a. DC	B														
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power		61	56	54	91	39	69	63	48	64	70	74	24	16	20
A	12	A1-12 Do you calculate the value of a resistor required for a circuit		53	45	45	87	46	45	34	30	44	51	53	6	12	4
	0011	3b. AC	B														
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage		57	56	47	87	30	67	63	48	71	67	74	21	9	13
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length		61	63	48	86	23	68	65	48	76	77	74	22	7	14
	0012	4. Resistors															
	0013	4a. Theory of operation	B														
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors		90	92	79	98	88	95	95	85	98	97	91	30	61	32

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	88	87	74	98	73	88	91	84	92	92	82	8	34	12
0014		4b. Isolate faulty resistors 2b														
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	89	81	70	98	82	77	74	60	91	90	76	13	33	10
A	14	A1-14 Do you ohm check resistors	90	85	80	98	86	90	90	80	95	92	88	15	39	20
0015		4c. Color code B														
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	88	72	73	96	76	74	62	47	79	88	74	6	12	7
0016		5. Relays/Solenoids														
0017		5a. Relay theory of operation B														
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	72	82	68	92	88	99	98	91	99	99	88	84	95	82
A	17	A1-17 Do you adjust relays	37	34	26	52	53	27	23	17	36	29	35	20	12	11
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	55	41	26	64	73	38	32	17	34	39	35	20	17	11
0018		5b. Isolate faulty relays 2b														
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	71	76	61	90	90	96	98	78	99	99	91	77	94	75
A	19	A1-19 Do you continuity check relays	67	71	60	90	85	94	93	75	96	95	76	63	83	66
0019		5c. Solenoid theory of operation -														
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	61	55	20	29	75	43	47	30	25	33	38	13	48	4
A	79	A2-35 Do you perform maintenance on solenoid component parts	41	27	13	15	58	19	21	10	11	12	26	5	2	0

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0020	5d. Isolate faulty solenoids	-														
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid		61	50	20	29	80	38	42	23	24	30	38	9	39	3
	0021	6. Inductors															
	0022	6a. Theory of operation	B														
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils		83	83	41	87	41	63	62	48	68	70	65	18	16	16
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors		72	52	22	79	18	37	37	17	28	51	38	5	4	1
	0023	6b. Isolate faulty inductors	2b														
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil		80	74	31	82	35	42	48	26	54	62	53	7	11	5
A	26	A1-26 Do you ohm check inductors		78	66	30	74	35	46	43	29	52	53	50	7	12	5
	0024	6c. Calculations	B														
A	22	A1-22 Do you calculate values of circuit total inductance		24	26	14	48	11	17	18	8	15	23	21	5	2	1
A	23	A1-23 Do you calculate values of circuit or component inductive reactance		25	23	15	49	10	16	16	8	14	19	24	5	2	1
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors		33	31	17	60	11	18	22	11	20	25	24	4	2	2
	0025	7. Capacitors															

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0026		7a. Theory of operation	B														
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors		91	89	69	97	83	91	88	82	97	94	79	26	62	28
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors		76	56	35	94	31	52	55	27	31	66	47	2	35	2
0027		7b. Isolate faulty capacitors	2b														
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor		91	80	61	96	82	64	70	49	90	86	71	10	49	9
A	33	A1-33 Do you ohm check capacitors		84	73	46	84	70	65	63	45	77	74	56	11	44	10
0028		7c. Calculations	-														
A	29	A1-29 Do you calculate values of circuit total capacitance		32	27	25	58	27	25	23	13	24	27	26	6	12	3
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance		27	25	24	55	22	23	20	11	20	22	24	6	12	2
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors		37	32	25	68	26	27	27	15	26	27	24	4	12	2
0029		7d. Color code	B														
A	34	A1-34 Do you use capacitor color codes in your present job		25	21	18	48	25	18	18	9	16	18	24	6	5	2
0030		8. Transformers															
0031		8a. Theory of operation	B														
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers		89	81	61	96	85	86	84	76	97	86	82	27	41	24
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers		44	39	16	68	35	35	33	22	42	47	35	4	7	2

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0032	8b. Isolate faulty transformers	2b														
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer		88	74	51	94	82	75	73	53	96	82	82	16	27	5
A	40	A1-40 Do you ohm check transformers		83	61	43	84	69	55	55	41	75	61	68	14	20	5
A	41	A1-41 Do you measure transformer output voltage		86	66	51	93	77	75	69	55	85	75	65	13	24	7
	0033	8c. Calculations	-														
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios		37	31	24	67	42	34	29	17	39	32	32	6	4	1
A	38	A1-38 Do you calculate impedance of transformers		24	17	16	42	19	23	16	11	20	16	24	7	2	1
	0034	9. Three Phase Transformers															
	0035	9a. Theory of operation	B														
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers		31	55	27	55	37	67	59	46	71	64	68	17	18	9
A	44	A1-44 Do you adjust three phase transformers		17	24	11	36	18	33	23	23	43	37	41	4	4	1
	0036	9b. Isolate faulty three phase transformers	-														
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer		27	49	24	50	32	58	51	33	67	58	62	11	13	5
	0037	10. DC Motors															
	0038	10a. Theory of operation	B														
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors		70	66	27	44	83	50	39	34	46	51	50	18	46	5

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	48	A2-4 Do you perform tasks on DC motor component parts	36	33	14	24	58	12	15	12	15	18	29	4	5	1
0039		10b. Isolate faulty DC motors 2b														
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor	70	61	24	42	85	48	37	33	45	49	53	12	39	4
0040		10c. Troubleshoot motors 2b														
A	47	A2-3 Do you troubleshoot DC motor component parts	39	33	12	25	61	14	15	11	20	21	32	5	11	1
0041		11. AC Motors														
0042		11a. Theory of operation B														
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors	52	63	24	38	79	53	45	37	52	51	59	16	43	5
A	52	A2-8 Do you perform tasks on AC motor component parts	29	29	11	20	58	12	16	10	16	18	32	5	5	1
0043		11b. Isolate faulty AC motors 2b														
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor	54	60	20	36	82	48	45	35	52	48	59	9	34	4
0044		11c. Troubleshoot motors 2b														
A	51	A2-7 Do you troubleshoot AC motor component parts	30	29	11	20	53	15	15	9	21	18	38	4	9	1
0045		12. DC Generators														

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0046	12a. Theory of operation														
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	17	20	14	43	11	31	30	20	22	29	47	14	18	5
A	56	A2-12 Do you perform tasks on component parts of DC generators	15	13	6	37	6	9	10	8	11	19	18	3	4	1
	0047	12b. Isolate faulty DC generators														
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	18	19	12	39	10	30	26	18	22	27	50	9	12	3
	0048	12c. Troubleshoot DC generators														
A	55	A2-11 Do you troubleshoot DC generator component parts	15	14	8	38	7	12	12	7	13	22	21	4	4	1
	0049	13. AC Generators														
	0050	13a. Theory of operation														
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generator-	13	23	12	46	8	30	29	18	21	25	53	14	20	5
A	60	A2-16 Do you perform tasks on component parts of AC generators	11	16	6	40	4	9	10	7	11	17	18	2	2	1
	0051	13b. Isolate faulty AC generators														
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	13	20	9	42	7	28	26	16	23	21	53	10	12	3
	0052	13c. Troubleshoot AC generators														
A	59	A2-15 Do you troubleshoot AC generator component parts	11	15	6	41	4	11	11	6	13	19	18	4	1	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0053	14. Alternators														
	0054	14a. Theory of operation -														
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	3	6	3	5	4	5	7	8	5	4	6	6	12	3
A	62	A2-20 Do you perform tasks on component parts of alternators	3	3	1	4	4	1	2	2	2	3	3	1	1	1
	0055	14b. Isolate faulty alternators -														
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	3	4	2	4	4	4	5	5	5	4	3	2	12	2
	0056	14c. Troubleshoot alternators -														
A	63	A2-19 Do you troubleshoot alternator component parts	3	3	1	4	4	2	2	3	2	3	3	1	2	1
	0057	15. Synchro/Servos														
	0053	15a. Theory of operation B														
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	57	65	23	60	12	60	62	61	83	49	68	49	89	21
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	44	39	15	40	6	14	18	14	37	18	47	13	12	7
	0059	15b. Isolate faulty synchro/servos 2b														
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	57	62	21	56	11	55	62	48	82	49	65	38	83	18

D T Tsk Y Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0060	15c. Troubleshoot synchro/servos	2b														
A 67	A2-23 Do you troubleshoot synchro or servo component parts		43	41	14	43	6	18	25	17	42	20	47	15	38	7
0061	16. Choppers (Synchronous Vibrators)															
0062	16a. Theory of operation	B														
A 69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers		11	8	7	48	7	21	9	13	14	18	32	10	12	3
0063	16b. Isolate faulty choppers	2b														
A 70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper		11	6	6	48	5	16	7	8	12	16	29	6	13	1
A 71	A2-27 Do you measure chopper coil excitation frequency		8	4	3	38	2	9	1	4	5	8	9	3	7	1
A 72	A2-28 Do you measure chopper coil voltage-current phase relationship		6	3	3	23	2	9	1	3	6	5	9	3	7	1
0064	17. Transducers															
0065	17a. Theory of operation	B														
A 73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers		18	18	32	45	4	38	22	48	17	23	41	16	74	8
A 75	A2-31 Do you calibrate or adjust transducers		13	14	27	44	4	14	8	31	11	10	38	5	62	2
A 76	A2-32 Do you repair, clean or lubricate transducers		17	15	24	32	4	12	10	19	10	8	32	5	21	1
0066	17b. Isolate faulty transducers	2b														
A 74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer		18	17	33	44	4	36	20	40	17	21	38	11	67	3

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0067	18. Meter Movements														
	0068	18a. Theory of operation B														
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	59	60	36	91	38	46	55	39	52	49	56	16	26	11
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	34	28	16	69	27	10	18	10	20	19	26	5	4	4
	0069	18b. Isolate faulty meter movements 2b														
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	57	53	32	90	38	36	45	30	49	47	53	11	23	9
	0070	19. Solid State Diodes														
	0071	19a. Theory of operation B														
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	89	89	68	97	67	94	92	82	95	95	88	34	70	38
	0072	19b. Isolate faulty solid state diodes 2b														
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	89	82	63	96	65	77	80	56	94	92	85	21	49	18
A	85	A3-3 Do you check diodes using an ohmmeter	89	82	65	96	69	79	85	64	92	93	79	18	48	21
	0073	19c. Specifications B														
A	86	A3-4 Do you use diode characteristic curves	26	21	16	62	15	11	9	8	18	25	21	3	0	1
A	87	A3-5 Do you use diode substitution information	67	47	34	81	20	16	19	12	39	45	50	4	1	1

D T Y	Tsk Nbr	Task Title		304 55	319 [illegible]	316 73	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0074	19d. Color code	B														
A	88	A3-6 Do you use diode color codes		24	18	13	35	18	13	12	8	14	23	26	8	2	4
	0075	20. Bipolar Junction Transistors															
	0076	20a. Theory of operation	B														
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors		90	88	70	97	73	91	93	80	98	97	82	26	40	32
	0077	20b. Isolate faulty transistors	2b														
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor		90	81	62	97	70	74	79	54	96	91	79	13	16	5
A	91	A3-9 Do you check transistors using an ohmmeter		90	80	59	96	69	67	74	53	92	90	68	10	13	5
A	92	A3-10 Do you check transistors using transistor testers		82	46	32	89	38	28	27	15	48	45	47	6	1	1
	0078	20c. Specifications	B														
A	93	A3-11 Do you use transistor characteristic curves		28	19	18	62	12	11	11	4	15	21	21	3	0	1
A	94	A3-12 Do you use transistor substitution information		78	56	41	87	26	21	20	12	39	50	44	5	0	1
	0079	21. Integrated Circuits															
	0080	21a. Familiarization	B														
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)		88	89	66	95	55	95	87	81	86	94	88	34	50	30

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0081		21b. Isolate faulty integrated circuits 2b														
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	89	79	61	95	47	77	70	46	82	87	79	13	24	8
0082		21c. Specifications B														
A	97	A3-15 Do you use IC substitution information	77	68	52	84	25	33	34	16	36	51	44	6	2	4
0083		22. Solid State Special Purpose Devices (SCR, Zener Diode, Tunnel Diode, LED, LCD, UJT, JFET, MOSFET)														
0084		22a. Theory of operation B														
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	70	74	46	86	36	60	60	51	55	74	62	26	16	15
A	100	A3-18 Do you perform tasks on varactors/varicaps	50	42	13	67	11	21	29	11	18	33	32	6	1	3
A	101	A3-19 Do you perform tasks on tunnel diodes	20	37	7	83	11	18	26	5	21	37	26	2	1	2
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	75	68	39	90	30	50	41	21	48	69	50	11	2	3
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	56	45	19	82	20	34	34	13	39	63	44	7	1	3
A	104	A3-22 Do you perform tasks on zener diodes	83	73	51	93	45	60	60	33	67	79	47	11	13	8
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	44	43	33	82	25	38	37	23	40	41	47	13	7	5
A	106	A3-24 Do you perform tasks on pin diodes	19	27	18	72	18	17	35	12	12	55	29	6	2	2
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	72	76	53	89	45	58	52	44	50	66	56	24	13	9
A	108	A3-26 Do you perform tasks on fantail transistors	16	17	4	38	9	11	11	4	8	15	12	3	1	2
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	70	71	23	83	34	26	34	11	40	49	50	9	1	4
A	110	A3-28 Do you perform tasks on triacs	25	24	9	45	29	11	18	5	16	21	18	9	2	3
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	11	11	3	33	9	10	11	2	5	8	24	4	1	3
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	23	25	9	42	14	12	13	6	13	21	32	5	2	3
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	11	8	3	25	8	10	7	3	5	8	21	4	1	2
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	9	14	2	31	9	11	14	3	6	10	12	2	2	2
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	25	28	13	44	15	23	23	9	21	28	35	5	2	2
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	7	12	3	29	8	9	15	4	7	15	15	2	0	2
A	117	A3-35 Do you perform tasks on varistors	52	45	18	71	27	24	22	19	27	38	21	5	1	3
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	12	15	5	31	8	9	7	2	5	10	12	2	0	2

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
A	119	A3-37 Do you perform tasks on schottky diodes		16	29	16	60	11	30	26	8	24	41	29	3	1	2
	0085	22b. Isolate faulty special purpose devices	2b														
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device		70	70	42	85	32	50	51	29	52	69	62	13	9	5
	0086	23. Electron Tubes															
	0087	23a. Theory of operation	B														
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes		55	26	9	84	28	25	40	22	38	72	26	8	2	7
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits		54	24	9	83	26	21	34	14	33	65	26	4	1	2
A	125	A4-6 Do you perform tasks on diode tubes		19	4	4	68	15	6	10	5	11	22	6	2	0	2
A	126	A4-7 Do you perform tasks on triode tubes		23	3	4	69	10	4	13	2	8	24	9	0	1	1
A	127	A4-8 Do you perform tasks on tetrode tubes		21	4	2	59	6	4	4	1	5	21	6	1	1	1
A	128	A4-9 Do you perform tasks on pentode tubes		22	2	2	61	7	4	5	1	5	18	6	2	1	0
A	129	A4-10 Do you perform tasks on beam power tubes		13	13	0	33	6	5	15	4	4	17	6	2	0	0
A	130	A4-11 Do you perform tasks on gas tubes		10	4	3	56	10	6	3	2	8	16	6	1	0	0
A	131	A4-12 Do you perform tasks on phantastrons		2	1	0	18	4	4	2	2	2	3	6	1	0	0
A	132	A4-13 Do you perform tasks on neon tubes		7	8	3	46	12	2	2	2	5	9	0	1	0	2
A	133	A4-14 Do you perform tasks on xenon tubes		4	2	2	24	14	1	2	1	4	7	0	0	0	0
A	134	A4-15 Do you perform tasks on nixie tubes		6	22	9	75	8	13	7	1	48	32	0	2	1	1
	0088	23b. Isolate faulty tubes	-														
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube		55	25	9	83	25	24	36	19	34	68	29	2	2	3
	0089	23c. Specifications	-														
A	123	A4-4 Do you use electron tube characteristic curves		6	6	2	25	4	4	7	2	4	17	6	1	0	0
A	124	A4-5 Do you use electron tube substitution manuals or charts		39	8	2	64	8	4	7	2	7	14	6	1	0	0

D T Tsk Y Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0090	24. Cathode Ray Tubes (CRT)															
0091	24a. Theory of operation	B														
A 135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)		80	52	13	80	37	65	41	56	39	50	56	45	11	28
A 136	A4-17 Do you trace schematic diagrams of CRT circuits		79	45	12	77	37	52	33	47	35	44	56	33	5	8
A 138	A4-19 Do you adjust or calibrate circuits that control CRT operations		80	48	15	80	32	58	38	48	32	45	53	9	2	1
A 139	A4-20 Do you perform tasks on electrostatic CRT		51	22	4	49	12	26	12	19	15	19	35	6	2	2
A 140	A4-21 Do you perform tasks on electromagnetic CRT		61	26	8	54	24	34	26	37	21	30	35	15	4	4
0092	24b. Isolate faulty CRTs	2b														
A 137	A4-18 Do you troubleshoot to isolate a faulty CRT		81	47	12	77	35	62	39	51	35	50	56	37	9	18
0093	25. Solder/Desolder															
0094	25a. Terminal connections	2b														
A 141	A5-1 Do you solder or desolder hardwire connections		91	84	89	99	97	99	96	97	98	98	85	84	76	61
A 142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc		91	83	84	98	96	93	93	81	97	95	85	13	20	12
0095	25b. P C Boards	2b														
A 143	A5-3 Do you solder or desolder printed circuit board connections		86	77	71	95	77	78	73	66	86	85	59	11	5	5
A 144	A5-4 Do you solder or desolder multi-layer circuit board connections		53	46	37	70	38	33	33	27	39	39	32	10	5	4
A 145	A5-5 Do you perform high reliability soldering		73	70	61	85	70	86	85	71	84	88	74	46	35	32

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0096		25c. Multipin connectors	2b														
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables		80	60	81	63	37	77	70	80	69	62	85	62	62	57
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables		38	45	56	51	27	25	46	52	30	46	71	12	6	7
0097		25d. Coaxial connectors	-														
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables		91	82	89	82	49	99	96	94	95	96	88	98	44	92
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables		31	28	35	44	16	91	65	64	25	40	68	98	38	68
0098		26. Assemble Solderless Connectors															
0099		26a. Crimp	2b														
A	146	A5-6 Do you use crimping tool to repair or make connections		86	83	89	89	92	97	96	97	99	96	88	98	95	91
A	147	A5-7 Do you use wire wrap tool to make connections		33	67	52	38	35	83	57	55	44	49	62	38	29	28
A	148	A5-8 Do you use punch-on tool to make connections		34	29	22	28	32	39	24	21	21	28	50	30	18	16
0100		26b. Coaxial	2b														
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables		91	82	89	82	49	99	96	94	95	96	88	98	44	92
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables		31	28	35	44	16	91	65	64	25	40	68	98	38	68
0101		26c. Multipin	2b														
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables		80	60	81	63	37	77	70	80	69	62	85	62	62	57
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables		38	45	56	51	27	25	46	52	30	46	71	12	6	7

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0102	27. Use Test Equipment Usage														
0103	27a. Multimeter, analog 2b														
B 153	B1-1 Do you use the multimeter to measure DC voltage values	93	92	92	99	98	99	99	97	99	99	91	95	96	89
B 154	B1-2 Do you use the multimeter to measure AC voltage values	92	90	91	99	99	96	98	95	100	96	91	90	95	83
B 155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	27	25	22	78	21	35	23	18	25	42	44	18	11	11
B 156	B1-4 Do you use the multimeter to measure DC current values	72	77	78	96	81	76	68	73	77	75	71	63	54	59
B 157	B1-5 Do you use the multimeter to measure AC current values	64	66	67	92	82	74	66	70	77	71	71	62	52	54
B 158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	19	17	20	74	18	26	16	13	16	29	44	13	9	10
B 159	B1-7 Do you use the multimeter to measure circuit resistance	79	80	75	92	88	89	85	83	90	87	79	78	90	78
B 160	B1-8 Do you use the multimeter to measure component resistance	90	87	82	98	91	93	93	88	96	92	88	57	84	64
0104	27b. Oscilloscope 2b														
B 161	B2-1 Do you use the oscilloscope to measure time to determine frequency	84	84	68	94	12	89	85	78	95	97	85	3	1	3
B 162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	85	87	64	95	14	90	98	81	95	98	82	3	1	3
B 163	B2-3 Do you use the oscilloscope to measure AC voltage	80	82	68	94	17	96	98	78	98	96	79	3	2	1
B 164	B2-4 Do you use the oscilloscope to measure DC voltage	88	88	78	92	17	96	98	78	98	97	79	2	2	1
B 165	B2-5 Do you use the oscilloscope to measure ripple voltages	67	77	37	91	9	56	74	46	76	89	65	2	0	0
B 166	B2-6 Do you use the oscilloscope to measure phase jitters	38	50	21	73	1	48	68	25	51	47	56	2	1	0
B 167	B2-7 Do you use the oscilloscope to observe signal/data patterns	78	83	63	81	10	84	76	52	68	73	62	2	1	1
B 168	B2-8 Do you use the oscilloscope to observe lissajous patterns	18	22	8	50	1	17	10	14	17	13	32	2	0	0
B 169	B2-9 Do you use the oscilloscope to observe phase relationships	73	78	54	84	12	89	88	59	88	81	79	2	1	2
B 170	B2-10 Do you use attenuator probes with oscilloscopes	71	72	51	94	8	86	83	67	82	85	65	2	2	3
B 171	B2-11 Do you use delay time multipliers with oscilloscopes	30	35	22	81	7	71	76	37	43	49	50	1	0	2
0105	27c. Signal Generator 2b														
B 172	B3-1 Do you use signal generators (SG) to perform operational checks	83	79	62	93	4	72	83	72	63	90	74	11	2	7

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations		82	79	54	95	4	51	60	72	58	88	71	4	4	2
B	174	B3-3 Do you use SG to troubleshoot circuits		76	75	49	84	3	44	57	58	53	77	71	10	4	4
0106		27d. Frequency counter	2b														
B	185	B4-1 Do you use frequency counters		74	87	70	97	12	99	100	89	85	96	71	10	1	7
0107		27e. Spectrum Analyzer	2b														
B	186	B4-2 Do you use spectrum analyzers		36	75	52	85	4	94	99	61	63	87	68	9	1	4
0108		27f. Field strength tester	-														
B	187	B4-3 Do you use field strength testers		22	8	8	24	3	8	9	5	5	6	15	19	2	5
0109		27g. Multimeter, digital	2b														
B	188	B4-4 Do you use digital multimeters		91	91	89	99	70	99	99	94	96	99	91	82	83	83
0110		27h. Digital logic probe	2b														
B	189	B4-5 Do you use digital logic probes		40	61	35	77	13	45	25	24	28	22	50	6	1	2
0111		27i. Capacitor tester	2b														
B	190	B4-6 Do you use capacitance testers		77	57	31	80	10	13	13	8	26	45	29	6	12	2
0112		27j. Capacitor substitution box	-														
B	191	B4-7 Do you use capacitor substitution boxes		15	3	11	59	4	5	7	3	8	8	21	6	7	2

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0113		27k. DC restorer	-														
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)		64	3	3	18	3	7	5	2	2	3	24	6	0	2
0114		27l. Logic current tracer	-														
B	193	B4-9 Do you use logic current tracers		17	26	16	66	6	9	13	5	8	7	21	5	0	2
0115		27m. Tube tester	-														
B	194	B4-10 Do you use tube testers		50	3	3	56	9	5	9	1	4	15	15	4	0	2
0116		27n. Logic pulser	-														
B	195	B4-11 Do you use logic pulsers		24	36	18	74	5	13	12	5	7	5	24	5	0	2
0117		27o. Logic analyzer	2b														
B	196	B4-12 Do you use logic analyzers		16	49	29	60	4	13	15	8	9	14	41	6	1	2
0118		27p. Signature analyzer	-														
B	197	B4-13 Do you use signature analyzers		8	14	11	59	3	11	9	5	8	6	26	5	0	2
0119		27q. Reflectometer	2b														
B	198	B4-14 Do you use reflectometers		5	18	14	40	2	67	31	11	21	7	35	50	26	61
0120		28. Transistor Amplifier Circuits (Common Emitter, Common Collector, Common Base)															

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0121	28a. Theory of operation														
	0122	28a(1). Amplifier circuits B														
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	85	81	41	90	26	72	64	53	69	86	71	21	18	27
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	85	77	40	90	26	65	56	42	68	86	65	13	13	16
C	204	C1-6 Do you adjust or align transistor amplifiers	67	60	21	79	6	28	32	18	35	61	44	1	1	2
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	33	37	18	59	6	18	20	7	17	28	26	1	0	2
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	56	50	13	76	10	16	12	11	21	30	29	2	0	1
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	38	37	12	72	10	23	22	10	25	45	38	2	0	1
C	209	C1-11 Do you work on paraphase transistor amplifiers	15	16	2	49	4	9	7	4	5	8	32	1	0	2
C	210	C1-12 Do you work on push-pull transistor amplifiers	69	50	22	83	12	33	28	16	38	56	38	2	0	5
C	211	C1-13 Do you work on audio transistor amplifiers	74	32	20	72	20	21	30	27	21	51	47	4	1	12
C	212	C1-14 Do you work on wideband transistor amplifiers	38	53	26	77	3	37	32	30	16	51	47	2	1	12
C	213	C1-15 Do you work on IF transistor amplifiers	67	64	20	73	9	49	45	34	39	77	56	8	1	12
C	214	C1-16 Do you work on RF transistor amplifiers	63	66	21	78	7	50	57	38	42	82	56	11	2	14
C	215	C1-17 Do you work on buffer transistor amplifiers	53	53	22	74	5	53	26	19	38	49	41	5	5	3
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	50	16	4	53	6	11	8	5	13	23	29	1	0	1
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	65	51	30	72	16	43	34	23	49	58	41	2	7	7
	0123	28a(2). Stabilization circuits B														
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	63	49	14	65	11	30	29	19	29	38	41	2	7	4
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	64	44	9	61	11	.	27	15	26	40	35	1	2	2
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	41	34	8	60	7	18	20	11	21	26	38	2	2	3
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	54	34	7	61	12	27	30	15	29	34	38	2	9	3
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	65	46	15	68	15	30	29	18	33	42	35	2	5	3
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	48	24	5	51	6	21	18	11	22	29	35	1	1	2

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0124		28a(3). Coupling circuits	B														
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits		72	68	26	75	11	42	38	32	35	50	53	14	5	8
C	226	C3-2 Do you trace schematic diagrams of coupling circuits		70	67	24	75	11	36	35	25	32	47	50	8	4	2
C	229	C3-5 Do you perform tasks on direct coupling circuits		68	62	18	71	9	28	30	18	31	47	47	3	4	1
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits		64	54	16	71	10	23	22	13	26	40	38	4	4	0
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits		60	52	12	67	9	21	18	13	23	37	38	2	1	0
C	232	C3-8 Do you perform tasks on transformer coupling circuits		64	56	20	67	10	21	21	18	26	35	44	4	1	1
C	233	C3-9 Do you perform tasks on optical coupling circuits		20	20	9	29	4	6	7	6	6	7	15	1	0	0
0125		28b. Isolate faulty amplifier circuits	2b														
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier		85	72	37	89	22	49	47	28	64	79	47	2	4	7
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain		70	62	29	80	11	35	35	21	41	58	44	2	1	3
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit		68	62	19	73	11	24	26	15	30	46	44	4	0	1
0126		28c. Troubleshoot circuits	2b														
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components		83	68	31	86	16	35	32	15	50	65	38	2	1	3
C	203	C1-5 Do you troubleshoot transistor amplifier distortion		61	50	15	69	5	21	20	10	29	44	32	2	0	2
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components		62	47	13	63	9	18	20	9	24	38	35	2	2	1
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components		66	57	16	72	10	17	17	7	26	38	29	4	1	1
0127		29. Electron Tube Amplifiers															

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0128		29a. Theory of operation -														
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	28	15	3	69	6	16	34	13	13	55	9	6	1	5
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	28	15	3	69	7	11	28	8	11	52	6	2	1	2
C	239	C4-6 Do you adjust or align electron tube amplifiers	24	14	2	63	2	8	21	6	8	50	6	0	0	0
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	9	7	0	39	3	2	19	3	3	25	3	0	0	0
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	6	1	1	40	0	2	3	0	3	5	6	0	0	0
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	14	3	0	58	3	3	5	0	4	20	6	0	0	0
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	12	2	1	55	2	1	4	2	2	16	6	0	0	1
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	20	6	2	65	2	6	8	3	7	24	6	0	1	0
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	20	4	2	62	1	4	16	4	6	29	6	0	0	0
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	17	5	2	62	2	7	15	4	7	32	6	1	1	0
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	17	4	2	62	0	4	10	2	5	18	6	0	0	0
0129		29b. Isolate faulty tube amplifiers -														
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	28	13	3	68	4	9	29	6	11	55	9	0	0	0
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	24	13	1	57	3	6	26	5	5	44	6	0	0	0
0130		29c. Troubleshoot circuits -														
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	25	10	2	66	4	4	11	2	7	36	6	0	0	0
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	20	9	1	52	3	7	12	2	4	34	6	0	0	0
0131		30. Operational Amplifiers														

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0132	30a. Theory of operation B														
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	73	77	47	88	20	70	51	48	72	74	38	16	9	14
C	251	C5-3 Do you calculate op amp gain	29	34	20	61	5	21	11	10	17	23	15	0	0	0
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	52	64	33	80	7	28	17	15	31	47	29	0	0	0
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	63	68	40	79	11	47	35	33	56	64	29	2	2	3
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	56	63	31	78	8	49	31	28	42	57	26	3	2	4
C	255	C5-7 Do you use or apply operational amplifiers for summing	37	55	23	68	6	38	21	27	38	56	24	4	2	7
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	48	53	27	74	5	38	21	19	29	38	24	4	2	3
C	257	C5-9 Do you use or apply operational amplifiers as active filters	29	43	24	52	4	32	20	15	24	25	18	1	0	1
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	50	51	23	70	9	41	34	23	42	53	24	6	2	10
C	259	C5-11 Do you use or apply operational amplifiers as integrators	43	44	12	61	6	37	20	18	31	33	24	1	1	3
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	47	50	18	59	7	31	16	16	28	38	24	1	1	0
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	62	64	33	78	13	45	40	35	57	62	29	10	1	12
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	38	64	30	74	10	57	43	37	54	59	32	13	2	10
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	47	44	14	70	13	43	35	17	34	47	29	5	4	10
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	44	58	18	67	4	31	29	22	30	42	21	5	1	8
	0133	30b. Isolate faulty Op Amps -														
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	71	70	41	87	18	48	40	29	63	68	29	2	4	2
	0134	31. Magnetic Amplifiers														

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0135		31a. Theory of operation -														
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	5	6	5	8	3	10	13	4	5	2	12	4	2	2
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	5	6	4	8	3	9	10	3	5	1	9	2	1	0
C	269	C6-5 Do you adjust magnetic amplifiers or components	5	3	1	8	3	4	3	2	4	2	6	0	1	0
0136		31b. Isolate faulty magnetic amplifiers -														
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	5	4	3	7	4	6	10	3	3	1	6	0	2	0
0137		31c. Troubleshoot circuits -														
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	5	3	1	8	3	4	3	2	2	2	9	0	1	0
0138		32. Saturable Reactors														
0139		32a. Theory of operation -														
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	1	2	0	5	0	5	5	2	4	3	6	3	0	0
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	1	2	0	5	0	5	5	2	3	3	6	1	0	0
C	274	C6-10 Do you adjust saturable reactor circuits or components	1	1	0	4	0	4	2	1	4	3	6	0	0	0
0140		32b. Isolate faulty saturable reactors -														
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	1	1	0	5	0	4	4	2	4	3	6	0	0	0

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0141	32c. Troubleshoot circuits														
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	1	1	0	5	0	3	2	1	4	3	6	0	0	0
	0142	33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)														
	0143	33a. Theory of operation														
	0144	33a(1). Rectifiers (Half-wave, Full-wave, Full-wave bridge)	B													
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	89	63	93	75	94	91	82	93	95	76	61	51	58
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	86	84	57	94	72	89	84	71	94	90	71	42	44	25
D	279	D1-5 Do you align or adjust power supplies	85	85	56	94	54	82	88	76	93	94	68	3	2	3
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	68	50	27	89	35	42	41	28	51	59	56	6	9	9
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	75	55	32	90	41	44	46	31	57	68	56	7	7	9
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	81	59	35	89	43	45	46	30	55	71	53	6	12	11
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	16	34	13	47	15	30	34	25	30	41	44	6	2	7
	0145	33a(2). Filters (Capacitive, Inductive, L-Section, Pi-Section)	B													
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	68	65	28	80	19	68	61	45	57	65	56	12	7	21
D	289	D2-2 Do you trace schematic diagrams of power supply filters	68	63	27	79	20	57	54	34	55	60	50	8	4	7
D	292	D2-5 Do you perform tasks on capacitive power supply filters	65	58	25	78	21	43	43	23	38	56	38	3	2	4
D	293	D2-6 Do you perform tasks on inductive power supply filters	50	48	17	69	16	38	36	19	32	52	38	2	2	4
D	294	D2-7 Do you perform tasks on L-type power supply filters	28	39	9	46	8	29	25	12	22	35	38	2	0	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	29	36	11	40	8	23	18	10	15	35	29	3	1	1
D	296	D2-9 Do you perform tasks on T-type power supply filters	20	28	8	39	4	20	13	8	13	27	26	2	0	0
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	59	56	23	77	18	38	40	23	36	53	38	4	4	3
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	54	51	14	70	16	36	38	19	29	49	38	3	4	3
0146		33b. Isolate faulty power supplies 2b														
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	87	85	59	93	73	89	88	80	96	94	79	39	37	36
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	66	58	23	78	18	54	48	26	52	59	50	2	2	11
0147		33c. Troubleshoot circuits 2b														
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	85	70	41	92	55	48	45	34	67	71	44	7	10	7
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	63	55	20	75	16	30	20	12	34	47	32	2	0	3
0148		34. Voltage Regulators (Shunt, Series EVR, IC EVR)														
0149		34a. Theory of operation B														
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	78	75	40	91	32	74	68	69	71	74	68	20	16	17
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	77	72	40	90	32	64	59	55	73	74	62	9	10	5
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	72	59	27	84	29	50	52	35	60	67	47	2	7	4
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	67	63	27	87	23	48	48	26	54	63	50	3	7	4
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	67	53	23	84	19	35	32	27	45	51	41	2	2	4
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	58	51	25	75	13	28	26	19	27	43	24	2	0	2
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	25	25	6	45	4	22	19	15	21	32	38	3	2	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	43	43	13	71	11	30	23	14	25	40	32	2	0	1
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	11	45	9	61	4	38	30	12	19	25	38	4	0	3
	0150	34b. Isolate faulty voltage regulators 2b														
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	78	68	37	90	31	60	54	58	68	74	68	3	6	4
	0151	34c. Troubleshoot circuits 2b														
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	75	60	30	88	24	28	24	13	49	60	35	1	1	2
	0152	35. Resistive/Capacitive/Inductive (RCL) Circuits														
	0153	35a. Basic operation B														
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	59	64	19	73	13	43	35	24	32	47	41	16	13	7
	0154	35b. Resonant operation B														
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	53	56	15	68	11	35	32	19	24	42	32	11	9	5
	0155	35c. Troubleshoot circuits 2b														
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	57	57	15	71	11	21	21	10	27	41	26	2	9	1
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	50	50	12	65	9	15	20	7	18	36	15	1	6	1

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0156		35d. Calculations	B														
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits		15	17	8	44	4	11	10	6	13	14	9	2	2	1
E	315	E1-6 Do you calculate phase angle of RCL circuits		10	12	4	31	2	6	7	4	9	12	9	1	1	1
E	316	E1-7 Do you calculate values of power in RCL circuits		10	14	5	36	3	6	9	5	9	12	9	1	1	1
0157		36. Frequency Sensitive Filters (Low Pass, High Pass, Band Pass, Band Reject)															
0158		36a. Theory of operation	B														
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters		46	60	22	70	7	31	37	34	20	65	47	14	5	22
E	320	E2-4 Do you align or adjust frequency sensitive filters		42	45	16	67	5	19	19	18	15	36	21	1	1	3
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters		48	50	23	72	4	32	32	29	18	51	35	5	1	11
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters		48	48	22	72	3	31	31	30	17	49	35	4	1	7
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters		49	57	27	72	3	30	34	31	16	77	35	4	1	8
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters		34	43	14	64	2	15	15	18	10	35	32	2	0	2
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters		29	14	2	37	1	7	11	5	5	14	26	2	0	2
0159		36b. Isolate faulty frequency sensitive filters	2b														
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter		44	53	19	68	6	23	29	27	20	64	44	3	1	8
0160		36c. Troubleshoot circuits	2b														
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components		42	47	13	64	4	11	13	13	15	40	18	1	0	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0161		36d. Calculations -														
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	13	15	6	39	2	6	5	5	5	12	12	1	0	3
0162		37. Wave Generating Circuits														
0163		37a. Theory of operation														
0164		37a(1). Oscillators (LC, RC, Crystal) B														
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	73	76	36	84	15	58	63	45	51	82	50	34	10	36
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	74	71	32	84	14	49	55	34	48	77	41	21	6	12
F	331	F1-5 Do you align or adjust oscillator circuits	72	64	28	84	7	35	40	30	39	71	41	2	0	0
F	332	F1-6 Do the oscillators you work with use LC tank circuits	60	50	17	77	10	29	37	18	35	49	35	3	2	1
F	333	F1-7 Do the oscillators you work with use RC networks	60	49	21	81	7	30	35	20	32	53	32	8	2	1
F	334	F1-8 Do the oscillators you work with use crystals	66	72	33	81	5	35	45	35	36	61	35	10	1	4
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	41	64	25	63	2	19	38	33	10	49	32	10	1	4
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	36	26	5	58	3	12	10	6	12	20	24	1	0	0
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	35	25	6	53	4	13	10	6	14	21	24	2	0	0
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	34	26	5	61	4	9	12	4	8	26	24	2	0	0
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	9	13	0	33	2	6	7	4	6	9	12	1	0	0
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTO)	49	53	29	75	4	23	40	26	14	64	35	6	2	1
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	62	61	24	78	4	28	30	24	27	51	32	6	0	2
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	20	16	4	73	1	9	9	3	10	21	24	1	1	0
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	41	39	10	62	5	23	25	16	20	36	35	8	2	3
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	30	13	1	36	2	9	7	3	7	10	26	0	0	0
F	345	F1-19 Do you perform tasks on hurst generators	48	6	1	39	1	6	8	4	11	13	26	2	0	1
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	30	22	6	51	3	20	21	10	15	31	29	5	2	1

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0165	37a(2). Multivibrators (Astable, Bistable, B Monostable)														
F 347	F2-1 Do you trace block diagrams of circuits containing multivibrators	59	53	21	77	12	49	41	27	45	58	44	15	18	14
F 348	F2-2 Do you trace schematic diagrams of multivibrator circuits	59	49	19	76	13	40	37	18	43	55	38	9	9	5
F 351	F2-5 Do you adjust or align multivibrator circuits	51	37	11	71	4	20	20	11	25	40	15	1	0	1
F 352	F2-6 Do the multivibrators you work with use LC tank circuits	55	39	11	65	9	24	26	13	31	38	29	2	2	2
F 353	F2-7 Do the multivibrators you work with use RC networks	56	43	16	73	11	26	29	15	30	47	29	5	4	4
F 354	F2-8 Do the multivibrators you work with use Crystals	53	46	18	70	4	20	27	17	23	40	32	2	2	5
F 355	F2-9 Do you perform tasks on astable (free running) multivibrators	55	42	17	77	11	34	29	14	35	51	35	2	4	7
F 356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	51	44	17	74	11	35	29	15	38	54	32	3	5	7
F 357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	54	46	19	75	11	37	32	15	39	53	32	3	6	8
F 358	F2-12 Do you perform tasks on triggered astable multivibrators	42	33	9	64	8	28	26	11	27	45	29	2	4	2
0166	37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff) B														
F 359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	62	51	11	73	8	45	37	27	43	52	44	11	4	4
F 360	F3-2 Do you trace schematic diagrams of WSC	62	49	11	72	9	38	30	18	40	47	38	6	2	1
F 363	F3-5 Do you adjust or calibrate WSC	57	43	9	72	4	25	15	15	34	38	29	0	0	0
F 364	F3-6 Do you perform tasks on sawtooth wave generator WSC	60	39	10	73	8	35	33	16	39	47	35	3	1	1
F 365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	50	38	5	65	5	21	16	12	23	33	32	3	1	0
F 366	F3-8 Do you perform tasks on RC differentiating WSC	46	24	5	50	4	18	11	8	14	21	26	2	0	0
F 367	F3-9 Do you perform tasks on RL differentiating WSC	41	23	3	45	3	17	10	7	13	21	26	2	0	0
F 368	F3-10 Do you perform tasks on RC integrating WSC	43	24	5	53	5	19	12	9	13	23	26	2	0	0
F 369	F3-11 Do you perform tasks on RL integrating WSC	40	23	4	45	4	19	10	8	13	21	26	2	0	0
F 370	F3-12 Do you perform tasks on square wave generator WSC	58	48	16	73	10	40	36	17	39	51	38	3	1	1
F 371	F3-13 Do you perform tasks on rectangular wave generator WSC	39	34	8	63	5	35	27	10	31	36	29	2	1	0
F 372	F3-14 Do you perform tasks on Schmitt trigger SC	50	34	11	69	7	26	19	11	21	38	29	1	0	0

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0167	37b. Isolate faulty wave generating circuits 2b														
F 329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	73	68	27	83	11	45	51	32	48	75	41	15	4	7
F 349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	57	45	16	75	10	30	26	14	38	52	32	2	2	3
F 361	F3-3 Do you troubleshoot to isolate a faulty WSC	60	45	11	70	6	34	25	17	39	47	35	2	1	0
0168	37c. Troubleshoot circuits 2b														
F 330	F1-4 Do you troubleshoot oscillators to circuit level components	70	59	21	80	6	21	26	11	32	49	26	3	0	0
F 350	F2-4 Do you troubleshoot multivibrators to circuit level components	56	40	11	71	7	12	12	7	26	39	15	2	0	1
F 362	F3-4 Do you troubleshoot WSC to circuit level components	60	41	8	67	3	13	10	6	30	37	15	2	0	0
0169	38. Limiter Circuits (Diode, Zener Diode, Transistor)														
0170	38a. Theory of operation B														
F 373	F4-1 Do you trace block diagrams of circuits containing limiters	62	53	8	71	8	53	35	28	39	51	44	8	5	2
F 374	F4-2 Do you trace schematic diagrams of limiter circuits	63	50	8	69	8	45	30	19	37	48	35	5	4	0
F 381	F4-9 Do you perform tasks on series diode limiter circuits	54	34	5	65	5	35	22	14	30	40	26	0	1	0
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	48	36	4	65	4	35	20	15	27	40	26	1	0	0
F 383	F4-11 Do you perform tasks on bias limiter circuits	40	30	3	55	3	30	13	11	24	33	26	0	0	0
F 384	F4-12 Do you perform tasks on zener diode circuits	62	46	9	70	7	37	28	16	35	48	35	1	2	0
F 385	F4-13 Do you perform tasks on transistor limiter circuits	57	32	6	64	5	29	19	12	26	34	26	1	1	0
F 386	F4-14 Do you perform tasks on triode limiter circuits	22	13	2	43	0	16	7	7	13	21	12	0	0	0
0171	38b. Isolate faulty limiters 2b														
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	60	43	7	67	5	33	20	13	33	45	32	1	2	0

D T Tsk Y Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0172	38c. Troubleshoot circuits	2b														
F 378	F4-6 Do you troubleshoot limiters to circuit level components		58	40	5	66	4	13	10	6	26	38	15	1	1	0
0173	39. Clamper Circuits															
0174	39a. Theory of operation	B														
F 375	F4-3 Do you trace block diagrams of circuits containing clampers		62	49	6	68	8	43	23	20	35	47	38	2	1	0
F 376	F4-4 Do you trace schematic diagrams of clamper circuits		64	46	6	67	6	40	22	16	35	44	35	2	0	0
F 387	F4-15 Do you perform tasks on diode clamper circuits		61	43	5	63	5	33	18	15	27	42	29	0	0	0
F 388	F4-16 Do you perform tasks on bias clamper circuits		39	26	1	54	3	26	13	12	22	34	24	0	0	0
0175	39b. Isolate faulty clampers	2b														
F 379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit		62	41	4	65	5	28	14	9	30	40	26	1	0	0
0176	39c. Troubleshoot circuits	2b														
F 380	F4-8 Do you troubleshoot clampers to circuit level components		60	39	3	64	3	12	9	5	24	36	15	0	0	0
0177	40. Digital Numbering Systems (Binary, Octal, Hexadecimal)															
0178	40a. Conversions	B														
G 389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal		26	64	37	47	8	91	63	67	60	51	62	66	21	32
G 390	G1-2 Do you convert octal numbers to binary or binary numbers to octal		13	44	25	37	4	91	50	66	49	49	59	62	18	2[illegible]

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	17	53	24	38	3	92	41	62	56	42	56	38	12	12
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	13	44	24	36	3	88	43	61	46	45	56	42	15	14
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	16	50	24	37	3	89	37	61	57	41	56	35	9	12
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	12	36	17	32	2	90	36	57	41	38	56	35	10	10
G	395	G1-7 Do you convert base number fractions to another base numbering system	11	28	11	31	3	48	23	28	30	27	29	26	7	9
0179		40b. Math operations B														
G	396	G1-8 Do you add binary numbers	17	41	22	38	6	78	41	49	45	44	38	26	9	18
G	397	G1-9 Do you subtract binary numbers	17	39	21	38	6	71	37	47	40	42	38	20	10	14
G	398	G1-10 Do you multiply binary numbers	13	25	12	27	4	48	23	27	25	27	29	12	5	8
G	399	G1-11 Do you divide binary numbers	13	23	11	26	3	45	22	26	23	27	26	11	5	7
G	400	G1-12 Do you add octal numbers	10	31	14	28	3	76	29	45	30	36	29	17	6	7
G	401	G1-13 Do you subtract octal numbers	10	30	12	28	3	70	27	42	30	36	29	16	6	5
G	402	G1-14 Do you add hexadecimal numbers	11	32	16	27	1	65	20	38	34	30	21	14	6	4
G	403	G1-15 Do you subtract hexadecimal numbers	10	30	14	27	1	59	20	35	35	30	21	14	6	4
0180		40c. Binary Code Systems B														
G	404	G1-16 Do you use binary coded decimal (BCD)	20	57	32	53	6	84	58	62	52	60	56	51	13	21
G	405	G1-17 Do you use gray codes	4	7	3	14	1	7	2	8	16	9	44	5	0	1
G	406	G1-18 Do you use ICAO codes	1	2	1	8	0	4	2	3	3	1	9	4	0	1
G	407	G1-19 Do you use excess-3 (XS3) codes	3	2	0	8	0	4	2	6	7	2	24	5	0	1
G	408	G1-20 Do you use parity bit codes	6	34	12	19	3	54	19	34	36	33	50	16	2	4
G	409	G1-21 Do you use biquinary codes	2	2	1	7	2	5	1	4	7	2	9	7	0	1
G	410	G1-22 Do you use ASCII codes	11	33	17	36	3	65	20	45	21	15	56	5	0	3
G	411	G1-23 Do you use EBCDI codes	2	4	4	11	0	4	1	3	5	1	12	3	0	1
0181		41. Digital Logic Functions (Main Logic Gates and Flip-Flops)														
0182		41a. Theory of operation B														
G	412	G1-24 Do you trace data flow through logic symbol diagrams	42	76	31	68	11	86	63	55	78	75	62	57	27	33
G	413	G1-25 Do you trace data flow through logic schematic diagrams	44	77	32	68	11	84	60	50	77	75	59	51	27	27

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)	40	74	28	65	6	74	50	36	68	71	47	25	17	16
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)	33	53	21	60	6	65	43	33	64	66	47	22	16	13
G	419	G1-31 Do you perform tasks related to AND gates	55	78	38	72	15	84	62	54	85	79	62	26	34	27
G	420	G1-32 Do you perform tasks related to OR gates	54	78	38	72	15	84	62	54	84	79	62	26	34	28
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions	49	72	24	68	6	73	53	48	80	77	50	24	24	20
G	422	G1-34 Do you perform tasks related to NAND or NOR gates	53	76	35	71	13	81	60	52	83	79	62	26	32	27
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions	50	73	30	67	9	79	52	49	76	75	62	23	18	17
G	424	G1-36 Do you perform tasks related to RS flip flops	41	63	16	59	5	74	43	42	74	65	50	8	5	5
G	425	G1-37 Do you perform tasks related to D(Data) flip flops	37	65	21	59	7	70	32	34	57	54	50	9	2	8
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops	37	60	17	59	7	62	35	33	60	55	44	7	2	10
G	427	G1-39 Do you perform tasks related to JK flip flops	45	71	24	63	5	77	48	38	77	69	50	7	0	2
G	428	G1-40 Do you perform tasks related to Schmidt triggers	39	52	21	64	7	46	33	25	46	53	50	5	0	3
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions	33	53	21	58	6	43	34	33	44	54	47	8	7	7
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")	28	55	16	47	3	40	23	19	32	43	41	7	6	3
G	431	G1-43 Do you perform tasks related to buffers	44	68	28	66	4	65	38	35	54	64	59	10	10	8
G	432	G1-44 Do you perform tasks related to inverters	49	72	31	68	7	67	46	38	66	71	59	10	15	11
G	433	G1-45 Do you perform tasks related to complemented flip flops	25	36	11	43	3	37	21	20	30	34	41	6	0	3
G	434	G1-46 Do you perform tasks related to complementing flip flops	25	36	10	43	3	36	22	20	30	34	41	5	0	3
0183		41b. Isolate faulty logic function circuits 2b														
G	414	G1-26 Do you troubleshoot digital systems to major units	41	78	29	64	11	76	52	56	70	71	59	51	22	23
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards	43	78	29	66	11	70	45	45	71	72	47	7	1	2
0184		41c. Troubleshoot circuits 2b														
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC	42	72	26	65	7	48	31	18	55	64	41	6	1	1
0185		41d. Logic families (TTL and CMOS) B														
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)	23	36	11	45	4	30	15	16	26	33	32	3	0	3
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)	30	33	11	48	5	36	17	18	29	33	32	3	0	2

D T Y	Tsk Nbr	Task Title		304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)		38	68	31	67	8	57	30	32	38	54	53	3	0	2
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)		13	18	6	35	4	26	12	22	20	27	38	1	0	1
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)		7	10	3	25	2	14	5	6	8	12	26	2	0	1
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)		29	39	24	49	7	30	25	21	21	39	35	1	0	2
G	444	G1-56 Do you perform tasks on positive MOS ICs		14	23	4	27	2	17	11	11	13	25	26	2	0	1
G	445	G1-57 Do you perform tasks on negative MOS ICs		13	16	4	27	0	16	9	10	13	20	26	3	0	1
G	446	G1-58 Do you perform tasks on vertical MOS ICs		6	7	2	18	0	14	5	6	10	10	15	2	0	1
	0186	42. Boolean Equations															
	0187	42a. Diagram to equation	B														
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams		9	24	9	25	3	30	17	13	26	27	21	10	5	5
	0188	42b. Equation to diagram	B														
G	436	G1-48 Do you develop logic diagrams from Boolean equations		8	17	8	22	3	26	16	12	21	23	21	8	4	4
	0189	42c. Simplify Expressions	-														
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra		9	21	8	23	3	23	18	15	21	25	21	10	5	4
	0190	43. Computers															
	0191	43a. Operation principles	B														
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems		19	61	25	35	7	82	43	75	48	46	68	62	32	32
G	454	G2-8 Do you perform tasks on analog computers		8	21	7	19	3	57	24	27	41	32	18	33	22	21
G	455	G2-9 Do you perform tasks on digital computers		21	65	47	35	6	87	45	82	54	47	68	55	24	30

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0192	43b. Load programs 2b														
G 448	G2-2 Do you load programs	21	58	43	42	11	85	44	82	42	42	71	60	9	27
0193	43c. Write/debug programs 2b														
G 449	G2-3 Do you write or debug programs	9	12	19	18	7	23	11	57	15	16	41	7	0	2
G 453	G2-7 Do you use computer flow charts or diagrams	11	52	17	27	4	65	41	70	35	33	65	46	11	7
0194	43d. Fault isolation 2b														
G 450	G2-4 Do you troubleshoot computers to a major unit	17	55	21	20	4	83	41	80	43	38	59	45	22	15
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card	13	56	15	18	3	82	42	81	49	37	59	7	1	2
0195	43e. Circuit troubleshooting 2b														
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC	12	41	8	14	2	38	17	20	26	18	26	5	0	1
0196	43f. Types of memories B														
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories	25	58	43	27	7	89	45	81	42	49	71	24	9	16
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories	22	55	27	29	4	70	32	68	28	44	59	21	7	15
G 468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories	2	20	10	9	1	58	40	42	27	39	15	6	0	12
G 469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories	4	4	3	3	1	6	1	4	4	10	3	4	0	1
0197	43g. Peripheral devices B														
G 470	G2-24 Do you perform tasks on computer keyboards	29	67	52	35	9	48	46	85	45	43	74	41	16	8
G 471	G2-25 Do you perform tasks on computer character printers	18	50	35	21	7	73	32	65	24	25	65	10	6	5
G 472	G2-26 Do you perform tasks on magnetic tape drives	14	47	31	16	2	83	26	67	33	26	50	11	5	3

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	10	34	32	19	2	18	10	42	21	19	53	10	4	4
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	24	44	33	18	3	57	25	65	22	29	62	29	7	10
G	475	G2-29 Do you perform tasks on paper tape readers/punches	1	20	5	4	1	64	38	39	19	45	9	6	0	5
G	476	G2-30 Do you perform tasks on paper card readers/punches	1	4	5	4	1	8	3	8	14	6	3	4	0	2
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	11	34	15	14	3	66	27	43	29	40	38	24	9	5
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	14	42	16	26	3	57	15	38	35	34	41	28	5	5
G	479	G2-33 Do you perform tasks on modems	7	40	14	5	3	4	2	4	6	7	47	4	1	4
G	480	G2-34 Do you perform tasks on line printers	10	44	37	11	4	29	27	41	21	19	59	8	4	7
G	481	G2-35 Do you perform tasks on floppy disc drives	17	49	43	18	5	11	7	6	14	13	26	8	1	3
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	7	15	17	10	1	7	38	78	10	20	59	5	0	3
G	483	G2-37 Do you perform tasks on removable pack disc drives	2	21	14	3	1	5	4	10	4	7	41	5	0	2
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	7	21	24	7	3	5	10	10	9	8	21	4	0	4
0198		43h. Programming languages -														
G	456	G2-10 Do you use Basic computer language	16	24	29	35	11	13	12	9	11	16	44	9	5	7
G	457	G2-11 Do you use COBOL computer language	0	2	4	4	1	3	2	2	4	1	3	2	0	4
G	458	G2-12 Do you use FORTRAN computer language	0	8	14	4	3	4	4	4	3	3	6	2	0	2
G	459	G2-13 Do you use ADA computer language	0	1	1	2	1	1	2	3	2	1	3	1	0	1
G	460	G2-14 Do you use ATLAS computer language	0	0	0	5	2	68	41	88	21	31	68	2	0	1
G	461	G2-15 Do you use ELAN computer language	0	0	0	3	1	2	34	1	2	1	3	1	0	1
G	462	G2-16 Do you use PASCAL computer language	0	1	6	4	2	4	2	2	6	2	6	2	0	2
G	463	G2-17 Do you use RPG computer language	0	0	0	2	1	1	1	3	1	1	3	1	0	2
G	464	G2-18 Do you use Machine computer language	5	19	8	16	2	36	15	16	18	7	44	3	0	3
G	465	G2-19 Do you use C computer language	1	1	5	2	2	1	1	2	2	1	3	2	0	1
0199		44. Microprocessor Controlled Systems														
0200		44a. Theory of operation B														
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	17	49	17	43	4	35	24	53	20	29	53	13	2	13

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0201		44b. Isolate faulty microprocessors 2b														
G 486		G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	16	48	13	42	4	34	24	48	21	28	44	2	0	3
G 487		G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	15	43	9	39	2	24	12	17	15	18	24	2	1	3
0202		45. Logic Circuits														
0203		45a. Theory of operation														
0204		45a(1). Counters (Synchronous/ Asynchronous-Up/Down counters) B														
G 488		G3-1 Do you trace data flow through circuits containing counters	31	66	22	61	11	62	45	36	52	54	56	12	15	4
G 491		G3-4 Do you perform tasks on UP counters in logic circuits	29	55	21	55	9	58	38	28	49	51	38	4	2	1
G 492		G3-5 Do you perform tasks on DOWN counters in logic circuits	28	50	19	52	9	59	38	28	48	49	38	2	0	0
G 493		G3-6 Do you perform tasks on DECADE counters in logic circuits	17	38	15	57	5	48	24	19	38	37	29	1	0	0
G 494		G3-7 Do you perform tasks on ring counters in logic circuits	9	28	4	28	1	14	11	6	14	14	26	2	0	0
G 495		G3-8 Do you perform tasks on modulous counters in logic circuits	10	23	2	16	1	11	7	8	12	10	12	0	0	0
G 496		G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	17	46	14	45	4	45	29	25	33	34	38	2	1	1
G 497		G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	18	47	13	45	4	45	28	23	33	36	38	2	1	1
0205		45a(2). Registers (Shift and Storage) B														
G 498		G3-11 Do you trace logic diagrams of circuits containing registers	23	61	17	36	4	62	40	34	45	44	50	5	2	3
G 501		G3-14 Do you perform tasks on shift registers in logic circuits	22	54	19	33	2	53	33	32	46	44	44	1	1	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	22	52	15	33	2	55	32	30	43	42	44	2	1	1
0206		45a(3). Combinational Logic Circuits (Half-adder, Full-adder, encoder, Decoder, Multiplexer, Demultiplexer, Count Detect) B														
G	503	G3-16 Do you trace data flow through combinational logic circuits	26	54	16	33	1	43	29	25	35	47	50	9	1	5
G	506	G3-19 Do you perform tasks on encoders	36	55	16	36	3	45	26	23	41	53	56	5	0	5
G	507	G3-20 Do you perform tasks on decoders	35	57	15	36	4	45	26	24	43	55	56	5	0	5
G	508	G3-21 Do you perform tasks on multiplexers	26	50	18	33	1	50	27	26	40	44	53	7	1	2
G	509	G3-22 Do you perform tasks on demultiplexers	18	46	16	26	1	43	23	23	30	38	47	4	0	1
G	510	G3-23 Do you perform tasks on comparators	23	55	12	33	1	46	26	24	27	46	53	3	1	2
G	511	G3-24 Do you perform tasks on parity generators or checkers	10	34	7	20	0	43	15	16	22	27	53	2	0	2
G	512	G3-25 Do you perform tasks on code converters	9	29	8	18	0	23	11	9	17	21	32	1	0	0
G	513	G3-26 Do you perform tasks on adders	18	37	5	30	1	36	18	13	26	25	44	5	0	2
G	514	G3-27 Do you perform tasks on subtractors	13	31	5	28	1	33	16	12	24	23	44	5	0	2
G	515	G3-28 Do you perform tasks on count detect circuits	11	21	3	17	0	25	10	6	11	10	18	0	0	1
0207		45b. Isolate faulty circuits 2b														
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	29	59	19	61	12	46	35	22	47	50	41	3	12	1
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	22	53	16	33	3	45	34	17	44	39	41	1	0	1
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	25	50	15	32	1	34	24	16	34	43	41	2	0	0
0208		45c. Troubleshoot circuits -														
G	490	G3-3 Do you troubleshoot counters to circuit level components	27	54	17	59	8	28	16	8	36	42	12	1	4	0
G	500	G3-13 Do you troubleshoot registers to circuit level components	21	46	14	30	2	28	15	5	30	31	15	0	0	1
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	24	43	11	30	0	23	10	6	27	34	15	2	0	0

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0209	46. D/A, A/D Converters (Approx D/A and Ramp A/D)														
0210	46a. Theory of operation B														
G 516	G4-1 Do you trace data flow through A/D converters	27	60	26	63	3	67	42	50	57	52	53	42	17	26
G 517	G4-2 Do you trace data flow through D/A converters	27	66	23	61	3	68	40	47	54	53	50	34	17	22
G 520	G4-5 Do the converters you perform tasks on use flash conversion	4	4	3	12	0	4	2	3	5	6	9	2	1	3
G 521	G4-6 Do the converters you perform tasks on use successive approximation conversion	7	15	5	27	1	14	4	9	10	12	18	2	0	3
G 522	G4-7 Do the converters you perform tasks on use ramp conversion	9	25	8	42	1	16	10	10	12	21	24	4	1	2
G 523	G4-8 Do the converters you perform tasks on use R2R conversion	3	7	2	16	0	6	5	5	5	6	0	1	0	2
0211	46b. Isolate faulty converters 2b														
G 518	G4-3 Do you troubleshoot A/D converter circuits	26	55	20	61	2	52	36	48	52	48	38	18	5	9
G 519	G4-4 Do you troubleshoot D/A converter circuits	26	61	18	60	2	51	33	44	49	48	38	15	4	5
0212	47. Transmission Lines														
0213	47a. Theory of operation B														
H 527	H1-4 Do you construct transmission lines	21	26	28	19	0	16	13	10	7	10	15	28	0	27
H 528	H1-5 Do you match transmission line impedance with loads	28	24	18	38	0	11	9	10	5	16	29	12	1	21
H 531	H1-8 Do you perform tasks on open-wire transmission lines	5	13	13	19	0	13	8	9	7	9	32	23	7	23
H 532	H1-9 Do you perform tasks on twisted pair transmission lines	13	31	33	17	0	26	13	12	14	14	41	62	11	46
H 533	H1-10 Do you perform tasks on twin lead transmission lines	20	14	15	18	0	13	8	12	7	8	29	14	0	21
H 534	H1-11 Do you perform tasks on flexible coaxial transmission lines	47	46	50	38	1	40	35	28	21	37	56	68	9	66
H 535	H1-12 Do you perform tasks on rigid coaxial transmission lines	18	33	23	34	0	34	30	16	10	27	47	46	4	39
H 536	H1-13 Do you perform tasks on fiber-optic transmission lines	8	8	11	4	0	16	3	1	4	2	3	4	0	4

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0214		47b. Perform Measurements 2b														
H	524	H1-1 Do you measure electrical length on transmission lines	12	18	17	20	0	16	9	6	4	5	15	20	2	23
H	525	H1-2 Do you measure physical length on transmission lines	26	25	31	21	1	22	10	6	7	8	21	33	2	36
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	13	24	14	43	0	9	18	18	7	18	32	22	1	54
0215		47c. Calculations -														
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	9	8	6	24	0	6	4	4	4	3	12	9	2	14
0216		47d. Isolate faulty transmission lines -														
H	530	H1-7 Do you troubleshoot transmission lines	34	36	30	25	0	21	20	15	13	22	26	42	9	59
0217		48. Waveguides														
0218		48a. Theory of operation B														
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	7	26	8	45	2	78	85	46	41	34	53	87	21	67
H	539	H1-16 Do you pressurize or purge waveguide assemblies	4	15	2	12	1	62	63	42	38	10	44	92	21	78
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies	1	11	3	42	1	21	38	28	17	18	35	26	4	30
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components	5	19	6	47	1	72	78	49	40	34	44	92	20	83
0219		48b. Isolate faulty waveguides 2b														
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	4	23	4	41	1	74	80	44	39	32	50	82	18	64

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0220		49. Microwave Oscillators & Amplifiers														
0221		49a. Theory of operation B														
H	542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	6	30	6	57	1	59	63	34	34	48	53	41	6	27
H	545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	0	2	0	37	0	2	4	2	13	3	6	2	0	0
H	546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	0	10	0	28	0	1	4	1	7	3	0	3	0	0
H	547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	0	3	0	44	0	6	6	2	24	7	9	4	0	0
H	548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	15	2	44	0	27	54	27	26	45	38	19	4	2
H	549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	0	2	0	28	0	9	20	9	35	5	29	11	2	2
H	550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	36	0	5	8	2	27	37	3	2	0	0
H	551	H2-10 Do you perform tasks on parametric amplifiers	0	3	4	13	0	23	4	2	4	6	0	7	0	0
H	552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	2	1	48	1	3	34	23	12	39	29	3	2	3
0222		49b. Tune or Adjust 2b														
H	544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	8	23	4	57	1	46	45	19	32	45	41	6	0	2
0223		49c. Isolate faulty microwave oscillators or amplifiers 2b														
H	543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	4	27	5	56	1	54	57	28	33	47	41	30	4	17
0224		50. Resonant Cavities														

D T Tsk Y Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0225	50a. Theory of operation B														
H 553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	4	19	2	40	0	9	14	12	17	30	21	3	0	1
H 558	H3-6 Do you perform tasks on probe resonant cavities	3	10	1	26	0	3	4	3	6	10	3	0	1	0
H 559	H3-7 Do you perform tasks on loop resonant cavities	2	4	2	18	0	0	3	3	5	10	3	0	0	0
H 560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	2	7	0	7	0	3	5	3	4	4	6	0	0	0
0226	50b. Isolate faulty resonant cavities 2b														
H 554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	3	15	1	38	0	6	12	5	14	25	15	0	0	0
H 557	H3-5 Do you measure frequency of resonant cavities	3	14	2	39	0	4	10	5	14	18	15	0	0	0
0227	50c. Tune/adjust 2b														
H 555	H3-3 Do you tune or adjust resonant cavities electrically	5	10	1	37	0	3	12	6	14	21	18	0	0	0
H 556	H3-4 Do you tune or adjust resonant cavities physically	3	13	3	37	0	3	14	4	15	16	15	0	0	0
0228	51. Transmitters														
0229	51a. Theory of operation														
0230	51a(1). Amplitude Modulation -														
H 561	H4-1 Do you use "AM" modulation principles	14	25	8	61	1	13	38	49	12	53	44	8	0	21
H 562	H4-2 Do you trace block diagrams of AM transmitters	12	21	5	50	1	10	41	52	10	55	38	8	2	25
H 563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	13	18	3	48	1	10	38	49	10	55	38	3	2	7
H 564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	13	15	2	44	1	9	34	35	9	51	32	2	1	3
H 568	H4-8 Do you align or adjust AM transmitters or circuits	12	15	3	52	1	6	37	51	8	52	29	2	1	3
H 569	H4-9 Do you calculate percentage of modulation for AM transmitters	8	10	5	61	1	4	26	44	4	46	18	1	1	3

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0231		51a(2). Frequency Modulation														
H	593	H4-33 Do you use "FM" modulation principles	25	25	22	58	1	14	37	48	13	42	53	18	4	27
H	594	H4-34 Do you trace block diagrams of FM transmitters	21	25	17	46	1	16	38	53	12	41	50	30	4	39
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	19	24	11	46	1	12	35	52	12	41	47	7	1	8
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	19	21	9	43	1	9	30	39	11	38	41	2	0	7
H	600	H4-40 Do you align or adjust FM transmitters or circuits	22	21	12	48	1	8	25	49	10	36	44	2	0	2
H	601	H4-41 Do you calculate modulation index for FM transmitters	8	12	8	41	1	4	7	24	2	24	15	1	0	0
H	602	H4-42 Do you measure frequency deviation for FM transmitters	16	16	12	54	1	6	20	46	7	32	26	2	0	3
0232		51a(3). Single Side Band														
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	4	8	2	8	0	4	13	10	5	38	18	2	2	11
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	12	9	4	38	18	1	1	3
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	4	8	2	7	0	4	8	8	4	38	18	1	1	3
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	4	6	2	7	0	4	11	8	6	38	18	0	0	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	3	3	1	9	0	2	7	8	2	36	9	0	0	1
0233		51a(4). Pulse Modulation														
H	612	H4-52 Do you use "PM" modulation principles	2	22	11	44	2	10	23	31	15	33	50	19	4	13
H	613	H4-53 Do you trace block diagrams of PM transmitters	2	21	6	36	1	13	24	29	17	36	47	30	5	20
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	2	20	4	36	0	12	22	27	16	33	44	8	2	2
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	2	18	4	34	0	9	21	22	15	32	44	3	2	2
H	619	H4-59 Do you align or adjust PM transmitters or circuits	2	17	3	38	0	5	21	22	14	30	44	0	1	3
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	2	13	3	42	1	6	18	17	11	29	35	3	2	5
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	2	15	5	44	1	9	25	22	15	34	41	5	2	7

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0234		51b. Isolate faulty transmitters -														
H	565	H4-5 Do you troubleshoot AM transmitters to major units	12	18	5	46	1	8	32	49	8	51	35	6	1	15
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	12	16	3	46	1	9	34	50	8	51	38	1	1	2
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	4	8	1	8	0	3	9	9	5	36	18	1	1	7
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	4	8	1	7	0	3	10	9	4	38	18	0	0	1
H	597	H4-37 Do you troubleshoot FM transmitters to major units	20	24	13	42	1	9	30	49	11	39	44	15	2	29
H	598	H4-38 Do you troubleshoot FM transmitters to subassemblies or circuit cards	19	20	7	43	1	9	29	50	12	40	47	2	0	1
H	616	H4-56 Do you troubleshoot PM transmitters to major units	2	19	4	33	1	8	23	24	15	33	47	16	5	13
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	18	3	32	1	9	20	25	14	33	47	0	2	0
0235		51c. Troubleshoot circuits -														
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	11	14	2	44	1	6	12	14	5	39	24	1	1	2
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	3	8	1	7	0	1	2	3	4	32	12	0	0	1
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	18	18	6	42	1	4	7	13	7	31	29	2	0	1
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	16	2	31	0	3	7	9	7	27	26	0	2	0
0236		52. Receivers														
0237		52a. Theory of operation														
0238		52a(1). Amplitude Modulation -														
H	570	H4-10 Do you use "AM" demodulation principles	16	40	10	35	0	5	19	33	4	36	35	2	0	15
H	571	H4-11 Do you trace block diagrams of AM receivers	18	42	8	33	0	9	34	48	4	45	35	6	2	32
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	18	39	7	31	0	9	32	47	5	45	35	1	1	11

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	19	36	6	30	0	8	29	36	4	45	32	0	1	4
H	577	H4-17 Do you align or adjust AM receivers or circuits	19	34	9	34	0	6	29	43	5	45	26	1	1	5
0239		52a(2). Frequency Modulation -														
H	603	H4-43 Do you use "FM" demodulation principles	22	47	24	35	0	11	22	37	9	28	47	14	2	16
H	604	H4-44 Do you trace block diagrams of FM receivers	25	48	22	32	0	15	33	49	8	32	47	20	4	33
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	25	47	16	31	0	14	30	49	8	32	44	6	1	9
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	25	44	14	30	0	12	27	37	8	30	41	2	0	4
H	610	H4-50 Do you align or adjust FM receivers or circuits	25	43	18	33	0	11	26	48	9	29	44	1	0	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	5	17	7	15	0	4	5	6	3	14	9	1	0	0
0240		52a(3). Single Side Band -														
H	586	H4-26 Do you trace block diagrams of SSB receivers	5	8	3	6	0	5	17	8	5	38	18	2	1	10
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	15	7	5	38	18	1	0	3
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	5	7	2	6	0	5	11	6	4	38	18	0	0	1
H	592	H4-32 Do you align or adjust SSB receivers or circuits	5	7	2	6	0	4	11	8	5	36	18	0	0	1
0241		52a(4). Pulse Modulation -														
H	622	H4-62 Do you use "PM" demodulation principles	2	41	12	28	1	5	13	23	10	25	47	15	4	9
H	623	H4-63 Do you trace block diagrams of PM receivers	2	42	10	24	0	8	18	25	11	27	44	24	5	16
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	2	41	8	23	0	6	17	23	11	27	41	4	2	2
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	2	38	8	23	0	5	16	19	10	26	41	2	2	1
H	629	H4-69 Do you align or adjust PM receivers or circuits	2	37	9	25	0	5	15	19	11	25	38	0	2	2
0242		52b. Isolate faulty receivers -														
H	574	H4-14 Do you troubleshoot AM receivers to major units	19	38	7	29	0	6	30	46	4	44	32	2	1	16
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	19	34	6	29	0	6	30	45	4	45	35	0	0	3
H	589	H4-29 Do you troubleshoot SSB receivers to major units	5	7	2	6	0	4	13	8	4	35	18	0	0	5

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	[illegible]1	452 51A	452 51B	452 51C
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	5	6	2	6	0	4	12	8	4	38	18	0	0	1
H	607	H4-47 Do you troubleshoot FM receivers to major units	26	47	18	29	0	14	28	46	8	30	41	12	2	25
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	25	42	13	29	0	14	24	48	10	31	44	2	0	3
H	626	H4-66 Do you troubleshoot PM receivers to major units	2	39	8	23	0	5	16	22	11	26	41	14	5	10
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	2	35	7	23	0	6	15	22	11	26	41	0	2	0
0243		52c. Troubleshoot circuits -														
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	18	30	4	29	0	4	9	10	2	36	24	0	1	3
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	5	6	1	6	0	4	5	3	4	34	9	0	0	1
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	24	38	10	29	0	7	7	13	5	25	26	1	0	1
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	2	31	5	22	0	3	6	7	7	22	24	0	2	0
0244		53. Transmission Power														
0245		53a. Perform measurements B														
I	660	I1-1 Do you measure RF power	22	58	27	79	1	73	90	76	43	95	65	42	7	51
I	661	I1-2 Do you measure RF peak power	17	39	19	75	1	67	80	59	36	86	59	18	2	28
I	662	I1-3 Do you measure RF average power	17	38	16	69	1	55	77	48	28	73	56	15	0	14
I	663	I1-4 Do you measure RF effective power	14	30	13	60	1	43	41	38	18	45	53	18	0	16
I	664	I1-5 Do you measure RF output power using wattmeters	20	37	22	68	1	54	76	63	25	67	50	30	9	62
0246		53b. Calculations B														
I	665	I2-1 Do you calculate RF apparent power	3	18	5	45	2	19	29	17	11	25	26	1	0	5
I	666	I2-2 Do you calculate RF true power	3	20	8	55	2	22	29	19	13	30	32	1	0	8
I	667	I2-3 Do you calculate RF power loss or gain in db	8	44	17	73	2	54	74	53	24	75	50	10	2	14

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
	0247	54. Antennas														
	0248	54a. Theory of operation -														
H	634	H5-5 Do you plot graph radiation patterns	1	5	3	1	0	1	4	5	4	4	21	4	0	3
H	637	H5-8 Do you work with Yagi antennas	12	2	3	0	0	0	2	1	1	0	3	2	0	1
H	638	H5-9 Do you work with dipole antennas	11	36	17	7	0	1	50	16	7	19	35	51	9	58
H	639	H5-10 Do you work with slotted antennas	1	0	3	2	0	1	21	15	1	3	9	18	1	1
H	640	H5-11 Do you work with rotary antennas	1	2	2	4	0	1	6	4	4	5	12	15	0	10
H	641	H5-12 Do you work with hertz antennas	0	2	1	1	0	0	2	1	2	2	0	2	0	10
H	642	H5-13 Do you work with marconi antennas	0	2	0	2	0	1	2	3	2	1	0	3	0	7
H	643	H5-14 Do you work with rhombic antennas	0	1	0	1	0	0	2	1	1	2	0	3	0	5
H	644	H5-15 Do you work with scimitar antennas	0	0	0	1	0	1	2	1	1	0	0	2	0	2
H	645	H5-16 Do you work with parabolic antennas	6	54	11	2	0	1	4	8	20	7	18	9	1	10
H	646	H5-17 Do you work with ground plane antennas	2	7	8	5	0	1	3	11	4	13	12	8	1	11
H	647	H5-18 Do you perform tasks on rotary antenna arrays	0	4	2	2	0	1	4	3	3	2	9	10	1	7
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	1	1	0	0	0	0	3	1	1	1	9	2	0	1
H	649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	1	0	0	2	1	1	1	3	4	0	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	1	1	1	0	0	0	2	4	1	3	3	4	4	37
H	651	H5-22 Do you perform tasks on collinear antenna arrays	1	1	0	1	0	1	2	2	1	0	3	2	0	1
H	652	H5-23 Do you perform tasks on phase antenna arrays	2	19	4	2	0	0	13	20	7	7	53	17	1	12
H	653	H5-24 Do you perform tasks on planar antenna arrays	2	7	3	1	0	2	41	13	7	2	9	54	6	8
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	7	14	13	3	1	2	19	16	14	8	38	36	5	13
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	7	17	10	3	1	3	20	15	14	5	38	35	5	9
H	656	H5-27 Do you perform tasks on antennas with circular polarization	2	34	14	3	1	1	18	11	14	5	47	21	2	12
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	9	36	14	5	1	1	16	24	9	11	50	38	6	37
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	6	13	7	4	1	1	15	14	13	9	47	17	5	17
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	11	22	15	6	1	4	30	23	10	18	41	29	9	64
	0249	54b. Perform alignments -														
H	630	H5-1 Do you physically align antennas	15	46	21	5	0	8	46	27	27	12	44	34	4	20
H	631	H5-2 Do you electrically align antennas	10	48	10	6	0	6	46	35	35	12	50	18	1	8
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	8	21	12	10	0	1	20	29	7	17	35	13	1	39

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0250		54c. Isolate faulty antennas -														
H	632	H5-3 Do you troubleshoot loading of antennas	7	21	10	5	0	6	15	20	10	14	35	10	5	21
H	633	H5-4 Do you troubleshoot coupling of antennas	6	25	10	5	0	3	20	20	13	14	47	14	6	17
H	635	H5-6 Do you troubleshoot antenna components	7	52	13	4	0	5	42	40	26	10	50	40	12	35
0251		55. Microphones														
0252		55a. Theory of operation -														
J	668	J1-1 Do you trace block diagrams of circuits containing microphones	57	6	11	7	25	1	4	18	2	17	3	9	6	43
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	56	6	8	7	25	1	3	16	2	16	3	6	6	18
J	672	J1-5 Do you work on carbon microphones	45	3	6	3	16	1	1	18	1	16	3	2	1	20
J	673	J1-6 Do you work on capacitor microphones	32	0	3	4	10	1	1	2	0	2	3	0	0	2
J	674	J1-7 Do you work on crystal microphones	28	3	5	6	11	1	1	5	0	3	0	0	1	7
J	675	J1-8 Do you work on dynamic microphones	56	4	10	6	13	1	2	10	1	11	6	2	1	7
J	676	J1-9 Do you work on velocity ribbon microphones	13	0	0	1	3	1	0	1	0	1	0	0	0	0
0253		55b. Isolate faulty microphones -														
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	61	7	12	7	27	1	5	19	2	18	6	6	7	35
0254		55c. Troubleshoot circuits -														
J	671	J1-4 Do you troubleshoot microphones	58	3	7	7	23	1	1	13	1	13	3	0	1	11
0255		56. Speakers														
0256		56a. Theory of operation -														
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	62	19	10	14	33	3	7	16	1	14	6	4	4	27

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
J	678	J1-11 Do you trace schematic diagrams of speaker circuits	60	16	8	13	34	3	5	13	1	13	3	3	4	14
	0257	56b. Isolate faulty speakers -														
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker	63	17	11	12	36	3	6	17	1	13	3	2	2	21
	0258	56c. Troubleshoot circuits -														
J	680	J1-13 Do you troubleshoot speakers	50	7	8	8	26	3	3	9	0	8	3	0	0	7
	0259	57. Photosensitive Devices														
	0260	57a. Theory of operation B														
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices	46	55	14	32	43	29	23	23	5	25	21	10	2	13
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits	46	52	13	32	44	26	22	18	4	23	9	3	1	1
J	684	J2-4 Do you adjust or calibrate photosensitive devices	35	42	11	29	35	15	10	16	3	16	6	0	0	0
J	685	J2-5 Do you work on photodiodes	30	42	11	24	32	13	13	10	4	23	3	2	0	1
J	686	J2-6 Do you work on phototransistors	31	13	8	21	22	8	11	4	3	8	6	2	0	0
J	687	J2-7 Do you work on phototubes	12	2	2	19	25	6	2	6	1	1	0	1	0	1
J	688	J2-8 Do you work on photo-SCRs	9	4	1	16	15	8	5	1	1	3	0	0	0	0
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)	17	30	10	24	38	13	8	8	3	7	6	2	0	2
	0261	57b. Isolate faulty photosensitive devices 2b														
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device	46	52	14	30	44	23	23	19	4	23	9	4	1	4
	0262	58. Display Tubes														

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
0263		58a. Theory of operation -														
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	5	5	1	26	2	6	6	8	11	11	0	13	1	7
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	5	5	1	26	2	6	5	7	11	10	0	8	1	1
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	4	4	0	27	2	4	4	7	10	10	0	1	0	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	3	1	1	15	1	1	2	2	11	10	0	3	0	1
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	1	1	0	8	1	1	1	1	1	2	0	2	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	1	1	0	7	1	1	1	0	1	1	0	2	0	0
0264		58b Isolate faulty display tubes -														
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	5	5	0	25	1	5	5	7	12	11	0	6	1	3
0265		59. Support Subjects														
0266		59a. Safety applicable to electronics B														
0267		59b. First aid for electrical shock B														
0268		59c. Electrostatic Discharge (ESD) Control B														
0269		Tasks not referenced														
B	175	B3-4 Do you use audio sine-wave signal generators	62	31	37	88	3	30	46	46	21	48	44	1	1	2
B	176	B3-5 Do you use audio non-sinusoidal signal generators	17	21	21	74	1	22	22	16	13	16	38	1	0	1
B	177	B3-6 Do you use RF less than 1,000MH signal generators	27	56	35	85	3	41	47	59	21	58	59	10	2	7
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	15	54	31	79	2	35	48	47	26	66	53	7	1	3
B	179	B3-8 Do you use white noise signal generators	12	13	8	24	1	4	6	5	2	14	29	1	0	3
B	180	B3-9 Do you use pattern signal generators	60	26	16	30	3	9	16	5	8	15	38	1	0	1

D T Y	Tsk Nbr	Task Title	304 55	309 50	316 53	324 50	404 50	451 54A	451 54B	451 55	451 56A	451 56B	451 X7	452 51A	452 51B	452 51C
B	181	B3-10 Do you use pseudo-random signal generators	2	30	11	18	0	6	7	5	4	3	35	2	0	1
B	182	B3-11 Do you use time mark signal generators	10	21	8	89	2	11	16	8	5	16	32	1	0	1
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	30	66	55	92	4	57	71	30	51	53	56	2	0	0
B	184	B3-13 Do you use TV signal signal generators	81	3	7	20	0	9	4	13	2	5	15	1	0	0
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	65	38	20	77	18	33	32	26	34	44	35	8	1	4
D	285	D1-11 Do you perform tasks on DC to DC converters	55	41	32	73	20	47	48	26	45	51	32	10	4	5
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	37	32	22	73	25	46	47	33	56	47	47	8	6	7
D	287	D1-13 Do you perform tasks on switching power supplies	47	44	25	62	27	26	18	14	22	23	15	7	5	8
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	78	6	9	1	8	3	0	17	0	3	0	2	1	0
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	77	6	4	1	7	2	0	17	0	3	0	2	1	0
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	78	5	6	1	8	2	0	20	0	3	0	3	1	0
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	78	3	3	1	4	4	2	10	0	3	0	0	0	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	79	4	6	1	6	4	2	19	0	3	0	1	0	0
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	7	19	5	2	4	2	2	1	0	0	0	2	2	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	7	19	5	2	4	2	2	1	0	0	0	2	1	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	6	19	5	2	4	2	2	1	0	0	0	2	1	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	6	18	5	2	4	2	2	1	0	0	0	0	0	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	6	19	5	2	4	2	2	1	0	0	0	0	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	5	2	4	1	2	2	2	1	1	7	0	1	0	1
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	5	2	5	1	2	3	2	1	1	8	0	1	0	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	5	2	5	0	2	2	2	1	1	8	0	0	0	0
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	6	2	5	0	3	3	2	1	1	8	0	1	0	1
J	712	J4-16 Do you adjust or calibrate infrared systems or components	4	2	5	1	2	2	2	1	1	8	0	1	0	0

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0065	GP0068/PMP	All DAFSC 45252A	85	9.47	15.40	92.94	.00	712
3	F0066	GP0069/PMP	All DAFSC 45252B	105	9.93	17.32	100.00	.00	712
4	F0067	GP0070/PMP	All DAFSC 45252C	98	9.40	15.91	97.96	.00	712
5	F0068	GP0071/PMP	All DAFSC 45253A	97	13.32	18.18	98.97	.00	712
6	F0069	GP0072/PMP	All DAFSC 45253B	61	10.57	18.77	100.00	.00	712
7	F0070	GP0073/PMP	All DAFSC 45253C	68	11.83	18.71	100.00	.00	712
8	F0071	GP0074/PMP	All DAFSC 45271	227	11.70	16.59	95.15	.00	712
9	F0072	GP0075/PMP	All DAFSC 45272	271	11.35	15.98	94.46	.00	712
10	F0073	GP0076/PMP	All DAFSC 45273	147	13.57	17.56	98.64	.00	712
11	F0074	GP0077/PMP	All DAFSC 45550A	149	22.92	22.87	97.32	.00	712
12	F0075	GP0078/PMP	All DAFSC 45550B	146	16.07	19.03	98.63	.00	712

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
13	F0094	GP0117/PMP	All DAFSC 455X3A	108	20.25	20.98	98.15	.00	712
14	F0099	GP0139/PMP	All DAFSC 456X0	111	21.07	23.35	97.30	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applications order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0001	STS 1 Electronic Fundamentals/ Applications dated 20 Feb 1987													
	0002	1. Basic Terms													
	0003	1a. Metric Notation	B												
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)	54	67	52	75	85	71	67	60	79	72	58	76	88
	0004	1b. DC Terms	B												
A	2	A1-2 Do you use basic DC electrical/electronic terms	88	97	95	97	97	93	93	94	97	94	97	96	97
	0005	1c. AC Terms	B												
A	3	A1-3 Do you use basic AC electrical/electronic terms	88	97	94	96	97	91	93	94	97	93	97	95	97
	0006	2. Basic Circuits													

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0007		2a. Theory of operation	B													
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries		86	100	96	96	97	91	92	93	99	97	95	96	97
0008		2b. Troubleshoot circuits	2b													
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries		84	95	93	87	97	84	86	89	95	95	92	94	95
0009		3. Basic Circuit Calculations														
0010		3a. DC	B													
A	6	A1-6 Do you calculate values of DC voltage, c "ent, resistance, or power		31	25	19	44	46	25	21	26	27	50	28	43	59
A	12	A1-12 Do you calculate the value of a resistor required for a circuit		13	15	14	14	18	7	13	17	16	32	28	31	26
0011		3b. AC	B													
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage		14	17	17	39	38	18	16	19	22	49	27	44	55
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length		14	17	15	40	33	22	16	18	20	55	27	46	58
0012		4. Resistors														
0013		4a. Theory of operation	B													
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors		52	53	63	67	75	40	48	63	65	89	78	84	85

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors		21	25	18	32	49	18	21	26	38	81	63	71	71
0014		4b. Isolate faulty resistors	2b													
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor		27	30	46	29	41	13	23	39	31	73	63	55	59
A	14	A1-14 Do you ohm check resistors		36	31	43	28	41	22	27	44	39	79	71	69	78
0015		4c. Color code	B													
A	13	A1-13 Do you determine ohmic value of a resistor using the color code		12	20	17	15	16	10	15	21	21	60	58	54	50
0016		5. Relays/Solenoids														
0017		5a. Relay theory of operation	B													
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays		93	99	92	85	97	75	89	91	92	95	86	98	94
A	17	A1-17 Do you adjust relays		18	20	18	18	18	15	20	18	20	20	26	17	21
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs		19	30	21	21	21	18	23	21	24	28	34	26	23
0018		5b. Isolate faulty relays	2b													
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay		89	97	87	73	90	69	84	90	85	87	85	96	92
A	19	A1-19 Do you continuity check relays		76	89	65	62	80	65	77	76	80	83	77	89	81
0019		5c. Solenoid theory of operation	-													
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids		21	32	8	24	59	13	28	21	46	64	54	17	23
A	79	A2-35 Do you perform maintenance on solenoid component parts		2	10	2	5	10	0	7	5	11	30	31	6	6

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0020		5d. Isolate faulty solenoids	-													
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid		13	30	6	15	44	6	22	17	39	62	54	14	23
0021		6. Inductors														
0022		6a. Theory of operation	B													
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils		31	21	22	42	16	19	26	32	27	56	54	47	48
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors		6	6	2	8	7	1	4	6	12	25	29	22	20
0023		6b. Isolate faulty inductors	2b													
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil		13	12	9	12	8	3	13	19	15	45	45	30	26
A	26	A1-26 Do you ohm check inductors		11	13	9	11	11	3	12	20	14	38	40	32	23
0024		6c. Calculations	B													
A	22	A1-22 Do you calculate values of circuit total inductance		4	4	3	5	5	0	5	7	8	10	17	10	6
A	23	A1-23 Do you calculate values of circuit or component inductive reactance		4	4	2	2	7	1	5	7	7	9	16	6	6
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors		4	4	3	5	7	1	6	6	6	15	17	12	8
0025		7. Capacitors														

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0026		7a. Theory of operation B													
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors	40	66	44	62	84	44	48	48	67	87	72	76	77
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors	12	33	8	13	44	10	17	18	31	25	32	23	37
0027		7b. Isolate faulty capacitors 2b													
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor	24	53	27	27	66	28	32	36	49	70	60	52	53
A	33	A1-33 Do you ohm check capacitors	21	36	22	21	48	22	24	24	37	61	55	53	43
0028		7c. Calculations -													
A	29	A1-29 Do you calculate values of circuit total capacitance	13	37	10	18	64	12	12	20	39	18	21	16	11
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance	12	26	7	13	43	13	10	16	29	17	18	13	10
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors	12	22	7	13	34	12	11	13	22	23	21	17	12
0029		7d. Color code B													
A	34	A1-34 Do you use capacitor color codes in your present job	9	16	8	8	7	9	9	9	13	12	19	11	9
0030		8. Transformers													
0031		8a. Theory of operation B													
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers	62	54	59	65	70	34	37	70	70	76	60	86	83
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers	8	11	7	3	11	4	7	14	17	22	23	16	35

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0032		8b. Isolate faulty transformers 2b													
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer	49	42	43	30	52	12	23	60	48	68	52	71	71
A	40	A1-40 Do you ohm check transformers	35	30	33	16	39	10	16	46	39	54	49	48	43
A	41	A1-41 Do you measure transformer output voltage	34	31	33	24	51	19	19	44	44	64	52	57	66
0033		8c. Calculations -													
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios	16	11	13	7	16	6	5	15	18	17	21	21	15
A	38	A1-38 Do you calculate impedance of transformers	13	9	9	4	7	3	4	13	14	13	16	14	9
0034		9. Three Phase Transformers													
0035		9a. Theory of operation B													
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers	32	28	15	27	39	18	15	33	34	52	38	56	53
A	44	A1-44 Do you adjust three phase transformers	11	12	6	5	8	3	5	11	14	17	20	15	28
0036		9b. Isolate faulty three phase transformers -													
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer	29	22	12	12	30	7	11	28	24	46	35	49	46
0037		10. DC Motors													
0038		10a. Theory of operation B													
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors	25	31	18	42	62	21	26	30	53	69	70	42	55

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A	48	A2-4 Do you perform tasks on DC motor component parts		4	9	6	4	13	1	5	8	13	23	28	11	13
0039		10b. Isolate faulty DC motors	2b													
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor		12	28	12	20	46	12	20	22	36	65	65	37	53
0040		10c. Troubleshoot motors	2b													
A	47	A2-3 Do you troubleshoot DC motor component parts		1	11	7	3	23	1	7	10	12	28	27	11	11
0041		11. AC Motors														
0042		11a Theory of operation	B													
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors		21	25	14	42	59	16	20	25	56	52	51	33	55
A	52	A2-8 Do you perform tasks on AC motor component parts		5	8	5	4	13	1	5	7	12	15	22	8	9
0043		11b. Isolate faulty AC motors	2b													
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor		11	23	10	15	48	10	15	20	39	49	45	31	54
0044		11c. Troubleshoot motors	2b													
A	51	A2-7 Do you troubleshoot AC motor component parts		5	7	6	4	23	1	6	9	12	16	19	12	7
0045		12. DC Generators														

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0046	12a. Theory of operation -													
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	15	38	14	16	31	9	15	21	20	15	17	16	20
A	56	A2-12 Do you perform tasks on component parts of DC generators	5	12	3	0	8	0	3	6	7	4	9	4	9
	0047	12b. Isolate faulty DC generators -													
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	6	31	7	6	25	1	9	16	13	13	15	12	19
	0048	12c. Troubleshoot DC generators -													
A	55	A2-11 Do you troubleshoot DC generator component parts	5	14	4	0	15	0	4	7	7	4	10	5	7
	0049	13. AC Generators													
	0050	13a. Theory of operation -													
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	12	36	12	14	28	9	15	25	24	13	14	18	14
A	60	A2-16 Do you perform tasks on component parts of AC generators	5	11	3	0	8	0	2	7	7	3	7	3	5
	0051	13b. Isolate faulty AC generators -													
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	6	32	9	5	23	1	7	21	16	11	13	12	13
	0052	13c. Troubleshoot AC generators -													
A	59	A2-15 Do you troubleshoot AC generator component parts	5	13	5	0	15	0	3	8	7	4	7	3	4

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0053	14. Alternators													
	0054	14a. Theory of operation -													
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	7	5	3	8	5	7	6	5	5	3	5	2	2
A	64	A2-20 Do you perform tasks on component parts of alternators	0	5	1	0	5	0	1	1	3	1	3	1	0
	0055	14b. Isolate faulty alternators -													
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	1	5	1	2	5	1	4	3	3	2	3	2	1
	0056	14c. Troubleshoot alternators -													
A	63	A2-19 Do you troubleshoot alternator component parts	1	3	1	0	3	0	1	1	3	1	3	1	0
	0057	15. Synchro/Servos													
	0058	15a. Theory of operation B													
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	41	92	30	71	98	40	62	62	80	74	42	74	86
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	5	31	5	10	23	9	18	17	18	28	21	21	31
	0059	15b. Isolate faulty synchro/servos 2b													
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	29	88	23	42	90	28	51	55	69	72	38	68	82

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0060		15c. Troubleshoot synchro/servos 2b													
A	67	A2-23 Do you troubleshoot synchro or servo component parts	9	48	8	14	49	9	22	23	25	35	21	29	28
0061		16. Choppers (Synchronous Vibrators)													
0062		16a. Theory of operation B													
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers	11	13	7	18	15	0	11	9	8	7	13	13	14
0063		16b. Isolate faulty choppers 2b													
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper	5	13	3	6	11	0	7	5	7	7	13	10	7
A	71	A2-27 Do you measure chopper coil excitation frequency	4	8	2	1	5	0	4	2	5	1	8	3	3
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship	2	4	2	1	5	0	4	2	5	2	9	6	3
0064		17. Transducers													
0065		17a. Theory of operation B													
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers	18	41	13	25	66	9	34	29	41	15	10	24	57
A	75	A2-31 Do you calibrate or adjust transducers	5	13	5	6	18	4	22	10	20	6	8	14	21
A	76	A2-32 Do you repair, clean or lubricate transducers	5	10	5	4	11	1	11	8	11	5	7	9	23
0066		17b. Isolate faulty transducers 2b													
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer	13	38	8	13	52	9	30	24	38	13	10	22	54

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0067	18. Meter Movements													
	0068	18a. Theory of operation B													
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements	16	26	9	46	33	15	26	22	39	26	17	52	56
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts	4	10	3	13	10	1	7	6	12	13	9	19	16
	0069	18b. Isolate faulty meter movements 2b													
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement	11	21	7	31	30	13	22	18	30	23	17	50	50
	0070	19. Solid State Diodes													
	0071	19a. Theory of operation B													
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes	47	55	59	67	75	49	62	62	70	85	75	85	78
	0072	19b. Isolate faulty solid state diodes 2b													
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode	25	45	45	37	44	22	46	46	48	77	67	69	71
A	85	A3-3 Do you check diodes using an ohmmeter	21	41	38	33	46	26	44	42	48	73	71	73	69
	0073	19c. Specifications B													
A	86	A3-4 Do you use diode characteristic curves	6	8	5	2	8	6	7	6	11	10	14	6	8
A	87	A3-5 Do you use diode substitution information	7	10	8	0	5	3	8	6	13	19	22	14	19

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0074		19d. Color code	B													
A	88	A3-6 Do you use diode color codes		8	10	7	1	3	9	7	7	13	16	24	15	17
0075		20. Bipolar Junction Transistors														
0076		20a. Theory of operation	B													
A	89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors		35	28	33	47	64	34	37	39	54	85	70	74	59
0077		20b. Isolate faulty transistors	2b													
A	90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor		12	14	18	11	26	9	14	16	29	77	61	49	42
A	91	A3-9 Do you check transistors using an ohmmeter		11	12	17	7	25	9	11	11	24	72	58	50	34
A	92	A3-10 Do you check transistors using transistor testers		7	9	9	0	8	9	6	5	14	20	32	6	5
0078		20c. Specifications	B													
A	93	A3-11 Do you use transistor characteristic curves		6	5	4	1	3	7	3	4	10	6	12	5	4
A	94	A3-12 Do you use transistor substitution information		8	6	5	1	2	7	4	3	10	21	18	11	11
0079		21. Integrated Circuits														
0080		21a. Familiarization	B													
A	95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)		40	38	30	39	51	29	44	42	37	83	54	69	60

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0081		21b. Isolate faulty integrated circuits 2b													
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	15	23	10	10	23	6	14	15	16	63	47	26	38
0082		21c. Specifications B													
A	97	A3-15 Do you use IC substitution information	5	10	6	5	7	4	9	7	6	19	1.	9	22
0083		22. Solid State Special Purpose Devices (SCR, Zener Diode, Tunnel Diode, LED, LCD, UJT, JFET, MOSFET)													
0084		22a. Theory of operation B													
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	19	15	9	20	18	13	23	19	19	50	37	37	37
A	100	A3-18 Do you perform tasks on varactors/varicaps	7	5	2	3	2	4	4	6	5	10	7	7	3
A	101	A3-19 Do you perform tasks on tunnel diodes	6	4	1	2	0	1	4	3	3	8	7	5	3
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	7	6	1	2	0	1	7	6	6	41	24	33	17
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	8	7	3	3	3	1	5	6	4	33	29	23	13
A	104	A3-22 Do you perform tasks on zener diodes	9	19	5	7	18	4	8	13	12	52	38	45	29
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	9	9	3	6	0	4	8	8	7	29	21	13	16
A	106	A3-24 Do you perform tasks on pin diodes	9	4	3	2	2	3	6	5	5	12	8	8	7
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	14	12	5	15	7	1.	10	14	12	58	34	21	39
A	108	A3-26 Do you perform tasks on fantail transistors	8	4	2	1	0	0	4	3	3	7	4	5	3
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	6	7	1	4	3	0	4	5	7	29	21	37	15
A	110	A3-28 Do you perform tasks on triacs	7	5	2	2	0	1	0	4	4	9	0	5	7
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	8	4	2	1	0	0	4	4	3	4	5	3	3
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	6	4	2	1	2	1	4	4	3	13	7	3	3
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	7	4	2	1	0	1	4	3	3	3	5	1	2
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	5	5	2	1	0	1	4	3	3	4	3	3	3
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	6	7	2	1	0	0	5	4	4	10	15	13	11
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	6	5	2	1	0	0	4	4	3	3	3	2	2
A	117	A3-35 Do you perform tasks on varistors	8	6	2	6	11	1	5	5	6	19	10	15	4
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	7	4	1	1	2	3	4	3	4	4	3	2	1

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
A 119	A3-37 Do you perform tasks on schottky diodes	7	7	2	1	0	1	4	4	3	14	6	8	9
0085	22b. Isolate faulty special purpose devices 2b													
A 99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	11	9	2	3	7	4	10	10	9	43	34	28	25
0086	23. Electron Tubes													
0087	23a. Theory of operation B													
A 120	A4-1 Do you trace block diagrams of circuits containing electron tubes	11	1	2	13	0	9	7	7	10	23	12	44	40
A 121	A4-2 Do you trace schematic diagrams of electron tube circuits	6	1	1	5	0	4	3	3	7	21	10	39	33
A 125	A4-6 Do you perform tasks on diode tubes	1	2	0	2	0	0	0	2	2	3	2	10	11
A 126	A4-7 Do you perform tasks on triode tubes	0	1	0	1	0	0	0	2	2	1	1	10	5
A 127	A4-8 Do you perform tasks on tetrode tubes	0	1	1	0	0	0	0	1	1	1	1	6	4
A 128	A4-9 Do you perform tasks on pentode tubes	0	1	1	0	0	0	0	1	2	1	1	4	3
A 129	A4-10 Do you perform tasks on beam power tubes	1	1	0	0	0	0	1	1	3	6	3	11	3
A 130	A4-11 Do you perform tasks on gas tubes	4	1	1	2	0	3	0	1	2	3	2	4	4
A 131	A4-12 Do you perform tasks on phantastrons	1	1	1	0	0	0	0	1	1	0	2	2	0
A 132	A4-13 Do you perform tasks on neon tubes	0	1	1	1	0	3	0	1	2	1	1	2	1
A 133	A4-14 Do you perform tasks on xenon tubes	0	1	0	2	0	1	0	1	2	6	0	1	1
A 134	A4-15 Do you perform tasks on nixie tubes	1	3	1	6	0	3	4	2	4	3	0	3	2
0088	23b. Isolate faulty tubes -													
A 122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	2	1	1	4	0	4	2	3	5	20	10	37	32
0089	23c. Specifications -													
A 123	A4-4 Do you use electron tube characteristic curves	2	2	0	0	0	3	0	1	1	3	1	4	4
A 124	A4-5 Do you use electron tube substitution manuals or charts	2	2	0	1	0	3	0	1	2	3	1	6	6

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0090	24. Cathode Ray Tubes (CRT)													
0091	24a. Theory of operation B													
A 135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)	40	6	20	46	8	28	32	30	29	45	29	71	71
A 136	A4-17 Do you trace schematic diagrams of CRT circuits	22	4	12	20	3	12	19	17	16	40	23	57	59
A 138	A4-19 Do you adjust or calibrate circuits that control CRT operations	6	3	3	19	2	13	4	4	12	39	26	46	53
A 139	A4-20 Do you perform tasks on electrostatic CRT	4	2	3	9	2	3	6	4	7	17	14	19	43
A 140	A4-21 Do you perform tasks on electromagnetic CRT	12	2	4	15	0	4	9	6	10	32	15	34	23
0092	24b. Isolate faulty CRTs 2b													
A 137	A4-18 Do you troubleshoot to isolate a faulty CRT	24	6	17	26	3	22	18	17	16	41	25	55	65
0093	25. Solder/Desolder													
0094	25a. Terminal connections 2b													
A 141	A5-1 Do you solder or desolder hardwire connections	68	75	91	91	97	91	73	79	91	89	84	84	92
A 142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc	24	25	24	20	18	16	22	22	26	83	73	60	72
0095	25b. P C Boards 2b													
A 143	A5-3 Do you solder or desolder printed circuit board connections	12	20	13	9	13	9	12	12	15	64	57	40	42
A 144	A5-4 Do you solder or desolder multi-layer circuit board connections	11	21	15	10	8	9	11	13	14	33	26	13	21
A 145	A5-5 Do you perform high reliability soldering	47	54	47	61	48	53	33	48	44	72	67	45	51

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0096		25c. Multipin connectors 2b													
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	54	57	51	62	48	60	67	59	68	68	58	59	62
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	20	20	14	12	10	12	13	20	16	23	15	4	22
0097		25d. Coaxial connectors -													
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	71	45	88	96	89	96	88	76	93	86	65	87	95
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	44	19	38	31	20	60	78	41	52	62	27	15	68
0098		26. Assemble Solderless Connectors													
0099		26a. Crimp 2b													
A	146	A5-6 Do you use crimping tool to repair or make connections	81	94	98	98	97	100	95	90	95	94	93	94	95
A	147	A5-7 Do you use wire wrap tool to make connections	28	34	39	25	33	21	30	25	31	30	29	22	29
A	148	A5-8 Do you use punch-on tool to make connections	19	29	29	20	20	15	21	23	24	18	18	8	16
0100		26b. Coaxial 2b													
A	150	A5-10 Do you repair or fabricate connectors or cables on coaxial cables	71	45	88	96	89	96	88	76	93	86	65	87	95
A	151	A5-11 Do you repair or fabricate connectors or cables on triaxial cables	44	19	38	31	20	60	78	41	52	62	27	15	68
0101		26c. Multipin 2b													
A	149	A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	54	57	51	62	48	60	67	59	68	68	58	59	62
A	152	A5-12 Do you repair or fabricate connectors or cables on ribbon cables	20	20	14	12	10	12	13	20	16	23	15	4	22

D Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0102	27 Use Test Equipment Usage													
	0103	27a. Multimeter, analog 2b													
B	153	B1-1 Do you use the multimeter to measure DC voltage values	88	97	88	99	100	99	92	89	96	97	99	93	97
B	154	B1-2 Do you use the multimeter to measure AC voltage values	87	94	87	97	98	99	92	87	96	95	95	92	96
B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	15	21	12	16	16	18	18	16	24	28	32	26	29
B	156	B1-4 Do you use the multimeter to measure DC current values	64	61	48	70	61	68	50	48	53	71	68	59	69
B	157	B1-5 Do you use the multimeter to measure AC current values	61	59	49	70	61	66	48	47	51	68	62	58	68
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	15	15	10	12	15	21	19	13	16	23	24	13	19
B	159	B1-7 Do you use the multimeter to measure circuit resistance	86	90	78	70	93	76	78	85	86	85	77	84	79
B	160	B1-8 Do you use the multimeter to measure component resistance	66	79	52	53	80	56	65	63	65	80	71	80	78
	0104	27b. Oscilloscope 2b													
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	6	2	3	46	20	28	3	5	22	82	54	62	75
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	6	2	4	43	16	25	4	5	25	83	55	61	90
B	163	B2-3 Do you use the oscilloscope to measure AC voltage	7	3	5	46	34	37	5	7	33	83	56	61	87
B	164	B2-4 Do you use the oscilloscope to measure DC voltage	7	3	5	45	33	35	5	8	35	84	60	56	88
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	2	1	1	13	5	12	3	4	14	57	24	57	66
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	4	1	1	16	7	13	2	2	14	38	19	26	43
B	167	B2-7 Do you use the oscilloscope to observe signal/data patterns	8	2	1	23	11	19	4	6	22	59	46	43	75
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	4	2	0	6	3	3	0	2	9	13	20	6	48
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	4	2	3	30	13	19	3	7	21	79	47	68	82
B	170	B2-10 Do you use attenuator probes with oscilloscopes	6	2	2	21	10	19	2	6	21	69	39	46	64
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	4	2	2	13	5	7	1	2	11	44	26	16	40
	0105	27c. Signal Generator 2b													
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	5	4	11	12	10	19	7	7	5	67	40	31	59

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations	2	2	6	6	5	0	2	2	5	62	37	27	59
B	174	B3-3 Do you use SG to troubleshoot circuits	5	4	8	9	11	15	5	6	6	52	32	29	36
0	0106	27d. Frequency counter 2b													
B	185	B4-1 Do you use frequency counters	5	6	5	7	7	4	9	8	9	72	62	49	69
0	0107	27e. Spectrum Analyzer 2b													
B	186	B4-2 Do you use spectrum analyzers	4	5	4	7	5	15	11	9	12	13	8	6	74
0	0108	27f. Field strength tester -													
B	187	B4-3 Do you use field strength testers	5	6	9	5	16	29	13	7	24	5	6	5	5
0	0109	27g. Multimeter, digital 2b													
B	188	B4-4 Do you use digital multimeters	76	74	73	82	92	91	80	75	84	93	90	87	93
0	0110	27h. Digital logic probe 2b													
B	189	B4-5 Do you use digital logic probes	6	5	4	4	7	6	8	8	12	13	30	6	31
0	0111	27i. Capacitor tester 2b													
B	190	B4-6 Do you use capacitance testers	20	62	14	16	62	7	15	34	40	5	10	2	5
0	0112	27j. Capacitor substitution box -													
B	191	B4-7 Do you use capacitor substitution boxes	7	22	4	4	11	9	11	11	12	3	5	2	3

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0113		27k. DC restorer	-													
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)		6	5	4	4	5	6	7	6	9	6	6	2	13
0114		271. Logic current tracer	-													
B	193	B4-9 Do you use logic current tracers		4	5	4	4	7	4	7	6	10	5	12	3	2
0115		27m. Tube tester	-													
B	194	B4-10 Do you use tube testers		5	6	3	4	5	4	7	6	8	5	6	2	11
0116		27n. Logic pulser	-													
B	195	B4-11 Do you use logic pulsers		5	5	4	4	5	4	7	6	10	4	14	3	5
0117		27o. Logic analyzer	2b													
B	196	B4-12 Do you use logic analyzers		5	6	5	4	5	6	8	7	10	9	12	2	5
0118		27p. Signature analyzer	-													
B	197	B4-13 Do you use signature analyzers		5	5	4	5	7	6	8	6	8	4	5	2	4
0119		27q. Reflectometer	2b													
B	198	B4-14 Do you use reflectometers		41	42	64	55	39	60	57	62	59	54	22	27	14
0120		28. Transistor Amplifier Circuits (Common Emitter, Common Collector, Common Base)														

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0121	28a. Theory of operation													
	0122	28a(1). Amplifier circuits B													
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	20	10	31	31	38	31	26	26	35	66	44	51	36
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	15	10	18	18	31	13	19	14	21	64	42	42	24
C	204	C1-6 Do you adjust or align transistor amplifiers	2	2	3	2	5	0	3	1	3	26	21	20	12
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	4	2	2	2	5	1	3	2	4	13	10	7	4
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	4	2	4	1	5	0	3	1	3	30	21	6	3
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	4	2	3	1	2	0	3	1	5	19	23	19	6
C	209	C1-11 Do you work on paraphase transistor amplifiers	2	2	2	1	2	1	2	1	3	7	5	5	2
C	210	C1-12 Do you work on push-pull transistor amplifiers	4	4	6	2	3	3	3	3	6	42	34	31	14
C	211	C1-13 Do you work on audio transistor amplifiers	6	7	22	6	5	15	5	13	8	7	28	6	2
C	212	C1-14 Do you work on wideband transistor amplifiers	6	4	7	4	2	10	6	6	5	10	14	11	2
C	213	C1-15 Do you work on IF transistor amplifiers	6	5	10	10	5	16	7	10	7	17	17	32	28
C	214	C1-16 Do you work on RF transistor amplifiers	9	6	16	13	7	16	10	12	13	21	23	44	21
C	215	C1-17 Do you work on buffer transistor amplifiers	6	5	5	7	7	4	4	4	7	39	27	19	7
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	2	3	2	1	3	1	1	1	3	12	14	2	2
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	7	7	4	10	15	4	5	5	12	43	32	30	14
	0123	28a(2). Stabilization circuits B													
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	5	4	4	9	11	3	7	4	9	37	26	20	12
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	1	3	1	3	3	0	2	2	6	22	26	13	5
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	1	2	1	3	2	0	2	1	5	15	21	6	2
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	5	4	1	5	16	1	3	2	9	23	23	22	7
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	4	3	1	5	8	3	3	2	7	29	26	20	9
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	1	1	1	3	2	0	2	1	4	9	18	8	4

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0124		28a(3). Coupling circuits B													
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	16	10	19	12	10	18	13	15	14	45	25	24	21
C	226	C3-2 Do you trace schematic diagrams of coupling circuits	12	10	12	5	7	7	9	10	9	42	25	21	17
C	229	C3-5 Do you perform tasks on direct coupling circuits	4	8	9	7	5	4	4	5	8	30	21	14	16
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	2	8	3	3	7	3	2	2	8	31	20	13	8
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	2	9	4	3	3	0	2	3	8	27	16	12	7
C	232	C3-8 Do you perform tasks on transformer coupling circuits	7	7	9	2	5	3	6	10	7	26	15	12	13
C	233	C3-9 Do you perform tasks on optical coupling circuits	2	4	1	3	2	1	1	2	4	25	9	2	5
0125		28b. Isolate faulty amplifier circuits 2b													
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	6	3	15	6	21	1	7	7	10	55	40	27	21
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	2	2	4	4	11	3	4	3	6	35	29	21	12
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	7	4	10	4	7	3	2	7	6	29	23	16	14
0126		28c. Troubleshoot circuits 2b													
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	5	2	7	3	5	1	4	3	5	36	32	19	7
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	2	2	3	2	3	1	4	1	3	15	20	6	5
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	4	2	1	0	7	0	4	0	5	28	24	9	5
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components	4	3	2	3	3	1	2	3	5	21	19	7	8
0127		29. Electron Tube Amplifiers													

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0128		29a. Theory of operation -													
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	6	2	2	7	0	3	3	1	2	9	5	23	17
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	4	2	1	3	0	0	1	1	1	9	4	24	14
C	239	C4-6 Do you adjust or align electron tube amplifiers	0	1	0	1	0	0	1	0	0	5	1	16	10
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	0	1	1	0	0	0	1	0	1	2	1	6	3
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	0	1	1	0	0	0	0	0	0	0	1	1	2
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	0	1	1	0	0	0	0	0	0	1	2	6	1
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	0	1	1	0	0	0	0	0	0	1	1	2	1
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	0	2	0	2	0	0	1	0	1	4	3	6	10
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	0	1	1	1	0	0	1	0	1	5	2	9	7
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	0	1	1	2	0	0	0	0	1	5	3	8	7
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	0	1	1	1	0	0	0	0	1	3	2	6	5
0129		29b. Isolate faulty tube amplifiers -													
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	1	1	1	2	0	0	1	0	1	8	3	19	11
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	0	1	1	0	0	0	1	0	1	5	3	13	10
0130		29c. Troubleshoot circuits -													
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	0	1	0	0	0	0	1	0	1	3	2	12	5
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	0	1	1	0	0	0	0	0	0	4	1	7	5
0131		30. Operational Amplifiers													

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0132	30a. Theory of operation B													
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	12	6	9	15	30	16	16	13	18	58	32	47	35
C	251	C5-3 Do you calculate op amp gain	1	2	1	0	3	1	1	1	4	16	7	6	5
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	1	2	1	2	2	1	2	1	4	30	14	14	11
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	5	1	5	5	13	4	6	3	10	44	23	19	17
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	5	3	3	3	10	1	5	3	8	42	22	17	16
C	255	C5-7 Do you use or apply operational amplifiers for summing	4	3	4	7	18	1	6	3	12	37	18	19	19
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	2	2	2	5	8	3	4	2	6	31	18	11	12
C	257	C5-9 Do you use or apply operational amplifiers as active filters	5	1	1	3	5	0	2	3	5	26	18	10	7
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	7	3	2	9	5	6	4	4	10	32	24	30	19
C	259	C5-11 Do you use or apply operational amplifiers as integrators	6	2	3	5	5	3	2	2	8	28	12	24	10
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	5	1	3	3	3	1	3	3	5	27	18	13	9
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	6	6	4	11	16	6	6	8	13	44	29	39	23
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	11	10	11	18	15	18	12	13	14	37	23	47	30
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	7	5	3	11	15	1	4	5	10	37	26	29	17
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	7	4	5	11	15	6	4	4	10	30	15	21	15
	0133	30b. Isolate faulty Op Amps -													
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	5	2	5	3	18	7	4	5	9	50	29	23	23
	0134	31. Magnetic Amplifiers													

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0135	31a. Theory of operation													
C 265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	5	5	0	7	7	1	2	3	3	2	1	8	11
C 266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	4	3	1	3	7	0	1	1	3	2	1	7	9
C 269	C6-5 Do you adjust magnetic amplifiers or components	0	1	1	1	3	0	0	0	1	1	1	6	7
0136	31b. Isolate faulty magnetic amplifiers													
C 267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	2	3	1	1	3	0	0	0	1	2	1	6	7
0137	31c. Troubleshoot circuits													
C 268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	0	1	1	0	2	0	0	0	1	1	1	4	5
0138	32. Saturable Reactors													
0139	32a. Theory of operation													
C 270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	2	3	1	3	0	1	1	1	1	3	1	7	3
C 271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	2	1	1	3	0	0	0	0	1	3	1	6	3
C 274	C6-10 Do you adjust saturable reactor circuits or components	0	1	2	0	0	0	0	0	1	2	1	3	2
0140	32b. Isolate faulty saturable reactors													
C 272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	0	1	1	0	0	0	0	0	1	2	1	6	3

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0141		32c. Troubleshoot circuits -													
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	0	1	1	0	0	0	0	0	1	2	1	3	2
0142		33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)													
0143		33a. Theory of operation													
0144		33a(1). Rectifiers (Half-wave, Full-wave, Full-wave bridge) B													
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	59	88	37	68	51	51	54	56	56	83	62	85	79
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	40	79	28	54	41	28	41	42	41	79	51	76	71
D	279	D1-5 Do you align or adjust power supplies	8	19	3	9	8	7	6	8	12	68	39	56	67
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	6	14	3	11	7	10	8	10	14	38	29	28	15
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	7	15	2	12	7	9	9	11	14	43	32	29	23
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	6	15	3	13	11	10	10	12	16	46	32	32	22
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	7	12	3	11	5	4	6	10	11	28	24	22	21
0145		33a(2). Filters (Capacitive, Inductive, L-Section, Pi-Section) B													
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	14	10	5	32	13	18	15	13	24	42	31	38	43
D	289	D2-2 Do you trace schematic diagrams of power supply filters	9	8	2	14	10	6	8	8	16	39	27	33	41
D	292	D2-5 Do you perform tasks on capacitive power supply filters	2	6	1	7	3	1	4	5	9	32	21	25	18
D	293	D2-6 Do you perform tasks on inductive power supply filters	2	6	0	7	3	0	5	4	8	24	16	22	14
D	294	D2-7 Do you perform tasks on L-type power supply filters	1	6	1	5	3	0	1	3	5	17	16	16	4

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	1	5	1	6	3	0	2	4	5	14	13	7	5
D	296	D2-9 Do you perform tasks on T-type power supply filters	1	5	0	3	2	0	1	3	4	12	10	7	4
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	1	7	3	7	3	0	4	4	10	29	20	20	13
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	1	7	2	7	3	0	3	4	9	23	14	17	12
0146		33b. Isolate faulty power supplies 2b													
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	41	85	27	47	38	37	33	38	34	77	53	71	76
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	4	5	4	14	3	4	3	4	8	38	25	28	38
0147		33c. Troubleshoot circuits 2b													
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	15	31	7	13	8	7	9	10	12	52	36	34	25
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	2	4	1	7	0	0	2	1	4	24	21	14	10
0148		34. Voltage Regulators (Shunt, Series EVR, IC EVR)													
0149		34a. Theory of operation B													
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	20	44	15	30	23	19	19	24	23	57	36	56	68
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	15	37	8	14	16	7	12	18	13	54	34	48	55
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	4	11	2	10	8	0	5	7	12	38	27	31	33
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	5	12	4	7	7	0	5	7	10	31	22	25	16
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	2	10	2	6	5	0	4	6	7	29	23	18	9
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	2	10	2	5	5	0	3	6	7	26	16	15	10
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	4	8	2	7	3	0	3	4	5	17	8	16	8

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	2	7	1	3	3	0	2	4	6	19	10	11	9
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	2	5	1	2	3	0	3	3	3	9	4	3	28
	0150	34b. Isolate faulty voltage regulators 2b													
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	7	38	7	7	11	1	6	13	7	50	32	39	59
	0151	34c. Troubleshoot circuits 2b													
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	5	14	1	4	5	0	3	4	4	32	27	14	13
	0152	35. Resistive/Capacitive/Inductive (RCL) Circuits													
	0153	35a. Basic operation B													
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	14	14	8	20	18	10	11	14	15	32	29	22	10
	0154	35b. Resonant operation B													
F	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	11	12	4	9	13	7	7	8	10	28	24	17	9
	0155	35c. Troubleshoot circuits 2b													
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	2	6	2	2	5	1	4	5	4	17	23	8	5
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	2	4	2	2	3	1	3	2	4	14	18	5	5

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0156	35d. Calculations	B													
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits		2	7	1	2	7	1	3	3	3	8	8	3	3
E	315	E1-6 Do you calculate phase angle of RCL circuits		2	4	1	1	2	0	1	1	2	6	8	3	3
E	316	E1-7 Do you calculate values of power in RCL circuits		2	6	1	1	3	1	2	1	3	7	8	2	2
	0157	36. Frequency Sensitive Filters (Low Pass, High Pass, Band Pass, Band Reject)														
	0158	36a. Theory of operation	B													
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters		11	8	9	8	11	16	11	10	10	18	13	16	8
E	320	E2-4 Do you align or adjust frequency sensitive filters		1	2	1	2	0	1	2	1	4	13	8	7	3
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters		1	4	3	1	3	6	6	4	4	15	13	10	6
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters		1	4	3	1	3	6	3	4	5	15	13	10	6
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters		2	2	5	2	2	9	4	6	6	15	8	12	5
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters		2	1	2	0	2	1	3	3	5	10	1	6	4
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters		1	1	1	0	2	1	1	1	2	7	3	6	3
	0159	36b. Isolate faulty frequency sensitive filters	2b													
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter		2	2	4	1	5	7	5	5	5	15	11	11	4
	0160	36c. Troubleshoot circuits	2b													
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components		1	1	1	0	2	3	2	2	4	13	8	3	1

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
	0161	36d. Calculations -													
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	1	2	1	0	2	3	2	1	3	5	3	3	2
	0162	37. Wave Generating Circuits													
	0163	37a. Theory of operation													
	0164	37a(1). Oscillators (LC, RC, Crystal) B													
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	19	8	8	35	10	16	25	17	20	42	27	50	38
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	11	5	2	13	3	7	15	6	11	40	24	44	30
F	331	F1-5 Do you align or adjust oscillator circuits	1	2	1	11	2	1	2	1	6	23	16	33	20
F	332	F1-6 Do the oscillators you work with use LC tank circuits	4	3	3	7	5	4	6	5	5	21	17	21	10
F	333	F1-7 Do the oscillators you work with use RC networks	5	5	2	9	2	4	7	7	7	24	21	22	15
F	334	F1-8 Do the oscillators you work with use crystals	6	3	2	20	2	9	10	7	7	20	10	40	28
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	6	3	3	6	2	6	7	8	7	21	12	9	14
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	1	1	1	3	2	3	1	3	3	7	6	7	2
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	1	1	1	3	0	3	1	3	3	9	9	7	3
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	1	1	0	4	2	3	2	3	2	10	3	6	2
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	1	1	1	3	0	3	1	2	2	5	3	0	2
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	1	3	1	7	2	1	6	5	4	14	11	20	23
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	1	1	2	8	2	4	4	5	4	15	12	30	20
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	1	1	1	2	2	1	1	2	1	11	4	5	3
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	1	4	1	6	2	4	2	4	3	22	15	25	7
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	1	2	1	3	0	3	1	3	2	8	13	5	4
F	345	F1-19 Do you perform tasks on burst generators	1	1	1	3	2	4	2	2	1	6	4	0	5
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	1	2	1	5	2	3	2	4	3	13	12	6	5

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0165		37a(2). Multivibrators (Astable, Bistable, Monostable)	B												
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	16	10	9	25	20	15	17	14	18	44	34	44	26
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	11	7	2	8	10	6	8	8	10	40	33	31	19
F	351	F2-5 Do you adjust or align multivibrator circuits	2	1	1	1	3	1	1	1	2	19	16	19	6
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	5	5	3	3	5	6	5	6	4	29	18	20	6
F	353	F2-7 Do the multivibrators you work with use RC networks	6	6	5	8	3	6	4	7	4	30	26	23	9
F	354	F2-8 Do the multivibrators you work with use Crystals	6	2	4	6	3	6	4	5	3	18	10	31	15
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	5	5	3	8	8	1	4	6	5	32	23	22	12
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	4	5	3	10	8	1	3	6	7	36	25	24	21
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	4	5	2	10	10	1	3	6	7	38	29	29	22
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	4	4	2	6	3	0	2	5	4	26	14	19	12
0166		37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff)	B												
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	7	7	4	18	3	6	9	7	5	44	27	33	15
F	360	F3-2 Do you trace schematic diagrams of WSC	6	3	2	9	2	0	4	3	3	42	25	24	13
F	363	F3-5 Do you adjust or calibrate WSC	1	1	1	0	0	0	1	0	1	30	18	16	13
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	2	3	1	7	3	0	3	3	2	38	25	21	14
F	365	F3-7 Do you perform tasks on trapezoidal (ramp) wave generator WSC	1	1	1	4	3	0	1	1	2	31	19	10	9
F	366	F3-8 Do you perform tasks on RC differentiating WSC	1	2	0	2	3	0	0	1	1	19	14	8	5
F	367	F3-9 Do you perform tasks on RL differentiating WSC	1	1	0	2	3	0	1	1	1	16	12	7	4
F	368	F3-10 Do you perform tasks on RC integrating WSC	1	2	1	4	3	0	0	1	1	20	15	6	6
F	369	F3-11 Do you perform tasks on RL integrating WSC	1	1	1	3	3	0	0	1	1	17	12	6	4
F	370	F3-12 Do you perform tasks on square wave generator WSC	2	4	1	11	3	0	3	3	3	37	24	18	16
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	1	2	1	5	0	0	1	2	1	30	14	8	13
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	1	1	1	4	2	0	1	2	1	25	16	8	8

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0167	37b. Isolate faulty wave generating circuits 2b													
F 329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	6	3	3	10	5	3	6	6	8	32	21	34	27
F 349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	6	2	1	4	5	3	3	4	5	33	29	19	14
F 361	F3-3 Do you troubleshoot to isolate a faulty WSC	4	3	1	5	0	0	2	2	3	30	23	16	11
0168	37c. Troubleshoot circuits 2b													
F 330	F1-4 Do you troubleshoot oscillators to circuit level components	5	1	1	3	0	1	1	1	5	18	19	15	10
F 350	F2-4 Do you troubleshoot multivibrators to circuit level components	5	1	1	2	2	1	2	1	2	18	23	11	6
F 362	F3-4 Do you troubleshoot WSC to circuit level components	2	1	1	1	0	0	1	0	1	20	20	9	5
0169	38. Limiter Circuits (Diode, Zener Diode, Transistor)													
0170	38a. Theory of operation B													
F 373	F4-1 Do you trace block diagrams of circuits containing limiters	9	6	4	11	5	4	11	7	3	41	24	22	14
F 374	F4-2 Do you trace schematic diagrams of limitor circuits	7	5	3	4	3	0	4	3	2	40	24	17	10
F 381	F4-9 Do you perform tasks on series diode limiter circuits	2	1	1	1	2	0	1	2	0	23	19	10	8
F 382	F4-10 Do you perform tasks on shunt diode limiter circuits	2	2	2	3	0	0	1	3	0	25	20	9	6
F 383	F4-11 Do you perform tasks on bias limiter circuits	2	2	1	2	2	0	1	1	0	18	12	8	5
F 384	F4-12 Do you perform tasks on zener diode circuits	2	2	2	4	2	0	2	3	1	32	22	17	12
F 385	F4-13 Do you perform tasks on transistor limiter circuits	2	2	2	2	2	0	1	1	1	19	16	7	7
F 386	F4-14 Do you perform tasks on triode limiter circuits	2	1	2	0	0	0	1	0	0	5	8	4	3
0171	38b. Isolate faulty limiters 2b													
F 377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	4	2	2	3	2	0	1	1	0	23	21	12	7

D T Tsk Y Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	452 50A	452 50B	455 X3A	455 X0	456
0172	38c. Troubleshoot circuits	2b														
F 378	F4-6 Do you troubleshoot limiters to circuit level components		2	2	2	0	0	0	1	1	0	14	18	6	5	
0173	39. Clamper Circuits															
0174	39a. Theory of operation	B														
F 375	F4-3 Do you trace block diagrams of circuits containing clampers		6	2	4	5	2	0	3	2	1	36	23	13	10	
F 376	F4-4 Do you trace schematic diagrams of clamper circuits		6	2	3	2	2	1	2	1	1	32	21	14	10	
F 387	F4-15 Do you perform tasks on diode clamper circuits		2	1	2	1	0	0	1	2	0	23	19	10	9	
F 388	F4-16 Do you perform tasks on bias clamper circuits		2	1	1	1	0	0	1	1	0	16	12	6	5	
0175	39b. Isolate faulty clampers	2b														
F 379	F4-7 Do you troubleshoot to isolate a faulty clamper circuit		2	2	2	1	0	0	1	1	0	22	20	8	6	
0176	39c. Troubleshoot circuits	2b														
F 380	F4-8 Do you troubleshoot clampers to circuit level components		2	2	2	0	0	0	1	1	0	13	19	6	5	
0177	40. Digital Numbering Systems (Binary, Octal, Hexadecimal)															
0178	40a. Conversions	B														
G 389	G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal		12	18	6	41	33	18	52	19	30	29	23	30	43	
G 390	G1-2 Do you convert octal numbers to binary or binary numbers to octal		11	14	5	39	15	16	46	13	26	23	12	24	38	

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	7	14	4	28	13	12	31	14	20	26	15	24	42
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	15	12	6	38	16	15	37	11	24	23	10	21	33
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	7	14	5	25	11	15	28	15	22	24	14	25	35
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	8	11	4	22	10	12	26	9	21	21	10	18	28
G	395	G1-7 Do you convert base number fractions to another base numbering system	7	10	6	14	10	12	15	8	12	17	12	14	17
0179		40b. Math operations B													
G	396	G1-8 Do you add binary numbers	7	6	3	22	20	10	22	11	17	25	20	24	23
G	397	G1-9 Do you subtract binary numbers	6	5	3	21	18	12	19	10	16	24	19	22	21
G	398	G1-10 Do you multiply binary numbers	7	4	3	12	3	7	9	6	9	21	14	18	6
G	399	G1-11 Do you divide binary numbers	6	4	3	13	3	7	8	5	8	20	14	18	6
G	400	G1-12 Do you add octal numbers	6	4	3	27	3	10	15	7	14	20	9	19	13
G	401	G1-13 Do you subtract octal numbers	7	4	3	25	3	10	14	7	14	20	9	19	12
G	402	G1-14 Do you add hexadecimal numbers	6	5	3	13	5	10	10	7	11	20	12	17	14
G	403	G1-15 Do you subtract hexadecimal numbers	6	5	3	13	5	9	10	7	11	20	12	17	12
0180		40c. Binary Code Systems B													
G	404	G1-16 Do you use binary coded decimal (BCD)	7	9	5	28	25	15	43	14	20	28	21	22	38
G	405	G1-17 Do you use gray codes	2	2	1	5	0	0	5	5	6	3	3	6	5
G	406	G1-18 Do you use ICAO codes	2	2	0	4	0	0	5	3	3	3	1	0	2
G	407	G1-19 Do you use excess-3 (XS3) codes	2	2	2	5	0	0	5	4	3	9	10	7	3
G	408	G1-20 Do you use parity bit codes	6	8	2	20	8	0	11	8	8	19	7	11	23
G	409	G1-21 Do you use biquinary codes	4	2	1	4	0	0	4	3	4	3	1	2	3
G	410	G1-22 Do you use ASCII codes	6	3	1	5	0	1	8	6	5	11	5	15	31
G	411	G1-23 Do you use EBCDI codes	5	2	1	4	0	0	4	3	4	3	1	1	3
0181		41. Digital Logic Functions (Main Logic Gates and Flip-Flops)													
0182		41a. Theory of operation B													
G	412	G1-24 Do you trace data flow through logic symbol diagrams	16	26	11	39	41	21	52	31	39	47	23	48	50
G	413	G1-25 Do you trace data flow through logic schematic diagrams	15	23	13	38	38	13	46	25	35	46	24	45	45

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)		7	12	0	21	18	10	24	12	21	38	19	21	31
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)		8	11	1	21	16	9	19	11	20	30	18	17	27
G	419	G1-31 Do you perform tasks related to AND gates		7	27	9	28	39	16	36	26	31	53	30	39	38
G	420	G1-32 Do you perform tasks related to OR gates		7	28	8	29	39	18	36	26	30	53	30	39	37
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions		5	18	6	24	20	10	26	17	19	50	25	34	31
G	422	G1-34 Do you perform tasks related to NAND or NOR gates		5	26	7	27	39	13	35	23	29	52	28	39	36
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions		5	23	5	22	15	12	26	16	20	50	23	33	32
G	424	G1-36 Do you perform tasks related to RS flip flops		2	11	0	15	5	4	10	8	9	25	17	19	23
G	425	G1-37 Do you perform tasks related to D(Data) flip flops		2	9	1	10	5	4	11	8	10	26	17	19	23
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops		2	10	0	9	7	1	11	8	10	24	18	17	23
G	427	G1-39 Do you perform tasks related to JK flip flops		2	7	0	6	5	1	7	7	7	36	18	12	28
G	428	G1-40 Do you perform tasks related to Schmidt triggers		1	7	1	10	3	1	8	6	6	26	16	19	23
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions		2	10	1	13	3	4	12	8	10	28	14	17	23
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")		4	5	0	7	7	3	8	6	9	20	17	12	16
G	431	G1-43 Do you perform tasks related to buffers		5	9	2	18	3	6	14	10	12	33	18	22	27
G	432	G1-44 Do you perform tasks related to inverters		6	16	6	15	10	4	17	16	16	38	21	29	29
G	433	G1-45 Do you perform tasks related to complemented flip flops		2	5	2	10	5	3	8	6	7	20	14	13	17
G	434	G1-46 Do you perform tasks related to complementing flip flops		2	5	2	11	5	3	8	6	7	23	14	13	17
0183		41b. Isolate faulty logic function circuits	2b													
G	414	G1-26 Do you troubleshoot digital systems to major units		16	19	12	42	25	19	41	28	33	44	23	50	53
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards		4	4	1	6	2	0	7	4	7	41	22	28	32
0184		41c. Troubleshoot circuits	2b													
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC		2	2	1	6	0	0	6	4	6	26	18	8	22
0185		41d. Logic families (TTL and CMOS)	B													
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)		1	3	2	4	5	0	4	4	5	10	8	3	6
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)		1	3	3	6	5	0	5	4	5	8	8	3	5

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)		4	3	4	5	5	0	5	6	6	21	17	6	23
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)		2	3	1	4	2	0	4	4	5	11	3	5	5
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)		2	2	1	4	0	0	4	3	5	5	3	1	3
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)		1	2	2	5	0	0	4	4	6	16	14	5	12
G	444	G1-56 Do you perform tasks on positive MOS ICs		2	2	1	5	0	0	4	3	5	8	8	2	6
G	445	G1-57 Do you perform tasks on negative MOS ICs		2	2	1	5	0	1	4	3	5	7	7	2	6
G	446	G1-58 Do you perform tasks on vertical MOS ICs		2	2	1	5	0	0	4	3	5	4	2	1	5
0186		42. Boolean Equations														
0187		42a. Diagram to equation	B													
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams		4	5	2	9	5	1	8	9	10	15	12	8	6
0188		42b. Equation to diagram	B													
G	436	G1-48 Do you develop logic diagrams from Boolean equations		1	5	1	9	3	1	7	7	7	14	11	8	5
0189		42c. Simplify Expressions	-													
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra		4	5	1	11	2	1	7	8	8	15	12	6	4
0190		43. Computers														
0191		43a. Operation principles	B													
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems		44	37	17	62	33	37	51	40	41	33	4	67	67
G	454	G2-8 Do you perform tasks on analog computers		11	29	11	44	33	22	28	18	31	13	5	13	37
G	455	G2-9 Do you perform tasks on digital computers		32	31	19	58	34	35	52	35	47	41	5	81	77

D T Tsk Y Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0192	43b. Load programs	2b													
G 448	G2-2 Do you load programs		38	10	20	53	10	29	43	30	35	40	2	61	69
0193	43c. Write/debug programs	2b													
G 449	G2-3 Do you write or debug programs		5	6	4	3	2	1	7	6	6	5	1	3	7
G 453	G2-7 Do you use computer flow charts or diagrams		16	14	4	29	16	13	32	13	21	17	1	38	43
0194	43d. Fault isolation	2b													
G 450	G2-4 Do you troubleshoot computers to a major unit		27	20	15	48	18	26	32	24	31	28	3	47	61
G 451	G2-5 Do you troubleshoot computers to a subassembly or circuit card		6	8	3	6	3	3	4	6	5	28	3	48	41
0195	43e. Circuit troubleshooting	2b													
G 452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC		5	7	3	5	2	0	4	4	5	12	2	6	14
0196	43f. Types of memories	B													
G 466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories		9	10	3	29	15	21	22	16	18	34	3	59	60
G 467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories		13	16	9	25	10	7	19	21	16	19	5	31	40
G 468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories		2	5	4	7	2	1	9	8	5	3	0	21	5
G 469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories		2	5	1	6	7	0	5	5	4	3	1	3	3
0197	43g. Peripheral devices	B													
G 470	G2-24 Do you perform tasks on computer keyboards		16	16	9	27	10	24	28	22	29	19	10	23	74
G 471	G2-25 Do you perform tasks on computer character printers		4	9	3	12	2	6	8	11	13	11	7	22	39
G 472	G2-26 Do you perform tasks on magnetic tape drives		2	7	2	12	3	1	8	6	5	13	1	24	43

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	4	8	4	9	3	4	8	10	7	11	3	8	29
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	5	9	5	25	10	16	16	15	16	24	8	13	69
G	475	G2-29 Do you perform tasks on paper tape readers/punches	2	5	4	11	2	3	6	5	6	3	0	16	3
G	476	G2-30 Do you perform tasks on paper card readers/punches	1	5	3	4	2	3	3	4	3	3	0	2	3
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	9	13	9	28	18	9	11	10	16	13	1	24	39
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	8	8	4	22	5	7	15	11	12	19	3	19	36
G	479	G2-33 Do you perform tasks on modems	2	6	3	7	2	6	6	6	10	5	1	5	13
G	480	G2-34 Do you perform tasks on line printers	4	6	3	5	3	3	11	9	9	10	5	11	33
G	481	G2-35 Do you perform tasks on floppy disc drives	2	5	3	3	2	4	11	8	9	11	3	6	8
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	2	5	2	5	2	0	4	5	3	6	1	6	38
G	483	G2-37 Do you perform tasks on removable pack disc drives	2	5	3	4	2	0	4	4	3	3	0	2	24
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	1	5	4	4	2	1	7	6	5	6	2	4	14
	0198	43h. Programming languages -													
G	456	G2-10 Do you use Basic computer language	8	6	5	9	3	4	10	8	10	9	2	11	13
G	457	G2-11 Do you use COBOL computer language	2	4	2	5	2	1	3	4	5	1	0	1	1
G	458	G2-12 Do you use FORTRAN computer language	2	4	3	4	2	1	4	4	5	5	0	4	4
G	459	G2-13 Do you use ADA computer language	1	4	2	3	2	0	3	3	5	3	0	0	0
G	460	G2-14 Do you use ATLAS computer language	1	4	3	4	2	3	3	3	4	2	0	0	1
G	461	G2-15 Do you use ELAN computer language	1	4	2	3	2	1	3	3	3	3	0	0	0
G	462	G2-16 Do you use PASCAL computer language	1	4	3	3	2	0	4	4	5	2	1	0	0
G	463	G2-17 Do you use RPG computer language	1	4	2	4	2	1	3	3	5	2	0	0	0
G	464	G2-18 Do you use Machine computer language	1	4	3	4	2	0	4	4	5	9	1	6	8
G	465	G2-19 Do you use C computer language	2	4	3	3	2	1	4	4	5	2	0	0	0
	0199	44. Microprocessor Controlled Systems													
	0200	44a. Theory of operation B													
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	11	7	6	10	7	12	14	15	9	9	2	13	36

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0201		44b. Isolate faulty microprocessors 2b													
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	5	5	2	3	2	3	4	4	4	9	2	8	23
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	4	5	3	3	3	6	4	4	4	7	1	3	14
0202		45. Logic Circuits													
0203		45a. Theory of operation													
0204		45a(1). Counters (Synchronous/ Asynchronous-Up/Down counters) B													
G	488	G3-1 Do you trace data flow through circuits containing counters	7	4	5	13	10	7	14	7	7	35	18	19	25
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	2	1	1	3	5	0	4	2	2	27	14	7	15
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	2	1	0	6	3	1	3	2	2	26	14	7	15
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	1	1	0	1	2	0	2	1	1	19	9	6	14
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	1	2	0	3	3	1	1	2	1	13	4	3	6
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	1	1	0	2	2	0	1	1	1	7	3	1	6
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	2	1	0	6	3	0	2	2	2	19	7	4	16
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	2	1	1	6	3	0	2	2	2	19	6	5	15
0205		45a(2). Registers (Shift and Storage) B													
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	4	5	1	3	3	6	8	4	5	23	12	16	23
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	2	3	0	3	2	1	0	2	0	19	9	11	21

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	2	5	0	4	2	0	1	3	1	17	8	9	20
0206		45a(3). Combinational Logic Circuits (Half-adder, Full-adder, encoder, Decoder, Multiplexer, Demultiplexer, Count Detect) B													
G	503	G3-16 Do you trace data flow through combinational logic circuits	9	6	1	9	3	9	8	5	4	22	10	13	27
G	506	G3-19 Do you perform tasks on encoders	1	5	6	5	2	9	4	6	2	19	10	10	23
G	507	G3-20 Do you perform tasks on decoders	1	5	7	7	2	7	4	6	2	22	8	10	23
G	508	G3-21 Do you perform tasks on multiplexers	1	6	1	9	3	3	4	7	2	18	8	11	27
G	509	G3-22 Do you perform tasks on demultiplexers	1	1	1	1	2	3	3	2	1	13	5	9	15
G	510	G3-23 Do you perform tasks on comparators	4	5	1	7	3	1	4	4	2	19	8	9	21
G	511	G3-24 Do you perform tasks on parity generators or checkers	1	2	3	3	2	1	3	4	1	14	3	7	15
G	512	G3-25 Do you perform tasks on code converters	1	3	2	1	2	3	2	4	1	13	3	5	10
G	513	G3-26 Do you perform tasks on adders	1	4	1	4	2	0	2	3	1	15	6	8	13
G	514	G3-27 Do you perform tasks on subtractors	1	4	1	5	2	1	2	3	1	15	5	8	10
G	515	G3-28 Do you perform tasks on count detect circuits	1	2	1	1	0	1	1	1	1	9	3	4	7
0207		45b. Isolate faulty circuits 2b													
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	5	1	2	4	7	3	5	3	4	24	17	11	19
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	2	2	1	1	0	1	1	1	1	17	8	10	15
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	6	2	0	4	3	1	3	2	1	20	9	10	18
0208		45c. Troubleshoot circuits -													
G	490	G3-3 Do you troubleshoot counters to circuit level components	2	1	2	1	3	1	1	1	1	13	12	3	8
G	500	G3-13 Do you troubleshoot registers to circuit level components	2	2	0	1	0	0	0	1	0	7	7	1	6
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	2	1	0	1	0	1	2	1	0	14	6	3	7

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0209		46. D/A, A/D Converters (Approx D/A and Ramp A/D)													
0210		46a. Theory of operation B													
G	516	G4-1 Do you trace data flow through A/D converters	27	24	16	27	13	21	32	26	23	26	11	48	43
G	517	G4-2 Do you trace data flow through D/A converters	27	23	34	27	11	21	28	31	22	26	10	33	43
G	520	G4-5 Do the converters you perform tasks on use flash conversion	2	2	2	1	2	1	2	2	1	6	2	2	2
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	1	2	2	2	5	3	4	4	4	9	4	4	9
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	1	2	1	3	3	0	6	3	2	11	3	4	10
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	1	3	1	2	2	1	2	2	1	5	1	3	5
0211		46b. Isolate faulty converters 2b													
G	518	G4-3 Do you troubleshoot A/D converter circuits	9	18	11	9	8	7	12	15	12	21	9	30	32
G	519	G4-4 Do you troubleshoot D/A converter circuits	9	18	13	9	8	6	11	18	11	21	9	25	32
0212		47. Transmission Lines													
0213		47a. Theory of operation B													
H	527	H1-4 Do you construct transmission lines	8	3	16	26	3	38	30	13	22	10	1	4	14
H	528	H1-5 Do you match transmission line impedance with loads	7	2	16	6	2	26	12	7	12	3	1	5	14
H	531	H1-8 Do you perform tasks on open-wire transmission lines	20	4	10	18	8	26	24	19	19	7	1	7	5
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	35	9	19	24	8	29	52	34	33	11	1	12	16
H	533	H1-10 Do you perform tasks on twin lead transmission lines	13	3	10	10	3	10	19	11	13	9	1	3	4
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	47	7	56	58	15	78	59	49	52	17	4	25	29
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	33	5	41	23	3	63	38	34	41	7	1	18	9
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	5	1	4	2	0	6	7	6	4	5	0	0	3

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0214	47b. Perform Measurements 2b													
H 524	H1-1 Do you measure electrical length on transmission lines	9	4	16	15	3	38	21	12	18	6	0	6	17
H 525	H1-2 Do you measure physical length on transmission lines	12	4	19	33	3	49	34	15	26	11	3	5	20
H 526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines	8	3	47	13	5	62	27	25	35	5	0	5	25
0215	47c. Calculations													
H 529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines	6	2	7	3	0	16	9	6	7	3	0	2	2
0216	47d. Isolate faulty transmission lines													
H 530	H1-7 Do you troubleshoot transmission lines	28	7	50	35	10	76	43	33	35	14	3	13	16
0217	48. Waveguides													
0218	48a. Theory of operation B													
H 537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides	78	13	20	77	15	66	66	52	58	8	1	73	68
H 539	H1-16 Do you pressurize or purge waveguide assemblies	81	10	16	76	11	57	69	50	58	7	1	69	72
H 540	H1-17 Do you measure standing wave ratio for waveguide assemblies	12	7	6	18	2	47	22	12	19	3	0	14	29
H 541	H1-18 Do you remove or install waveguide or associated coupling hardware components	86	14	15	78	10	60	68	52	56	8	2	72	75
0219	48b. Isolate faulty waveguides 2b													
H 538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly	76	11	18	75	10	57	63	48	52	8	0	70	59

D T Tsk Y Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0220	4[illegible] Microwave Oscillators & Amplifiers														
0221	49a. Theory of operation	B													
H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers		21	5	4	33	11	10	33	14	16	6	0	52	32
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers		1	1	0	9	0	1	2	1	6	3	0	30	7
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers		1	2	0	3	0	0	2	1	3	2	0	18	1
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers		1	1	0	23	2	0	2	1	8	4	0	23	5
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers		13	2	2	22	3	4	11	10	7	5	0	8	4
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers		5	1	1	31	5	1	6	4	12	5	0	60	30
H 550	H2-9 Do you perform tasks on backward wave oscillator		1	1	1	3	0	0	2	1	1	2	0	5	1
H 551	H2-10 Do you perform tasks on parametric amplifiers		1	1	1	2	0	1	2	1	1	2	0	15	1
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers		1	1	1	4	0	0	4	1	0	3	0	1	1
0222	49b. Tune or Adjust	2b													
H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers		2	1	2	26	5	1	4	2	7	5	0	49	23
0223	49c. Isolate faulty microwave oscillators or amplifiers	2b													
H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier		12	3	2	15	5	3	19	5	6	6	0	46	25
0224	50. Resonant Cavities														

D T Tsk Y Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0225	50a. Theory of operation B													
H 553	H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	2	3	0	9	5	1	6	4	3	11	1	37	21
H 558	H3-6 Do you perform tasks on probe resonant cavities	1	3	0	3	3	0	0	1	1	2	0	5	7
H 559	H3-7 Do you perform tasks on loop resonant cavities	0	1	0	4	0	0	1	2	1	3	1	4	2
H 560	H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	0	1	0	3	2	0	1	1	0	6	1	5	5
0226	50b. Isolate faulty resonant cavities 2b													
H 554	H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	0	3	0	4	3	0	3	1	0	10	1	29	14
H 557	H3-5 Do you measure frequency of resonant cavities	1	1	1	4	2	0	1	0	0	11	1	30	14
0227	50c. Tune/adjust 2b													
H 555	H3-3 Do you tune or adjust resonant cavities electrically	1	1	1	5	2	0	0	0	3	10	1	31	14
H 556	H3-4 Do you tune or adjust resonant cavities physically	0	1	0	11	2	0	0	0	1	7	1	38	7
0228	51. Transmitters													
0229	51a. Theory of operation													
0230	51a(1). Amplitude Modulation -													
H 561	H4-1 Do you use "AM" modulation principles	8	8	35	20	7	47	10	24	27	5	0	25	2
H 562	H4-2 Do you trace block diagrams of AM transmitters	15	9	53	19	8	59	15	34	29	4	1	27	2
H 563	H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	6	4	13	6	3	15	6	11	9	4	1	22	2
H 564	H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	4	3	10	4	3	7	4	6	7	3	1	18	2
H 568	H4-8 Do you align or adjust AM transmitters or circuits	1	1	8	6	2	7	3	4	3	3	1	19	2
H 569	H4-9 Do you calculate percentage of modulation for AM transmitters	2	3	15	4	2	4	3	7	5	3	1	8	1

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0231		51a(2). Frequency Modulation -													
H	593	H4-33 Do you use "FM" modulation principles	11	8	41	20	5	41	18	31	20	4	4	23	7
H	594	H4-34 Do you trace block diagrams of FM transmitters	20	12	51	26	5	47	24	39	21	4	3	31	10
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	6	5	13	3	3	4	9	12	5	4	3	27	6
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	4	4	9	4	3	4	5	6	5	3	3	22	5
H	600	H4-40 Do you align or adjust FM transmitters or circuits	2	3	8	4	2	4	4	5	5	3	3	24	6
H	601	H4-41 Do you calculate modulation index for FM transmitters	1	2	8	0	2	1	4	5	2	1	1	6	2
H	602	H4-42 Do you measure frequency deviation for FM transmitters	4	4	13	3	2	4	4	7	4	3	5	24	7
0232		51a(3). Single Side Band -													
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	1	1	7	9	7	62	6	9	28	1	0	1	2
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	2	1	1	4	3	7	3	3	9	1	0	1	1
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	2	1	1	3	3	6	1	2	7	1	0	1	0
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	1	0	2	3	2	10	1	1	4	1	1	1	1
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	1	0	2	0	3	6	0	3	3	1	1	1	0
0233		51a(4). Pulse Modulation -													
H	612	H4-52 Do you use "PM" modulation principles	11	1	9	24	3	25	11	12	16	6	1	22	11
H	613	H4-53 Do you trace block diagrams of PM transmitters	21	1	6	33	7	24	19	14	19	8	1	33	21
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	4	0	2	8	2	1	5	5	4	9	1	24	15
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	4	0	3	7	2	0	4	3	3	8	1	20	15
H	619	H4-59 Do you align or adjust PM transmitters or circuits	1	0	3	5	2	0	2	1	5	7	1	28	15
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	4	0	3	5	0	3	4	3	2	7	1	13	17
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	4	0	2	14	0	4	6	3	5	8	1	25	21

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0234		51b. Isolate faulty transmitters													
H	565	H4-5 Do you troubleshoot AM transmitters to major units	11	8	38	18	7	50	12	23	23	3	1	23	3
H	566	H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	4	2	6	0	2	4	3	3	3	4	1	17	2
H	581	H4-21 Do you troubleshoot SSB transmitters to major units	2	0	6	10	5	53	2	7	25	1	0	1	1
H	582	H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	2	0	1	0	0	6	0	1	3	1	0	1	0
H	597	H4-37 Do you troubleshoot FM transmitters to major units	12	10	36	19	5	38	15	25	17	3	3	27	7
H	598	H4-38 Do you troubleshoot FM transmitters to subassemblies or circuit cards	4	3	7	1	0	3	4	3	1	3	3	19	6
H	616	H4-56 Do you troubleshoot PM transmitters to major units	15	1	5	23	7	19	11	12	16	7	1	28	22
H	617	H4-57 Do you troubleshoot PM transmitters to subassemblies or circuit cards	2	0	2	4	0	0	2	1	1	8	1	18	14
0235		51c. Troubleshoot circuits													
H	567	H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	2	2	6	0	2	3	3	3	1	3	1	6	2
H	583	H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	1	0	1	0	0	4	0	1	2	1	0	1	0
H	599	H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	2	3	6	0	0	1	3	2	1	3	2	9	3
H	618	H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	2	0	2	4	0	0	2	1	1	5	1	9	6
0236		52. Receivers													
0237		52a. Theory of operation													
0238		52a(1). Amplitude Modulation													
H	570	H4-10 Do you use "AM" demodulation principles	7	7	23	16	5	41	9	21	21	3	0	6	2
H	571	H4-11 Do you trace block diagrams of AM receivers	15	9	48	18	7	63	15	33	27	3	0	13	2
H	572	H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	5	4	11	4	3	13	5	8	7	3	0	9	1

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	2	3	8	3	3	9	4	4	4	3	0	8	1
H	577	H4-17 Do you align or adjust AM receivers or circuits	5	1	11	3	2	9	4	6	6	2	0	9	1
	0239	52a(2). Frequency Modulation -													
H	603	H4-43 Do you use "FM" demodulation principles	8	8	29	18	5	35	15	28	17	3	3	7	3
H	604	H4-44 Do you trace block diagrams of FM receivers	18	10	42	20	7	44	22	36	20	4	3	10	6
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	4	3	11	3	3	4	8	10	5	4	3	8	5
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	4	4	8	1	3	3	4	6	3	4	3	7	4
H	610	H4-50 Do you align or adjust FM receivers or circuits	2	2	8	3	2	4	4	5	4	3	3	10	5
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	1	1	6	1	0	1	3	3	1	1	1	2	2
	0240	52a(3). Single Side Band -													
H	586	H4-26 Do you trace block diagrams of SSB receivers	1	0	7	9	7	59	7	8	26	1	1	1	0
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	1	3	3	10	2	3	8	1	1	1	0
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	1	0	0	3	3	4	1	2	6	1	1	1	0
H	592	H4-32 Do you align or adjust SSB receivers or circuits	1	0	1	2	2	12	1	2	5	1	1	1	0
	0241	52a(4). Pulse Modulation -													
H	622	H4-62 Do you use "PM" demodulation principles	5	2	8	20	2	24	10	14	14	5	1	15	9
H	623	H4-63 Do you trace block diagrams of PM receivers	12	2	9	25	7	21	15	15	18	7	1	22	17
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	1	1	2	5	2	1	4	5	4	7	1	16	14
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	1	1	3	4	2	0	4	3	3	7	1	15	14
H	629	H4-69 Do you align or adjust PM receivers or circuits	1	0	2	5	2	0	2	1	5	6	1	19	16
	0242	52b. Isolate faulty receivers -													
H	574	H4-14 Do you troubleshoot AM receivers to major units	9	8	37	16	5	53	10	24	22	2	0	10	1
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	2	2	6	0	2	4	3	3	3	2	0	7	1
H	589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	4	9	5	54	2	7	24	1	1	1	0

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	0	0	1	0	0	4	1	1	2	1	1	1	0
H	607	H4-47 Do you troubleshoot FM receivers to major units	11	8	32	16	7	35	14	25	16	4	3	10	5
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	2	2	4	0	0	1	3	3	1	3	3	7	4
H	626	H4-66 Do you troubleshoot PM receivers to major units	9	2	8	21	7	19	9	11	16	7	1	21	18
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	1	0	1	3	0	0	2	1	0	5	1	13	14
0243		52c. Troubleshoot circuits													
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	2	2	5	0	0	3	3	3	2	2	0	6	1
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0	0	0	3	1	1	3	1	1	1	0
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	2	2	5	1	0	1	3	3	1	3	2	5	2
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	1	0	0	4	0	0	2	1	0	4	1	7	7
0244		53. Transmission Power													
0245		53a. Perform measurements B													
I	660	I1-1 Do you measure RF power	6	7	49	20	7	75	36	28	31	8	3	69	50
I	661	I1-2 Do you measure RF peak power	4	3	26	16	2	40	15	11	14	8	3	49	45
I	662	I1-3 Do you measure RF average power	4	3	18	10	2	32	13	13	12	7	3	36	32
I	663	I1-4 Do you measure RF effective power	4	4	20	11	3	34	13	11	12	7	3	25	19
I	664	I1-5 Do you measure RF output power using wattmeters	7	8	60	20	7	87	37	39	39	6	0	24	26
0246		53b. Calculations B													
I	665	I2-1 Do you calculate RF apparent power	1	2	9	2	2	10	5	6	5	5	0	13	14
I	666	I2-2 Do you calculate RF true power	1	2	9	2	2	9	5	6	7	5	0	12	21
I	667	I2-3 Do you calculate RF power loss or gain in db	2	2	18	7	3	26	9	10	13	7	0	30	28

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0247		54. Antennas													
0248		54a. Theory of operation -													
H	634	H5-5 Do you plot graph radiation patterns	5	1	5	3	0	3	5	4	6	3	0	4	3
H	637	H5-8 Do you work with Yagi antennas	2	0	5	3	0	4	4	4	2	2	0	1	0
H	638	H5-9 Do you work with dipole antennas	11	5	29	32	7	60	45	22	35	3	0	33	3
H	639	H5-10 Do you work with slotted antennas	18	0	7	5	2	19	8	11	13	4	0	1	0
H	640	H5-11 Do you work with rotary antennas	2	0	8	12	2	22	12	5	10	2	0	13	32
H	641	H5-12 Do you work with hertz antennas	4	0	8	3	0	21	7	8	4	2	0	1	0
H	642	H5-13 Do you work with marconi antennas	2	0	9	2	0	18	7	7	7	2	0	1	1
H	643	H5-14 Do you work with rhombic antennas	2	0	7	6	2	34	11	6	14	2	0	2	0
H	644	H5-15 Do you work with scimitar antennas	2	0	4	4	0	6	4	4	3	2	0	1	0
H	645	H5-16 Do you work with parabolic antennas	9	1	10	57	5	18	14	10	33	3	0	50	67
H	646	H5-17 Do you work with ground plane antennas	5	0	11	6	2	12	12	11	14	3	0	1	1
H	647	H5-18 Do you perform tasks on rotary antenna arrays	2	0	6	11	0	18	7	5	9	2	0	10	25
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	2	0	5	2	0	4	4	4	2	2	0	1	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	2	0	5	2	0	4	4	4	3	3	0	2	1
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	2	0	12	7	0	38	11	10	13	3	0	2	2
H	651	H5-22 Do you perform tasks on collinear antenna arrays	5	0	5	5	0	6	4	4	6	2	0	1	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	15	2	11	12	2	13	15	14	7	4	0	16	10
H	653	H5-24 Do you perform tasks on planar antenna arrays	34	3	9	34	2	10	27	19	12	3	0	1	1
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	9	3	13	55	7	31	15	14	34	3	0	17	13
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	11	0	9	52	7	31	16	13	35	4	0	19	15
H	656	H5-27 Do you perform tasks on antennas with circular polarization	11	0	9	69	7	32	11	15	38	4	0	51	11
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	19	6	29	43	5	51	26	26	29	7	0	19	25
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	16	6	18	31	3	40	17	14	21	5	0	19	22
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	20	9	59	35	8	79	34	36	41	4	0	21	11
0249		54b. Perform alignments -													
H	630	H5-1 Do you physically align antennas	22	8	18	60	3	25	21	15	28	7	1	65	66
H	631	H5-2 Do you electrically align antennas	14	3	5	55	5	18	14	6	20	6	1	72	68
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	7	3	41	9	5	51	19	27	29	3	0	5	10

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0250		54c. Isolate faulty antennas -													
H	632	H5-3 Do you troubleshoot loading of antennas	9	6	17	18	3	38	11	14	18	5	0	19	14
H	633	H5-4 Do you troubleshoot coupling of antennas	13	5	19	23	5	47	16	18	27	5	0	20	15
H	635	H5-6 Do you troublushoot antenna components	19	7	27	24	7	51	30	25	30	7	0	47	55
0251		55. Microphones													
0252		55a. Theory of operation -													
J	668	J1-1 Do you trace block diagrams of circuits containing microphones	8	10	45	13	2	62	26	29	23	3	1	0	0
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	7	8	30	9	2	29	20	20	14	3	1	0	0
J	672	J1-5 Do you work on carbon microphones	0	1	15	4	2	43	10	6	12	3	0	0	0
J	673	J1-6 Do you work on capacitor microphones	0	1	5	1	2	4	3	3	2	2	0	0	0
J	674	J1-7 Do you work on crystal microphones	2	2	5	2	0	15	4	4	1	2	0	0	0
J	675	J1-8 Do you work on dynamic microphones	1	3	13	2	2	29	8	11	11	3	1	0	1
J	676	J1-9 Do you work on velocity ribbon microphones	0	1	2	0	0	6	3	1	1	2	0	0	0
0253		55b. Isolate faulty microphones -													
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	5	10	32	11	2	50	21	23	21	3	1	0	0
0254		55c. Troubleshoot circuits -													
J	671	J1-4 Do you troubleshoot microphones	4	5	15	3	2	18	7	7	10	3	1	0	1
0255		56. Speakers													
0256		56a. Theory of operation -													
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	1	5	30	7	3	40	17	21	16	3	4	0	0

D T Y	Tsk Nbr	Task Title		452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
J	678	J1-11 Do you trace schematic diagrams of speaker circuits		1	4	18	6	3	25	13	15	10	3	3	0	0
	0257	56b. Isolate faulty speakers	-													
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker		2	4	24	7	3	34	14	15	16	4	3	0	0
	0258	56c. Troubleshoot circuits	-													
J	680	J1-13 Do you troubleshoot speakers		0	2	12	2	3	9	6	5	5	3	2	0	0
	0259	57. Photosensitive Devices														
	0260	57a. Theory of operation	B													
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices		9	2	0	9	0	3	14	6	4	44	49	1	19
J	682	J2-2 Do you trace schenatic diagrams of photosensitive device circuits		2	1	0	2	0	1	7	3	3	45	42	1	14
J	684	J2-4 Do you adjust or calibrate photosensitive devices		1	0	0	2	0	0	1	1	0	29	21	2	7
J	685	J2-5 Do you work on photodiodes		1	1	0	0	0	1	2	1	1	38	23	0	9
J	686	J2-6 Do you work on phototransistors		1	0	0	0	0	0	1	1	0	21	12	0	5
J	687	J2-7 Do you work on phototubes		1	0	1	0	0	0	1	1	0	12	3	0	9
J	688	J2-8 Do you work on photo-SCRs		1	0	0	0	0	0	2	1	0	10	3	0	2
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)		6	0	1	0	0	1	4	1	1	21	37	0	2
	0261	57b. Isolate faulty photosensitive devices	2b													
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device		6	1	0	5	0	1	7	3	3	38	47	0	12
	0262	58. Display Tubes														

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
0263		58a. Theory of operation													
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	12	2	8	31	2	3	13	8	13	4	2	29	19
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	7	1	3	10	2	1	7	4	4	4	2	24	14
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	4	0	3	5	2	0	3	1	2	3	0	19	12
J	694	J3-5 Do you work on direct view storage tubes (DVST)	7	0	4	21	3	0	5	3	8	3	1	27	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	7	0	3	2	0	0	7	2	3	2	0	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	4	0	4	8	0	0	2	3	2	1	0	16	19
0264		58b. Isolate faulty display tubes													
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	8	1	6	20	0	3	8	4	3	3	3	25	14
0265		59. Support Subjects													
0266		59a. Safety applicable to electronics B													
0267		59b. First aid for electrical shock B													
0268		59c. Electrostatic Discharge (ESD) Control B													
0269		Tasks not referenced													
B	175	B3-4 Do you use audio sine-wave signal generators	0	2	4	4	2	3	2	2	5	14	29	5	5
B	176	B3-5 Do you use audio non-sinusoidal signal generators	0	1	2	4	2	1	1	1	3	2	5	3	6
B	177	B3-6 Do you use RF less than 1,000MH signal generators	1	1	5	9	7	10	4	4	6	10	10	15	23
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	2	1	2	9	2	10	5	3	5	6	5	18	32
B	179	B3-8 Do you use white noise signal generators	0	1	2	3	2	1	1	0	3	3	8	3	1
B	180	B3-9 Do you use pattern signal generators	0	1	1	2	2	3	1	0	3	24	24	12	5

D T Y	Tsk Nbr	Task Title	452 52A	452 52B	452 52C	452 53A	452 53B	452 53C	452 71	452 72	452 73	455 50A	455 50B	455 X3A	456 X0
B	181	B3-10 Do you use pseudo-random signal generators	0	1	2	3	2	1	1	0	2	3	3	4	1
B	182	B3-11 Do you use time mark signal generators	0	1	1	3	2	3	2	0	3	9	5	5	6
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	1	1	2	6	2	6	2	2	3	42	17	11	30
B	184	B3-13 Do you use TV signal signal generators	0	1	2	3	2	1	2	1	3	40	38	22	4
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	7	13	1	14	3	1	5	7	11	37	21	25	20
D	285	D1-11 Do you perform tasks on DC to DC converters	9	35	5	12	5	4	9	14	14	35	19	24	27
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	18	73	12	12	7	6	10	30	14	32	20	32	27
D	287	D1-13 Do you perform tasks on switching power supplies	9	34	7	13	8	3	6	14	12	17	8	4	3
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	9	0	0	4	0	4	5	5	5	62	28	33	68
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	7	0	0	3	0	1	3	4	2	61	29	26	64
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	5	0	1	2	0	3	3	3	2	60	29	28	66
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	1	0	1	0	0	0	0	1	0	53	27	11	29
J	701	J4-5 Do you adjust or calibrate TV systems or components	1	0	0	0	0	0	0	1	0	58	28	21	47
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	4	0	0	0	2	0	4	2	0	63	5	2	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	2	0	0	0	0	0	3	2	0	60	5	1	1
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	4	0	0	0	0	0	3	1	0	63	6	1	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	1	0	0	0	0	0	0	1	0	42	4	1	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	1	0	1	0	2	0	0	1	0	59	5	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	5	0	1	2	0	12	4	4	7	63	34	1	81
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	4	0	0	0	0	7	3	3	3	62	29	1	75
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	5	0	2	0	0	9	2	3	6	64	32	3	82
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	1	0	1	0	0	1	0	1	1	57	12	1	35
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	1	0	1	0	0	7	2	1	3	62	32	2	79
J	712	J4-16 Do you adjust or calibrate infrared systems or components	2	0	2	0	0	0	1	1	1	60	16	0	56

Report Option Table for Modules

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Report Option Table for Tasks

Option	Status
Primary Sort	Inventory Sequence
Secondary Sort	Not Used
Print Suppress	Not Used

Description of Reported Module Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Module Statement						

Description of Reported Task Factors

Col	Factor	Source vector	Title	Number Members	Based on All Tasks Within Range Mean	S.D.	Max	Min	Valid
1	TITLE		Task Statement						
2	F0102	GP0142/PMP	All DAFSC 456X2A	29	18.16	26.31	100.00	.00	712
3	F0106	GP0149/PMP	All DAFSC 456X2B	19	12.69	20.08	100.00	.00	712
4	F0103	GP0144/PMP	All DAFSC 457X3A	28	12.36	17.57	92.86	.00	712
5	F0105	GP0146/PMP	All DAFSC 457X3C	19	12.43	19.01	100.00	.00	712
6	F0076	GP0079/PMP	All DAFSC 46150	1034	.82	3.24	34.82	.00	712
7	F0077	GP0080/PMP	All DAFSC 46250	1616	2.59	8.68	69.99	.00	712
8	F0078	GP0081/PMP	All DAFSC 46350	347	1.58	5.96	53.89	.00	712
9	F0079	GP0082/PMP	All Reporting Identifier 99104	144	29.41	22.62	93.75	.00	712
10	F0080	GP0083/PMP	All Reporting Identifier 99105	206	4.18	9.32	81.55	.00	712
11	F0081	GP0084/PMP	All Reporting Identifier 99106	119	2.47	7.29	75.63	.00	712

Electronic Principles Inventory (EPI) data for Air Force specialties is presented below in Electronic Fundamentals/Applications order. Data for this report was collected from job incumbents during the period March 1987 - April 1989

Percent members responding "YES" is shown for each specialty listed. Where skill level is not specified, both 5 and 7 skill levels are included (e.g., DAFSC 000X0 includes 00050 and 00070).

For assistance in using this EPI printout phone USAFOMC/OMYA, at AUTOVON 487-6623.

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0001		STS 1 Electronic Fundamentals/ Applications dated 20 Feb 1987											
0002		1. Basic Terms											
0003		1a. Metric Notation	B										
A	1	A1-1 Do you use metric terms (example mili, kilo, mega)		55	53	68	89	17	19	45	87	82	76
0004		1b. DC Terms	B										
A	2	A1-2 Do you use basic DC electrical/electronic terms		100	95	89	100	32	70	54	93	44	45
0005		1c. AC Terms	B										
A	3	A1-3 Do you use basic AC electrical/electronic terms		100	95	86	100	30	61	52	94	43	45
0006		2. Basic Circuits											

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
	0007	2a. Theory of operation	B										
A	4	A1-4 Do you trace schematic or block diagrams of circuits containing conductors, fuses, lamps, switches, or batteries		97	100	89	68	10	60	38	85	16	20
	0008	2b. Troubleshoot circuits	2b										
A	5	A1-5 Do you troubleshoot circuits containing conductors, fuses, lamps, switches, or batteries		97	100	79	58	16	62	39	80	11	18
	0009	3. Basic Circuit Calculations											
	0010	3a. DC	B										
A	6	A1-6 Do you calculate values of DC voltage, current, resistance, or power		38	47	29	16	12	16	8	61	8	8
A	12	A1-12 Do you calculate the value of a resistor required for a circuit		21	11	4	0	2	9	2	41	2	5
	0011	3b. AC	B										
A	7	A1-7 Do you calculate values of AC effective voltage, average voltage, or peak-to-peak voltage		48	47	29	16	3	11	3	59	6	6
A	8	A1-8 Do you calculate values of frequency, phase relationship, or wave length		48	58	21	26	1	5	2	55	15	5
	0012	4. Resistors											
	0013	4a. Theory of operation	B										
A	9	A1-9 Do you trace schematic or block diagrams of circuits containing resistors		93	84	46	16	2	38	11	82	11	7

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	11	A1-11 Do you calibrate or adjust circuits by using variable resistors	72	74	11	0	1	8	6	72	6	5
0014		4b. Isolate faulty resistors 2b										
A	10	A1-10 Do you troubleshoot circuits to isolate a faulty resistor	59	42	29	5	2	32	10	69	4	6
A	14	A1-14 Do you ohm check resistors	79	74	32	5	9	29	14	72	4	8
0015		4c. Color code B										
A	13	A1-13 Do you determine ohmic value of a resistor using the color code	55	32	18	0	1	15	3	69	3	5
0016		5. Relays/Solenoids										
0017		5a. Relay theory of operation B										
A	15	A1-15 Do you trace schematic or block diagrams of circuits containing relays	97	79	93	42	2	50	13	74	10	9
A	17	A1-17 Do you adjust relays	31	32	4	0	1	7	6	28	1	2
A	18	A1-18 Do you perform tasks on contacts, cores, coils, armatures, or springs	24	32	14	11	2	9	6	40	2	3
0018		5b. Isolate faulty relays 2b										
A	16	A1-16 Do you troubleshoot circuits to isolate a faulty relay	76	68	93	37	2	49	15	65	5	7
A	19	A1-19 Do you continuity check relays	83	79	57	26	4	42	19	60	3	3
0019		5c. Solenoid theory of operation -										
A	77	A2-33 Do you trace schematic or block diagrams of circuits containing solenoids	79	47	29	0	1	36	13	49	4	9
A	79	A2-35 Do you perform maintenance on solenoid component parts	38	11	4	0	1	16	9	35	1	6

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0020		5d. Isolate faulty solenoids	-										
A	78	A2-34 Do you troubleshoot circuits to isolate a faulty solenoid		76	47	21	0	1	37	17	44	2	10
0021		6. Inductors											
0022		6a. Theory of operation	B										
A	20	A1-20 Do you trace schematic or block diagrams of circuits containing inductors, chokes, or choke coils		48	32	18	16	0	4	1	71	5	5
A	25	A1-25 Do you calibrate or adjust circuits by using variable inductors		7	11	4	0	0	1	0	34	1	2
0023		6b. Isolate faulty inductors	2b										
A	21	A1-21 Do you troubleshoot circuits to isolate a faulty inductor, choke, or choke coil		31	11	14	0	0	3	0	60	1	3
A	26	A1-26 Do you ohm check inductors		24	21	14	5	1	3	1	56	1	3
0024		6c. Calculations	B										
A	22	A1-22 Do you calculate values of circuit total inductance		3	0	4	0	0	1	0	26	0	1
A	23	A1-23 Do you calculate values of circuit or component inductive reactance		3	0	4	0	0	1	0	24	1	1
A	24	A1-24 Do you calculate values of circuit voltage or current in circuits containing inductors		3	0	4	0	0	1	0	30	1	1
0025		7. Capacitors											

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0026		7a. Theory of operation	B										
A	27	A1-27 Do you trace schematic or block diagrams of circuits containing capacitors		69	58	32	11	0	17	5	80	8	10
A	32	A1-32 Do you calibrate or adjust circuits using variable capacitors		21	0	4	0	0	2	2	40	1	2
0027		7b. Isolate faulty capacitors	2b										
A	28	A1-28 Do you troubleshoot circuits to isolate a faulty capacitor		41	32	18	0	0	13	4	67	3	6
A	33	A1-33 Do you ohm check capacitors		41	32	21	0	1	10	5	60	3	3
0028		7c. Calculations	-										
A	29	A1-29 Do you calculate values of circuit total capacitance		10	0	4	0	0	3	2	26	1	1
A	30	A1-30 Do you calculate values of circuit or component capacitive reactance		3	0	4	0	0	2	1	23	0	1
A	31	A1-31 Do you calculate values of circuit or component voltage or current in circuits containing capacitors		10	5	4	0	0	2	1	28	1	2
0029		7d. Color code	B										
A	34	A1-34 Do you use capacitor color codes in your present job		3	0	7	0	0	3	1	19	0	1
0030		8. Transformers											
0031		8a. Theory of operation	B										
A	35	A1-35 Do you trace schematic or block diagrams of circuits containing transformers		97	68	79	53	1	10	3	78	8	9
A	39	A1-39 Do you calibrate or adjust circuits using variable transformers		17	11	7	5	0	1	1	31	0	3

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0032		8b. Isolate faulty transformers	2b										
A	36	A1-36 Do you troubleshoot circuits to isolate a faulty transformer		76	47	79	47	1	9	2	67	3	4
A	40	A1-40 Do you ohm check transformers		52	42	50	37	1	6	2	61	2	3
A	41	A1-41 Do you measure transformer output voltage		86	47	64	42	1	6	2	65	3	4
0033		8c. Calculations	-										
A	37	A1-37 Do you calculate transformer voltage or current step-up or step-down ratios		28	16	29	5	0	2	0	41	1	2
A	38	A1-38 Do you calculate impedance of transformers		10	5	18	0	0	1	0	21	0	2
0034		9. Three Phase Transformers											
0035		9a. Theory of operation	B										
A	42	A1-42 Do you trace schematic or block diagrams of circuits containing three phase transformers		59	42	57	21	0	3	1	35	0	3
A	44	A1-44 Do you adjust three phase transformers		21	21	11	5	0	1	1	15	0	2
0036		9b. Isolate faulty three phase transformers	-										
A	43	A1-43 Do you troubleshoot circuits to isolate a faulty three phase transformer		55	32	57	26	0	3	1	31	0	3
0037		10. DC Motors											
0038		10a. Theory of operation	B										
A	45	A2-1 Do you trace schematic or block diagrams of circuits containing DC motors		90	42	32	5	1	4	1	60	4	4

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	48	A2-4 Do you perform tasks on DC motor component parts		17	0	4	0	1	2	1	28	0	2
0039		10b. Isolate faulty DC motors	2b										
A	46	A2-2 Do you troubleshoot circuits to isolate a faulty DC motor		83	42	29	5	1	4	1	56	2	3
0040		10c. Troubleshoot motors	2b										
A	47	A2-3 Do you troubleshoot DC motor component parts		31	11	4	0	1	2	1	25	0	2
0041		11. AC Motors											
0042		11a. Theory of operation	B										
A	49	A2-5 Do you trace schematic or block diagrams of circuits containing AC motors		97	42	25	0	1	3	1	62	5	4
A	52	A2-8 Do you perform tasks on AC motor component parts		21	0	4	0	1	1	1	28	0	3
0043		11b. Isolate faulty AC motors	2b										
A	50	A2-6 Do you troubleshoot circuits to isolate a faulty AC motor		93	37	21	0	1	3	1	56	2	2
0044		11c. Troubleshoot motors	2b										
A	51	A2-7 Do you troubleshoot AC motor component parts		28	16	7	0	1	1	1	24	0	3
0045		12. DC Generators											

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0046		12a. Theory of operation -										
A	53	A2-9 Do you trace schematic or block diagrams of circuits containing DC generators	45	26	4	0	0	1	1	15	2	1
A	56	A2-12 Do you perform tasks on component parts of DC generators	14	5	0	0	0	1	1	11	0	0
0047		12b. Isolate faulty DC generators -										
A	54	A2-10 Do you troubleshoot to isolate a faulty DC generator	38	26	0	0	0	1	2	14	0	0
0048		12c. Troubleshoot DC generators -										
A	55	A2-11 Do you troubleshoot DC generator component parts	14	21	0	0	0	1	1	11	0	0
0049		13. AC Generators										
0050		13a. Theory of operation -										
A	57	A2-13 Do you trace schematic or block diagrams of circuits containing AC generators	59	16	7	0	0	1	1	22	3	1
A	60	A2-16 Do you perform tasks on component parts of AC generators	21	11	0	0	0	1	1	16	1	0
0051		13b. Isolate faulty AC generators -										
A	58	A2-14 Do you troubleshoot circuits to isolate a faulty AC generator	52	16	4	0	0	1	1	21	1	0
0052		13c. Troubleshoot AC generators -										
A	59	A2-15 Do you troubleshoot AC generator component parts	21	11	0	0	0	0	1	15	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
	0053	14. Alternators										
	0054	14a. Theory of operation -										
A	61	A2-17 Do you trace schematic or block diagrams of circuits containing alternators	0	0	0	0	0	0	0	8	1	0
A	64	A2-20 Do you perform tasks on component parts of alternators	0	0	0	0	0	0	0	6	0	0
	0055	14b. Isolate faulty alternators -										
A	62	A2-18 Do you troubleshoot circuits to isolate a faulty alternator	0	0	0	0	0	0	0	8	0	0
	0056	14c. Troubleshoot alternators -										
A	63	A2-19 Do you troubleshoot alternator component parts	0	0	0	0	0	0	0	6	0	0
	0057	15. Synchro/Servos										
	0058	15a. Theory of operation B										
A	65	A2-21 Do you trace schematic or block diagrams of circuits containing synchros or servos	100	79	39	11	0	1	1	30	3	1
A	68	A2-24 Do you perform tasks on component parts of synchros or servos	38	32	14	0	1	1	1	19	0	0
	0059	15b. Isolate faulty synchro/servos 2b										
A	66	A2-22 Do you troubleshoot circuits to isolate a faulty synchro or servo	100	95	32	11	1	1	1	28	0	1

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0060		15c. Troubleshoot synchro/servos	2b										
A	67	A2-23 Do you troubloshoot synchro or servo component parts		41	58	14	0	0	1	1	20	0	0
0061		16. Choppers (Synchronous Vibrators)											
0062		16a. Theory of operation	B										
A	69	A2-25 Do you trace schematic or block diagrams of circuits containing choppers		3	0	7	0	0	0	0	8	2	0
0063		16b. Isolate faulty choppers	2b										
A	70	A2-26 Do you troubleshoot circuits to isolate a faulty chopper		3	0	11	0	0	0	0	6	0	0
A	71	A2-27 Do you measure chopper coil excitation frequency		3	0	4	0	0	0	0	6	0	0
A	72	A2-28 Do you measure chopper coil voltage-current phase relationship		3	0	4	0	0	0	0	4	0	0
0064		17. Transducers											
0065		17a. Theory of operation	B										
A	73	A2-29 Do you trace schematic or block diagrams of circuits containing transducers		7	37	29	0	0	1	0	40	2	1
A	75	A2-31 Do you calibrate or adjust transducers		3	11	7	0	2	1	0	37	0	3
A	76	A2-32 Do you repair, clean or lubricate transducers		7	16	7	0	1	1	0	38	0	1
0066		17b. Isolate faulty transducers	2b										
A	74	A2-30 Do you troubleshoot circuits to isolate a faulty transducer		10	37	14	0	1	1	0	37	0	1

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0067		18. Meter Movements											
0068		18a. Theory of operation	B										
A	80	A2-36 Do you trace schematic or block diagrams of circuits containing meter movements		17	11	18	0	1	7	4	54	4	6
A	82	A2-38 Do you perform maintenance on meter movement mechanical parts		7	16	11	0	1	4	4	22	1	3
0069		18b. Isolate faulty meter movements	2b										
A	81	A2-37 Do you troubleshoot circuits to isolate a faulty meter movement		17	11	18	5	2	8	6	49	2	5
0070		19. Solid State Diodes											
0071		19a. Theory of operation	B										
A	83	A3-1 Do you trace schematic or block diagrams of circuits containing diodes		66	68	61	21	1	20	2	77	11	8
0072		19b. Isolate faulty solid state diodes	2b										
A	84	A3-2 Do you troubleshoot circuits to isolate a faulty diode		31	42	46	5	1	19	1	67	3	5
A	85	A3-3 Do you check diodes using an ohmmeter		34	53	43	0	1	18	1	70	2	4
0073		19c. Specifications	B										
A	86	A3-4 Do you use diode characteristic curves		3	11	4	0	0	1	0	35	1	1
A	87	A3-5 Do you use diode substitution information		3	5	7	0	0	2	0	49	2	3

D T Tsk Y Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0074	19d. Color code	B										
A 88	A3-6 Do you use diode color codes		3	11	18	0	0	6	0	19	0	1
0075	20. Bipolar Junction Transistors											
0076	20a. Theory of operation	B										
A 89	A3-7 Do you trace schematic or block diagrams of circuits containing transistors		55	63	29	16	1	9	2	78	10	4
0077	20b. Isolate faulty transistors	2b										
A 90	A3-8 Do you troubleshoot circuits to isolate a faulty transistor		14	26	18	0	0	8	2	67	3	3
A 91	A3-9 Do you check transistors using an ohmmeter		14	32	11	0	1	6	3	64	2	2
A 92	A3-10 Do you check transistors using transistor testers		3	11	4	0	0	2	1	56	2	2
0078	20c. Specifications	B										
A 93	A3-11 Do you use transistor characteristic curves		0	5	4	0	0	0	0	35	1	1
A 94	A3-12 Do you use transistor substitution information		0	5	7	0	0	1	0	54	2	3
0079	21. Integrated Circuits											
0080	21a. Familiarization	B										
A 95	A3-13 Do you trace schematic or block diagrams of circuits containing integrated circuits (IC)		48	37	46	16	1	10	2	81	10	5

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0081		21b. Isolate faulty integrated circuits 2b										
A	96	A3-14 Do you troubleshoot circuits to isolate a faulty IC	17	26	14	0	1	8	2	67	3	4
0082		21c. Specifications B										
A	97	A3-15 Do you use IC substitution information	7	21	11	0	0	2	1	60	3	4
0083		22. Solid State Special Purpose Devices (SCR, Zener Diode, Tunnel Diode, LED, LCD, UJT, JFET, MOSFET)										
0084		22a. Theory of operation B										
A	98	A3-16 Do you trace schematic or block diagrams of circuits containing solid-state special purpose devices	24	26	29	16	0	4	2	67	9	3
A	100	A3-18 Do you perform tasks on varactors/varicaps	3	5	0	0	0	0	0	20	2	2
A	101	A3-19 Do you perform tasks on tunnel diodes	3	0	4	0	0	0	0	24	1	1
A	102	A3-20 Do you perform tasks on field effect transistors (FET)	3	5	14	0	0	0	0	57	4	3
A	103	A3-21 Do you perform tasks on unijunction transistors (UJT)	3	0	4	0	0	0	0	38	1	2
A	104	A3-22 Do you perform tasks on zener diodes	17	11	25	0	0	2	0	68	3	3
A	105	A3-23 Do you perform tasks on liquid crystal displays (LCD)	7	0	14	0	0	1	1	42	2	2
A	106	A3-24 Do you perform tasks on pin diodes	3	11	18	0	0	1	0	16	1	1
A	107	A3-25 Do you perform tasks on light emitting diodes (LED)	7	47	36	5	0	2	1	68	5	3
A	108	A3-26 Do you perform tasks on fantail transistors	0	0	7	0	0	0	0	13	1	0
A	109	A3-27 Do you perform tasks on silicon controlled rectifiers (SCR)	0	11	7	0	0	1	0	65	2	1
A	110	A3-28 Do you perform tasks on triacs	0	0	0	0	0	0	0	36	2	1
A	111	A3-29 Do you perform tasks on programmable unijunction transistors (PUT)	0	0	7	0	0	0	0	5	1	0
A	112	A3-30 Do you perform tasks on silicon controlled switches (SCS)	3	0	0	0	0	0	0	17	2	1
A	113	A3-31 Do you perform tasks on silicon unilateral switches (SUS)	3	0	0	0	0	0	0	6	1	0
A	114	A3-32 Do you perform tasks on step recovery diodes (SRD)	3	0	7	0	0	0	0	1	1	0
A	115	A3-33 Do you perform tasks on field effect diodes (FED)	3	0	14	0	0	0	0	13	1	0
A	116	A3-34 Do you perform tasks on DIAC (Bi-directional trigger diode)	3	0	0	0	0	0	0	14	2	0
A	117	A3-35 Do you perform tasks on varistors	7	21	4	0	0	1	0	33	2	0
A	118	A3-36 Do you perform tasks on metal oxide varistors (MOV)	3	0	0	0	0	0	0	20	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
A	119	A3-37 Do you perform tasks on schottky diodes	3	0	18	0	0	0	0	26	1	0
0085		22b. Isolate faulty special purpose devices 2b										
A	99	A3-17 Do you troubleshoot circuits to isolate a faulty solid-state special purpose device	14	16	25	0	0	3	2	60	2	3
0086		23. Electron Tubes										
0087		23a. Theory of operation B										
A	120	A4-1 Do you trace block diagrams of circuits containing electron tubes	97	21	11	5	0	0	0	13	2	1
A	121	A4-2 Do you trace schematic diagrams of electron tube circuits	86	11	7	0	0	0	0	12	1	1
A	125	A4-6 Do you perform tasks on diode tubes	28	0	4	0	0	1	0	10	0	0
A	126	A4-7 Do you perform tasks on triode tubes	21	0	4	0	0	0	0	9	0	0
A	127	A4-8 Do you perform tasks on tetrode tubes	10	0	4	0	0	0	0	8	0	0
A	128	A4-9 Do you perform tasks on pentode tubes	24	0	0	0	0	0	0	8	0	0
A	129	A4-10 Do you perform tasks on beam power tubes	14	0	0	0	0	0	0	4	0	1
A	130	A4-11 Do you perform tasks on gas tubes	24	0	4	0	0	0	0	7	0	3
A	131	A4-12 Do you perform tasks on phantastrons	10	0	0	0	0	0	0	1	0	0
A	132	A4-13 Do you perform tasks on neon tubes	7	0	0	0	0	0	0	3	0	0
A	133	A4-14 Do you perform tasks on xenon tubes	7	0	0	0	0	0	0	2	0	3
A	134	A4-15 Do you perform tasks on nixie tubes	3	0	4	0	0	0	0	5	0	0
0088		23b. Isolate faulty tubes -										
A	122	A4-3 Do you troubleshoot circuits to isolate a faulty electron tube	86	11	11	0	0	0	0	12	0	1
0089		23c. Specifications -										
A	123	A4-4 Do you use electron tube characteristic curves	3	0	4	0	0	0	0	6	0	2
A	124	A4-5 Do you use electron tube substitution manuals or charts	17	0	4	0	0	0	0	8	0	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0090		24. Cathode Ray Tubes (CRT)											
0091		24a. Theory of operation	B										
A	135	A4-16 Do you trace block diagrams of circuits containing cathode ray tubes (CRT)		90	58	25	26	0	0	0	22	3	0
A	136	A4-17 Do you trace schematic diagrams of CRT circuits		93	42	18	11	0	0	0	21	1	0
A	138	A4-19 Do you adjust or calibrate circuits that control-CRT operations		90	47	7	0	0	0	0	19	1	1
A	139	A4-20 Do you perform tasks on electrostatic CRT		28	26	7	5	0	0	0	11	1	0
A	140	A4-21 Do you perform tasks on electromagnetic CRT		14	11	11	11	0	0	0	12	2	1
0092		24b. Isolate faulty CRTs	2b										
A	137	A4-18 Do you troubleshoot to isolate a faulty CRT		86	47	21	21	0	0	0	20	1	1
0093		25. Solder/Desolder											
0094		25a. Terminal connections	2b										
A	141	A5-1 Do you solder or desolder hardwire connections		100	84	39	68	6	44	27	78	5	9
A	142	A5-2 Do you solder or desolder component connections such as resistors, capacitors, diodes, transformers, etc		59	58	25	0	2	27	8	76	4	8
0095		25b. P C Boards	2b										
A	143	A5-3 Do you solder or desolder printed circuit board connections		14	32	18	0	1	10	2	69	2	5
A	144	A5-4 Do you solder or desolder multi-layer circuit board connections		10	11	14	0	0	5	1	38	1	3
A	145	A5-5 Do you perform high reliability soldering		31	42	25	26	4	25	10	63	1	3

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0096		25c. Multipin connectors 2b										
A 149		A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	66	26	57	68	3	16	15	69	4	3
A 152		A5-12 Do you repair or fabricate connectors or cables on ribbon cables	3	16	7	5	1	2	5	61	4	5
0097		25d. Coaxial connectors -										
A 150		A5-10 Do you repair or fabricate connectors or cables on coaxial cables	100	100	54	74	2	22	21	65	4	6
A 151		A5-11 Do you repair or fabricate connectors or cables on triaxial cables	10	5	21	32	1	7	7	19	0	1
0098		26. Assemble Solderless Connectors										
0099		26a. Crimp 2b										
A 146		A5-6 Do you use crimping tool to repair or make connections	97	95	79	79	11	51	19	79	4	9
A 147		A5-7 Do you use wire wrap tool to make connections	31	32	25	5	3	19	7	69	4	4
A 148		A5-8 Do you use punch-on tool to make connections	21	11	11	5	1	12	4	31	1	2
0100		26b. Coaxial 2b										
A 150		A5-10 Do you repair or fabricate connectors or cables on coaxial cables	100	100	54	74	2	22	21	65	4	6
A 151		A5-11 Do you repair or fabricate connectors or cables on triaxial cables	10	5	21	32	1	7	7	19	0	1
0101		26c. Multipin 2b										
A 149		A5-9 Do you repair or fabricate connectors or cables on multiconductor cables	66	26	57	68	3	16	15	69	4	3
A 152		A5-12 Do you repair or fabricate connectors or cables on ribbon cables	3	16	7	5	1	2	5	61	4	5

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0102		27. Use Test Equipment Usage										
0103		27a. Multimeter, analog 2b										
B	153	B1-1 Do you use the multimeter to measure DC voltage values	100	100	71	74	27	68	44	81	4	11
B	154	B1-2 Do you use the multimeter to measure AC voltage values	100	100	68	74	18	58	34	81	4	9
B	155	B1-3 Do you use the multimeter to extend the range of voltmeters using external shunts	59	26	11	26	7	12	9	26	0	5
B	156	B1-4 Do you use the multimeter to measure DC current values	100	84	43	42	23	47	33	70	3	8
B	157	B1-5 Do you use the multimeter to measure AC current values	90	84	43	42	15	41	26	71	3	6
B	158	B1-6 Do you use the multimeter to extend the range of ammeters using external shunts	28	0	7	21	5	7	7	23	0	2
B	159	B1-7 Do you use the multimeter to measure circuit resistance	100	74	75	53	35	48	53	69	4	10
B	160	B1-8 Do you use the multimeter to measure component resistance	97	74	64	21	26	40	47	75	3	8
0104		27b. Oscilloscope 2b										
B	161	B2-1 Do you use the oscilloscope to measure time to determine frequency	79	79	21	68	0	3	0	69	16	3
B	162	B2-2 Do you use the oscilloscope to measure time (rise, fall, pulse width, etc)	100	74	29	79	0	4	1	71	24	4
B	163	B2-3 Do you use the oscilloscope to measure AC voltage	97	63	29	53	1	4	0	68	4	7
B	164	B2-4 Do you use the oscilloscope to measure DC voltage	90	63	29	53	1	4	0	72	8	8
B	165	B2-5 Do you use the oscilloscope to measure ripple voltages	48	37	21	53	0	2	0	63	3	3
B	166	B2-6 Do you use the oscilloscope to measure phase jitters	17	58	21	21	0	0	0	35	0	2
B	167	B2-7 Do you use the oscilloscope to observe signal/data patterns	66	53	25	58	0	1	0	65	15	8
B	168	B2-8 Do you use the oscilloscope to observe lissajous patterns	14	0	11	5	0	0	0	15	1	1
B	169	B2-9 Do you use the oscilloscope to observe phase relationships	55	58	21	32	0	1	0	63	10	2
B	170	B2-10 Do you use attenuator probes with oscilloscopes	66	32	21	68	0	1	0	51	3	4
B	171	B2-11 Do you use delay time multipliers with oscilloscopes	14	32	18	11	0	1	0	24	5	1
0105		27c. Signal Generator 2b										
B	172	B3-1 Do you use signal generators (SG) to perform operational checks	48	37	11	47	2	1	1	65	14	1

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
B	173	B3-2 Do you use SG to perform alignments, adjustments, or calibrations		48	37	14	16	1	1	0	66	16	0
B	174	B3-3 Do you use SG to troubleshoot circuits		45	16	11	37	1	1	0	58	5	0
0106		27d. Frequency counter	2b										
B	185	B4-1 Do you use frequency counters		93	58	18	26	1	2	2	69	3	3
0107		27e. Spectrum Analyzer	2b										
B	186	B4-2 Do you use spectrum analyzers		48	53	18	84	0	0	1	36	4	5
0108		27f. Field strength tester	-										
B	187	B4-3 Do you use field strength testers		7	0	0	5	0	1	0	12	1	3
0109		27g. Multimeter, digital	2b										
B	188	B4-4 Do you use digital multimeters		100	79	68	79	9	33	28	79	5	11
0110		27h. Digital logic probe	2b										
B	189	B4-5 Do you use digital logic probes		3	11	4	16	0	1	1	57	2	0
0111		27i. Capacitor tester	2b										
B	190	B4-6 Do you use capacitance testers		10	0	4	0	0	1	9	41	0	1
0112		27j. Capacitor substitution box	-										
B	191	B4-7 Do you use capacitor substitution boxes		3	0	0	0	0	0	0	16	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0113		27k. DC restorer										
B	192	B4-8 Do you use DC restorers (CRT rejuvinators)	0	0	0	0	0	0	0	1	0	0
0114		27l. Logic current tracer										
B	193	B4-9 Do you use logic current tracers	0	0	0	21	0	0	0	33	0	1
0115		27m. Tube tester										
B	194	B4-10 Do you use tube testers	48	0	7	5	0	0	0	7	0	0
0116		27n. Logic pulser										
B	195	B4-11 Do you use logic pulsers	3	0	0	11	0	0	1	46	1	0
0117		27o. Logic analyzer 2b										
B	196	B4-12 Do you use logic analyzers	3	11	0	47	0	0	1	33	2	0
0118		27p. Signature analyzer										
B	197	B4-13 Do you use signature analyzers	10	0	0	5	0	0	0	15	0	0
0119		27q. Reflectometer 2b										
B	198	B4-14 Do you use reflectometers	34	5	14	47	0	1	0	15	0	0
0120		28. Transistor Amplifier Circuits (Common Emitter, Common Collector, Common Base)										

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
	0121	28a. Theory of operation										
	0122	28a(1). Amplifier circuits B										
C	199	C1-1 Do you trace block diagrams of circuits containing transistor amplifiers	28	42	14	16	0	1	0	64	7	2
C	200	C1-2 Do you trace schematic diagrams of transistor amplifier circuits	24	21	11	5	0	0	0	65	6	1
C	204	C1-6 Do you adjust or align transistor amplifiers	7	16	7	0	0	0	0	47	2	1
C	206	C1-8 Do you calculate values of transistor amplifier voltage, current or power gain	3	5	4	0	0	0	0	34	1	1
C	207	C1-9 Do you work on compound-connected (Darlington Pair) transistor amplifiers	3	16	0	5	0	0	0	45	2	1
C	208	C1-10 Do you work on cascade-connected transistor amplifiers	3	16	4	5	0	0	0	41	2	0
C	209	C1-11 Do you work on paraphase transistor amplifiers	3	11	0	0	0	0	0	13	1	0
C	210	C1-12 Do you work on push-pull transistor amplifiers	7	16	7	0	0	0	0	53	2	1
C	211	C1-13 Do you work on audio transistor amplifiers	0	11	0	0	0	0	0	35	2	0
C	212	C1-14 Do you work on wideband transistor amplifiers	3	11	0	5	0	0	0	32	2	0
C	213	C1-15 Do you work on IF transistor amplifiers	21	37	7	11	0	0	0	26	2	0
C	214	C1-16 Do you work on RF transistor amplifiers	17	37	11	11	0	0	0	28	2	0
C	215	C1-17 Do you work on buffer transistor amplifiers	7	16	7	5	0	0	0	49	1	0
C	216	C1-18 Do you work on complementary symmetry transistor amplifiers	3	16	0	0	0	0	0	29	2	0
C	217	C1-19 Do you work on DC transistor amplifiers (switching applications)	7	21	11	5	0	0	0	42	3	1
	0123	28a(2). Stabilization circuits B										
C	218	C2-1 Do you trace schematic diagrams of amplifier stabilization circuits	3	5	7	0	0	0	0	42	3	0
C	220	C2-3 Do you perform tasks on emitter (swamping) resistor stabilization amplifiers	3	11	0	0	0	0	0	42	0	0
C	221	C2-4 Do you perform tasks on self-bias stabilization amplifiers	7	0	0	0	0	0	0	36	0	0
C	222	C2-5 Do you perform tasks on thermistor stabilization amplifiers	0	11	4	0	0	0	0	28	0	0
C	223	C2-6 Do you perform tasks on diode stabilization amplifiers	7	11	4	0	0	0	0	38	0	0
C	224	C2-7 Do you perform tasks on double diode stabilization amplifiers	3	0	4	0	0	0	0	21	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0124		28a(3). Coupling circuits B										
C	225	C3-1 Do you trace block diagrams of circuits containing coupling circuits	10	21	14	16	0	1	0	57	3	1
C	226	C3-2 Do you trace schematic diagrams of coupling circuits	10	21	14	5	0	1	0	52	2	0
C	229	C3-5 Do you perform tasks on direct coupling circuits	10	21	4	0	0	0	0	55	1	1
C	230	C3-6 Do you perform tasks on capacitive-resistive coupling circuits	7	11	4	0	0	0	0	47	1	1
C	231	C3-7 Do you perform tasks on capacitive-inductive coupling circuits	3	11	4	0	0	0	0	42	0	0
C	232	C3-8 Do you perform tasks on transformer coupling circuits	10	16	11	0	0	0	0	48	0	1
C	233	C3-9 Do you perform tasks on optical coupling circuits	0	11	0	0	0	0	0	20	0	0
0125		28b. Isolate faulty amplifier circuits 2b										
C	201	C1-3 Do you troubleshoot to isolate a faulty transistor amplifier	21	11	11	5	0	1	0	60	3	1
C	205	C1-7 Do you measure transistor amplifier voltage, current, or power gain	7	16	7	0	0	0	0	44	3	1
C	227	C3-3 Do you troubleshoot circuits to isolate a faulty coupling circuit	10	11	7	0	0	0	1	42	1	0
0126		28c. Troubleshoot circuits 2b										
C	202	C1-4 Do you troubleshoot transistor amplifiers to circuit level components	3	5	11	0	0	0	0	51	1	1
C	203	C1-5 Do you troubleshoot transistor amplifier distortion	3	5	4	0	0	0	0	38	1	1
C	219	C2-2 Do you troubleshoot amplifier stabilization circuits to circuit level components	3	0	4	0	0	0	0	33	1	0
C	228	C3-4 Do you troubleshoot coupling circuits to circuit level components	3	5	0	0	0	0	0	40	1	0
0127		29. Electron Tube Amplifiers										

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0128		29a. Theory of operation -										
C	234	C4-1 Do you trace block diagrams of circuits containing electron tube amplifiers	76	5	4	5	0	0	0	6	0	0
C	235	C4-2 Do you trace schematic diagrams of electron tube amplifiers	66	5	4	0	0	0	0	6	0	0
C	239	C4-6 Do you adjust or align electron tube amplifiers	17	5	0	0	0	0	0	4	0	0
C	241	C4-8 Do you calculate values of electron tube amplifier voltage, current, or power gain	3	0	0	0	0	0	0	4	0	0
C	242	C4-9 Do you perform tasks on paraphase electron tube amplifiers	7	0	0	0	0	0	0	3	0	0
C	243	C4-10 Do you perform tasks on push-pull electron tube amplifiers	10	0	0	0	0	0	0	3	0	0
C	244	C4-11 Do you perform tasks on audio electron tube amplifiers	3	0	0	0	0	0	0	2	0	0
C	245	C4-12 Do you perform tasks on voltage regulator electron tube amplifiers	48	0	4	0	0	0	0	3	0	0
C	246	C4-13 Do you perform tasks on common grid electron tube amplifiers	21	0	0	0	0	0	0	3	0	0
C	247	C4-14 Do you perform tasks on common cathode electron tube amplifiers	28	0	0	0	0	0	0	3	0	0
C	248	C4-15 Do you perform tasks on cathode follower electron tube amplifiers	31	0	0	0	0	0	0	3	0	0
0129		29b. Isolate faulty tube amplifiers -										
C	236	C4-3 Do you troubleshoot to isolate a faulty electron tube amplifier	62	5	4	0	0	0	0	5	0	0
C	240	C4-7 Do you measure electron tube amplifier voltage, current, or power gain	41	0	0	0	0	0	0	4	0	0
0130		29c. Troubleshoot circuits -										
C	237	C4-4 Do you troubleshoot electron tube amplifiers to circuit level components	31	0	0	0	0	0	0	5	0	0
C	238	C4-5 Do you troubleshoot electron tube amplifier distortion	7	5	0	0	0	0	0	4	0	0
0131		30. Operational Amplifiers										

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0132		30a. Theory of operation B										
C	249	C5-1 Do you trace block or schematic diagrams of circuits containing operational amplifiers (op amps)	21	26	14	21	0	0	0	69	7	3
C	251	C5-3 Do you calculate op amp gain	0	0	0	0	0	0	0	33	1	0
C	252	C5-4 Do you adjust op amp bias, offsets, or drift	3	5	4	0	0	0	0	47	2	0
C	253	C5-5 Do you use or apply operational amplifiers for general purpose (inverting or non-inverting)	21	16	7	11	0	0	0	58	4	0
C	254	C5-6 Do you use or apply operational amplifiers as differential/comparators	7	16	4	11	0	0	0	52	3	0
C	255	C5-7 Do you use or apply operational amplifiers for summing	3	5	4	11	0	0	0	42	2	0
C	256	C5-8 Do you use or apply operational amplifiers for unity gain amplifier (buffer)	3	16	4	11	0	0	0	45	3	0
C	257	C5-9 Do you use or apply operational amplifiers as active filters	3	0	0	16	0	0	0	44	2	0
C	258	C5-10 Do you use or apply operational amplifiers as oscillators	7	21	4	16	0	0	0	42	2	0
C	259	C5-11 Do you use or apply operational amplifiers as integrators	3	16	4	11	0	0	0	28	1	0
C	260	C5-12 Do you use or apply operational amplifiers for differentiators	3	16	0	5	0	0	0	39	1	0
C	261	C5-13 Do you use or apply operational amplifiers for power supplies (voltage regulators)	24	16	11	5	1	0	1	54	4	2
C	262	C5-14 Do you use or apply operational amplifiers as analog/digital (A/D) digital/analog (D/A) converters	28	11	14	21	0	0	0	54	9	3
C	263	C5-15 Do you use or apply operational amplifiers as multivibrators	14	11	7	5	0	0	0	39	1	0
C	264	C5-16 Do you use or apply operational amplifiers as modulators/demodulators	17	11	7	5	0	0	0	37	1	0
0133		30b. Isolate faulty Op Amps -										
C	250	C5-2 Do you troubleshoot to isolate a faulty op amp circuit	17	0	7	0	0	0	0	58	2	2
0134		31. Magnetic Amplifiers										

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0135		31a. Thsory of operation -										
C	265	C6-1 Do you trace block diagrams of circuits containing magnetic amplifiers	48	0	0	0	0	0	0	3	0	0
C	266	C6-2 Do you trace schematic diagrams of magnetic amplifier circuits	59	0	0	0	0	0	0	3	0	0
C	269	C6-5 Do you adjust magnetic amplifiers or components	7	0	0	0	0	0	0	3	0	0
0136		31b. Isolate faulty magnetic amplifiers -										
C	267	C6-3 Do you troubleshoot to isolate a faulty magnetic amplifier	55	0	0	0	0	0	0	3	0	0
0137		31c. Troubleshoot circuits -										
C	268	C6-4 Do you troubleshoot magnetic amplifiers to circuit level components	10	0	0	0	0	0	0	3	0	0
0138		32. Saturable Reactors										
0139		32a. Theory of operation -										
C	270	C6-6 Do you trace block diagrams of circuits containing saturable reactors	0	5	0	0	0	0	0	1	0	0
C	271	C6-7 Do you trace schematic diagrams of saturable reactor circuits	0	5	0	0	0	0	0	1	0	0
C	274	C6-10 Do you adjust saturable reactor circuits or components	0	5	0	0	0	0	0	1	0	0
0140		32b. Isolate faulty saturable reactors -										
C	272	C6-8 Do you troubleshoot to isolate a faulty saturable reactor	0	5	0	0	0	0	0	1	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0141		32c. Troubleshoot circuits										
C	273	C6-9 Do you troubleshoot saturable reactors to circuit level components	0	5	0	0	0	0	0	1	0	0
0142		33. Power Supply Circuits (Half-wave, Full-wave, Full-wave bridge)										
0143		33a. Theory of operation										
0144		33a(1). Rectifiers (Half-wave, Full-wave, Full-wave bridge) B										
D	275	D1-1 Do you trace block diagrams of circuits containing power supplies	86	68	61	53	1	16	8	78	9	8
D	276	D1-2 Do you trace schematic diagrams of power supply circuits	100	63	54	21	1	13	7	74	6	8
D	279	D1-5 Do you align or adjust power supplies	93	53	18	0	1	3	12	72	3	6
D	280	D1-6 Do you perform tasks on half-wave rectifier power supplies	14	11	7	5	0	1	0	47	2	3
D	281	D1-7 Do you perform tasks on full-wave rectifier power supplies	24	16	11	5	0	1	0	53	2	2
D	282	D1-8 Do you perform tasks on full-wave bridge rectifier power supplies	28	16	14	5	0	1	0	61	2	3
D	283	D1-9 Do you perform tasks on three-phase rectifier power supplies	17	16	7	5	0	1	1	25	1	1
0145		33a(2). Filters (Capacitive, Inductive, L-Section, Pi-Section) B										
D	288	D2-1 Do you trace block diagrams of circuits containing power supply filters	28	26	11	5	0	1	0	56	5	1
D	289	D2-2 Do you trace schematic diagrams of power supply filters	24	16	11	0	0	1	0	56	3	1
D	292	D2-5 Do you perform tasks on capacitive power supply filters	14	5	7	5	0	0	0	51	2	1
D	293	D2-6 Do you perform tasks on inductive power supply filters	7	0	7	5	0	0	0	40	1	0
D	294	D2-7 Do you perform tasks on L-type power supply filters	3	0	4	5	0	0	0	24	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
D	295	D2-8 Do you perform tasks on Pi-type power supply filters	3	0	0	5	0	0	0	22	1	0
D	296	D2-9 Do you perform tasks on T-type power supply filters	3	0	0	5	0	0	0	19	1	0
D	297	D2-10 Do you perform tasks on resistive capacitive (RC) power supply filters	14	0	7	5	0	0	0	46	2	1
D	298	D2-11 Do you perform tasks on inductive capacitive (LC) power supply filters	7	0	7	5	0	0	0	42	1	0
0146		33b. Isolate faulty power supplies 2b										
D	277	D1-3 Do you troubleshoot circuits to isolate a faulty power supply	100	68	54	21	1	18	12	66	4	7
D	290	D2-3 Do you troubleshoot circuits to isolate a faulty power supply filter	17	16	11	0	0	1	0	47	1	2
0147		33c. Troubleshoot circuits 2b										
D	278	D1-4 Do you troubleshoot power supplies to circuit level components	55	16	14	5	1	5	5	55	1	2
D	291	D2-4 Do you troubleshoot power supply filters to circuit level components	7	5	4	0	0	1	0	40	1	1
0148		34. Voltage Regulators (Shunt, Series EVR, IC EVR)										
0149		34a. Theory of operation B										
D	299	D3-1 Do you trace block diagrams of circuits containing power supply voltage regulators	69	32	25	5	0	2	1	69	5	3
D	300	D3-2 Do you trace schematic diagrams of power supply voltage regulator circuits	62	21	25	0	0	2	1	66	4	1
D	303	D3-5 Do you perform tasks on variable resistor power supply voltage regulators	59	11	4	5	0	1	1	53	2	0
D	304	D3-6 Do you perform tasks on zener diode power supply voltage regulators	17	5	7	5	0	1	0	56	2	0
D	305	D3-7 Do you perform tasks on transistor series power supply voltage regulators	7	5	0	5	0	0	0	54	2	0
D	306	D3-8 Do you perform tasks on IC power supply voltage regulators	3	11	7	5	0	0	0	49	2	1
D	307	D3-9 Do you perform tasks on pulse width modulator power supply voltage regulators	7	11	0	5	0	0	0	24	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
D	308	D3-10 Do you perform tasks on transistor series power supply voltage regulators with current limiting	3	11	4	5	0	0	0	40	1	1
D	309	D3-11 Do you perform tasks on crow bar power supply voltage regulators	0	0	7	0	0	0	1	50	2	1
	0150	34b. Isolate faulty voltage regulators 2b										
D	301	D3-3 Do you troubleshoot circuits to isolate a faulty power supply voltage regulator	69	16	25	0	0	2	1	58	2	1
	0151	34c. Troubleshoot circuits 2b										
D	302	D3-4 Do you troubleshoot power supply voltage regulators to circuit level components	24	5	7	0	0	1	0	50	1	0
	0152	35. Resistive/Capacitive/Inductive (RCL) Circuits										
	0153	35a. Basic operation B										
E	310	E1-1 Do you trace schematic or block diagrams of circuits containing resistive capacitive inductive (RCL) circuits	7	16	0	11	0	0	1	40	3	1
	0154	35b. Resonant operation B										
E	312	E1-3 Do you trace schematic or block diagrams of circuits containing resonant RCL circuits	7	11	0	11	0	0	0	32	2	0
	0155	35c. Troubleshoot circuits 2b										
E	311	E1-2 Do you troubleshoot RCL circuits to circuit level components	7	0	0	0	0	0	1	33	0	0
E	313	E1-4 Do you troubleshoot resonant RCL circuits to circuit level components	7	0	0	0	0	0	0	28	0	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
	0156	35d. Calculations	B										
E	314	E1-5 Do you calculate values of impedance, voltage, or current in RCL circuits		0	0	0	0	0	0	3	17	1	1
E	315	E1-6 Do you calculate phase angle of RCL circuits		0	0	0	0	0	0	0	13	1	0
E	316	E1-7 Do you calculate values of power in RCL circuits		0	0	0	0	0	0	2	13	1	0
	0157	36. Frequency Sensitive Filters (Low Pass, High Pass, Band Pass, Band Reject)											
	0158	36a. Theory of operation	B										
E	317	E2-1 Do you trace schematic or block diagrams of circuits containing frequency sensitive filters		10	5	0	21	0	0	0	53	5	0
E	320	E2-4 Do you align or adjust frequency sensitive filters		0	0	0	0	0	0	0	42	3	0
E	322	E2-6 Do you perform tasks on low pass frequency sensitive filters		3	5	4	11	0	0	0	45	5	0
E	323	E2-7 Do you perform tasks on high pass frequency sensitive filters		3	5	4	11	0	0	0	41	4	0
E	324	E2-8 Do you perform tasks on band pass frequency sensitive filters		7	0	4	11	0	0	0	51	4	0
E	325	E2-9 Do you perform tasks on band-reject frequency sensitive filters		3	0	4	11	0	0	0	29	2	0
E	326	E2-10 Do you perform tasks on ferrite bead frequency sensitive filters		3	0	0	5	0	0	0	8	1	0
	0159	36b. Isolate faulty frequency sensitive filters	2b										
E	318	E2-2 Do you troubleshoot circuits to isolate a faulty frequency sensitive filter		10	5	0	5	0	0	0	46	2	0
	0160	36c. Troubleshoot circuits	2b										
E	319	E2-3 Do you troubleshoot frequency sensitive filters to circuit level components		7	0	0	0	0	0	0	32	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0161		36d. Calculations -										
E	321	E2-5 Do you calculate capacitance or inductance values for specific frequency sensitive filters	0	0	0	0	0	0	0	19	1	0
0162		37. Wave Generating Circuits										
0163		37a. Theory of operation										
0164		37a(1). Oscillators (LC, RC, Crystal) B										
F	327	F1-1 Do you trace block diagrams of circuits containing oscillators	55	32	11	16	0	0	0	56	4	0
F	328	F1-2 Do you trace schematic diagrams of oscillator circuits	38	16	11	11	0	0	0	54	2	0
F	331	F1-5 Do you align or adjust oscillator circuits	41	16	7	0	0	0	0	52	2	0
F	332	F1-6 Do the oscillators you work with use LC tank circuits	3	0	4	5	0	0	0	33	2	0
F	333	F1-7 Do the oscillators you work with use RC networks	21	0	7	5	0	0	0	40	2	0
F	334	F1-8 Do the oscillators you work with use crystals	66	26	7	5	0	0	0	52	2	1
F	335	F1-9 Do the oscillators you work with use phase lock loops (PLL)	3	0	4	5	0	0	0	38	2	0
F	336	F1-10 Do you perform tasks on series Hartley oscillator circuits	0	0	4	0	0	0	0	21	1	0
F	337	F1-11 Do you perform tasks on shunt Hartley oscillator circuits	0	0	4	0	0	0	0	22	2	0
F	338	F1-12 Do you perform tasks on Colpitts oscillator circuits	3	0	0	0	0	0	0	21	2	0
F	339	F1-13 Do you perform tasks on Clapp oscillator circuits	0	0	0	5	0	0	0	15	1	0
F	340	F1-14 Do you perform tasks on voltage control oscillators (VCO/VTD)	10	16	11	16	0	0	0	42	2	0
F	341	F1-15 Do you perform tasks on crystal oscillator circuits	45	16	4	0	0	0	0	46	2	0
F	342	F1-16 Do you perform tasks on Wien bridge oscillator circuits	0	0	0	5	0	0	0	13	1	0
F	343	F1-17 Do you perform tasks on pulse generating oscillator circuits	24	0	0	5	0	0	0	22	2	0
F	344	F1-18 Do you perform tasks on blocked/blocking oscillator circuits	17	0	0	5	0	0	0	7	1	0
F	345	F1-19 Do you perform tasks on burst generators	3	0	0	0	0	0	0	5	1	0
F	346	F1-20 Do you perform tasks on RC phase shift oscillators	17	0	0	5	0	0	0	15	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0165		37a(2). Multivibrators (Astable, Bistable, B Monostable)										
F	347	F2-1 Do you trace block diagrams of circuits containing multivibrators	45	16	4	11	0	0	0	42	3	0
F	348	F2-2 Do you trace schematic diagrams of multivibrator circuits	45	5	4	0	0	0	0	42	2	0
F	351	F2-5 Do you adjust or align multivibrator circuits	21	5	4	0	0	0	0	35	0	0
F	352	F2-6 Do the multivibrators you work with use LC tank circuits	10	0	0	5	0	0	0	25	1	0
F	353	F2-7 Do the multivibrators you work with use RC networks	17	0	4	5	0	0	0	36	2	0
F	354	F2-8 Do the multivibrators you work with use Crystals	17	11	4	5	0	0	0	31	1	0
F	355	F2-9 Do you perform tasks on astable (free running) multivibrators	24	0	0	5	0	0	0	34	2	0
F	356	F2-10 Do you perform tasks on monostable (one shot) multivibrators	10	11	4	5	0	0	0	35	2	0
F	357	F2-11 Do you perform tasks on bistable (flip flop) multivibrators	10	5	4	5	0	0	0	38	3	0
F	358	F2-12 Do you perform tasks on triggered astable multivibrators	7	5	4	5	0	0	0	28	2	0
0166		37a(3). Waveshaping Circuits (Schmitt Trigger, Sawtooth, RC Integ/Diff) B										
F	359	F3-1 Do you trace block diagrams of circuits containing waveshaping circuits (WSC)	24	16	4	21	0	0	0	31	2	0
F	360	F3-2 Do you trace schematic diagrams of WSC	17	11	4	5	0	0	0	32	1	0
F	363	F3-5 Do you adjust or calibrate WSC	21	16	0	0	0	0	0	25	1	0
F	364	F3-6 Do you perform tasks on sawtooth wave generator WSC	24	11	4	11	0	0	0	24	2	0
F	365	F3-7 Do you perform tasks on trapazoidal (ramp) wave generator WSC	7	0	0	11	0	0	0	24	1	0
F	366	F3-8 Do you perform tasks on RC differentiating WSC	3	0	0	5	0	0	0	21	1	0
F	367	F3-9 Do you perform tasks on RL differentiating WSC	3	0	0	5	0	0	0	14	1	0
F	368	F3-10 Do you perform tasks on RC integrating WSC	3	0	0	5	0	0	0	20	1	0
F	369	F3-11 Do you perform tasks on RL integrating WSC	3	0	0	5	0	0	0	14	-	0
F	370	F3-12 Do you perform tasks on square wave generator WSC	28	11	4	11	0	0	0	30	\	0
F	371	F3-13 Do you perform tasks on rectangular wave generator WSC	10	5	0	11	0	0	0	22	1	0
F	372	F3-14 Do you perform tasks on Schmitt trigger WSC	14	0	4	5	0	0	0	31	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0167		37b. Isolate faulty wave generating circuits 2b										
F	329	F1-3 Do you troubleshoot to isolate a faulty oscillator circuit	45	16	11	0	0	0	0	47	1	0
F	349	F2-3 Do you troubleshoot to isolate a faulty multivibrator circuit	41	0	0	0	0	0	0	38	1	0
F	361	F3-3 Do you troubleshoot to isolate a faulty WSC	24	11	0	0	0	0	0	26	0	0
0168		37c. Troubleshoot circuits 2b										
F	330	F1-4 Do you troubleshoot oscillators to circuit level components	24	0	4	0	0	0	0	35	1	0
F	350	F2-4 Do you troubleshoot multivibrators to circuit level components	10	0	0	0	0	0	0	31	1	0
F	362	F3-4 Do you troubleshoot WSC to circuit level components	10	0	0	0	0	0	0	22	0	0
0169		38. Limiter Circuits (Diode, Zener Diode, Transistor)										
0170		38a. Theory of operation										
F	373	F4-1 Do you trace block diagrams of circuits containing limiters	10	11	0	16	0	0	0	35	2	0
F	374	F4-2 Do you trace schematic diagrams of limiter circuits	7	5	0	5	0	0	0	35	2	0
F	381	F4-9 Do you perform tasks on series dicde limiter circuits	7	0	0	5	0	0	0	25	1	0
F	382	F4-10 Do you perform tasks on shunt diode limiter circuits	0	0	0	5	0	0	0	26	1	0
F	383	F4-11 Do you perform tasks on bias limiter circuits	3	0	0	5	0	0	0	21	1	0
F	384	F4-12 Do you perform tasks on zener diode circuits	10	11	0	5	0	0	0	30	1	1
F	385	F4-13 Do you perform tasks on transistor limiter circuits	10	0	0	5	0	0	0	26	1	0
F	386	F4-14 Do you perform tasks on triode limiter circuits	7	0	0	5	0	0	0	10	0	0
0171		38b. Isolate faulty limiters 2b										
F	377	F4-5 Do you troubleshoot to isolate a faulty limiter circuit	10	0	0	5	0	0	0	31	0	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0172		38c. Troubleshoot circuits	2b										
F 378		F4-6 Do you troubleshoot limiters to circuit level components		3	0	0	0	0	0	0	25	0	0
0173		39. Clamper Circuits											
0174		39a. Theory of operation	B										
F 375		F4-3 Do you trace block diagrams of circuits containing clampers		7	5	0	11	0	0	0	32	2	0
F 376		F4-4 Do you trace schematic diagrams of clamper circuits		0	5	0	0	0	0	0	31	2	0
F 387		F4-15 Do you perform tasks . . diode clamper circuits		7	0	0	5	0	0	0	28	0	0
F 388		F4-16 Do you perform tasks on bias clamper circuits		0	5	0	5	0	0	0	19	1	0
0175		39b. Isolate faulty clampers	2b										
F 379		F4-7 Do you troubleshoot to isolate a faulty clamper circuit		3	0	0	0	0	0	0	29	0	0
0176		39c. Troubleshoot circuits	2b										
F 380		F4-8 Do you troubleshoot clampers to circuit level components		0	0	0	0	0	0	0	23	0	0
0177		40. Digital Numbering Systems (Binary, Octal, Hexadecimal)											
0178		40a. Conversions	B										
G 389		G1-1 Do you convert decimal numbers to binary numbers or binary numbers to decimal		0	26	50	42	0	2	1	56	32	11
G 390		G1-2 Do you convert octal numbers to binary or binary numbers to octal		0	11	29	32	0	1	0	39	24	6

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	391	G1-3 Do you convert hexadecimal numbers to binary or binary numbers to hexadecimal	0	16	50	47	1	1	0	53	32	9
G	392	G1-4 Do you convert octal numbers to decimal or decimal numbers to octal	0	11	25	32	0	1	0	37	24	6
G	393	G1-5 Do you convert hexadecimal numbers to decimal or decimal numbers to hexadecimal	0	21	54	42	0	1	0	52	35	9
G	394	G1-6 Do you convert octal numbers to hexadecimal or hexadecimal numbers to octal	0	11	25	32	0	0	0	33	19	5
G	395	G1-7 Do you convert base number fractions to another base numbering system	0	11	18	26	0	1	1	27	14	6
	0179	40b. Math operations B										
G	396	G1-8 Do you add binary numbers	0	11	29	26	0	2	1	47	21	10
G	397	G1-9 Do you subtract binary numbers	0	11	25	26	0	2	1	43	20	8
G	398	G1-10 Do you multiply binary numbers	0	5	21	26	0	1	1	31	13	5
G	399	G1-11 Do you divide binary numbers	0	5	21	26	0	1	1	31	12	5
G	400	G1-12 Do you add octal numbers	0	0	21	26	0	1	0	28	17	5
G	401	G1-13 Do you subtract octal numbers	0	0	21	26	0	1	0	28	17	5
G	402	G1-14 Do you add hexadecimal numbers	0	5	25	26	0	0	0	43	18	8
G	403	G1-15 Do you subtract hexadecimal numbers	0	5	25	26	0	0	0	42	19	8
	0180	40c. Binary Code Systems B										
G	404	G1-16 Do you use binary coded decimal (BCD)	0	5	32	32	0	1	0	52	27	9
G	405	G1-17 Do you use gray codes	0	0	14	26	0	0	0	19	6	2
G	406	G1-18 Do you use ICAO codes	0	0	0	11	0	0	0	3	1	0
G	407	G1-19 Do you use excess-3 (XS3) codes	0	0	14	11	0	0	0	6	1	0
G	408	G1-20 Do you use parity bit codes	0	0	32	32	0	0	0	35	11	7
G	409	G1-21 Do you use biquinary codes	0	0	4	5	0	0	0	6	1	0
G	410	G1-22 Do you use ASCII codes	0	16	36	11	1	0	1	51	29	14
G	411	G1-23 Do you use EBCDI codes	0	0	4	5	0	0	0	9	13	10
	0181	41. Digital Logic Functions (Main Logic Gates and Flip-Flops)										
	0182	41a. Theory of operation B										
G	412	G1-24 Do you trace data flow through logic symbol diagrams	7	21	71	53	0	2	0	63	16	6
G	413	G1-25 Do you trace data flow through logic schematic diagrams	14	21	75	37	0	2	0	60	12	4

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	417	G1-29 Do you trace data flow through circuits using positive logic (High = Binary 1)		0	16	54	32	0	1	0	53	6	2
G	418	G1-30 Do you trace data flow through circuits using negative logic (High = Binary 0)		0	16	43	26	0	1	0	47	5	1
G	419	G1-31 Do you perform tasks related to AND gates		3	21	54	26	0	3	1	62	9	2
G	420	G1-32 Do you perform tasks related to OR gates		3	21	54	26	0	4	1	62	9	2
G	421	G1-33 Do you perform tasks related to inhibited gates logic functions		0	11	43	26	0	2	0	48	5	1
G	422	G1-34 Do you perform tasks related to NAND or NOR gates		0	21	54	26	0	3	1	60	8	2
G	423	G1-35 Do you perform tasks related to exclusive OR/NOR logic functions		0	5	39	26	0	2	1	55	7	0
G	424	G1-36 Do you perform tasks related to RS flip flops		0	16	18	11	0	1	0	51	4	0
G	425	G1-37 Do you perform tasks related to D(Data) flip flops		0	5	21	21	0	1	0	50	4	0
G	426	G1-38 Do you perform tasks related to T(Toggle) flip flops		0	11	18	21	0	1	0	47	2	0
G	427	G1-39 Do you perform tasks related to JK flip flops		0	11	18	21	0	0	0	56	5	0
G	428	G1-40 Do you perform tasks related to Schmidt triggers		0	0	18	21	0	0	0	47	2	0
G	429	G1-41 Do you perform tasks related to delay (One-shot) logic functions		3	21	21	21	0	0	0	41	2	0
G	430	G1-42 Do you perform tasks related to open collector gates (wired "AND" or wired "OR")		0	0	21	21	0	0	0	40	2	0
G	431	G1-43 Do you perform tasks related to buffers		0	16	29	21	0	0	0	60	5	1
G	432	G1-44 Do you perform tasks related to inverters		0	21	36	21	0	0	0	59	5	0
G	433	G1-45 Do you perform tasks related to complemented flip flops		0	5	18	21	0	0	0	33	3	0
G	434	G1-46 Do you perform tasks related to complementing flip flops		0	5	18	21	0	0	0	31	3	0
0183		41b. Isolate faulty logic function circuits	2b										
G	414	G1-26 Do you troubleshoot digital systems to major units		10	16	79	53	0	1	0	58	6	2
G	415	G1-27 Do you troubleshoot digital systems subassemblies or circuit cards		7	16	25	0	0	1	0	58	4	1
0184		41c. Troubleshoot circuits	2b										
G	416	G1-28 Do you troubleshoot digital systems, subsystems or circuit cards to circuit level components or IC		0	0	4	0	0	1	0	47	3	1
0185		41d. Logic families (TTL and CMOS)	B										
G	438	G1-50 Do you perform tasks on RTL (resistor transistor logic formally DCTL)		0	0	7	5	0	0	0	25	2	0
G	439	G1-51 Do you perform tasks on DTL (diode transistor logic)		0	0	7	5	0	0	0	31	2	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	440	G1-52 Do you perform tasks on TTL (transistor transistor logic)		3	5	14	5	0	0	0	58	3	0
G	441	G1-53 Do you perform tasks on ECL/CML (emitter coupled or current mode logic)		0	0	11	5	0	0	0	18	2	0
G	442	G1-54 Do you perform tasks on HTL (high threshold logic)		0	0	0	5	0	0	0	16	1	0
G	443	G1-55 Do you perform tasks on CMOS (complementary metal oxide semiconductor)		0	0	11	5	0	0	0	53	2	0
G	444	G1-56 Do you perform tasks on positive MOS ICs		0	0	4	5	0	0	0	17	1	0
G	445	G1-57 Do you perform tasks on negative MOS ICs		0	0	4	5	0	0	0	17	1	0
G	446	G1-58 Do you perform tasks on vertical MOS ICs		0	0	0	5	0	0	0	8	1	0
	0186	42. Boolean Equations											
	0187	42a. Diagram to equation	B										
G	435	G1-47 Do you develop Boolean equations from logic circuits or diagrams		0	0	14	0	0	0	0	26	2	0
	0188	42b. Equation to diagram	B										
G	436	G1-48 Do you develop logic diagrams from Boolean equations		0	0	14	0	0	0	0	24	1	0
	0189	42c. Simplify Expressions	-										
G	437	G1-49 Do you simplify Boolean expressions using Boolean algebra		0	0	11	0	0	0	0	24	2	1
	0190	43. Computers											
	0191	43a. Operation principles	B										
G	447	G2-1 Do you trace block or schematic diagrams of computer controlled or computer based systems		14	16	68	63	1	2	1	65	18	10
G	454	G2-8 Do you perform tasks on analog computers		38	5	14	21	3	2	3	20	19	6
G	455	G2-9 Do you perform tasks on digital computers		24	16	89	68	3	3	3	74	67	39

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
	0192	43b. Load programs	2b										
G	448	G2-2 Do you load programs		0	21	82	79	8	5	9	71	65	48
	0193	43c. Write/debug programs	2b										
G	449	G2-3 Do you write or debug programs		0	5	11	0	2	1	3	36	30	26
G	453	G2-7 Do you use computer flow charts or diagrams		0	11	54	32	2	2	3	56	27	18
	0194	43d. Fault isolation	2b										
G	450	G2-4 Do you troubleshoot computers to a major unit		10	16	64	68	1	1	2	63	23	13
G	451	G2-5 Do you troubleshoot computers to a subassembly or circuit card		17	21	36	0	0	1	1	62	7	3
	0195	43e. Circuit troubleshooting	2b										
G	452	G2-6 Do you troubleshoot computer subassembly or circuit card to circuit level components or IC		3	5	4	0	0	0	1	42	2	1
	0196	43f. Types of memories	B										
G	466	G2-20 Do you perform tasks on magnetic (tape, disc, core) computer memories		0	16	68	53	9	4	6	67	67	47
G	467	G2-21 Do you perform tasks on semiconductor (RAM, ROM, EPROM, PROM) computer memories		0	0	54	42	3	1	3	65	35	24
G	468	G2-22 Do you perform tasks on paper (tape, punch card) computer memories		0	16	21	5	2	1	1	13	28	9
G	469	G2-23 Do you perform tasks on advanced technology (bubble, CCD, electron beam, laser, thin film) computer memories		0	0	7	5	0	0	1	24	7	2
	0197	43g. Peripheral devices	B										
G	470	G2-24 Do you perform tasks on computer keyboards		0	16	61	58	15	9	14	70	72	61
G	471	G2-25 Do you perform tasks on computer character printers		0	5	39	5	9	4	10	58	46	43
G	472	G2-26 Do you perform tasks on magnetic tape drives		0	5	46	16	3	1	2	65	54	36

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	473	G2-27 Do you perform tasks on microprocessor computer terminals	0	5	29	5	6	1	5	49	52	45
G	474	G2-28 Do you perform tasks on video display unit (VDU/ monitors)	0	5	43	47	8	4	7	39	50	42
G	475	G2-29 Do you perform tasks on paper tape readers/punches	0	5	14	5	1	0	1	8	31	3
G	476	G2-30 Do you perform tasks on paper card readers/punches	0	0	4	0	0	0	0	3	7	1
G	477	G2-31 Do you perform tasks on toggle or push button switch inputs	0	0	39	32	2	2	3	47	34	9
G	478	G2-32 Do you perform tasks on incandescent displays (Nixie tubes, LEDs, LCDs)	0	5	36	11	1	1	1	42	19	8
G	479	G2-33 Do you perform tasks on modems	0	0	14	11	4	2	4	41	36	13
G	480	G2-34 Do you perform tasks on line printers	0	0	21	5	9	4	9	44	45	42
G	481	G2-35 Do you perform tasks on floppy disc drives	0	0	21	5	12	4	10	39	59	53
G	482	G2-36 Do you perform tasks on removable cartridge disc drives	0	0	18	0	3	1	3	18	32	24
G	483	G2-37 Do you perform tasks on removable pack disc drives	0	0	4	0	2	0	1	43	33	14
G	484	G2-38 Do you perform tasks on fixed winchester type disc drives	0	0	7	0	4	1	2	28	23	23
0198		43h. Programming languages -										
G	456	G2-10 Do you use Basic computer language	3	0	18	0	9	4	9	31	32	35
G	457	G2-11 Do you use COBOL computer language	0	0	4	0	1	0	0	2	1	3
G	458	G2-12 Do you use FORTRAN computer language	0	0	11	0	1	0	1	8	24	30
G	459	G2-13 Do you use ADA computer language	0	0	0	0	0	0	0	2	10	6
G	460	G2-14 Do you use ATLAS computer language	0	0	0	11	0	0	1	0	0	0
G	461	G2-15 Do you use ELAN computer language	0	0	0	0	0	0	0	0	0	0
G	462	G2-16 Do you use PASCAL computer language	0	0	0	5	1	0	0	3	9	9
G	463	G2-17 Do you use RPG computer language	0	0	0	0	0	0	0	0	1	1
G	464	G2-18 Do you use Machine computer language	0	0	4	11	1	0	2	37	12	8
G	465	G2-19 Do you use C computer language	0	0	0	0	1	0	0	2	13	4
0199		44. Microprocessor Controlled Systems										
0200		44a. Theory of operation F										
G	485	G2-39 Do you trace block or schematic diagrams of microprocessor controlled systems	0	5	29	21	0	0	0	53	7	3

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0201		44b. Isolate faulty microprocessors 2b										
G	486	G2-40 Do you troubleshoot microprocessor controlled systems to a subassembly or circuit card	0	5	11	0	0	0	0	47	4	3
G	487	G2-41 Do you troubleshoot microprocessor controlled systems to isolate a faulty microprocessor	0	0	4	0	0	0	0	35	1	2
0202		45. Logic Circuits										
0203		45a. Theory of operation										
0204		45a(1). Counters (Synchronous/ Asynchronous-Up/Down counters) B										
G	488	G3-1 Do you trace data flow through circuits containing counters	3	5	18	5	0	0	0	50	6	0
G	491	G3-4 Do you perform tasks on UP counters in logic circuits	3	5	11	5	0	0	0	42	5	0
G	492	G3-5 Do you perform tasks on DOWN counters in logic circuits	3	5	11	5	0	0	0	40	4	0
G	493	G3-6 Do you perform tasks on DECADE counters in logic circuits	0	0	11	5	0	0	0	39	3	0
G	494	G3-7 Do you perform tasks on ring counters in logic circuits	0	0	11	5	0	0	0	22	2	0
G	495	G3-8 Do you perform tasks on modulous counters in logic circuits	0	0	4	0	0	0	0	13	2	0
G	496	G3-9 Do you perform tasks on synchronous (parallel) counters in logic circuits	3	0	4	5	0	0	0	38	2	0
G	497	G3-10 Do you perform tasks on asynchronous (serial) counters in logic circuits	3	0	4	5	0	0	0	39	2	0
0205		45a(2). Registers (Shift and Storage) B										
G	498	G3-11 Do you trace logic diagrams of circuits containing registers	0	0	21	5	0	0	0	48	5	0
G	501	G3-14 Do you perform tasks on shift registers in logic circuits	0	0	21	5	0	0	0	42	4	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
G	502	G3-15 Do you perform tasks on storage registers in logic circuits	0	0	14	5	0	0	0	44	5	0
	0206	45a(3). Combinational Logic Circuits (Half-adder, Full-adder, encoder, Decoder, Multiplexer, Demultiplexer, Count Detect) B										
G	503	G3-16 Do you trace data flow through combinational logic circuits	3	11	29	5	0	0	0	44	4	1
G	506	G3-19 Do you perform tasks on encoders	0	0	21	5	1	0	1	40	2	0
G	507	G3-20 Do you perform tasks on decoders	0	0	21	5	1	0	1	39	2	0
G	508	G3-21 Do you perform tasks on multiplexers	0	11	32	5	0	0	0	45	3	1
G	509	G3-22 Do you perform tasks on demultiplexers	0	5	29	5	0	0	0	40	2	1
	510	G3-23 Do you perform tasks on comparators	3	5	21	5	0	0	0	40	2	0
G	511	G3-24 Do you perform tasks on parity generators or checkers	0	5	25	5	0	0	0	37	2	0
G	512	G3-25 Do you perform tasks on code converters	0	0	11	5	0	0	0	21	1	0
G	513	G3-26 Do you perform tasks on adders	0	5	14	5	0	0	0	32	1	0
G	514	G3-27 Do you perform tasks on subtractors	0	5	14	5	0	0	0	30	1	0
G	515	G3-28 Do you perform tasks on count detect circuits	0	0	11	5	0	0	0	26	2	1
	0207	45b. Isolate faulty circuits 2b										
G	489	G3-2 Do you troubleshoot counter circuits to isolate a faulty counter	3	5	14	0	0	1	0	43	2	0
G	499	G3-12 Do you troubleshoot circuits containing registers to isolate a faulty register	0	0	18	0	0	0	0	38	1	0
G	504	G3-17 Do you troubleshoot to isolate a faulty combinational logic circuit	3	11	25	0	0	0	0	39	1	0
	0208	45c. Troubleshoot circuits -										
G	490	G3-3 Do you troubleshoot counters to circuit level components	0	0	4	0	0	0	0	36	2	0
G	500	G3-13 Do you troubleshoot registers to circuit level components	0	0	4	0	0	0	0	31	1	0
G	505	G3-18 Do you troubleshoot combinational logic circuits to circuit level components	0	5	4	0	0	0	0	33	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0209		46. D/A, A/D Converters (Approx D/A and Ramp A/D)										
0210		46a. Theory of operation B										
G	516	G4-1 Do you trace data flow through A/D converters	7	11	36	11	0	0	0	57	11	3
G	517	G4-2 Do you trace data flow through D/A converters	7	11	36	11	0	0	0	57	8	2
G	520	G4-5 Do the converters you perform tasks on use flash conversion	0	0	7	0	0	0	0	5	1	2
G	521	G4-6 Do the converters you perform tasks on use successive approximation conversion	0	0	7	0	0	0	0	44	3	3
G	522	G4-7 Do the converters you perform tasks on use ramp conversion	3	0	7	5	0	0	0	31	3	1
G	523	G4-8 Do the converters you perform tasks on use R2R conversion	0	5	11	0	0	0	0	15	1	0
0211		46b. Isolate faulty converters 2b										
G	518	G4-3 Do you troubleshoot A/D converter circuits	10	5	29	0	0	0	0	49	2	1
G	519	G4-4 Do you troubleshoot D/A converter circuits	10	5	29	0	0	0	0	51	2	1
0212		47. Transmission Lines										
0213		47a. Theory of operation B										
H	527	H1-4 Do you construct transmission lines	7	0	7	26	0	0	0	15	1	0
H	528	H1-5 Do you match transmission line impedance with loads	10	0	7	26	0	0	0	15	0	0
H	531	H1-8 Do you perform tasks on open-wire transmission lines	7	5	11	32	0	0	0	17	2	0
H	532	H1-9 Do you perform tasks on twisted pair transmission lines	14	5	36	37	0	1	0	29	2	0
H	533	H1-10 Do you perform tasks on twin lead transmission lines	3	5	0	32	0	0	0	9	2	0
H	534	H1-11 Do you perform tasks on flexible coaxial transmission lines	21	5	25	74	0	1	1	33	2	0
H	535	H1-12 Do you perform tasks on rigid coaxial transmission lines	3	5	7	53	0	0	0	11	1	0
H	536	H1-13 Do you perform tasks on fiber-optic transmission lines	0	0	0	5	0	0	1	8	2	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0214		47b. Perform Measurements	2b										
H	524	H1-1 Do you measure electrical length on transmission lines		3	0	18	26	0	0	0	15	1	0
H	525	H1-2 Do you measure physical length on transmission lines		7	0	7	47	0	0	0	22	2	0
H	526	H1-3 Do you measure standing wave ratio (SWR) on transmission lines		0	0	14	32	0	0	0	15	0	0
0215		47c. Calculations	-										
H	529	H1-6 Do you calculate the characteristic impedance (ZO) of transmission lines		0	0	7	0	0	0	0	10	0	0
0216		47d. Isolate faulty transmission lines	-										
H	530	H1-7 Do you troubleshoot transmission lines		21	0	21	63	0	0	0	38	3	1
0217		48. Waveguides											
0218		48a. Theory of operation	B										
H	537	H1-14 Do you trace schematic or block diagrams of circuits containing waveguides		86	53	32	74	0	0	0	4	1	0
H	539	H1-16 Do you pressurize or purge waveguide assemblies		76	63	32	63	0	0	0	2	0	0
H	540	H1-17 Do you measure standing wave ratio for waveguide assemblies		7	5	14	37	0	0	0	3	0	0
H	541	H1-18 Do you remove or install waveguide or associated coupling hardware components		90	42	39	84	2	0	0	3	0	0
0219		48b. Isolate faulty waveguides	2b										
H	538	H1-15 Do you troubleshoot circuits to isolate a faulty waveguide assembly		86	63	32	74	0	0	0	3	0	0

D T Tsk Y Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0220	49. Microwave Oscillators & Amplifiers										
0221	49a. Theory of operation B										
H 542	H2-1 Do you trace schematic or block diagrams of circuits containing microwave oscillators or amplifiers	55	32	7	21	0	0	0	4	2	0
H 545	H2-4 Do you perform tasks on two-cavity klystron microwave oscillators and amplifiers	14	5	0	0	0	0	0	0	0	0
H 546	H2-5 Do you perform tasks on three-cavity klystron microwave oscillators and amplifiers	10	0	4	0	0	0	0	0	0	0
H 547	H2-6 Do you perform tasks on reflex klystron microwave oscillators and amplifiers	41	0	0	0	0	0	0	1	0	0
H 548	H2-7 Do you perform tasks on traveling wave tube microwave oscillators and amplifiers	0	0	7	5	0	0	0	1	0	0
H 549	H2-8 Do you perform tasks on magnetron microwave oscillators and amplifiers	55	32	7	0	0	0	0	1	0	0
H 550	H2-9 Do you perform tasks on backward wave oscillator	0	0	0	0	0	0	0	1	0	0
H 551	H2-10 Do you perform tasks on parametric amplifiers	0	5	0	5	0	0	0	0	0	0
H 552	H2-11 Do you perform tasks on yttrium iron garnet (YIG) tuned microwave oscillators and amplifiers	0	0	0	5	0	0	0	0	0	0
0222	49b. Tune or Adjust 2b										
H 544	H2-3 Do you tune or adjust microwave oscillators or amplifiers	48	32	4	0	0	0	0	5	0	0
0223	49c. Isolate faulty microwave oscillators or amplifiers 2b										
H 543	H2-2 Do you troubleshoot circuits to isolate a faulty microwave oscillator or amplifier	48	32	7	5	0	0	0	4	0	0
0224	50. Resonant Cavities										

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 56	991 04	991 05	991 06
0225		50a. Theory of operation B										
H 553		H3-1 Do you trace schematic or block diagrams of circuits containing resonant cavities	48	21	11	11	0	0	0	5	0	0
H 558		H3-6 Do you perform tasks on probe resonant cavities	7	5	4	5	0	0	0	1	0	0
H 559		H3-7 Do you perform tasks on loop resonant cavities	3	0	0	5	0	0	0	1	0	0
H 560		H3-8 Do you perform tasks on aperture (iris/window) resonant cavities	10	0	4	5	0	0	0	1	0	0
0226		50b. Isolate faulty resonant cavities 2b										
H 554		H3-2 Do you troubleshoot circuits to isolate a faulty resonant cavity	41	21	11	0	0	0	0	3	0	0
H 557		H3-5 Do you measure frequency of resonant cavities	34	21	7	5	0	0	0	3	0	0
0227		50c. Tune/adjust 2b										
H 555		H3-3 Do you tune or adjust resonant cavities electrically	34	16	11	0	0	0	0	4	0	0
H 556		H3-4 Do you tune or adjust resonant cavities physically	59	16	4	0	0	0	0	4	0	0
0228		51. Transmitters										
0229		51a. Theory of operation										
0230		51a(1). Amplitude Modulation -										
H 561		H4-1 Do you use "AM" modulation principles	3	0	0	26	0	0	0	6	2	0
H 562		H4-2 Do you trace block diagrams of AM transmitters	3	0	0	37	0	0	0	7	1	0
H 563		H4-3 Do you trace block diagrams of AM transmitter subassemblies or circuit cards	7	0	0	5	0	0	0	7	0	0
H 564		H4-4 Do you trace schematic diagrams of AM transmitter subassemblies or circuits cards	7	0	0	5	0	0	0	8	0	0
H 568		H4-8 Do you align or adjust AM transmitters or circuits	3	0	0	0	0	0	0	5	0	0
H 569		H4-9 Do you calculate percentage of modulation for AM transmitters	3	0	0	0	0	0	0	6	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0231		51a(2). Frequency Modulation -										
H	593	H4-33 Do you use "FM" modulation principles	17	0	0	37	0	0	1	23	2	0
H	594	H4-34 Do you trace block diagrams of FM transmitters	24	11	4	37	0	0	0	23	2	0
H	595	H4-35 Do you trace block diagrams of FM transmitter subassemblies or circuit cards	24	0	4	5	0	0	0	17	0	0
H	596	H4-36 Do you trace schematic diagrams of FM transmitter subassemblies or circuit cards	17	0	4	0	0	0	0	17	0	0
H	600	H4-40 Do you align or adjust FM transmitters or circuits	17	0	4	0	0	0	0	21	0	0
H	601	H4-41 Do you calculate modulation index for FM transmitters	3	0	0	5	0	0	0	8	0	0
H	602	H4-42 Do you measure frequency deviation for FM transmitters	14	0	4	26	0	0	0	22	0	0
0232		51a(3). Single Side Band -										
H	578	H4-18 Do you trace block diagrams of single side band (SSB) transmitters	0	0	0	16	0	0	0	2	0	0
H	579	H4-19 Do you trace block diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H	580	H4-20 Do you trace schematic diagrams of SSB transmitter subassemblies or circuit cards	0	0	0	5	0	0	0	2	0	0
H	584	H4-24 Do you align or adjust SSB transmitters or circuits	0	0	0	11	0	0	0	1	0	0
H	585	H4-25 Do you calculate percentage of modulation for SSB transmitters	0	0	0	0	0	0	0	2	0	0
0233		51a(4). Pulse Modulation -										
H	612	H4-52 Do you use "PM" modulation principles	17	11	7	37	0	0	0	9	1	0
H	613	H4-53 Do you trace block diagrams of PM transmitters	21	21	14	37	0	0	0	9	2	0
H	614	H4-54 Do you trace block diagrams of PM transmitter subassemblies or circuit cards	24	11	11	5	0	0	0	8	0	0
H	615	H4-55 Do you trace schematic diagrams of PM transmitter subassemblies or circuit cards	10	11	11	0	0	0	0	8	0	0
H	619	H4-59 Do you align or adjust PM transmitters or circuits	28	11	7	0	0	0	0	7	0	0
H	620	H4-60 Do you calculate pulse recurrence time (PRT) or pulse recurrence frequency (PRF) for PM transmitters	24	5	11	21	0	0	0	8	0	0
H	621	H4-61 Do you measure PRT, PRF or pulse width for PM transmitters	31	11	14	37	0	0	0	8	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0234		51b. Isolate faulty transmitters -										
H 565		H4-5 Do you troubleshoot AM transmitters to major units	3	0	0	32	0	0	0	4	0	0
H 566		H4-6 Do you troubleshoot AM transmitters to subassemblies or circuit cards	3	0	0	0	0	0	0	5	0	0
H 581		H4-21 Do you troubleshoot SSB transmitters to major units	0	0	0	16	0	0	0	1	0	0
H 582		H4-22 Do you troubleshoot SSB transmitters to subassemblies or circuit cards	0	0	0	0	0	0	0	1	0	0
H 597		H4-37 Do you troubleshoot FM transmitters to major units	24	0	4	37	0	0	0	21	0	0
H 598		H4-38 Do you troubleshoot FM transmitters to sub-assemblies or circuit cards	7	0	4	0	0	0	0	11	0	0
H 616		H4-56 Do you troubleshoot PM transmitters to major units	17	11	14	37	0	0	0	7	0	0
H 617		H4-57 Do you troubleshoot PM transmitters to sub-assemblies or circuit cards	14	11	4	0	0	0	0	7	0	0
0235		51c. Troubleshoot circuits -										
H 567		H4-7 Do you troubleshoot AM transmitter subassemblies or circuit cards to circuit level components	3	0	0	0	0	0	0	4	0	0
H 583		H4-23 Do you troubleshoot SSB transmitter subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H 599		H4-39 Do you troubleshoot FM transmitter subassemblies or circuit cards or circuit level components	3	0	4	0	0	0	0	10	0	0
H 618		H4-58 Do you troubleshoot PM transmitter subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	5	0	0
0236		52. Receivers										
0237		52a. Theory of operation										
0238		52a(1). Amplitude Modulation -										
H 570		H4-10 Do you use "AM" demodulation principles	3	0	0	32	0	0	0	10	2	0
H 571		H4-11 Do you trace block diagrams of AM receivers	3	0	0	37	0	0	0	13	2	0
H 572		H4-12 Do you trace block diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	13	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	573	H4-13 Do you trace schematic diagrams of AM receiver subassemblies or circuit cards	3	0	0	5	0	0	0	12	1	0
H	577	H4-17 Do you align or adjust AM receivers or circuits	3	0	0	0	0	0	0	12	2	0
0239		52a(2). Frequency Modulation -										
H	603	H4-43 Do you use "FM" demodulation principles	17	0	0	42	1	1	1	24	3	0
H	604	H4-44 Do you trace block diagrams of FM receivers	21	5	4	37	0	0	0	26	4	0
H	605	H4-45 Do you trace block diagrams of FM receiver subassemblies or circuit cards	21	0	4	5	0	0	0	19	1	0
H	606	H4-46 Do you trace schematic diagrams of FM receiver subassemblies or circuit cards	7	0	4	0	0	0	0	19	1	0
H	610	H4-50 Do you align or adjust FM receivers or circuits	10	0	4	0	0	0	0	26	2	0
H	611	H4-51 Do you plot receiver signal level curves (RSL) for FM receivers	7	0	0	11	0	0	0	8	0	0
0240		52a(3). Single Side Band -										
H	586	H4-26 Do you trace block diagrams of SSB receivers	0	0	0	16	0	0	0	3	1	0
H	587	H4-27 Do you trace block diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H	588	H4-28 Do you trace schematic diagrams of SSB receiver subassemblies or circuit cards	0	0	0	0	0	0	0	3	1	0
H	592	H4-32 Do you align or adjust SSB receivers or circuits	0	0	0	0	0	0	0	2	1	0
0241		52a(4). Pulse Modulation -										
H	622	H4-62 Do you use "PM" demodulation principles	7	0	4	37	0	0	0	9	1	0
H	623	H4-63 Do you trace block diagrams of PM receivers	17	5	14	37	0	0	0	10	2	0
H	624	H4-64 Do you trace block diagrams of PM receiver subassemblies or circuit cards	17	5	11	5	0	0	0	9	0	0
H	625	H4-65 Do you trace schematic diagrams of PM receiver subassemblies or circuit cards	14	0	7	0	0	0	0	9	0	0
H	629	H4-69 Do you align or adjust PM receivers or circuits	17	5	7	0	0	0	0	7	0	0
0242		52b. Isolate faulty receivers -										
H	574	H4-14 Do you troubleshoot AM receivers to major units	3	0	0	26	0	0	0	9	0	0
H	575	H4-15 Do you troubleshoot AM receivers to subassemblies or circuit cards	3	0	0	0	0	0	0	8	0	0
H	589	H4-29 Do you troubleshoot SSB receivers to major units	0	0	0	16	0	0	0	2	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
H	590	H4-30 Do you troubleshoot SSB receivers to sub-assemblies or circuit cards	0	0	0	0	0	0	0	2	0	0
H	607	H4-47 Do you troubleshoot FM receivers to major units	14	0	4	37	0	0	0	23	1	0
H	608	H4-48 Do you troubleshoot FM receivers to subassemblies or circuit cards	3	0	4	0	0	0	0	14	1	0
H	626	H4-66 Do you troubleshoot PM receivers to major units	14	0	11	37	0	0	0	8	0	0
H	627	H4-67 Do you troubleshoot PM receivers to subassemblies or circuit cards	14	0	7	5	0	0	0	8	0	0
	0243	52c. Troubleshoot circuits										
H	576	H4-16 Do you troubleshoot AM receiver subassemblies or circuit cards to circuit level components	3	0	0	0	0	0	0	6	0	0
H	591	H4-31 Do you troubleshoot SSB receiver subassemblies or circuit cards to circuit level components	0	0	0	0	0	0	0	1	0	0
H	609	H4-49 Do you troubleshoot FM receiver subassemblies or circuit cards to circuit level components	7	0	4	0	0	0	0	11	0	0
H	628	H4-68 Do you troubleshoot PM receiver subassemblies or circuit cards to circuit level components	10	0	4	0	0	0	0	5	0	0
	0244	53. Transmission Power										
	0245	53a. Perform measurements B										
I	660	I1-1 Do you measure RF power	76	47	14	47	1	0	0	20	1	1
I	661	I1-2 Do you measure RF peak power	52	42	14	47	0	0	0	10	1	0
I	662	I1-3 Do you measure RF average power	24	47	7	47	0	0	0	11	1	0
I	663	I1-4 Do you measure RF effective power	10	26	7	47	0	0	0	10	0	0
I	664	I1-5 Do you measure RF output power using wattmeters	10	42	0	32	0	0	0	20	0	0
	0246	53b. Calculations B										
I	665	I2-1 Do you calculate RF apparent power	7	21	0	32	0	0	0	8	1	0
I	666	I2-2 Do you calculate RF true power	10	21	0	26	0	0	0	9	0	0
I	667	I2-3 Do you calculate RF power loss or gain in db	52	37	7	42	0	0	1	15	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0247		54. Antennas										
0248		54a. Theory of operation -										
H	634	H5-5 Do you plot graph radiation patterns	7	5	0	5	0	0	0	3	0	0
H	637	H5-8 Do you work with Yagi antennas	3	0	0	11	0	0	0	10	1	0
H	638	H5-9 Do you work with dipole antennas	79	26	7	37	0	0	0	24	2	0
H	639	H5-10 Do you work with slotted antennas	3	0	0	11	0	0	0	1	1	0
H	640	H5-11 Do you work with rotary antennas	52	11	0	5	0	0	0	1	1	0
H	641	H5-12 Do you work with hertz antennas	3	0	0	0	0	0	0	2	1	0
H	642	H5-13 Do you work with marconi antennas	0	0	0	0	0	0	0	3	1	0
H	643	H5-14 Do you work with rhombic antennas	0	0	0	0	0	0	0	3	1	0
H	644	H5-15 Do you work with scimitar antennas	0	0	0	26	0	0	0	0	1	0
H	645	H5-16 Do you work with parabolic antennas	86	5	11	21	0	0	0	8	1	0
H	646	H5-17 Do you work with ground plane antennas	3	0	0	5	0	0	0	8	1	0
H	647	H5-18 Do you perform tasks on rotary antenna arrays	38	16	0	0	0	0	0	0	0	0
H	648	H5-19 Do you perform tasks on stacked (end fire) antenna arrays	0	0	0	0	0	0	0	8	0	0
H	649	H5-20 Do you perform tasks on broadside antenna arrays	0	0	0	0	0	0	0	1	0	0
H	650	H5-21 Do you perform tasks on cardioid antenna arrays	0	0	0	0	0	0	0	2	0	0
H	651	H5-22 Do you perform tasks on collinear antenna arrays	0	0	0	5	0	0	0	5	0	0
H	652	H5-23 Do you perform tasks on phase antenna arrays	24	0	29	84	0	0	0	1	1	0
H	653	H5-24 Do you perform tasks on planar antenna arrays	7	0	0	5	0	0	0	1	0	0
H	654	H5-25 Do you perform tasks on antennas with vertical polarization	17	5	14	58	0	0	0	12	2	0
H	655	H5-26 Do you perform tasks on antennas with horizontal polarization	24	5	14	58	0	0	0	13	2	0
H	656	H5-27 Do you perform tasks on antennas with circular polarization	21	21	25	68	0	0	0	4	1	0
H	657	H5-28 Do you perform tasks on antennas with unidirectional radiation patterns	24	0	4	68	0	0	0	21	2	0
H	658	H5-29 Do you perform tasks on antennas with bidirectional radiation patterns	34	21	14	58	0	0	0	9	1	0
H	659	H5-30 Do you perform tasks on antennas with omnidirectional radiation patterns	21	16	14	74	0	0	0	18	2	0
0249		54b. Perform alignments -										
H	630	H5-1 Do you physically align antennas	76	42	18	37	1	0	1	24	3	0
H	631	H5-2 Do you electrically align antennas	41	53	18	16	0	0	0	13	3	0
H	636	H5-7 Do you measure standing wave ratio (SWR) for antennas	0	5	7	37	0	0	0	15	0	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0250		54c. Isolate faulty antennas -										
H	632	H5-3 Do you troubleshoot loading of antennas	14	11	0	42	0	0	0	10	1	0
H	633	H5-4 Do you troubleshoot coupling of antennas	31	32	0	47	0	0	0	16	1	0
H	635	H5-6 Do you troubleshoot antenna components	31	42	18	58	0	0	0	14	0	0
0251		55. Microphones										
0252		55a. Theory of operation -										
J	668	J1-1 Do you trace block diagrams of circuits containing microphones	0	0	0	16	0	0	0	9	0	0
J	669	J1-2 Do you trace schematic diagrams of microphone circuits	0	0	0	5	0	0	0	8	0	0
J	672	J1-5 Do you work on carbon microphones	0	0	0	0	0	0	0	1	0	0
J	673	J1-6 Do you work on capacitor microphones	0	0	0	11	0	0	0	1	0	0
J	674	J1-7 Do you work on crystal microphones	0	0	0	11	0	0	0	2	0	0
J	675	J1-8 Do you work on dynamic microphones	0	0	0	11	0	0	0	6	0	1
J	676	J1-9 Do you work on velocity ribbon microphones	0	0	0	0	0	0	0	1	0	0
0253		55b. Isolate faulty microphones -										
J	670	J1-3 Do you troubleshoot to isolate a faulty microphone	0	0	0	16	0	0	1	9	0	1
0254		55c. Troubleshoot circuits -										
J	671	J1-4 Do you troubleshoot microphones	0	0	0	0	0	0	0	7	0	1
0255		56. Speakers										
0256		56a. Theory of operation -										
J	677	J1-10 Do you trace block diagrams of circuits containing speakers	0	0	0	5	0	0	0	24	1	0

D T Y	Tsk Nbr	Task Title		456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
J	678	J1-11 Do you trace schematic diagrams of speaker circuits		0	0	0	0	0	0	0	22	0	0
	0257	56b. Isolate faulty speakers	-										
J	679	J1-12 Do you troubleshoot to isolate a faulty speaker		0	0	0	5	0	0	1	23	1	2
	0258	56c. Troubleshoot circuits	-										
J	680	J1-13 Do you troubleshoot speakers		0	0	0	0	0	0	0	13	0	0
	0259	57. Photosensitive Devices											
	0260	57a. Theory of operation	B										
J	681	J2-1 Do you trace block diagrams of circuits containing photosensitive devices		0	0	0	0	0	0	0	33	8	2
J	682	J2-2 Do you trace schematic diagrams of photosensitive device circuits		0	0	0	0	0	0	0	32	4	2
J	684	J2-4 Do you adjust or calibrate photosensitive devices		0	0	4	0	0	0	0	22	2	3
J	685	J2-5 Do you work on photodiodes		0	0	0	0	0	0	0	25	5	0
J	686	J2-6 Do you work on phototransistors		0	0	0	0	0	0	0	22	1	0
J	687	J2-7 Do you work on phototubes		0	0	0	0	0	0	0	8	1	3
J	688	J2-8 Do you work on photo-SCRs		0	0	0	0	0	0	0	3	1	0
J	689	J2-9 Do you work on photocells (Photoconductive or Photovoltaic)		0	0	0	0	0	0	0	19	1	1
	0261	57b. Isolate faulty photosensitive devices	2b										
J	683	J2-3 Do you troubleshoot to isolate a faulty photo-sensitive device		0	0	0	0	0	0	0	29	2	2
	0262	58. Display Tubes											

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
0263		58a. Theory of operation -										
J	690	J3-1 Do you trace block diagrams of circuits containing display tubes	0	0	0	5	0	0	0	2	1	0
J	691	J3-2 Do you trace schematic diagrams of display tubes or circuits	0	0	0	0	0	0	0	2	0	0
J	693	J3-4 Do you adjust or calibrate display tubes or circuits	0	0	0	0	0	0	0	3	0	0
J	694	J3-5 Do you work on direct view storage tubes (DVST)	0	5	0	0	0	0	0	0	0	0
J	695	J3-6 Do you work on multiple mode storage tubes (MMST)	0	0	0	0	0	0	0	0	0	0
J	696	J3-7 Do you work on scan converter tubes (SCT)	0	0	0	0	0	0	0	0	0	0
0264		58b. Isolate faulty display tubes -										
J	692	J3-3 Do you troubleshoot to isolate a faulty display tube	0	0	0	0	0	0	0	2	0	0
0265		59. Support Subjects										
0266		59a. Safety applicable to electronics B										
0267		59b. First aid for electrical shock B										
0268		59c. Electrostatic Discharge (ESD) Control B										
0269		Tasks not referenced										
B	175	B3-4 Do you use audio sine-wave signal generators	7	0	7	11	0	0	0	43	4	1
B	176	B3-5 Do you use audio non-sinusoidal signal generators	7	0	4	11	0	0	0	31	0	0
B	177	B3-6 Do you use RF less than 1,000MH signal generators	24	16	7	42	0	0	0	40	2	1
B	178	B3-7 Do you use RF greater than 1,000MH signal generators	24	16	11	47	0	0	0	16	2	0
B	179	B3-8 Do you use white noise signal generators	0	0	0	21	0	0	0	8	0	0
B	180	B3-9 Do you use pattern signal generators	3	0	0	32	1	0	0	10	1	0

D T Y	Tsk Nbr	Task Title	456 X2A	456 X2B	457 X3A	457 X3C	461 50	462 50	463 50	991 04	991 05	991 06
B	181	B3-10 Do you use pseudo-random signal generators	3	0	0	26	0	0	0	6	1	0
B	182	B3-11 Do you use time mark signal generators	3	0	0	5	0	0	0	17	3	0
B	183	B3-12 Do you use multi-function (square/sine/triangular) signal generators	3	32	4	32	0	0	0	62	10	1
B	184	B3-13 Do you use TV signal signal generators	3	0	0	0	1	0	0	1	0	0
D	284	D1-10 Do you perform tasks on voltage multipliers (doublers/triplers)	14	11	21	11	0	1	1	31	3	3
D	285	D1-11 Do you perform tasks on DC to DC converters	28	11	21	5	0	1	1	65	3	3
D	286	D1-12 Do you perform tasks on inverters (DC to AC converters)	55	16	29	11	1	2	2	49	4	2
D	287	D1-13 Do you perform tasks on switching power supplies	3	0	7	5	0	3	3	44	3	2
J	697	J4-1 Do you trace block diagrams of TV systems or subassemblies	0	0	7	5	0	1	0	1	1	1
J	698	J4-2 Do you trace schematic diagrams of TV systems or component circuits	0	0	7	0	0	1	0	1	0	1
J	699	J4-3 Do you troubleshoot TV systems to major subassemblies	0	0	7	5	2	1	0	1	0	1
J	700	J4-4 Do you troubleshoot TV systems to circuit level components	0	0	0	0	1	0	0	1	0	0
J	701	J4-5 Do you adjust or calibrate TV systems or components	0	0	4	0	0	0	0	0	0	3
J	702	J4-6 Do you trace block diagrams of laser systems or subassemblies	0	0	0	0	0	0	0	1	1	0
J	703	J4-7 Do you trace schematic diagrams of laser systems or component circuits	0	0	0	0	0	0	0	1	0	0
J	704	J4-8 Do you troubleshoot laser systems to major subassemblies	0	0	0	0	1	0	1	1	0	0
J	705	J4-9 Do you troubleshoot laser systems to circuit level components	0	0	0	0	0	0	0	0	0	0
J	706	J4-10 Do you adjust or calibrate laser systems or components	0	0	0	0	1	0	1	1	0	0
J	707	J4-11 Do you trace block diagrams of infrared systems or subassemblies	0	0	7	0	0	0	0	1	1	0
J	708	J4-12 Do you trace schematic diagrams of infrared systems or component circuits	0	0	7	0	0	0	0	1	0	0
J	709	J4-13 Do you troubleshoot infrared systems to major subassemblies	0	0	7	0	2	0	0	1	0	0
J	710	J4-14 Do you troubleshoot infrared systems circuit level components	0	0	0	0	1	0	0	0	0	0
J	711	J4-15 Do you inspect, clean, or service infrared systems or components	0	0	7	0	3	0	0	1	0	0
J	712	J4-16 Do you adjust or calibrate infrared systems or components	0	0	4	0	1	0	0	1	0	0