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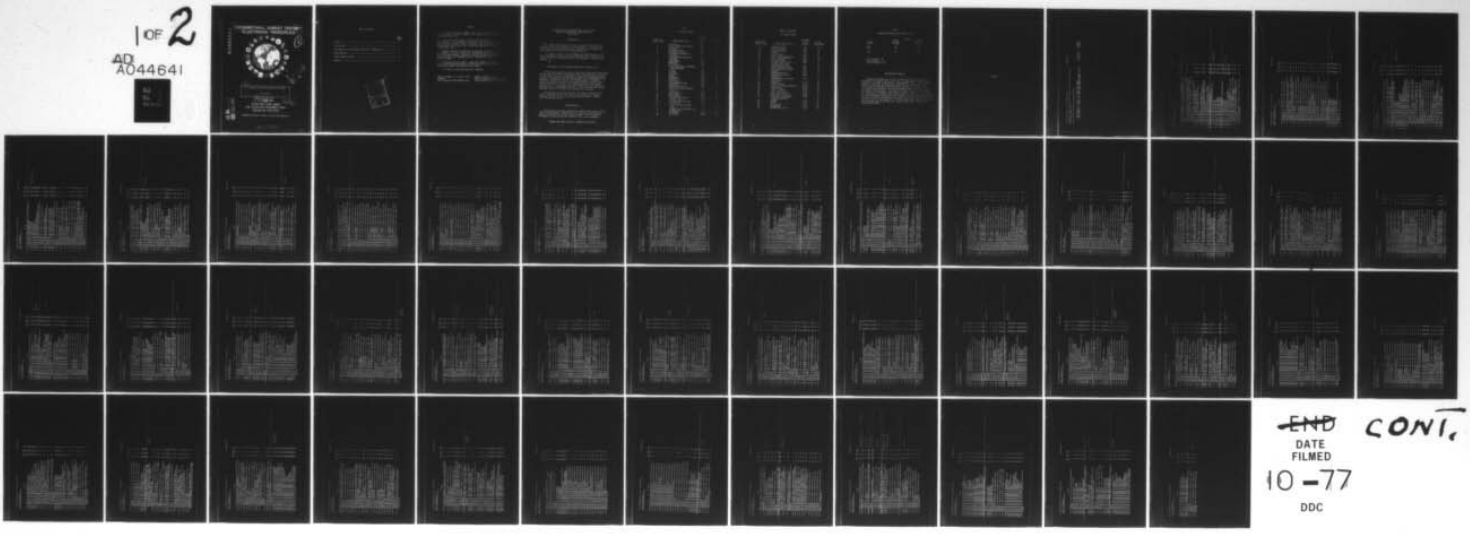

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OCCUPATIONAL SURVEY REPORT
ELECTRONIC PRINCIPLES

Apr-Jun 77

AIRBORNE EARLY WARNING RADAR SPECIALIST

AFSC 32852

AFPT-90-328-222
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OCCUPATIONAL SURVEY BRANCH
USAF OCCUPATIONAL MEASUREMENT CENTER
LACKLAND AFB TEXAS 78236

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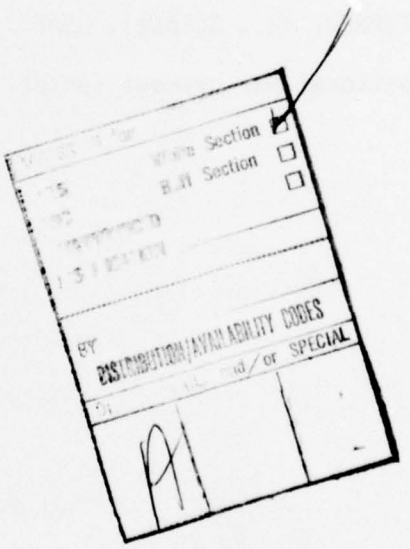

PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Airborne Early Warning Radar Specialist, AFSC 32852.

The Electronic Principles Inventory (EPI) was developed by Major Thomas J. O'Connor and Mr. Hendrick W. Ruck and the survey data were analyzed by Major William A. Tamashunas. All are members of the Occupational Survey Branch, USAF Occupational Measurement Center, Lackland AFB, Texas.

Computer programs for analyzing the data were designed by Dr. Raymond E. Christal, Occupational and Manpower Research Division, Air Force Human Resources Laboratory (AFHRL), and were written by the Project Analysis and Programming Branch, Computational Sciences Division, AFHRL.

Distribution of this report is made upon request to the USAF Occupational Measurement Center, attention of the Chief, Occupational Survey Branch (OMY), Lackland AFB, Texas 78236.

This report has been reviewed and is approved.

JAMES A. TURNER, JR., Colonel, USAF
Commander
USAF Occupational Measurement Center

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USAF Occupational Measurement Center

ELECTRONIC PRINCIPLES OCCUPATIONAL SURVEY REPORT
AIRBORNE EARLY WARNING RADAR SPECIALIST
AFSC 32852

INTRODUCTION

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Airborne Early Warning Radar Specialist (AFSC 32852). The data for this report were collected during the period April through June 1977.

This report describes: (1) development and administration of the survey instrument; and (2) electronic principles used by DAFSC 5-skill level personnel both CONUS and overseas and assigned to selected major commands.

DEVELOPMENT OF THE ELECTRONIC PRINCIPLES INVENTORY (EPI)

The EPI was developed by personnel from the Occupational Survey Branch who were well qualified in theoretical physics and electronics, as well as in task analysis and survey development. Over 300 maintenance personnel from SAC, TAC, ADC, MAC, and AFCS participated in the development of the inventory. Representing the five ATC training centers, electronics experts who averaged 12 years of maintenance experience and four years of electronic principles instruction experience spent several weeks refining the EPI. In addition, personnel at the Electrical Engineering Department of the USAF Academy and the Air Force Human Resources Laboratory were consulted during the development of the inventory.

The final version of the EPI used in this survey contained 1,257 items in 62 subject matter areas covering all electronic principles training given at the five ATC technical training centers. Table 1 lists the 62 subject areas.

ADMINISTRATION

The Electronic Principles Inventory was administered by mail to AFSC 32852 airmen worldwide. Responses from 14 individuals represented 31 percent of the total of all AFSC 32852 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

TABLE 1

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER	GPSUM PAGE NUMBER
1	MATHEMATICS	A1	2
2	DIRECT CURRENT AND VOLTAGE	A15	2
3	RESISTANCE	A24	2
4	MULTIMETER USES	B52	3
5	ALTERNATING CURRENT	B61	4
6	INDUCTORS AND INDUCTIVE REACTANCE	B67	4
7	CAPACITORS AND CAPACITIVE REACTANCE	C92	5
8	TRANSFORMERS	C128	6
9	MAGNETISM	C171	7
10	RCL CIRCUITS	D185	8
11	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)	D229	10
12	FILTERS	D239	10
13	COUPLING	E261	11
14	SOLDERING	E273	11
15	RELAYS	E295	12
16	MICROPHONES	F314	12
17	SPEAKERS	F327	13
18	OSCILLOSCOPES	F342	13
19	SEMICONDUCTOR DIODES	G354	13
20	TRANSISTORS	G404	15
21	TRANSISTOR AMPLIFIERS	G428	16
22	SOLID-STATE SPECIAL PURPOSE DEVICES	H477	19
23	POWER SUPPLIES	H483	19
24	OSCILLATORS	H512	19
25	MULTIVIBRATORS	I539	20
26	LIMITERS AND CLAMPERS	I555	21
27	ELECTRON TUBES	I565	21
28	ELECTRON TUBE AMPLIFIERS AND CIRCUITS	J609	22
29	SPECIAL PURPOSE ELECTRON TUBES	J616	23
30	HETERODYNING, MODULATION, AND DEMODULATION	J632	23
31	AM SYSTEMS	K638	23
32	FM SYSTEMS	K666	24

TABLE 1 (CONTINUED)

EPI SUBJECT AREAS

SEQUENCE OF SUBJECT AREAS	SUBJECT AREA TITLE	BEGINNING ITEM NUMBER	GPSUM PAGE NUMBER
33	NUMBERING SYSTEMS	K685	25
34	LOGIC FUNCTIONS	L695	25
35	BOOLEAN EQUATIONS	L708	26
36	COUNTERS	L733	27
37	TIMING CIRCUITS	M757	27
38	USE OF SIGNAL GENERATORS	M769	28
39	MOTORS AND GENERATORS	M779	28
40	METER MOVEMENTS	N808	29
41	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS	N818	29
42	WAVESHAPING CIRCUITS	N834	30
43	SINGLE SIDEBAND SYSTEMS	0845	30
44	PULSE MODULATION SYSTEMS	0875	31
45	ANTENNAS	0914	32
46	TRANSMISSION LINES	P953	34
47	WAVEGUIDES AND CAVITY RESONATORS	P984	35
48	MICROWAVE AMPLIFIERS AND OSCILLATORS	P1034	37
49	REGISTERS	Q1110	39
50	STORAGE DEVICES	Q1117	40
51	DIGITAL TO ANALOG CONVERTERS	Q1126	40
52	PHANTASTRONS	Q1140	41
53	SCHMITT TRIGGERS	R1141	41
54	CABLE FABRICATION	R1144	41
55	INPUT/OUTPUT DEVICES	S1146	41
56	PHOTO SENSITIVE DEVICES	S1149	41
57	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)	S1150	41
58	INFRARED	T1159	41
59	LASERS	T1186	42
60	DISPLAY TUBES	T1220	43
61	PROGRAMMING	U1234	43
62	DB AND POWER RATIOS	U1255	44

TABLE 2

COMMAND REPRESENTATION OF SURVEY SAMPLE

COMMAND	32852 PERCENT ASSIGNED	PERCENT OF SAMPLE
ADC	58	93
OTHER	42	7
TOTAL	100	100

Total Assigned - 45
Total Sampled - 14
Percent Sampled - 31%

PRESENTATON OF RESULTS

Personnel responded "yes" or "no" to the 1,257 electronic principles questions as related to their present job. A Group Summary (GPSUM) computer printout is provided in the Appendix portion of this report. Page 1 of the GPSUM lists the three selected groups identified for this report. Pages 2-44 show the percentage of the incumbents responding to the EPI items. The computer program results display the percent members answering "yes" to the subject area questions. The reader can locate a specific subject area by referring to the Appendix page number as listed in Table 1. For example, the Transformers area results are given on page 6 of the GPSUM. The percentage of survey respondents indicating use of specific electronic principles ranged from high in areas such as Alternating Current (p.4) and Soldering (pp. 11-12) to low in areas such as Speakers (p. 13) and Infrared (pp. 41-42). Additional AFSC 328X2 data can be obtained upon request to the Chief, Occupational Survey Branch (OMY).

APPENDIX

TABULATION OF ELECTRONIC PRINCIPLES UTILIZATION DATA FOR SELECTED GROUPS
IN THE 32852 CAREER FIELD.

REPORTS ON THE FOLLOWING GROUPS WERE REQUESTED

GROUP IDENTITY = SPC151	ALL AIRMEN DAFSC 32852	CONTAINING	14 MEMBERS.
GROUP IDENTITY = SPC152	ALL AIRMEN DAFSC 32852 STATIONED IN CONUS	CONTAINING	14 MEMBERS.
GROUP IDENTITY = SPC154	ALL AIRMEN DAFSC 32852 ASSIGNED TO ADC	CONTAINING	13 MEMBERS.

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154	
A	1	A1-01 IN YOUR PRESENT JOB, DO YOU USE INSTRUMENTS, SUCH AS METERS OR OSCILLOSCOPES, IN WHICH IT IS NECESSARY TO AMPLIFY OR ATTENUATE VOLTAGE, RESISTANCE, ETC., BY POWERS OF 10.	93	93	92	MATHEMATICS
A	2	A1-02 DO YOU USE PUBLICATIONS, SUCH AS A TECHNICAL ORDERS OR MAINTENANCE MANUALS, IN WHICH IT IS NECESSARY FOR YOU TO MULTIPLY OR DIVIDE BY A POWER OF 10 BEFORE YOU CAN APPLY THE INFORMATION FROM THE PUBLICATION IN A USEFUL WAY ON THE JOB.	86	86	85	
A	3	A1-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS.	57	57	54	
A	4	A1-04 DO YOU CALCULATE THE SQUARE ROOT OF A QUANTITY.	7	7	0	
A	5	A1-05 DO YOU SOLVE FOR UNKNOWN QUANTITIES.	36	36	38	
A	6	A1-06 DO YOU CONVERT NUMBERS TO LOGARITHMS.	29	29	31	
A	7	A1-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS.	29	29	31	
A	8	A1-08 DO YOU SOLVE QUADRATIC EQUATIONS.	0	0	0	
A	9	A1-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS.	14	14	15	
A	10	A1-10 DO YOU PERFORM CALCULATIONS ON VECTOR QUANTITIES.	29	29	31	
A	11	A1-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT.	43	43	46	
A	12	A1-12 DO YOU DETERMINE AREAS OF PLANE FIGURES.	7	7	8	
A	13	A1-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS.	0	0	0	
A	14	A1-14 DO YOU SOLVE OR USE PROPORTIONS.	29	29	23	
A	15	A2-01 DO YOU USE THE TERM VOLTAGE OR VOLT (V).	100	100	100	
A	16	A2-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF).	93	93	96	DIRECT CURRENT AND VOLTAGE
A	17	A2-03 DO YOU USE THE TERM OHM.	100	100	100	
A	18	A2-04 DO YOU USE THE TERM ION.	29	29	31	
A	19	A2-05 DO YOU USE THE TERM DYNE.	7	7	8	
A	20	A2-06 DO YOU USE THE TERM AMPERE.	100	100	100	
A	21	A2-07 DO YOU USE THE TERM NEUTRON.	14	14	15	
A	22	A2-08 DO YOU USE THE TERM COULOMB.	21	21	23	
A	23	A2-09 DO YOU USE THE TERM PROTON.	7	7	8	
A	24	A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB.	86	86	85	
A	25	A3-02 DO YOU INSPECT RESISTORS.	100	100	100	
A	26	A3-03 DO YOU CLEAN RESISTORS.	100	100	100	RESISTANCE
A	27	A3-04 DO YOU ADJUST RESISTORS.	100	100	100	
A	28	A3-05 DO YOU CHECK OHMIC VALUE OF RESISTORS.	100	100	100	
A	29	A3-06 DO YOU REMOVE OR REPLACE RESISTORS.	100	100	100	
A	30	A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS YOU PERFORM.	50	50	46	
A	31	A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS SUCH AS FIXED RESISTOR SYMBOLS OR TAPPED RESISTOR SYMBOLS.	93	93	92	
A	32	A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FIXED WIRE, SLIDE TAP, RHEOSTAT, OR POTENTIOMETER.	93	93	92	
A	33	A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE OHMIC VALUE OF RESISTANCE.	93	93	92	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154	
A	34	A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE TOLERANCE.	86	86	85	
A	35	A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE FAILURE RATE.	43	43	38	
A	36	A3-13 DO YOU MAKE DECISIONS IN WHICH YOU MUST DETERMINE HOW TWO OR MORE BATTERIES MUST BE CONNECTED TOGETHER TO ACHIEVE A SPECIFIC VOLTAGE.	36	36	31	
A	37	A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT BATTERIES, FUSES, CONDUCTORS, LAMPS, OR SWITCHES	100	100	100	
A	38	A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	57	57	54	
A	39	A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	64	64	62	
A	40	A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	64	64	62	
A	41	A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	50	50	54	
A	42	A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	64	64	62	
A	43	A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	64	64	62	
A	44	A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	71	71	69	
A	45	A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	43	43	38	
A	46	A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	43	43	46	
A	47	A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	57	57	54	
A	48	A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	57	57	54	
A	49	A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	64	64	62	
A	50	A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	43	43	38	
A	51	A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	43	43	46	
B	52	B1-01 DO YOU MEASURE RESISTANCE.	100	100	100	
B	53	B1-02 DO YOU REPAIR OHMMETERS.	7	7	8	
B	54	B1-03 DO YOU MEASURE VOLTAGE.	100	100	100	MULTIMETER USES
B	55	B1-04 DO YOU REPAIR VOLTMETERS.	21	21	23	
B	56	B1-05 DO YOU REPAIR AMMETERS.	21	21	23	
B	57	B1-06 DO YOU MEASURE CURRENT.	100	100	100	
B	58	B1-07 DO YOU USE MULTIMETERS.	100	100	100	
B	59	B1-08 DO YOU DIRECTLY USE A QUANTITY OF CHARGE CALLED A COULOMB.	7	7	8	
B	60	B1-09 DO YOU READ SCHEMATICS.	100	100	100	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 154	
B	61	B2-01 DO YOU USE OR REFER TO THE TERM EFFECTIVE VOLTAGE (RMS).	71	71	69	ALTERNATING CURRENT
B	62	B2-02 DO YOU USE OR REFER TO THE TERM PEAK TO PEAK VOLTAGE.	93	93	92	
B	63	B2-03 DO YOU USE OR REFER TO THE TERM AVERAGE VOLTAGE (DC).	79	79	77	
B	64	B2-04 DO YOU USE OR REFER TO THE TERM WAVE LENGTH.	79	79	77	
B	65	B2-05 DO YOU USE OR REFER TO THE TERM FREQUENCY.	100	100	100	
B	66	B2-06 DO YOU USE OR REFER TO THE TERM INSTANTANEOUS VALUE.	36	36	31	
B	67	B3-01 DO YOU WORK WITH INDUCTORS OR CIRCUITS CONTAINING INDUCTORS, CHOKES, OR CHOKE COILS IN YOUR PRESENT JOB.	86	86	85	
B	68	B3-02 DO YOU INSPECT INDUCTORS.	71	71	69	INDUCTORS AND INDUCTIVE REACTANCE
B	69	B3-03 DO YOU CLEAN INDUCTORS.	57	57	54	
B	70	B3-04 DO YOU ADJUST INDUCTORS.	86	86	85	
B	71	B3-05 DO YOU REMOVE OR REPLACE INDUCTORS.	71	71	69	
B	72	B3-06 DO YOU USE OR REFER TO INDUCTANCE.	79	79	77	
B	73	B3-07 DO YOU USE OR REFER TO HENRIES.	71	71	69	
B	74	B3-08 DO YOU USE OR REFER TO INDUCTIVE REACTANCE.	71	71	69	
B	75	B3-09 DO YOU USE OR REFER TO COPPER LOSS IN INDUCTORS.	0	0	0	
B	76	B3-10 DO YOU USE OR REFER TO HYSTERESIS LOSS IN INDUCTORS.	0	0	0	
B	77	B3-11 DO YOU USE OR REFER TO EDDY CURRENT LOSS IN INDUCTORS	0	0	0	
B	78	B3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTANCE IS PROPORTIONAL TO THE SQUARE OF THE NUMBER OF TURNS OF THE COIL.	14	14	15	
B	79	B3-13 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE CROSS SECTIONAL AREA OF THE CORE.	14	14	15	
B	80	B3-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS INVERSELY PROPORTIONAL TO ITS LENGTH.	14	14	15	
B	81	B3-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS DIRECTLY PROPORTIONAL TO THE PERMEABILITY OF THE CORE MATERIAL.	21	21	23	
B	82	B3-16 DO YOU CALCULATE INDUCTANCE FOR PARTICULAR INDUCTORS USING FORMULAS.	21	21	15	
B	83	B3-17 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTANCE IN SERIES.	29	29	23	
B	84	B3-18 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN PARALLEL.	29	29	23	
B	85	B3-19 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN SERIES-PARALLEL CIRCUITS.	29	29	23	
B	86	B3-20 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LAGS VOLTAGE IN AC INDUCTOR CIRCUITS.	57	57	54	
B	87	B3-21 DO YOU CALCULATE INDUCTIVE REACTANCE.	36	36	31	
B	88	B3-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO FREQUENCY.	43	43	38	
B	89	B3-23 DO YOU WORK WITH POWER INDUCTORS.	79	79	77	
B	90	B3-24 DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	43	43	38	
B	91	B3-25 DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	79	79	77	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 154	
C	92	C1-01 DO YOU WORK WITH CAPACITORS OR CIRCUITS CONTAINING CAPACITORS IN YOUR PRESENT JOB.	86	86	85	
C	93	C1-02 DO YOU INSPECT CAPACITORS.	93	93	92	CAPACITORS AND CAPACITIVE REACTANCE
C	94	C1-03 DO YOU CLEAN CAPACITORS.	79	79	77	
C	95	C1-04 DO YOU ADJUST CAPACITORS.	100	100	100	
C	96	C1-05 DO YOU TEST CAPACITORS.	71	71	69	
C	97	C1-06 DO YOU DISCHARGE CAPACITORS.	100	100	100	
C	98	C1-07 DO YOU REMOVE OR REPLACE CAPACITORS.	100	100	100	
C	99	C1-08 DO YOU USE OR REFER TO DISTRIBUTED CAPACITANCE.	43	43	38	
C	100	C1-09 DO YOU USE OR REFER TO ORBITAL STRESS OF ELECTRONS IN A DIELECTRIC.	7	7	8	
C	101	C1-10 DO YOU USE OR REFER TO FARADS, MICROFARADS, OR PICOFARADS.	93	93	92	
C	102	C1-11 DO YOU USE OR REFER TO CAPACITANCE.	100	100	100	
C	103	C1-12 DO YOU USE OR REFER TO DIELECTRIC CONSTANT	29	29	23	
C	104	C1-13 DO YOU USE OR REFER TO WORKING VOLTAGE RATING OF CAPACITORS	93	93	92	
C	105	C1-14 DO YOU USE OR REFER TO CAPACITIVE REACTANCE	50	50	46	
C	106	C1-15 DO YOU USE OR REFER TO CAPACITOR COLOR CODES	71	71	69	
C	107	C1-16 DO YOU WORK WITH CAPACITORS IN DC CIRCUITS	93	93	92	
C	108	C1-17 DO YOU WORK WITH CAPACITORS IN AC CIRCUITS	100	100	100	
C	109	C1-18 DO YOU WORK WITH CAPACITORS IN CIRCUITS WITH BOTH DC AND AC	100	100	100	
C	110	C1-19 DO YOU WORK WITH CAPACITORS IN DON'T REMEMBER WHICH CIRCUITS	14	14	15	
C	111	C1-20 DO YOU CALCULATE CAPACITANCE FOR PARTICULAR CAPACITORS USING FORMULAS	21	21	23	
C	112	C1-21 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS DIRECTLY PROPORTIONAL TO THE DIELECTRIC CONSTANT	14	14	8	
C	113	C1-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITANCE OF A CAPACITOR IS INVERSELY PROPORTIONAL TO THE DIELECTRIC THICKNESS	21	21	15	
C	114	C1-23 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES	43	43	38	
C	115	C1-24 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN PARALLEL	43	43	38	
C	116	C1-25 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES-PARALLEL CIRCUITS	43	43	38	
C	117	C1-26 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT DOES NOT FLOW THROUGH CAPACITORS, IT ONLY APPEARS TO DO SO	64	64	62	
C	118	C1-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LEADS VOLTAGE IN AC CAPACITOR CIRCUITS	57	57	62	
C	119	C1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITIVE REACTANCE IS INVERSELY PROPORTIONAL TO FREQUENCY	50	50	54	
C	120	C1-29 DO YOU CALCULATE CAPACITIVE REACTANCE	29	29	23	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154	
C 121	C1-30	DO YOU WORK WITH ROTOR-STATOR (VARIABLE) CAPACITORS	93	93	92	
C 122	C1-31	DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS	71	71	69	
C 123	C1-32	DO YOU WORK WITH ELECTROLYTIC (FIXED) CAPACITORS	100	100	100	
C 124	C1-33	DO YOU WORK WITH PAPER (FIXED) CAPACITORS	100	100	100	
C 125	C1-34	DO YOU WORK WITH MICA (FIXED) CAPACITORS	100	100	100	
C 126	C1-35	DO YOU WORK WITH CERAMIC (FIXED) CAPACITORS	100	100	100	
C 127	C1-36	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS	14	14	15	
C 128	C2-01	DO YOU WORK WITH TRANSFORMERS IN YOUR PRESENT JOB	86	86	85	
C 129	C2-02	DO YOU INSPECT TRANSFORMERS	93	93	92	
C 130	C2-03	DO YOU CLEAN TRANSFORMERS	71	71	69	
C 131	C2-04	DO YOU ADJUST TRANSFORMERS	71	71	69	TRANSFORMERS
C 132	C2-05	DO YOU TROUBLESHOOT TRANSFORMERS	86	86	92	
C 133	C2-06	DO YOU REMOVE OR REPLACE COMPLETE TRANSFORMERS	93	93	92	
C 134	C2-07	DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING	14	14	15	
C 135	C2-08	DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTION AND MUTUAL INDUCTANCE (M)	7	7	8	
C 136	C2-09	DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M	7	7	8	
C 137	C2-10	DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS	7	7	8	
C 138	C2-11	DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS	21	21	23	
C 139	C2-12	DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS	21	21	23	
C 140	C2-13	DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS	7	7	8	
C 141	C2-14	DO YOU WORK WITH AUTOTRANSFORMERS	29	29	23	
C 142	C2-15	DO YOU WORK WITH POWER TRANSFORMERS	93	93	92	
C 143	C2-16	DO YOU WORK WITH AUDIO TRANSFORMERS	36	36	31	
C 144	C2-17	DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS	71	71	69	
C 145	C2-18	DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMERS	14	14	15	
C 146	C2-19	DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE	93	93	92	
C 147	C2-20	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE	86	86	85	
C 148	C2-21	DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES	86	86	85	
C 149	C2-22	DO YOU MEASURE RESISTANCE OF TRANSFORMER WINDINGS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-DOWN TURNS RATIO	29	29	23	
C 150	C2-23	DO YOU MEASURE OUTPUT VOLTAGE OF TRANSFORMERS TO DETERMINE WHETHER A TRANSFORMER HAS A STEP-UP OR STEP-DOWN TURNS RATIO	64	64	62	
C 151	C2-24	DO YOU REFER TO BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS	86	86	85	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 159	
C 152	C2-25 DO YOU REFER TO MULTIPLE SECONDARY-WINDINGS SCHEMATIC SYMBOLS FOR TRANSFORMERS	86	86	85	
C 153	C2-26 DO YOU REFER TO MULTIPLE TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	86	86	85	
C 154	C2-27 DO YOU REFER TO CENTER TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	93	93	92	
C 155	C2-28 DO YOU REFER TO AIR CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	79	79	77	
C 156	C2-29 DO YOU REFER TO IRON CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	86	86	85	
C 157	C2-30 DO YOU REFER TO COMBINATIONS OF THE ABOVE SCHEMATIC SYMBOLS FOR TRANSFORMERS	93	93	92	
C 158	C2-31 DO YOU DETERMINE PHASE RELATIONSHIPS BETWEEN SECONDARY AND PRIMARY VOLTAGES OF TRANSFORMERS USING SCHEMATIC SYMBOLS	64	64	62	
C 159	C2-32 DO YOU DETERMINE OR REFER TO THE TYPE OF CORE IN TRANSFORMERS YOU WORK WITH	50	50	46	
C 160	C2-33 DO YOU REFER TO OR USE THE GENERAL RULE THAT THE TURNS RATIO OF A TRANSFORMER IS EQUAL TO THE VOLTAGE RATIO	43	43	38	
C 161	C2-34 DO YOU USE OR REFER TO STEP-UP OR STEP-DOWN RATIOS FOR TRANSFORMERS	79	79	77	
C 162	C2-35 DO YOU CALCULATE VOLTAGE RATIOS FOR TRANSFORMERS USING TURNS RATIOS	21	21	23	
C 163	C2-36 DO YOU CALCULATE CURRENT RATIOS FOR TRANSFORMERS USING TURNS RATIOS	21	21	23	
C 164	C2-37 DOES YOUR JOB INVOLVE ANY TASKS DEALING WITH THREE PHASE TRANSFORMERS	64	64	69	
C 165	C2-38 DO YOU INSPECT THREE PHASE TRANSFORMERS	57	57	62	
C 166	C2-39 DO YOU CLEAN OR LUBRICATE THREE PHASE TRANSFORMERS	43	43	46	
C 167	C2-40 DO YOU ADJUST THREE PHASE TRANSFORMERS	43	43	46	
C 168	C2-41 DO YOU TROUBLESHOOT THREE PHASE TRANSFORMERS	64	64	69	
C 169	C2-42 DO YOU REMOVE OR REPLACE COMPLETE THREE PHASE TRANSFORMERS	64	64	69	
C 170	C2-43 DO YOU REMOVE OR REPLACE THREE PHASE TRANSFORMER PARTS SUCH AS WINDINGS	14	14	15	
C 171	C3-01 DO YOU USE OR REFER TO PERMANENT MAGNETS	86	86	85	
C 172	C3-02 DO YOU USE OR REFER TO TEMPORARY MAGNETS	50	50	46	
C 173	C3-03 DO YOU USE OR REFER TO RETENTIVITY OF MAGNETIC MATERIALS	21	21	23	MAGNETISM
C 174	C3-04 DO YOU USE OR REFER TO RELUCTANCE OF MAGNETIC MATERIALS	21	21	23	
C 175	C3-05 DO YOU USE OR REFER TO PERMEABILITY OF MAGNETIC MATERIALS	21	21	23	
C 176	C3-06 DO YOU USE OR REFER TO RESIDUAL MAGNETISM	43	43	46	
C 177	C3-07 DO YOU USE OR REFER TO MAGNETIC LINES OF FORCE OR FLUX	50	50	46	
C 178	C3-08 DO YOU USE OR REFER TO WEBER'S THEORY OF MAGNETISM	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154	
C	179	C3-09 DO YOU USE OR REFER TO DOMAIN THEORY OF MAGNETISM	0	0	0	
C	180	C3-10 DO YOU USE OR REFER TO MAGNETIC INDUCTION	36	36	31	
C	181	C3-11 DO YOU USE OR REFER TO FLUX DENSITY	21	21	23	
C	182	C3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT	64	64	62	
C	183	C3-13 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES	21	21	23	
C	184	C3-14 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE NORTH POLE OF A CURRENT CARRYING COIL	21	21	23	
D	185	D1-01 DO YOU WORK WITH RC, LR, RCL CIRCUITS IN YOUR PRESENT JOB	64	64	62	
D	186	D1-02 DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH RCL CIRCUITS	14	14	15	RCL CIRCUITS
D	187	D1-03 DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN WORKING WITH RCL CIRCUITS	7	7	8	
D	188	D1-04 DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL CIRCUITS	21	21	23	
D	189	D1-05 DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL CIRCUITS	21	21	23	
D	190	D1-06 DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH RCL CIRCUITS	14	14	15	
D	191	D1-07 DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL CIRCUITS	57	57	54	
D	192	D1-08 DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING WITH RCL CIRCUITS	21	21	23	
D	193	D1-09 DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN WORKING WITH RCL CIRCUITS	50	50	54	
D	194	D1-10 DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN WORKING WITH RCL CIRCUITS	57	57	54	
D	195	D1-11 DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN WORKING WITH RCL CIRCUITS	14	14	15	
D	196	D1-12 DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING WITH RCL CIRCUITS	29	29	31	
D	197	D1-13 DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN WORKING WITH RCL CIRCUITS	64	64	62	
D	198	D1-14 DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH RCL CIRCUITS	50	50	46	
D	199	D1-15 DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH RCL CIRCUITS	57	57	54	
D	200	D1-16 DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN WORKING WITH RCL CIRCUITS	71	71	69	
D	201	D1-17 DO YOU USE OR REFER TO HALF POWER POINTS WHEN WORKING WITH RCL CIRCUITS	57	57	54	
D	202	D1-18 DO YOU USE OR REFER TO BANDPASS REGION WHEN WORKING WITH RCL CIRCUITS	43	43	38	
D	203	D1-19 DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH RCL CIRCUITS	21	21	15	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154
D 204	D1-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS	57	57	54
D 205	D1-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS	7	7	8
D 206	D1-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS	21	21	23
D 207	D1-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS	14	14	15
D 208	D1-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS	14	14	15
D 209	D1-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS	14	14	15
D 210	D1-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS	7	7	8
D 211	D1-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS	14	14	15
D 212	D1-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS	7	7	8
D 213	D1-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS	14	14	15
D 214	D1-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS	7	7	8
D 215	D1-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS	7	7	8
D 216	D1-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD	7	7	8
D 217	D1-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW	7	7	8
D 218	D1-34 DO YOU CHECK CAPACITORS USING OHMMETERS	64	64	62
D 219	D1-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION	50	50	46
D 220	D1-36 DO YOU CHECK INDUCTORS USING OHMMETERS	50	50	46
D 221	D1-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION	43	43	38
D 222	D1-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT THETA= 0, PF = 1, AND PA = PT FOR RESONANT CIRCUITS	7	7	8
D 223	D1-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS	14	14	15
D 224	D1-40 DO YOU USE OR REFER TO THE GENERAL RULE THAT IMPEDANCE IS MINIMUM AND CURRENT MAXIMUM AT THE RESONANT FREQUENCY FOR SERIES RCL CIRCUITS	36	36	38
D 225	D1-41 DO YOU USE OR REFER TO THE GENERAL RULE THAT LINE CURRENT IS MINIMUM AND IMPEDANCE MAXIMUM AT RESONANT FREQUENCY FOR PARALLEL RCL CIRCUITS	29	29	31
D 226	D1-42 DO YOU USE OR REFER TO THE GENERAL RULE THAT HALF POWER POINTS ARE AT 70.7 PERCENT OF THE PEAK CURRENT VALUE	36	36	31
D 227	D1-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q	21	21	15
D 228	D1-44 DO YOU DETERMINE HOW CHANGES IN FREQUENCY, RESISTANCE, CAPACITANCE, OR INDUCTANCE WILL AFFECT CURRENT OR PHASE ANGLES FOR RCL CIRCUITS	21	21	15

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
D 229	D2-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANT CIRCUITS OR TIME CONSTANTS	50	50	46	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)
D 230	D2-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS	50	50	46	
D 231	D2-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE	36	36	38	
D 232	D2-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS	36	36	38	
D 233	D2-05 DO YOU USE OR REFER TO THE GENERAL RULE THAT A CAPACITOR IS FULLY CHARGED (OR DISCHARGED) AFTER FIVE (5) TIME CONSTANTS (TC)	29	29	31	
D 234	D2-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS	7	7	8	
D 235	D2-07 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CIRCUIT CURRENT OR COMPONENT VOLTAGES AFTER A SPECIFIC TIME FOR RC OR LR CIRCUITS	14	14	15	
D 236	D2-08 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE THE TIME REQUIRED FOR CIRCUIT CURRENT OR COMPONENT VOLTAGES TO REACH SPECIFIC VALUES FOR RC OR LR CIRCUITS	14	14	15	
D 237	D2-09 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE COMPONENT VALUES REQUIRED FOR CIRCUIT CURRENT AND COMPONENT VOLTAGES TO REACH SPECIFIC VALUES IN SPECIFIC TIMES	7	7	8	
D 238	D2-10 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT IN LR CIRCUITS REACHES ITS MINIMUM VALUE (OR ZERO) AFTER FIVE (5) TIME CONSTANTS	21	21	23	
D 239	D3-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS IN YOUR PRESENT JOB	86	86	85	
D 240	D3-02 DO YOU INSPECT FILTER CIRCUITS	86	86	85	FILTERS
D 241	D3-03 DO YOU CLEAN FILTER CIRCUITS	57	57	54	
D 242	D3-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS	64	64	62	
D 243	D3-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT LEVEL	64	64	62	
D 244	D3-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS	57	57	54	
D 245	D3-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT	86	86	85	
D 246	D3-08 DO YOU REMOVE OR REPLACE FILTER CIRCUIT COMPONENT PARTS	57	57	54	
D 247	D3-09 DO YOU WORK WITH LOW PASS FILTERS	64	64	62	
D 248	D3-10 DO YOU WORK WITH HIGH PASS FILTERS	64	64	62	
D 249	D3-11 DO YOU WORK WITH BANDPASS FILTERS	64	64	62	
D 250	D3-12 DO YOU WORK WITH BAND-REJECT FILTERS	50	50	46	
D 251	D3-13 DON'T REMEMBER WHICH TYPE OF FILTER YOU WORK WITH	29	29	31	
D 252	D3-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATION	50	50	46	
D 253	D3-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATION	43	43	38	
D 254	D3-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATION	36	36	31	
D 255	D3-17 DON'T REMEMBER WHICH TYPE FILTER CONFIGURATION	36	36	38	
D 256	D3-18 DO THE FILTERS YOU WORK WITH USE PARALLEL RESONANT CIRCUITS	50	50	46	
D 257	D3-19 DO THE FILTERS YOU WORK WITH USE SERIES-PARALLEL CIRCUITS	50	50	46	
D 258	D3-20 DO THE FILTERS YOU WORK WITH USE SERIES RESONANT CIRCUITS	50	50	46	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
D 259	D3-21 DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT	50	50	54	
D 260	D3-22 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC FILTERS	14	14	15	
E 261	E1-01 DO YOU WORK WITH COUPLING DEVICES IN YOUR PRESENT JOB	71	71	69	
E 262	E1-02 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH RC COUPLING	64	64	62	
E 263	E1-03 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH IMPEDANCE COUPLING	71	71	69	
E 264	E1-04 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH TRANSFORMER COUPLING	71	71	69	
E 265	E1-05 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM RC COUPLING	64	64	62	
E 266	E1-06 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM IMPEDANCE COUPLING	71	71	69	
E 267	E1-07 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM TRANSFORMER COUPLING	71	71	69	
E 268	E1-08 DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS	50	50	46	
E 269	E1-09 DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS	50	50	46	
E 270	E1-10 DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS	43	43	38	
E 271	E1-11 DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS	57	57	54	
E 272	E1-12 DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUITS	29	29	31	
E 273	E2-01 IN YOUR PRESENT JOB, DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS	100	100	100	
E 274	E2-02 DO YOU SELECT TYPE OF SOLDER TO USE	86	86	85	
E 275	E2-03 DO YOU ADD FLUX TO CONNECTIONS	100	100	100	
E 276	E2-04 DO YOU CLEAN CONNECTIONS USING SOLVENTS	93	93	92	
E 277	E2-05 DO YOU STRIP INSULATION FROM WIRES	100	100	100	
E 278	E2-06 DO YOU CONNECT OR DISCONNECT HEAT SINKS	93	93	92	
E 279	E2-07 DO YOU BEND OR SHAPE WIRES OR LEADS	100	100	100	
E 280	E2-08 DO YOU CUT WIRES	100	100	100	
E 281	E2-09 DO YOU FILE OR SHAPE SOLDERING IRON TIPS	93	93	92	
E 282	E2-10 DO YOU TIN SOLDERING IRON TIPS	100	100	100	
E 283	E2-11 DO YOU CLEAN SOLDERING IRON TIPS	100	100	100	
E 284	E2-12 DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS	71	71	69	
E 285	E2-13 DO YOU TIN OR PRE-TIN CONDUCTORS	100	100	100	
E 286	E2-14 DO YOU INSPECT SOLDERED CONNECTIONS	100	100	100	
E 287	E2-15 DO YOU DESOLDER CONNECTIONS BY WICKING	93	93	92	
E 288	E2-16 DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS	79	79	77	
E 289	E2-17 DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS	100	100	100	
E 290	E2-18 DO YOU CRUSH COMPONENTS FOR REMOVAL	43	43	46	

COUPLING

SOLDERING

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154	
E 291	E2-19	DO YOU MAKE HARDWIRE CONNECTIONS	100	100	100	
E 292	E2-20	DO YOU MAKE PRINTED CIRCUIT BOARD CONNECTIONS	71	71	69	
E 293	E2-21	DO YOU SOLDER PASSIVE COMPONENTS SUCH AS RESISTORS OR CAPACITORS ON PRINTED CIRCUIT BOARDS	69	69	62	
E 294	E2-22	DO YOU SOLDER ACTIVE COMPONENTS SUCH AS SOLID-STATE DIODES OR TRANSISTORS ON PRINTED CIRCUIT BOARDS	71	71	69	
E 295	E3-01	DO YOU WORK WITH RELAYS ON YOUR PRESENT JOB	86	86	92	
E 296	E3-02	DO YOU ADJUST RELAYS	36	36	38	
E 297	E3-03	DO YOU CLEAN RELAYS	71	71	77	
E 298	E3-04	DO YOU INSPECT RELAYS	71	71	77	RELAYS
E 299	E3-05	DO YOU REMOVE OR REPLACE COMPLETE RELAYS	86	86	92	
E 300	E3-06	DO YOU REMOVE OR REPLACE PARTS OR RELAYS	29	29	31	
E 301	E3-07	DO YOU TROUBLESHOOT RELAYS	79	79	85	
E 302	E3-08	DO YOU STRAIGHTEN RELAY CONTACTS	50	50	54	
E 303	E3-09	DO YOU PERFORM TASKS ON RELAY CONTACTS	69	69	69	
E 304	E3-10	DO YOU PERFORM TASKS ON RELAY CORES	21	21	23	
E 305	E3-11	DO YOU PERFORM TASKS ON RELAY COILS	21	21	23	
E 306	E3-12	DO YOU PERFORM TASKS ON RELAY ARMATURES	36	36	38	
E 307	E3-13	DO YOU PERFORM TASKS ON RELAY SPRINGS	36	36	38	
E 308	E3-14	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY OPER (NO) SCHEMATIC SYMBOLS FOR RELAYS	79	79	85	
E 309	E3-15	DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY CLOSED (NC) SCHEMATIC SYMBOLS FOR RELAYS	79	79	85	
E 310	E3-16	DO YOU USE OR REFER TO SINGLE POLE, DOUBLE THROW (SPDT) SCHEMATIC SYMBOLS FOR RELAYS	71	71	77	
E 311	E3-17	DO YOU USE OR REFER TO DOUBLE POLE, DOUBLE THROW (DPDT) SCHEMATIC SYMBOLS FOR RELAYS	71	71	77	
E 312	E3-18	DO YOU USE OR REFER TO OTHER RELAY SYMBOLS SCHEMATIC SYMBOLS FOR RELAYS	79	79	85	
E 313	E3-19	DO YOU CHECK ELECTRICAL CONTINUITY OF COILS BY MEASURING RESISTANCE	69	69	69	
F 314	F1-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH MICROPHONES	14	14	15	
F 315	F1-02	DO YOU INSPECT MICROPHONES	14	14	15	
F 316	F1-03	DO YOU CLEAN MICROPHONES	14	14	15	MICROPHONES
F 317	F1-04	DO YOU OPERATE MICROPHONES	14	14	15	
F 318	F1-05	DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OR MICROPHONES	14	14	15	
F 319	F1-06	DO YOU TROUBLESHOOT DOWN TO MICROPHONE PARTS	0	0	0	
F 320	F1-07	DO YOU REMOVE OR REPLACE COMPLETE MICROPHONES	14	14	15	
F 321	F1-08	DO YOU REMOVE OR REPLACE MICROPHONE PARTS	0	0	0	
F 322	F1-09	DO YOU PERFORM TASKS ON CARBON MICROPHONES	0	0	0	
F 323	F1-10	DO YOU PERFORM TASKS ON CAPACITOR MICROPHONES	14	14	15	
F 324	F1-11	DO YOU PERFORM TASKS ON CRYSTAL MICROPHONES	0	0	0	
F 325	F1-12	DO YOU PERFORM TASKS ON DYNAMIC MICROPHONES	0	0	0	
F 326	F1-13	DO YOU PERFORM TASKS ON VELOCITY RIBBON MICROPHONES	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
F 327	F2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH SPEAKERS	14	14	8	
F 328	F2-02 DO YOU INSPECT SPEAKERS	14	14	8	
F 329	F2-03 DO YOU CLEAN SPEAKERS	14	14	8	SPEAKERS
F 330	F2-04 DO YOU OPERATE SPEAKERS	14	14	8	
F 331	F2-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OF SPEAKERS	14	14	8	
F 332	F2-06 DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS	0	0	0	
F 333	F2-07 DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS	14	14	8	
F 334	F2-08 DO YOU REMOVE OR REPLACE SPEAKER PARTS	0	0	0	
F 335	F2-09 DO YOU PERFORM ANY TASKS ON SPEAKER CONES	0	0	0	
F 336	F2-10 DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS	0	0	0	
F 337	F2-11 DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS	0	0	0	
F 338	F2-12 DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS	0	0	0	
F 339	F2-13 DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS	0	0	0	
F 340	F2-14 DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS	0	0	0	
F 341	F2-15 DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES	0	0	0	
F 342	F3-01 DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB	100	100	100	
F 343	F3-02 DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL CHECKS	100	100	100	
F 344	F3-03 DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR ADJUSTMENTS	100	100	100	OSCILLOSCOPES
F 345	F3-04 DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC CIRCUITS	100	100	100	
F 346	F3-05 DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY	100	100	100	
F 347	F3-06 DO YOU USE OSCILLOSCOPES TO MEASURE TIME	93	93	92	
F 348	F3-07 DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	36	36	31	
F 349	F3-08 DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	93	93	92	
F 350	F3-09 DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	71	71	69	
F 351	F3-10 DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	86	86	85	
F 352	F3-11 DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	86	86	85	
F 353	F3-12 DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	93	93	92	
G 354	G1-01 DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	86	86	85	
G 355	G1-02 DO YOU INSPECT DIODES	86	86	85	
G 356	G1-03 DO YOU REMOVE OR REPLACE DIODES	86	86	85	SEMICONDUCTOR DIODES
G 357	G1-04 DO YOU CHECK DIODES USING AN INSTRUMENT	79	79	77	
G 358	G1-05 DO YOU USE ENERGY LEVEL DIAGRAMS IN YOUR WORK WITH DIODES	7	7	8	
G 359	G1-06 DO YOU USE PN JUNCTION DIODE CHARACTERISTIC CURVES, TOGETHER WITH VALUES OF FORWARD AND REVERSE BIAS VOLTAGE, TO COMPUTE FORWARD OR REVERSE BIAS RESISTANCE	7	7	8	
G 360	G1-07 DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154
G 361	G1-08 DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	79	79	77
G 362	G1-09 DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON THEIR PHYSICAL APPEARANCE	79	79	77
G 363	G1-10 DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	14	14	15
G 364	G1-11 DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	43	43	46
G 365	G1-12 DO YOU USE OR REFER TO DIODE COLOR CODING	43	43	46
G 366	G1-13 DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	7	7	8
G 367	G1-14 DO YOU USE OR REFER TO CENTRIPETAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	7	7	8
G 368	G1-15 DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	79	79	85
G 369	G1-16 DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	0	0	0
G 370	G1-17 DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	0	0	0
G 371	G1-18 DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	50	50	54
G 372	G1-19 DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAR SHELL OR ORBIT	0	0	0
G 373	G1-20 DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	0	0	0
G 374	G1-21 DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	0	0	0
G 375	G1-22 DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	0	0	0
G 376	G1-23 DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	0	0	0
G 377	G1-24 DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	86	86	85
G 378	G1-25 DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	7	7	8
G 379	G1-26 DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE INCREASES RESISTANCE DECREASES)	50	50	46
G 380	G1-27 DO YOU USE OR REFER TO PN JUNCTION DIODE CHARACTERISTIC CURVES, SUCH AS VOLTAGE - CURRENT CHARACTERISTIC CURVES (PERHAPS YOU DO THIS TO IDENTIFY POINTS OF STRUCTURAL BREAKDOWN OR OPERATING REGIONS)	21	21	15
G 381	G1-28 DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR INTERPRET CIRCUIT DIAGRAMS	71	71	69
G 382	G1-29 DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	7	7	8

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
G 383	G1-30 DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	7	7	8	
G 384	G1-31 DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	7	7	8	
G 385	G1-32 DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	7	7	8	
G 386	G1-33 DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	0	0	0	
G 387	G1-34 DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	21	21	23	
G 388	G1-35 DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	7	7	8	
G 389	G1-36 DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	7	7	8	
G 390	G1-37 DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	57	57	54	
G 391	G1-38 DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	57	57	54	
G 392	G1-39 DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	7	7	8	
G 393	G1-40 DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	7	7	8	
G 394	G1-41 DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	7	7	8	
G 395	G1-42 DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	7	7	8	
G 396	G1-43 DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	7	7	8	
G 397	G1-44 DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	71	71	69	
G 398	G1-45 DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	14	14	15	
G 399	G1-46 DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	64	64	62	
G 400	G1-47 DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	29	29	23	
G 401	G1-48 DO YOU USE OR REFER TO PEAK RECURRENT FORWARD CURRENT DIODE RATINGS	21	21	15	
G 402	G1-49 DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	21	21	15	
G 403	G1-50 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	36	36	31	
G 404	G2-01 DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB.	86	86	85	
G 405	G2-02 DO YOU INSPECT TRANSISTORS	86	86	85	
G 406	G2-03 DO YOU REMOVE OR REPLACE TRANSISTORS	79	79	77	
G 407	G2-04 DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	79	79	77	TRANSISTORS
G 408	G2-05 DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	71	71	69	
G 409	G2-06 DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	64	64	62	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK	SPC 151	SPC 152	SPC 154
G 410 G2-07 DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS	64	64	62
G 411 G2-08 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION	14	14	15
G 412 G2-09 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION	14	14	15
G 413 G2-10 DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER)	43	43	38
G 414 G2-11 DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR	14	14	15
G 415 G2-12 DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS	86	86	85
G 416 G2-13 DO YOU USE OR REFER TO TRANSISTOR NOTATION SUCH AS Q1, Q2, Q3, ETC	86	86	85
G 417 G2-14 DO YOU USE OR REFER TO TRANSISTOR SUBSTITUTION INFORMATION	57	57	54
G 418 G2-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE TRANSISTOR BASE CURRENT IB IS NORMALLY SIGNIFICANTLY SMALLER THAN THE EMITTER CURRENT IE (USUALLY IB BEING 2 TO 8 PERCENT OF IE)	29	29	23
G 419 G2-16 DO YOU USE THE INFORMATION THAT THE EFFECT OF EMITTER BASE VOLTAGE ON BASE CURRENT IS THE CONTROLLING FACTOR FOR TRANSISTORS	36	36	31
G 420 G2-17 DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT (ICBO) IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES	29	29	23
G 421 G2-18 DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES	14	14	15
G 422 G2-19 DO YOU USE OR REFER TO BETA TRANSISTOR GAINS	7	7	8
G 423 G2-20 DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS	7	7	8
G 424 G2-21 DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS	7	7	8
G 425 G2-22 DO YOU CALCULATE BETA TRANSISTOR GAINS	7	7	8
G 426 G2-23 DO YOU CALCULATE ALPHA TRANSISTOR GAINS	7	7	8
G 427 G2-24 DO YOU CALCULATE GAMMA TRANSISTOR GAINS	7	7	8
G 428 G3-01 DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB	71	71	69
G 429 G3-02 DO YOU INSPECT TRANSISTOR AMPLIFIERS	64	64	62
G 430 G3-03 DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS	64	64	62
G 431 G3-04 DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL	57	57	54
G 432 G3-05 DO YOU TROUBLESHOOT TO AMPLIFIER COMPONENTS	50	50	46
G 433 G3-06 DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER	71	71	69
G 434 G3-07 DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS	57	57	54
G 435 G3-08 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A CHANGE IN BASE CURRENT	21	21	23
G 436 G3-09 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A SPECIFIC CHANGE IN BASE CURRENT	14	14	15

TRANSISTOR AMPLIFIERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154
G 437	GJ-10 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CURRENT	21	21	23
G 438	GJ-11 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A SPECIFIC CHANGE IN BASE CURRENT	7	7	8
G 439	GJ-12 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	14	14	15
G 440	GJ-13 DO YOU USE OR REFER TO (COMMON EMITTER) THE CALCULATIONS NECESSARY TO MEASURE THE SPECIFIC CHANGE IN BASE CURRENT WHICH RESULTS FROM A SPECIFIC INPUT SIGNAL	7	7	8
G 441	GJ-14 DO YOU USE THE LOAD-LINE METHOD OF ANALYSIS IN YOUR CIRCUIT ANALYSIS (THIS METHOD REQUIRES YOU TO PLOT A LOAD-LINE ON A TRANSISTOR CHARACTERISTIC CURVE)	7	7	8
G 442	GJ-15 DO YOU USE OR REFER TO THE OPERATING POINT Q (QUIESCENT POINT) FOR A TRANSISTOR	14	14	15
G 443	GJ-16 DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	7	7	8
G 444	GJ-17 DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	29	29	31
G 445	GJ-18 DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	21	21	23
G 446	GJ-19 DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	29	29	31
G 447	GJ-20 DO YOU CALCULATE THE VOLTAGE GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE IN BASE-EMITTER VOLTAGE INTO THE CHANGE THE BASE COLLECTOR VOLTAGE TO DETERMINE THE VOLTAGE GAIN	0	0	0
G 448	GJ-21 DO YOU CALCULATE THE CURRENT GAIN FOR SPECIFIC TRANSISTORS USING A FORMULA THAT IS, DO YOU DIVIDE THE CHANGE IN BASE CURRENT INTO THE CHANGE IN COLLECTOR CURRENT TO DETERMINE THE CURRENT GAIN	0	0	0
G 449	GJ-22 DO YOU CALCULATE THE POWER GAIN FOR A SPECIFIC TRANSISTOR USING A FORMULA THAT IS, DO YOU MULTIPLY THE CURRENT GAIN TIMES THE VOLTAGE GAIN TO DETERMINE THE POWER GAIN	0	0	0
G 450	GJ-23 DO YOU NEED TO KNOW THAT MORE COLLECTOR CURRENT IS GENERATED WITH LESS COLLECTOR VOLTAGE AS TEMPERATURE INCREASES (THIS AFFECTS THE STATIC OPERATING POINT [Q] OF THE TRANSISTOR)	21	21	23
G 451	GJ-24 DO YOU COMPUTE THE STATIC OPERATING POINT [Q] OF A TRANSISTOR AT DIFFERENT TEMPERATURES	14	14	15
G 452	GJ-25 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH EMITTER (SWAMPING) RESISTOR STABILIZATION	36	36	31
G 453	GJ-26 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH SELF-BIAS STABILIZATION	29	29	23

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 151	SPC 152	SPC 154
G	454	G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH THERMISTOR STABILIZATION	29	29	23
G	455	G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH FORWARD BIAS DIODE STABILIZATION	29	29	23
G	456	G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH REVERSE BIAS DIODE STABILIZATION	29	29	23
G	457	G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH DOUBLE DIODE STABILIZATION	29	29	23
G	458	G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPING) RESISTOR STABILIZATION	43	43	38
G	459	G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	36	36	31
G	460	G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	36	36	31
G	461	G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	36	36	31
G	462	G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	36	36	31
G	463	G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	36	36	31
G	464	G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	36	36	38
G	465	G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	43	43	38
G	466	G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	29	29	23
G	467	G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	21	21	15
G	468	G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	14	14	15
G	469	G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	21	21	23
G	470	G3-43 DO YOU NEED TO KNOW THE DEGENERATIVE EFFECTS ON THE CIRCUIT CAUSED BY CHANGING EMITTER RESISTANCE FOR TRANSISTOR AMPLIFIERS IN THE COMMON COLLECTOR CONFIGURATION	7	7	8
G	471	G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	14	14	8
G	472	G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	29	29	23
G	473	G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	57	57	54
G	474	G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	14	14	15
G	475	G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	29	29	23

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 154	
G 476	G3-49	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	43	43	38	
H 477	H1-01	DO YOU USE OR REFER TO VARACTORS	64	64	62	
H 478	H1-02	DO YOU USE OR REFER TO TUNNEL DIODES	21	21	15	
H 479	H1-03	DO YOU USE OR REFER TO FIELD EFFECT TRANSISTORS (FET)	50	50	46	SOLID-STATE
H 480	H1-04	DO YOU USE OR REFER TO UNIJUNCTION TRANSISTORS	43	43	38	SPECIAL PURPOSE
H 481	H1-05	DO YOU USE OR REFER TO ZENER DIODES	93	93	92	DEVICES
H 482	H1-06	DO YOU USE OR REFER TO INTEGRATED CIRCUITS	93	93	92	
H 483	H2-01	IN YOUR PRESENT JOB, DO YOU WORK WITH POWER SUPPLIES	93	93	92	
H 484	H2-02	DO YOU INSPECT POWER SUPPLIES	93	93	92	
H 485	H2-03	DO YOU CLEAN POWER SUPPLIES	86	86	85	
H 486	H2-04	DO YOU ALIGN OR ADJUST POWER SUPPLIES	93	93	92	
H 487	H2-05	DO YOU TROUBLESHOOT TO POWER SUPPLY CIRCUIT LEVEL	93	93	92	
H 488	H2-06	DO YOU TROUBLESHOOT TO POWER SUPPLY COMPONENTS	86	86	85	POWER SUPPLIES
H 489	H2-07	DO YOU REMOVE OR REPLACE COMPLETE POWER SUPPLIES	86	86	85	
H 490	H2-08	DO YOU REMOVE OR REPLACE POWER SUPPLY COMPONENTS	86	86	85	
H 491	H2-09	DO YOU WORK WITH HALF-WAVE RECTIFIERS	64	64	62	
H 492	H2-10	DO YOU WORK WITH FULL-WAVE RECTIFIERS OTHER THAN BRIDGE RECTIFIERS	71	71	69	
H 493	H2-11	DO YOU WORK WITH BRIDGE RECTIFIERS	71	71	69	
H 494	H2-12	DO YOU WORK WITH THREE-PHASE RECTIFIERS	71	71	69	
H 495	H2-13	DO YOU USE OR REFER TO INPUT VOLTAGE	86	86	85	
H 496	H2-14	DO YOU USE OR REFER TO INPUT FREQUENCY	71	71	77	
H 497	H2-15	DO YOU USE OR REFER TO PEAK OUTPUT VOLTAGE	79	79	77	
H 498	H2-16	DO YOU USE OR REFER TO AVERAGE OUTPUT VOLTAGE	79	79	77	
H 499	H2-17	DO YOU USE OR REFER TO RIPPLE AMPLITUDE	86	86	85	
H 500	H2-18	DO YOU USE OR REFER TO RIPPLE FREQUENCY	29	29	31	
H 501	H2-19	DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE	36	36	31	
H 502	H2-20	DO YOU USE OR REFER TO SHAPE OF OUTPUT WAVEFORMS	86	-86	85	
H 503	H2-21	DO YOU USE OR REFER TO EFFECTIVE OUTPUT VOLTAGE	71	71	69	
H 504	H2-22	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE FILTERS	93	93	92	
H 505	H2-23	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE FILTERS	79	79	77	
H 506	H2-24	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE INPUT L-TYPE FILTERS	71	71	69	
H 507	H2-25	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE INPUT L-TYPE FILTERS	57	57	54	
H 508	H2-26	DO YOU WORK WITH CIRCUITS WHICH EMPLOY LC PI-TYPE FILTERS	50	50	46	
H 509	H2-27	DO YOU WORK WITH CIRCUITS WHICH EMPLOY RC PI-TYPE FILTERS	57	57	54	
H 510	H2-28	DO YOU WORK WITH CIRCUITS WHICH EMPLOY DON'T REMEMBER WHICH TYPE OF FILTER	29	29	31	
H 511	H2-29	DO YOU HAVE THE OPTION OF REPLACING ONE TYPE OF FILTER WITH A DIFFERENT TYPE FILTER	21	21	23	
H 512	H3-01	DO YOU WORK WITH OSCILLATORS IN YOUR PRESENT JOB	57	57	54	

OSCILLATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
M 513 M3-02	DO YOU INSPECT OSCILLATORS	57	57	54	
M 514 M3-03	DO YOU ALIGN OR ADJUST OSCILLATORS	57	57	54	
M 515 M3-04	DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	57	57	54	
M 516 M3-05	DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	50	50	46	
M 517 M3-06	DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	57	57	54	
M 518 M3-07	DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	50	50	46	
M 519 M3-08	DO YOU USE OR REFER TO FEEDBACK	57	57	54	
M 520 M3-09	DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	50	50	46	
M 521 M3-10	DO YOU USE OR REFER TO AMPLITUDE STABILITY	43	43	46	
M 522 M3-11	DO YOU USE OR REFER TO FREQUENCY STABILITY	43	43	46	
M 523 M3-12	DO YOU USE OR REFER TO DAMPING	43	43	38	
M 524 M3-13	DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	50	50	46	
M 525 M3-14	DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	29	29	31	
M 526 M3-15	DO YOU USE OR REFER TO CRITICAL DAMPING	36	36	38	
M 527 M3-16	DO YOU USE OR REFER TO UNDER DAMPING	29	29	31	
M 528 M3-17	DO YOU USE OR REFER TO OVER DAMPING	36	36	38	
M 529 M3-18	DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	50	50	46	
M 530 M3-19	DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	50	50	46	
M 531 M3-20	DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	57	57	54	
M 532 M3-21	DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	14	14	15	
M 533 M3-22	DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	29	29	23	
M 534 M3-23	DO YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	29	29	23	
M 535 M3-24	DO YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	21	21	15	
M 536 M3-25	DO YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	21	21	15	
M 537 M3-26	DO YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	21	21	15	
M 538 M3-27	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	50	50	46	
I 539 I1-01	DO YOU WORK WITH MULTIVIBRATORS IN YOUR PRESENT JOB	50	50	46	
I 540 I1-02	DO YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	43	43	38	
I 541 I1-03	DO YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	43	43	38	
I 542 I1-04	DO YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	29	29	31	
I 543 I1-05	DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	43	43	38	
I 544 I1-06	DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	29	29	23	
I 545 I1-07	DO YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	43	43	38	
I 546 I1-08	DO YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING COMPONENTS	29	29	23	
I 547 I1-09	DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN LC TANK CIRCUITS	36	36	31	

MULTIVIBRATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
I 548	11-10 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN RC NETWORKS	36	36	31	
I 549	11-11 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN CRYSTALS	43	43	38	
I 550	11-12 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T REMEMBER WHICH TYPE OF FDD	29	29	31	
I 551	11-13 DO YOU WORK WITH ASTABLE MULTIVIBRATORS	29	29	31	
I 552	11-14 DO YOU WORK WITH MONOSTABLE MULTIVIBRATORS	29	29	31	
I 553	11-15 DO YOU WORK WITH BISTABLE MULTIVIBRATORS	29	29	31	
I 554	11-16 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE MULTIVIBRATORS	36	36	31	
I 555	12-01 DO YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR PRESENT JOB	57	57	54	
I 556	12-02 DO YOU WORK WITH SERIES DIODE LIMITERS	50	50	46	LIMITERS AND CLAMPERS
I 557	12-03 DO YOU WORK WITH SHUNT DIODE LIMITERS	43	43	38	
I 558	12-04 DO YOU WORK WITH LIMITERS WITH BIAS	29	29	23	
I 559	12-05 DO YOU WORK WITH ZENER DIODE LIMITERS	43	43	38	
I 560	12-06 DO YOU WORK WITH TRANSISTOR LIMITERS	36	36	31	
I 561	12-07 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS	21	21	23	
I 562	12-08 DO YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS	43	43	38	
I 563	12-09 DO YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS	36	36	31	
I 564	12-10 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING CIRCUIT	29	29	31	
I 565	13-01 IN YOUR PRESENT JOB, DO YOU WORK ON EQUIPMENT WHICH CONTAINS ELECTRON TUBES	93	93	92	
I 566	13-02 DO YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD	79	79	77	
I 567	13-03 DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES	71	71	69	ELECTRON TUBES
I 568	13-04 DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES	64	64	62	
I 569	13-05 DO YOU USE SCOPES TO CHECK ELECTRON TUBES	71	71	69	
I 570	13-06 DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES	93	93	92	
I 571	13-07 DO YOU USE OR REFER TO CUTOFF	64	64	62	
I 572	13-08 DO YOU USE OR REFER TO PEAK INVERSE VOLTAGE RATING	36	36	31	
I 573	13-09 DO YOU USE OR REFER TO PEAK CURRENT RATING	36	36	31	
I 574	13-10 DO YOU USE OR REFER TO TRANSIT TIME	21	21	23	
I 575	13-11 DO YOU USE OR REFER TO PLATE DISSIPATION RATING	21	21	23	
I 576	13-12 DO YOU USE OR REFER TO SATURATION	57	57	54	
I 577	13-13 DO YOU USE OR REFER TO DC PLATE RESISTANCE	36	36	31	
I 578	13-14 DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE RESISTANCE FOR ELECTRON TUBES	21	21	23	
I 579	13-15 DO YOU USE OR REFER TO PLATE VOLTAGE	93	93	92	
I 580	13-16 DO YOU USE OR REFER TO PLATE CURRENT	79	79	77	
I 581	13-17 DO YOU USE OR REFER TO GRID VOLTAGE	86	86	85	
I 582	13-18 DO YOU USE OR REFER TO GRID CURRENT	64	64	62	
I 583	13-19 DO YOU USE OR REFER TO CATHODE VOLTAGE	93	93	92	
I 584	13-20 DO YOU USE OR REFER TO CATHODE CURRENT	79	79	77	
I 585	13-21 DO YOU USE OR REFER TO THE TRIODE AMPLIFICATION FACTOR (THE AMPLIFICATION FACTOR FOR TRIODES IS DEFINED AS THE RATIO OF CHANGE IN PLATE VOLTAGE TO A CHANGE IN GRID VOLTAGE)	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 151	SPC 152	SPC 154	
I	586	I3-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	7	7	8	
I	587	I3-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	21	21	23	
I	588	I3-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G, WHICH IS MEASURED IN MHOS)	7	7	8	
I	589	I3-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	7	7	8	
I	590	I3-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	7	7	8	
I	591	I3-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	7	7	8	
I	592	I3-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	43	43	38	
I	593	I3-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	7	7	8	
I	594	I3-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	14	14	15	
I	595	I3-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	14	14	15	
I	596	I3-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	29	29	31	
I	597	I3-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	21	21	23	
I	598	I3-34 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER GAIN	79	79	77	
I	599	I3-35 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER EFFICIENCY	43	43	46	
I	600	I3-36 DO YOU USE TEST TUBE CHECKERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	50	50	46	
I	601	I3-37 DO YOU USE MULTIMETERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	64	64	62	
I	602	I3-38 DO YOU USE OSCILLOSCOPES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	79	79	77	
I	603	I3-39 DO YOU USE CHARACTERISTIC CURVES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	7	7	8	
I	604	I3-40 DO YOU CALCULATE ANY ELECTRON TUBE CAPACITANCES SUCH AS INPUT CAPACITANCE	14	14	15	
I	605	I3-41 DO YOU USE OR REFER TO TUBE SOCKET NOTATION	79	79	77	
I	606	I3-42 DO YOU USE OR REFER TO PIN NUMBERING SYSTEMS	86	86	85	
I	607	I3-43 DO YOU USE OR REFER TO THE TYPE OF MATERIAL OR THE OPERATING TEMPERATURE OF THE EMITTING SURFACE IN THE ELECTRON TUBES YOU WORK ON	7	7	8	
I	608	I3-44 DO YOU USE OR REFER TO TUBE SUBSTITUTION MATERIAL SUCH AS MANUALS OR CHARTS	71	71	69	
J	609	J1-01 DO YOU WORK WITH ELECTRON TUBE AMPLIFIERS OR CIRCUITS IN YOUR PRESENT JOB	79	79	77	
J	610	J1-02 DO YOU DETERMINE THE CLASS OF OPERATION FOR ELECTRON TUBE AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	21	21	15	ELECTRON TUBE AMPLIFIERS AND CIRCUITS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
J 611	J1-03 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	29	29	31	
J 612	J1-04 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	64	64	62	
J 613	J1-05 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	36	36	31	
J 614	J1-06 DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	36	36	31	
J 615	J1-07 DO YOU TROUBLESHOOT OR REPAIR DON'T KNOW WHICH TYPE OF AMPLIFIER	50	50	54	
J 616	J2-01 DO YOU WORK WITH GAS TUBES (HOT CATHODE OR COLD CATHODE)	86	86	85	
J 617	J2-02 DO YOU WORK WITH CATHODE-RAY TUBES	86	86	92	SPECIAL PURPOSE ELECTRON TUBES
J 618	J2-03 DO YOU USE OR REFER TO THE CHARACTERISTICS OF BEAM POWER TUBES	7	7	8	
J 619	J2-04 DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH BEAM POWER TUBES ARE USED	29	29	31	
J 620	J2-05 DO YOU USE OR REFER TO THE CHARACTERISTICS OF THYRATRONS	57	57	62	
J 621	J2-06 DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH THYRATRONS ARE USED	71	71	77	
J 622	J2-07 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTRON GUNS OF CATHODE-RAY TUBES (CRT)	71	71	77	
J 623	J2-08 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROMAGNETIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	64	64	69	
J 624	J2-09 DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	64	64	69	
J 625	J2-10 DO YOU USE OR REFER TO PHOSPHOR SCREENS	71	71	77	
J 626	J2-11 DO YOU USE OR REFER TO AQUADAG COATINGS	57	57	62	
J 627	J2-12 DO YOU USE OR REFER TO ELECTRON OPTICS	21	21	23	
J 628	J2-13 DO YOU USE OR REFER TO PERSISTENCE	36	36	38	
J 629	J2-14 DO YOU USE OR REFER TO DECAY TIMES	29	29	31	
J 630	J2-15 DO YOU USE OR REFER TO FLUORESCENCE	43	43	46	
J 631	J2-16 DO YOU USE OR REFER TO PHOSPHORESCENCE	50	50	54	
J 632	J3-01 DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	86	86	85	
J 633	J3-02 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	71	71	69	
J 634	J3-03 DO YOU PERFORM TASKS ON FREQUENCY MIXERS	79	79	77	HETERODYNING, MODULATION, AND DEMODULATION
J 635	J3-04 DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS IN YOUR WORK WITH TRANSMIT OR RECEIVE SYSTEMS	71	71	69	
J 636	J3-05 DO YOU PERFORM TASKS ON REACTANCE MODULATORS	57	57	54	
J 637	J3-06 DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	57	57	54	
K 638	K1-01 DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	29	29	31	
K 639	K1-02 DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	29	29	31	
K 640	K1-03 DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	21	21	23	AM SYSTEMS
K 641	K1-04 DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
K 642	K1-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	29	29	31	
K 643	K1-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	29	29	31	
K 644	K1-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	29	29	31	
K 645	K1-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	21	21	23	
K 646	K1-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	29	29	31	
K 647	K1-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	29	29	31	
K 648	K1-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	7	7	8	
K 649	K1-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	21	21	23	
K 650	K1-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	29	29	31	
K 651	K1-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	29	29	31	
K 652	K1-15 DO YOU PERFORM TASKS ON DETECTORS	29	29	31	
K 653	K1-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE	7	7	8	
K 654	K1-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	14	14	15	
K 655	K1-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	21	21	23	
K 656	K1-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	29	29	31	
K 657	K1-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	29	29	31	
K 658	K1-21 DO YOU USE OR REFER TO 2ND HARMONIC DISTORTION	21	21	23	
K 659	K1-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	21	21	23	
K 660	K1-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	14	14	15	
K 661	K1-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	14	14	15	
K 662	K1-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	14	14	15	
K 663	K1-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	14	14	15	
K 664	K1-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	29	29	31	
K 665	K1-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	29	29	31	
K 666	K2-01 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	21	21	15	
K 667	K2-02 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	29	29	23	
K 668	K2-03 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	21	21	15	FM SYSTEMS
K 669	K2-04 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	29	29	23	
K 670	K2-05 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	29	29	23	
K 671	K2-06 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	29	29	23	
K 672	K2-07 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	21	21	15	
K 673	K2-08 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	21	21	15	
K 674	K2-09 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	7	7	0	
K 675	K2-10 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	21	21	15	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
K 676	K2-11 DO YOU PERFORM TASKS ON DRIVERS (INTERMEDIATE AMPLIFIERS)	21	21	15	
K 677	K2-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	21	21	15	
K 678	K2-13 DO YOU PERFORM TASKS ON RF AMPLIFIERS	21	21	15	
K 679	K2-14 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	21	21	15	
K 680	K2-15 DO YOU PERFORM TASKS ON IF AMPLIFIERS	21	21	15	
K 681	K2-16 DO YOU PERFORM TASKS ON LIMITERS	21	21	15	
K 682	K2-17 DO YOU PERFORM TASKS ON FREQUENCY DISCRIMINATORS	21	21	15	
K 683	K2-18 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM TRANSMITTERS	21	21	15	
K 684	K2-19 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM RECEIVERS	21	21	15	
K 685	K3-01 DO YOU CONVERT DECIMAL (BASE 10) NUMBERS TO OCTAL (BASE 8) NUMBERS	21	21	23	
K 686	K3-02 DO YOU CONVERT DECIMAL NUMBERS TO BINARY (BASE 2) NUMBERS	29	29	31	NUMBERING SYSTEMS
K 687	K3-03 DO YOU CONVERT OCTAL NUMBERS TO DECIMAL NUMBERS	29	29	31	
K 688	K3-04 DO YOU CONVERT OCTAL NUMBERS TO BINARY NUMBERS	29	29	31	
K 689	K3-05 DO YOU CONVERT BINARY NUMBERS TO DECIMAL NUMBERS	36	36	38	
K 690	K3-06 DO YOU CONVERT BINARY NUMBERS TO OCTAL NUMBERS	29	29	31	
K 691	K3-07 DO YOU ADD BINARY NUMBERS TO GET A SUM	29	29	31	
K 692	K3-08 DO YOU SUBRRACT BINARY NUMBERS USING THE END-AROUND-CARRY METHOD	21	21	23	
K 693	K3-09 DO YOU SUBTRACT BINARY NUMBERS USING THE DIRECT SUBTRACTION METHOD	29	29	31	
K 694	K3-10 DO YOU ADD OCTAL NUMBERS TO GET A SUM	29	29	31	
L 695	L1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO LOGIC FUNCTIONS	36	36	38	
L 696	L1-02 DO YOU CONSTRUCT TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	29	29	31	LOGIC FUNCTIONS
L 697	L1-03 DO YOU CONSTRUCT TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	29	29	31	
L 698	L1-04 DO YOU CONSTRUCT TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	29	29	31	
L 699	L1-05 DO YOU CONSTRUCT TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS OR GATES	29	29	31	
L 700	L1-06 DO YOU USE OR REFER TO TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	29	29	31	
L 701	K1-07 DO YOU USE OR REFER TO TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	29	29	31	
L 702	K1-08 DO YOU USE OR REFER TO TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	29	29	31	
L 703	L1-09 DO YOU USE OR REFER TO TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS	21	21	23	
L 704	L1-10 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR AND GATES	29	29	31	
L 705	L1-11 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR OR GATES	29	29	31	
L 706	L1-12 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR NAND OR NOR GATES	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
L 707	L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	29	29	31	
L 708	L2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAMS, OR LOGIC CIRCUITS	29	29	31	
L 709	L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	14	14	15	BOOLEAN EQUATIONS
L 710	L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	14	14	15	
L 711	L2-04 DO YOU DRAW LOGIC DIAGRAMS FROM GIVEN BOOLEAN EQUATIONS	7	7	8	
L 712	L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	36	36	38	
L 713	L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF TROUBLESHOOTING DIGITAL CIRCUITS	14	14	15	
L 714	L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	21	21	23	
L 715	L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	14	14	15	
L 716	L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	14	14	15	
L 717	L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	29	29	31	
L 718	L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	21	21	23	
L 719	L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	21	21	23	
L 720	L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	29	29	31	
L 721	L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	36	36	38	
L 722	L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	36	36	38	
L 723	L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	36	36	38	
L 724	L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	36	36	38	
L 725	L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	36	36	38	
L 726	L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	29	29	31	
L 727	L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	29	29	31	
L 728	L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	29	29	31	
L 729	L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	36	36	38	
L 730	L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	29	29	31	
L 731	L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	29	29	31	
L 732	L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
L 733	L3-01 DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	29	29	31	
L 734	L3-02 DO YOU USE OR REFER TO UP-COUNTERS	29	29	31	
L 735	L3-03 DO YOU USE OR REFER TO DOWN-COUNTERS	29	29	31	
L 736	L3-04 DO YOU USE OR REFER TO SERIAL COUNTERS	29	29	31	COUNTERS
L 737	L3-05 DO YOU USE OR REFER TO PARALLEL COUNTERS	29	29	31	
L 738	L3-06 DO YOU USE OR REFER TO RING COUNTERS	14	14	15	
L 739	L3-07 DO YOU USE OR REFER TO DECADE COUNTERS	14	14	15	
L 740	L3-08 DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	21	21	23	
L 741	L3-09 DO YOU USE OR REFER TO DOWN CLOCKS	29	29	31	
L 742	L3-10 DO YOU USE OR REFER TO UP CLOCKS	29	29	31	
L 743	L3-11 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	29	29	31	
L 744	L3-12 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	29	29	31	
L 745	L3-13 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	14	14	15	
L 746	L3-14 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	14	14	15	
L 747	L3-15 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	29	29	31	
L 748	L3-16 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	29	29	31	
L 749	L3-17 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	29	29	31	
L 750	L3-18 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	21	21	23	
L 751	L3-19 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	21	21	23	
L 752	L3-20 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTERS	21	21	23	
L 753	L3-21 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	21	21	23	
L 754	L3-22 DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	14	14	15	
L 755	L3-23 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	21	21	23	
L 756	L3-24 DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	14	14	15	
M 757	M1-01 DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	71	71	77	
M 758	M1-02 DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	57	57	62	
M 759	M1-03 DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	79	79	77	TIMING CIRCUITS
M 760	M1-04 DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	79	79	77	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
M 761	M1-05 DO YOU WORK WITH BLOCKING OSCILLATORS	79	79	77	
M 762	M1-06 DO YOU USE OR REFER TO RISE TIME	64	64	62	
M 763	M1-07 DO YOU USE OR REFER TO FALL OR FLYBACK TIME	64	64	62	
M 764	M1-08 DO YOU USE OR REFER TO SWEEP TIME	64	64	62	
M 765	M1-09 DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	43	43	46	
M 766	M1-10 DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	43	43	46	
M 767	M1-11 DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	36	36	38	
M 768	M1-12 DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	43	43	46	
M 769	M2-01 DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	86	86	85	
M 770	M2-02 DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	86	86	85	USE OF SIGNAL GENERATORS
M 771	M2-03 DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL GENERATORS	79	79	77	
M 772	M2-04 DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	71	71	77	
M 773	M2-05 DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	36	36	38	
M 774	M2-06 DO YOU USE AUDIO SINE-WAVE GENERATORS	21	21	15	
M 775	M2-07 DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	43	43	46	
M 776	M2-08 DO YOU USE RF GENERATORS LESS THAN 1,000 MH	57	57	54	
M 777	M2-09 DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	36	36	31	
M 778	M2-10 DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	79	79	77	
M 779	M3-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR GENERATORS	57	57	62	
M 780	M3-02 DO YOU INSPECT MOTORS	57	57	62	MOTORS AND GENERATORS
M 781	M3-03 DO YOU CLEAN OR LUBRICATE MOTORS	50	50	54	
M 782	M3-04 DO YOU OPERATE MOTORS	57	57	62	
M 783	M3-05 DO YOU REMOVE OR REPLACE COMPLETE MOTORS	57	57	62	
M 784	M3-06 DO YOU REMOVE OR REPLACE MOTOR PARTS	36	36	38	
M 785	M3-07 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF MOTORS	57	57	62	
M 786	M3-08 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	36	36	38	
M 787	M3-09 DO YOU PERFORM ANY TASKS ON FIELD COILS	29	29	31	
M 788	M3-10 DO YOU PERFORM ANY TASKS ON ARMATURES	36	36	38	
M 789	M3-11 DO YOU PERFORM ANY TASKS ON ROTORS	29	29	31	
M 790	M3-12 DO YOU PERFORM ANY TASKS ON BRUSHES	43	43	46	
M 791	M3-13 DO YOU PERFORM ANY TASKS ON SLIP RINGS	36	36	38	
M 792	M3-14 DO YOU PERFORM ANY TASKS ON COMMUTATORS	29	29	31	
M 793	M3-15 DO YOU PERFORM ANY TASKS ON POLE PIECES	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
M 794	M3-16 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OF THE FORCE OR TORQUE CREATED BY A MOTOR	7	7	8	
M 795	M3-17 DO YOU DETERMINE OR MEASURE THE DIRECTION OF THE MECHANICAL FORCE OR TORQUE CREATED BY A MOTOR	29	29	31	
M 796	M3-18 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OR DIRECTION OF THE INDUCED VOLTAGE IN MOTORS	14	14	15	
M 797	M3-19 DO YOU WORK WITH SYNCHRONOUS MOTORS	57	57	62	
M 798	M3-20 DO YOU WORK WITH INDUCTION MOTORS	43	43	46	
M 799	M3-21 DO YOU WORK WITH SPLIT-PHASE MOTORS	21	21	23	
M 800	M3-22 DO YOU WORK WITH SOME COMBINATION OF THE ABOVE MOTORS	57	57	62	
M 801	M3-23 DO YOU INSPECT GENERATORS	36	36	38	
M 802	M3-24 DO YOU CLEAN OR LUBRICATE GENERATORS	14	14	15	
M 803	M3-25 DO YOU OPERATE GENERATORS	43	43	46	
M 804	M3-26 DO YOU REMOVE OR REPLACE COMPLETE GENERATORS	21	21	23	
M 805	M3-27 DO YOU REMOVE OR REPLACE GENERATOR PARTS	7	7	8	
M 806	M3-28 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF GENERATORS	36	36	38	
M 807	M3-29 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF GENERATORS	7	7	8	
N 808	N1-01 DO YOU WORK WITH METERS IN YOUR PRESENT JOB	86	86	85	
N 809	N1-02 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF PERMANENT MAGNETS	36	36	31	METER MOVEMENTS
N 810	N1-03 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF MOVING COILS	36	36	31	
N 811	N1-04 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF SPIRAL SPRINGS	29	29	23	
N 812	N1-05 DO YOU READ METER SCALES	86	86	85	
N 813	N1-06 DO YOU EXTEND THE RANGE OF AMMETERS	50	50	54	
N 814	N1-07 DO YOU ZERO OHMMETERS	79	79	77	
N 815	N1-08 DO YOU ZERO AMMETERS	64	64	62	
N 816	N1-09 DO YOU EXTEND THE RANGE OF VOLTMETERS	57	57	62	
N 817	N1-10 DO YOU USE OR REFER TO VOLTMETER SENSITIVITY (EXPRESSED IN UNITS OF OHMS PER VOLT)	79	79	77	
N 818	N2-01 DO YOU WORK WITH SATURABLE REACTORS OR MAGNETIC AMPLIFIERS IN YOUR PRESENT JOB	50	50	54	
N 819	N2-02 DO YOU INSPECT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	50	50	54	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS
N 820	N2-03 DO YOU CLEAN MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	43	43	46	
N 821	N2-04 DO YOU ADJUST MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	43	43	46	
N 822	N2-05 DO YOU TROUBLESHOOT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	50	50	54	
N 823	N2-06 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	50	50	54	
N 824	N2-07 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIER OR SATURABLE REACTOR COMPONENTS	29	29	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSX	SPC 151	SPC 152	SPC 154	
N 825	N2-08	DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	14	14	15	
N 826	N2-09	DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	36	36	38	
N 827	N2-10	DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	36	36	38	
N 828	N2-11	DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS FOR MAGNETIC AMPLIFIERS	36	36	38	
N 829	N2-12	DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE REACTORS	7	7	8	
N 830	N2-13	DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN SATURABLE REACTORS	14	14	15	
N 831	N2-14	DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE REACTORS	7	7	8	
N 832	N2-15	DO YOU USE OR REFER TO POINT OF SATURATION IN SATURABLE REACTORS	21	21	23	
N 833	N2-16	DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC SYMBOLS	50	50	54	
N 834	N3-01	DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT JOB	86	86	85	
N 835	N3-02	DO YOU USE OR REFER TO TRANSIENT INTERVALS	36	36	38	WAVESHAPING CIRCUITS
N 836	N3-03	DO YOU USE OR REFER TO PULSE WIDTH (PW)	86	86	85	
N 837	N3-04	DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	86	86	85	
N 838	N3-05	DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	86	86	85	
N 839	N3-06	DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	50	50	54	
N 840	N3-07	DO YOU USE OR REFER TO INTEGRATING CIRCUITS	43	43	38	
N 841	N3-08	DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT	36	36	38	
N 842	N3-09	DO YOU DETERMINE WHETHER AN LR OR RC CIRCUIT IS DIFFERENTIATING OR INTEGRATING BASED ON THE TIME CONSTANT AND OUTPUT CONFIGURATION	21	21	23	
N 843	N3-10	DO YOU WORK WITH SQUARE WAVE GENERATORS	64	64	69	
N 844	N3-11	DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	36	36	38	
O 845	O1-01	DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR PRESENT JOB	0	0	0	
O 846	O1-02	DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	0	0	0	
O 847	O1-03	DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	0	0	0	SINGLE SIDEBAND SYSTEMS
O 848	O1-04	DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	0	0	0	
O 849	O1-05	DO YOU TROUBLESHOOT TO SS_B TRANSMIT OR RECEIVE SYSTEMS	0	0	0	
O 850	O1-06	DO YOU TROUBLESHOOT TO SS_B TRANSMIT OR RECEIVE COMPONENTS	0	0	0	
O 851	O1-07	DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE SYSTEMS	0	0	0	
O 852	O1-08	DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE COMPONENTS	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
0 853	01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	0	0	0	
0 854	01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	0	0	0	
0 855	01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	0	0	0	
0 856	01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	0	0	0	
0 857	01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	0	0	0	
0 858	01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	0	0	0	
0 859	01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	0	0	0	
0 860	01-16 DO YOU PERFORM TASKS ON SSB MIXERS	0	0	0	
0 861	01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	0	0	0	
0 862	01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	0	0	0	
0 863	01-19 DO YOU PERFORM TASKS ON SSB RF AMPLIFIERS	0	0	0	
0 864	01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	0	0	0	
0 865	01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	0	0	0	
0 866	01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	0	0	0	
0 867	01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB SYSTEM STAGES	0	0	0	
0 868	01-24 DO YOU USE OR REFER TO SELECTIVE FADING	0	0	0	
0 869	01-25 DO YOU USE OR REFER TO PEAK POWER	0	0	0	
0 870	01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	0	0	0	
0 871	01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	0	0	0	
0 872	01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB TRANSMITTERS	0	0	0	
0 873	01-29 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB TRANSMITTER SCHEMATIC DIAGRAMS	0	0	0	
0 874	01-30 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB RECEIVER SCHEMATIC DIAGRAMS	0	0	0	
0 875	02-01 DO YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	64	64	62	
0 876	02-02 DO YOU INSPECT PULSE MODULATION SYSTEMS	64	64	62	PULSE MODULATION SYSTEMS
0 877	02-03 DO YOU CLEAN PULSE MODULATION SYSTEMS	50	50	46	
0 878	02-04 DO YOU ALIGN PULSE MODULATION SYSTEMS	50	50	46	
0 879	02-05 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	57	57	54	
0 880	02-06 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	50	50	46	
0 881	02-07 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	57	57	54	
0 882	02-08 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	50	50	46	
0 883	02-09 DO YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	36	36	38	
0 884	02-10 DO YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	50	50	54	
0 885	02-11 DO YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	36	36	38	
0 886	02-12 DO YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	29	29	31	
0 887	02-13 DO YOU WORK ON LINE PULSING MODULATION SYSTEMS	14	14	15	
0 888	02-14 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	29	29	23	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154
0 889	02-15 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER SUPPLIES	64	64	62
0 890	02-16 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM CHARGING CHOKES AND CHARGING DIODES	64	64	62
0 891	02-17 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE FORMING NETWORKS	64	64	62
0 892	02-18 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TIMERS	50	50	54
0 893	02-19 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM SWITCHES SUCH AS GAS THYRATRONS	50	50	54
0 894	02-20 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE TRANSFORMERS	57	57	54
0 895	02-21 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TRANSMITTER TUBES	57	57	54
0 896	02-22 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM RF AMPLIFIERS	64	64	62
0 897	02-23 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM FREQUENCY CONVERTERS	57	57	54
0 898	02-24 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM IF AMPLIFIERS	57	57	54
0 899	02-25 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DETECTORS	57	57	54
0 900	02-26 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM VIDEO AMPLIFIERS	50	50	54
0 901	02-27 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER VIDEO AMPLIFIERS	43	43	46
0 902	02-28 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DON'T REMEMBER WHICH PULSE MODULATION SYSTEM STAGES	14	14	15
0 903	02-29 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	64	64	62
0 904	02-30 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	64	64	62
0 905	02-31 DO YOU USE OR REFER TO PULSE WIDTH (PW)	64	64	62
0 906	02-32 DO YOU USE OR REFER TO PULSE SHAPE	64	64	62
0 907	02-33 DO YOU USE OR REFER TO PEAK POWER	64	64	62
0 908	02-34 DO YOU USE OR REFER TO AVERAGE POWER	64	64	62
0 909	02-35 DO YOU CALCULATE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	57	57	62
0 910	02-36 DO YOU MEASURE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	64	64	62
0 911	02-37 DO YOU USE FORMULAS TO CALCULATE AVERAGE POWER OR PEAK POWER OF PULSE MODULATION TRANSMIT SYSTEMS	50	50	54
0 912	02-38 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION TRANSMITTER SCHEMATIC DIAGRAMS	64	64	62
0 913	02-39 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION RECEIVER SCHEMATIC DIAGRAMS	64	64	62
0 914	03-01 DO YOU WORK WITH ANTENNAS IN YOUR PRESENT JOB	79	79	77
0 915	03-02 DO YOU INSPECT ANTENNAS	79	79	77

ANTENNAS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154
0 916	03-03 DO YOU CLEAN ANTENNAS	79	79	77
0 917	03-04 DO YOU PHYSICALLY ALIGN ANTENNAS	50	50	54
0 918	03-05 DO YOU ELECTRICALLY ALIGN ANTENNAS	43	43	46
0 919	03-06 DO YOU TROUBLESHOOT TO ANTENNAS	71	71	69
0 920	03-07 DO YOU TROUBLESHOOT TO ANTENNA COMPONENTS	50	50	54
0 921	03-08 DO YOU REMOVE OR INSTALL ANTENNAS	71	71	69
0 922	03-09 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	57	57	62
0 923	03-10 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	29	29	31
0 924	03-11 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	29	29	31
0 925	03-12 DO YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	21	21	23
0 926	03-13 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE OF CORRECT LENGTH (HALF-WAVE) ACT AS INDUCTIVE LOADS TO THE GENERATOR	21	21	23
0 927	03-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE LONGER THAN A HALF-WAVE ACT AS INDUCTIVE LOADS TO THE GENERATOR	21	21	23
0 928	03-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT ANTENNAS WHICH ARE SHORTER THAN A HALF-WAVE ACT AS CAPACITIVE LOADS TO THE GENERATOR	21	21	23
0 929	03-16 DO YOU WORK WITH HERTZ ANTENNAS	21	21	23
0 930	03-17 DO YOU WORK WITH MARCONI ANTENNAS	14	14	15
0 931	03-18 DO YOU WORK WITH BROADSIDE ARRAYS	43	43	38
0 932	03-19 DO YOU WORK WITH END-FIRE ARRAYS	29	29	23
0 933	03-20 DO YOU WORK WITH CARDIOID ARRAYS	21	21	23
0 934	03-21 DO YOU WORK WITH COLLINEAR ARRAYS	21	21	15
0 935	03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	14	14	15
0 936	03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	14	14	15
0 937	03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	29	29	23
0 938	03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	21	21	15
0 939	03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	7	7	8
0 940	03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	7	7	8
0 941	03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	43	43	38
0 942	03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	21	21	15
0 943	03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	14	14	8
0 944	03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR SPECIFIC WAVELENGTHS	7	7	8

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
O 945	03-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	21	21	23	
O 946	03-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	21	21	23	
O 947	03-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	21	21	23	
O 948	03-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	64	64	62	
O 949	03-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	57	57	54	
O 850	03-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	29	29	23	
O 851	03-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	36	36	38	
O 852	03-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	57	57	62	
P 953	P1-01 IN YOUR PRESENT JOB DO YOU WORK WITH TRANSMISSION LINES (TRANSMISSION LINES ARE DEFINED TO INCLUDE LEADS BETWEEN RECEIVERS AND ANTENNAS, TELEPHONE LEADS, AS WELL AS HIGH VOLTAGE POWER LINES, ETC. DO NOT CONSIDER WAVEGUIDES AS TRANSMISSION LINES	79	79	77	TRANSMISSION LINES
P 954	P1-02 DO YOU REFER TO OR USE COPPER LOSS OR I2R LOSS IN TRANSMISSION LINES	14	14	15	
P 955	P1-03 DO YOU REFER TO OR USE SKIN EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	14	14	15	
P 956	P1-04 DO YOU REFER TO OR USE RADIATION LOSS IN TRANSMISSION LINES	36	36	31	
P 957	P1-05 DO YOU USE OR REFER TO DIELECTRIC LOSS IN TRANSMISSION LINES	7	7	8	
P 958	P1-06 DO YOU USE OR REFER TO LEAKAGE LOSSES IN TRANSMISSION LINES	29	29	23	
P 959	P1-07 DO YOU WORK WITH TWISTED PAIR TRANSMISSION LINES	21	21	23	
P 960	P1-08 DO YOU WORK WITH TWIN LEAD TRANSMISSION LINES	21	21	23	
P 961	P1-09 DO YOU WORK WITH OPEN TWO-WIRE TRANSMISSION LINES	14	14	15	
P 962	P1-10 DO YOU WORK WITH FLEXIBLE COAXIAL CABLE TRANSMISSION LINES	71	71	69	
P 963	P1-11 DO YOU WORK WITH RIGID COAXIAL CABLE TRANSMISSION LINES	71	71	69	
P 964	P1-12 DO YOU TROUBLESHOOT TRANSMISSION LINES	64	64	62	
P 965	P1-13 DO YOU ANALYZE VOLTAGE OR CURRENT WAVEFORMS IN TRANSMISSION LINES TO DETERMINE THE TYPE OF TERMINATION (OPEN, SHORTED, CAPACITIVE, INDUCTIVE)	7	7	8	
P 966	P1-14 DO YOU SELECT APPROPRIATE TRANSMISSION LINES TERMINATIONS TO ACHIEVE DESIRED WAVEFORMS	29	29	31	
P 967	P1-15 DO YOU USE OR REFER TO SCHEMATIC SYMBOLS FOR LINE TERMINATIONS IN TERMS OF CIRCUIT TERMINATIONS	93	93	96	
P 968	P1-16 DO YOU MEASURE STANDING WAVE RATIOS (SR) OF TRANSMISSION LINES	57	57	54	
P 969	P1-17 DO YOU CALCULATE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	93	93	96	
P 970	P1-18 DO YOU PERFORM THE CALCULATIONS NECESSARY TO DETERMINE THE IMPEDANCE AND LENGTH OF QUARTER - WAVELENGTH MATCHING TRANSFORMERS TO MATCH TRANSMISSION LINES TO LOADS	7	7	8	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 159	
P 971	P1-19 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING MATCHING TRANSFORMERS	29	29	23	
P 972	P1-20 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING DELTA MATCHING	7	7	8	
P 973	P1-21 DO YOU SELECT THE TYPE OF TRANSMISSION LINE NEEDED FOR PARTICULAR JOBS WITHOUT REFERRING TO TECHNICAL DATA	7	7	8	
P 974	P1-22 DO YOU USE OR REFER TO THE TERM CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	21	21	23	
P 975	P1-23 DO YOU CALCULATE THE CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	14	14	15	
P 976	P1-24 DO YOU USE OR REFER TO THE TERM CUTOFF FREQUENCY OF TRANSMISSION LINES	21	21	23	
P 977	P1-25 DO YOU USE OR REFER TO THE TERM VELOCITY FACTOR (K) OF TRANSMISSION LINES	14	14	15	
P 978	P1-26 DO YOU COMPUTE THE ELECTRICAL LENGTH OF TRANSMISSION LINES FOR PARTICULAR FREQUENCIES	36	36	38	
P 979	P1-27 DO YOU CONSTRUCT TRANSMISSION LINES OF PARTICULAR ELECTRICAL LENGTH FOR GIVEN FREQUENCIES	36	36	38	
P 980	P1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT AS THE FREQUENCY INCREASES AND THE PHYSICAL LENGTH OF TRANSMISSION LINES REMAIN CONSTANT, THE ELECTRICAL LENGTH INCREASES	29	29	31	
P 981	P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	21	21	23	
P 982	P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	36	36	31	
P 983	P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	36	36	38	
P 984	P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	79	79	85	
P 985	P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	79	79	85	WAVEGUIDES AND CAVITY RESONATORS
P 986	P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	79	79	85	
P 987	P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	14	14	15	
P 988	P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	14	14	15	
P 989	P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	50	50	54	
P 990	P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	36	36	38	
P 991	P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	43	43	46	
P 992	P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	50	50	54	
P 993	P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	57	57	62	
P 994	P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	57	57	62	
P 995	P2-12 DO YOU REMOVE OR INSTALL E BENDS	29	29	31	
P 996	P2-13 DO YOU REMOVE OR INSTALL H BENDS	29	29	31	
P 997	P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	50	50	54	
P 998	P2-15 DO YOU REMOVE OR INSTALL CHOKE JOINTS	29	29	31	
P 999	P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	43	43	46	
P1000	P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	50	50	54	
P1001	P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	50	50	54	
P1002	P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	7	7	8	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 161	SPC 152	SPC 154
P1003	P2-20 DO YOU USE OR REFER TO "B" WALL OF WAVEGUIDES	7	7	8
P1004	P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	29	29	31
P1005	P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	7	7	8
P1006	P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	14	14	15
P1007	P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	0	0	0
P1008	P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	0	0	0
P1009	P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	14	14	15
P1010	P2-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST WAVEGUIDES ARE MADE WITH A "B" WALL SIZE OF .7 WAVELENGTHS OF THE OPERATING FREQUENCY	14	14	16
P1011	P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .5 WAVELENGTHS IN SIZE, WITH .35 USED AS AN AVERAGE	7	7	8
P1012	P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	50	50	54
P1013	P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	0	0	0
P1014	P2-31 DO YOU USE THE RIGHT HAND RULE TO DETERMINE THE DIRECTION OF PROPAGATION, DIRECTION OF "E" FIELD, OR DIRECTION OF "H" FIELD IN WAVEGUIDES	21	21	23
P1015	P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	14	14	15
P1016	P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	14	14	15
P1017	P2-34 DO YOU USE OR REFER TO THE SPACE QUADRATURE OF "E" OR "H" LINES IN WAVEGUIDES	14	14	15
P1018	P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	36	36	38
P1019	P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	36	36	38
P1020	P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	36	36	38
P1021	P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	50	50	54
P1022	P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	36	36	38
P1023	P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	14	14	15
P1024	P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	14	14	15

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
P1025	P2-42 DO YOU DETERMINE THE POSITIONING OR SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	14	14	15	
P1026	P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	29	29	31	
P1027	P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	57	57	62	
P1028	P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	36	36	38	
P1029	P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	36	36	38	
P1030	P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	21	21	23	
P1031	P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	29	29	31	
P1032	P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	43	43	46	
P1033	P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	43	43	46	
P1034	P3-01 IN YOUR PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR MAGNETRONS	57	57	62	MICROWAVE AMPLIFIERS AND OSCILLATORS
P1035	P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	7	7	8	
P1036	P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	7	7	8	
P1037	P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	7	7	8	
P1038	P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	29	29	31	
P1039	P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	7	7	8	
P1040	P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	7	7	8	
P1041	P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	14	14	15	
P1042	P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	14	14	15	
P1043	P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	50	50	54	
P1044	P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT)	14	14	15	
P1045	P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	50	50	54	
P1046	P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	21	21	23	
P1047	P3-14 DO YOU WORK WITH MAGNETRONS	57	57	62	
P1048	P3-15 DO YOU INSPECT KLYSTRONS OR TWT	43	43	46	
P1049	P3-16 DO YOU CLEAN KLYSTRONS OR TWT	36	36	38	
P1050	P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	43	43	46	
P1051	P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	36	36	38	
P1052	P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	50	50	54	
P1053	P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	43	43	46	
P1054	P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	50	50	54	
P1055	P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR TWT COMPONENTS	14	14	15	
P1056	P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	57	57	62	
P1057	P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	43	43	46	
P1058	P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	50	50	54	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154
P1059	PJ-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	50	50	54
P1060	PJ-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	57	57	62
P1061	PJ-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	50	50	54
P1062	PJ-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	50	50	54
P1063	PJ-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	29	29	31
P1064	PJ-31 DO YOU INSPECT MAGNETRONS	57	57	62
P1065	PJ-32 DO YOU CLEAN MAGNETRONS	50	50	54
P1066	PJ-33 DO YOU ADJUST MAGNETRONS	21	21	23
P1067	PJ-34 DO YOU TUNE MAGNETRONS	50	50	54
P1068	PJ-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	50	50	54
P1069	PJ-36 DO YOU TROUBLESHOOT MAGNETRONS	43	43	46
P1070	PJ-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	50	50	54
P1071	PJ-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	7	7	8
P1072	PJ-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	7	7	8
P1073	PJ-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	7	7	8
P1074	PJ-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	7	7	8
P1075	PJ-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	14	14	15
P1076	PJ-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	7	7	8
P1077	PJ-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER GRIDS	14	14	15
P1078	PJ-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER CAVITIES	14	14	15
P1079	PJ-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	14	14	15
P1080	PJ-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	14	14	15
P1081	PJ-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REPELLER (REFLECTOR) PLATES	50	50	54
P1082	PJ-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	50	50	54
P1083	PJ-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	43	43	46
P1084	PJ-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	43	43	46
P1085	PJ-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	36	36	38
P1086	PJ-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	43	43	46
P1087	PJ-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	50	50	54

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
P1088	P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON OUTPUT LEADS	50	50	54	
P1089	P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES FILAMENTS	7	7	8	
P1090	P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES CATHODES	7	7	8	
P1091	P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MODULATOR GRIDS	7	7	8	
P1092	P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ANODES	7	7	8	
P1093	P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES HELIXES	7	7	8	
P1094	P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES COLLECTORS	7	7	8	
P1095	P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MAGNETS	0	0	0	
P1096	P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ATTENUATORS	0	0	0	
P1097	P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE CIRCULATORS	7	7	8	
P1098	P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL CAVITIES	29	29	31	
P1099	P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER CAVITIES	29	29	31	
P1100	P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR DIODES	29	29	31	
P1101	P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE ISOLATORS	7	7	8	
P1102	P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-BIAS BATTERIES	14	14	15	
P1103	P3-70 DO YOU PERFORM TASKS ON ANODES	21	21	23	
P1104	P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS	7	7	8	
P1105	P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS	14	14	15	
P1106	P3-73 DO YOU PERFORM TASKS ON HEATER LEADS	14	14	15	
P1107	P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES	21	21	23	
P1108	P3-75 DO YOU PERFORM TASKS ON CATHODES	7	7	8	
P1109	P3-76 DO YOU PERFORM TASKS ON MAGNETS	7	7	8	
Q1110	Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS	36	36	31	
Q1111	Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS	36	36	31	
Q1112	Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT REGISTERS	36	36	31	REGISTERS
Q1113	Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE REGISTERS	36	36	31	
Q1114	Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	36	36	31	
Q1115	Q1-06 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF REGISTERS	43	43	38	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
Q1116	Q1-07 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP OF A SHIFT REGISTER AFTER A SPECIFIED NUMBER OF SHIFT PULSES HAVE PASSED	29	29	23	
Q1117	Q2-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR STORAGE DEVICES IN YOUR PRESENT JOB	29	29	31	
Q1118	Q2-02 DO YOU USE OR REFER TO DELAY LINES	29	29	31	STORAGE DEVICES
Q1119	Q2-03 DO YOU USE OR REFER TO MAGNETIC CORES	21	21	23	
Q1120	Q2-04 DO YOU USE OR REFER TO MAGNETIC DRUMS	7	7	8	
Q1121	Q2-05 DO YOU USE OR REFER TO MAGNETIC TAPES	7	7	8	
Q1122	Q2-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED OR MEMORY SYSTEMS	21	21	23	
Q1123	Q2-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY SYSTEMS	14	14	15	
Q1124	Q2-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS	7	7	8	
Q1125	Q2-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES	21	21	23	
Q1126	Q3-01 IN YOUR PRESENT JOB, DO YOU WORK WITH DIGITAL-TO-ANALOG (D/A) CONVERTERS, ANALOG-TO-DIGITAL (A/D) CONVERTERS, OR BINARY-TO-DECIMAL READOUT CONVERTERS	36	36	38	DIGITAL TO ANALOG CONVERTERS
Q1127	Q3-02 DO YOU COMPUTE OUTPUT VOLTAGES FOR ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS FOR GIVEN INPUT VOLTAGES	7	7	8	
Q1128	Q3-03 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE COUNT IN ELECTROMECHANICAL DIGITAL-TO-ANALOG (D/A) CONVERTERS IS DETERMINED BY ADDING THE DENOMINATORS OF THE RESISTORS	14	14	15	
Q1129	Q3-04 DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS	7	7	8	
Q1130	Q3-05 DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	21	21	23	
Q1131	Q3-06 DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	21	21	23	
Q1132	Q3-07 DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	21	21	23	
Q1133	Q3-08 DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	21	21	23	
Q1134	Q3-09 DO YOU PERFORM DON'T REMEMBER WHICH FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	21	21	23	
Q1135	Q3-10 DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D CONVERTERS	21	21	23	
Q1136	Q3-11 DO YOU USE OR REFER TO HOLD FUNCTION OF A/D CONVERTERS	21	21	23	
Q1137	Q3-12 DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D CONVERTERS	21	21	23	
Q1138	Q3-13 DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D CONVERTERS	21	21	23	
Q1139	Q3-14 DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-DIGITAL (A/D) CONVERTERS	21	21	23	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
R1140	R1-01 DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB	36	36	31	PHANTASTRONS
R1141	R2-01 IN YOUR PRESENT JOB DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS	36	36	38	
R1142	R2-02 DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS	36	36	38	SCHMITT TRIGGERS
R1143	R2-03 DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS	36	36	38	
R1144	R3-01 IN YOUR PRESENT JOB DO YOU FABRICATE MULTICONDUCTOR CABLES	86	86	85	CABLE FABRICATION
R1145	R3-02 DO YOU FABRICATE COAXIAL CABLES	86	86	85	
S1146	S1-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS	57	57	54	
S1147	S1-02 DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS	7	7	8	INPUT/OUTPUT DEVICES
S1148	S1-03 DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA	0	0	0	
S1149	S2-01 DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB	0	0	0	PHOTO SENSITIVE DEVICES
S1150	S3-01 IN YOUR PRESENT JOB DO YOU WORK WITH CHOPPER CIRCUITS	29	29	31	
S1151	S3-02 DO YOU MEASURE EXCITATION FREQUENCIES	14	14	15	
S1152	S3-03 DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS	7	7	8	
S1153	S3-04 DO YOU USE OR REFER TO EXCITATION FREQUENCIES	14	14	15	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)
S1154	S3-05 DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS	14	14	15	
S1155	S3-06 DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	21	21	23	
S1156	S3-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	21	21	23	
S1157	S3-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	29	29	31	
S1158	S3-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	21	21	23	
T1159	T1-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS	0	0	0	
T1160	T1-02 DO YOU INSPECT INFRARED SYSTEMS	0	0	0	
T1161	T1-03 DO YOU CLEAN INFRARED SYSTEMS	0	0	0	INFRARED
T1162	T1-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS	0	0	0	
T1163	T1-05 DO YOU OPERATE INFRARED SYSTEMS	0	0	0	
T1164	T1-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF INFRARED SYSTEMS	0	0	0	
T1165	T1-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF INFRARED SYSTEMS	0	0	0	
T1166	T1-08 DO YOU TROUBLESHOOT DOWN TO INFRARED SYSTEM COMPONENT PARTS	0	0	0	
T1167	T1-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS	0	0	0	
T1168	T1-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
T1169	T1-11 DO YOU USE OR REFER TO FAR REGION	0	0	0	
T1170	T1-12 DO YOU USE OR REFER TO INTERMEDIATE REGION	0	0	0	
T1171	T1-13 DO YOU USE OR REFER TO NEAR REGION	0	0	0	
T1172	T1-14 DO YOU USE OR REFER TO MICRON	0	0	0	
T1173	T1-15 DO YOU USE OR REFER TO GRAY BODIES	0	0	0	
T1174	T1-16 DO YOU USE OR REFER TO BLACK BODIES	0	0	0	
T1175	T1-17 DO YOU USE OR REFER TO ABSORPTION	0	0	0	
T1176	T1-18 DO YOU USE OR REFER TO SCATTERING	0	0	0	
T1177	T1-19 DO YOU USE OR REFER TO ABSOLUTE ZERO	0	0	0	
T1178	T1-20 DO YOU PERFORM TASKS ON BLITZ	0	0	0	
T1179	T1-21 DO YOU PERFORM TASKS ON TARGET BUTTONS	0	0	0	
T1180	T1-22 DO YOU PERFORM TASKS ON ERECTOR LENSES	0	0	0	
T1181	T1-23 DO YOU PERFORM TASKS ON OCULAR LENSES	0	0	0	
T1182	T1-24 DO YOU PERFORM TASKS ON CORRECTION LENSES	0	0	0	
T1183	T1-25 DO YOU PERFORM TASKS ON FILTERS	0	0	0	
T1184	T1-26 DO YOU PERFORM TASKS ON SPHERICAL MIRRORS	0	0	0	
T1185	T1-27 DO YOU PERFORM TASKS ON PLANE MIRRORS	0	0	0	
T1186	T2-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH LASERS	0	0	0	
T1187	T2-02 DO YOU INSPECT LASER SYSTEMS	0	0	0	
T1188	T2-03 DO YOU CLEAN LASER SYSTEMS	0	0	0	LASERS
T1189	T2-04 DO YOU OPERATE LASER SYSTEMS	0	0	0	
T1190	T2-05 DO YOU OPERATE LASER SYSTEMS	0	0	0	
T1191	T2-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF LASER SYSTEMS	0	0	0	
T1192	T2-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	0	
T1193	T2-08 DO YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER SYSTEMS	0	0	0	
T1194	T2-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER SYSTEMS	0	0	0	
T1195	T2-10 DO YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER SYSTEMS	0	0	0	
T1196	T2-11 DO YOU USE OR REFER TO ANGSTROMS (A)	0	0	0	
T1197	T2-12 DO YOU USE OR REFER TO ELECTRON ENERGY LEVELS	0	0	0	
T1198	T2-13 DO YOU USE OR REFER TO GROUND STATE	0	0	0	
T1199	T2-14 DO YOU USE OR REFER TO EXCITED STATE	0	0	0	
T1200	T2-15 DO YOU USE OR REFER TO PACKET OF RADIATION	0	0	0	
T1201	T2-16 DO YOU USE OR REFER TO PHOTONS	0	0	0	
T1202	T2-17 DO YOU USE OR REFER TO SPONTANEOUS EMISSION	0	0	0	
T1203	T2-18 DO YOU USE OR REFER TO STIMULATED EMISSION	0	0	0	
T1204	T2-19 DO YOU USE OR REFER TO COHERENCE OR INCOHERENCE	0	0	0	
T1205	T2-20 DO YOU USE OR REFER TO INVERSION LEVEL	0	0	0	
T1206	T2-21 DO YOU USE OR REFER TO MONOCHROMATIC	0	0	0	
T1207	T2-22 DO YOU WORK WITH ACTIVE MATERIALS	0	0	0	
T1208	T2-23 DO YOU WORK WITH PUMPING SOURCES	0	0	0	
T1209	T2-24 DO YOU WORK WITH FULL SILVERED (100% REFLECTIVE) MIRRORS	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 151	SPC 152	SPC 154	
T1210	T2-25 DO YOU WORK WITH HALF SILVERED (92% REFLECTIVE) MIRRORS	0	0	0	
T1211	T2-26 DO YOU WORK WITH HELICAL FLASHTUBES	0	0	0	
T1212	T2-27 DO YOU WORK WITH RUBY	0	0	0	
T1213	T2-28 DO YOU WORK WITH HELIUM-NEON	0	0	0	
T1214	T2-29 DO YOU WORK WITH HELIUM-XENON	0	0	0	
T1215	T2-30 DO YOU WORK WITH XENON	0	0	0	
T1216	T2-31 DO YOU WORK WITH CESIUM-HELIUM	0	0	0	
T1217	T2-32 DO YOU WORK WITH ARGON	0	0	0	
T1218	T2-33 DO YOU WORK WITH NEODYMIUM IN GLASS	0	0	0	
T1219	T2-34 DO YOU WORK WITH GALLIUM ARSENIDE	0	0	0	
T1220	T3-01 IN YOUR PRESENT JOB DO YOU WORK WITH DISPLAY TUBES, SUCH AS DIRECT VIEW STORAGE (DVST) OR MULTIPLE MODE STORAGE TUBES (MMST)	14	14	15	
T1221	T3-02 DO YOU INSPECT DVST OR MMST	7	7	8	DISPLAY TUBES
T1222	T3-03 DO YOU CLEAN DVST OR MMST	0	0	0	
T1223	T3-04 DO YOU ADJUST OR CALIBRATE DVST OR MMST	7	7	8	
T1224	T3-05 DO YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	7	7	8	
T1225	T3-06 DO YOU TROUBLESHOOT DVST OR MMST CIRCUITS	7	7	8	
T1226	T3-07 DO YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES OR UNITS	7	7	8	
T1227	T3-08 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	7	7	8	
T1228	T3-09 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF MMST	0	0	0	
T1229	T3-10 DO YOU PERFORM TASKS ON FLOOD GUNS	0	0	0	
T1230	T3-11 DO YOU PERFORM TASKS ON WRITE GUNS	0	0	0	
T1231	T3-12 DO YOU PERFORM TASKS ON ATTACK GUNS	0	0	0	
T1232	T3-13 DO YOU PERFORM TASKS ON ERASE GUNS	0	0	0	
T1233	T3-14 DO YOU PERFORM TASKS ON STORAGE GRIDS	0	0	0	
U1234	U1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY PROGRAMMING TASKS	0	0	0	
U1235	U1-02 DO YOU USE OR REFER TO DECIMAL SYSTEMS	0	0	0	PROGRAMMING
U1236	U1-03 DO YOU USE OR REFER TO PROGRAMS	0	0	0	
U1237	U1-04 DO YOU USE OR REFER TO HEXIDECIMAL SYSTEMS	0	0	0	
U1238	U1-05 DO YOU USE OR REFER TO 8-4-2-1 SYSTEMS	0	0	0	
U1239	U1-06 DO YOU USE OR REFER TO FOUR SYSTEMS	0	0	0	
U1240	U1-07 DO YOU USE OR REFER TO BINARY SYSTEMS	0	0	0	
U1241	U1-08 DO YOU USE OR REFER TO TIME-SHARING	0	0	0	
U1242	U1-09 DO YOU USE OR REFER TO DATA WORDS	0	0	0	
U1243	U1-10 DO YOU USE OR REFER TO ADDRESS WORDS	0	0	0	
U1244	U1-11 DO YOU USE OR REFER TO ADDRESS/SUBADDRESS	0	0	0	
U1245	U1-12 DO YOU USE OR REFER TO STEERING/INFORMATION	0	0	0	
U1246	U1-13 DO YOU USE OR REFER TO INFORMATION WORDS	0	0	0	
U1247	U1-14 DO YOU PERFORM TASKS ON SINGLE LEVEL PROGRAMMING	0	0	0	
U1248	U1-15 DO YOU PERFORM TASKS ON MULTI-LEVEL PROGRAMMING	0	0	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 151	SPC 152	SPC 154	
U1249	U1-16 DO YOU PERFORM TASKS ON INPUT DEVICES	0	0	0	
U1250	U1-17 DO YOU PERFORM TASKS ON STORAGE DEVICES	0	0	0	
U1251	U1-18 DO YOU PERFORM TASKS ON ARITHMETIC SECTIONS	0	0	0	
U1252	U1-19 DO YOU PERFORM TASKS ON CONTROL SECTIONS	7	7	8	
U1253	U1-20 DO YOU PERFORM TASKS ON OUTPUT DEVICES	7	7	8	
U1254	U1-21 DO YOU PERFORM TASKS ON POWER SUPPLIES	7	7	8	
U1255	U2-01 DO YOU USE DECIBELS TO EXPRESS AMPLIFICATION AND ATTENUATION	93	93	92	
U1256	U2-02 DO YOU USE LOGARITHMS TO COMPUTE OUTPUT POWER IN DECIBELS	29	29	31	DB AND POWER RATIOS
U1257	U2-03 DO YOU USE LOGARITHMS TO COMPUTE ATTENUATION IN DECIBELS	29	29	31	
U1258	U2-04 DUMMY TASK TO IDENTIFY INCUMBENTS WHO PERFORMED NO TASKS	0	0	0	

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AIRBORNE EARLY WARNING RADAR SPECIALIST, AFSC 32852.(U)
SEP 77 T J O'CONNOR, W A TAMASHUNAS

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SUPPLEMENTARY

INFORMATION

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Airborne Early Warning Radar Specialist (AFSC 32852). The report gives a detailed listing of the technical tasks and knowledge needed to perform the jobs within the specialty or career ladder.

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This specialty has the following functions:

Inspects, repairs, removes, replaces, modified, and maintains airborne warning and control radar and IFF systems and support equipment. Performs scheduled maintenance on airborne warning and control radar and IFF equipment. Performs unscheduled maintenance on airborne warning and control radar and IFF equipment. Maintains support equipment. Maintains inspection and maintenance records. Supervises airborne warning and control radar maintenance personnel.