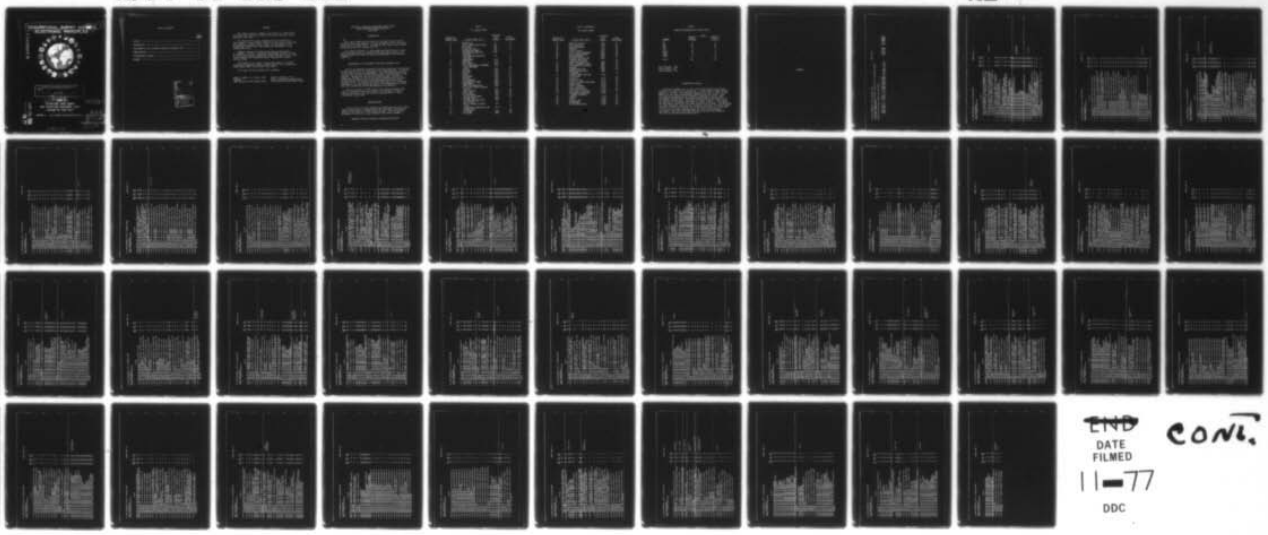
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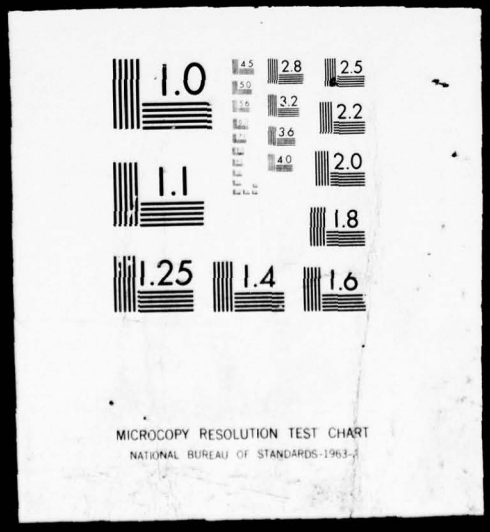
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OCCUPATIONAL SURVEY REPORT
ELECTRONIC PRINCIPLES



AVIONIC NAVIGATION SYSTEM SPECIALIST

AFSC 32851

AFPT-90-328-222

22 September 1977

52p.

OCCUPATIONAL SURVEY BRANCH
USAF OCCUPATIONAL MEASUREMENT CENTER
LACKLAND AFB TEXAS 78236

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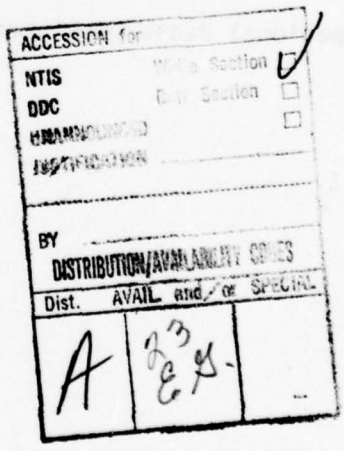
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TABLE OF CONTENTS

	PAGE NUMBER
PREFACE	2
INTRODUCTION	3
DEVELOPMENT OF THE ELECTRONIC PRINCIPLES INVENTORY (EPI)	3
ADMINISTRATION	3
PRESENTATION OF RESULTS	6
APPENDIX	7



PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Avionic Navigation System Specialist, AFSC 32851.

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 Captain Elena J. Weber. 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
AVIONIC NAVIGATION SYSTEM SPECIALIST
AFSC 32851

INTRODUCTION

This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Avionic Navigation System Specialist (AFSC 32851). 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 32851 airmen worldwide. Responses from 344 individuals represented 20 percent of the total of all AFSC 32851 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

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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

	32851	
COMMAND	PERCENT ASSIGNED	PERCENT OF SAMPLE
ATC	7	5
MAC	26	29
SAC	25	25
AFSC	2	1
TAC	18	17
USAFE	10	11
PACAF	5	4
OTHER	7	8
TOTAL	100	100

Total Assigned - 1683
Total Sampled - 344
Percent Sampled - 20%

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 Relays (p. 12) and Oscilloscopes (p. 13) to low in areas such as Single Sideband Systems (pp. 30-31) and Programming (pp. 43-44). Additional AFSC 328X1 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 32851 CAREER FIELD.

REPORTS ON THE FOLLOWING GROUPS WERE REQUESTED

GROUP IDENTITY = SPC126	ALL AIRMEN DAFSC 32851	CONTAINING	344 MEMBERS.
GROUP IDENTITY = SPC127	ALL AIRMEN DAFSC 32851 STATIONED IN CONUS	CONTAINING	260 MEMBERS.
GROUP IDENTITY = SPC128	ALL AIRMEN DAFSC 32851 STATIONED OVERSEAS	CONTAINING	84 MEMBERS.

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
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.	90	90	88	
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.	57	57	57	MATHEMATICS
A	3	A1-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS.	42	40	50	
A	4	A1-04 DO YOU CALCULATE THE SQUARE ROOT OF A QUANTITY.	12	11	14	
A	5	A1-05 DO YOU SOLVE FOR UNKNOWN QUANTITIES.	34	35	32	
A	6	A1-06 DO YOU CONVERT NUMBERS TO LOGARITHMS.	9	9	8	
A	7	A1-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS.	15	15	15	
A	8	A1-08 DO YOU SOLVE QUADRATIC EQUATIONS.	8	8	10	
A	9	A1-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS.	8	7	8	
A	10	A1-10 DO YOU PERFORM CALCULATIONS ON VECTOR QUANTITIES.	14	14	14	
A	11	A1-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT.	17	17	18	
A	12	A1-12 DO YOU DETERMINE AREAS OF PLANE FIGURES.	5	5	5	
A	13	A1-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS.	5	4	8	
A	14	A1-14 DO YOU SOLVE OR USE PROPORTIONS.	26	27	20	
A	15	A2-01 DO YOU USE THE TERM VOLTAGE OR VOLT (V).	97	97	95	
A	16	A2-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF).	44	47	38	
A	17	A2-03 DO YOU USE THE TERM OHM.	96	97	94	DIRECT CURRENT AND VOLTAGE
A	18	A2-04 DO YOU USE THE TERM ION.	20	21	17	
A	19	A2-05 DO YOU USE THE TERM DYNE.	13	12	13	
A	20	A2-06 DO YOU USE THE TERM AMPERE.	93	94	92	
A	21	A2-07 DO YOU USE THE TERM NEUTRON.	16	17	13	
A	22	A2-08 DO YOU USE THE TERM COULOMB.	20	21	18	
A	23	A2-09 DO YOU USE THE TERM PROTON.	16	17	15	
A	24	A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB.	83	84	79	
A	25	A3-02 DO YOU INSPECT RESISTORS.	92	92	90	
A	26	A3-03 DO YOU CLEAN RESISTORS.	82	83	80	
A	27	A3-04 DO YOU ADJUST RESISTORS.	93	94	89	RESISTANCE
A	28	A3-05 DO YOU CHECK OHMIC VALUE OR RESISTORS.	92	93	88	
A	29	A3-06 DO YOU REMOVE OR REPLACE RESISTORS.	92	93	90	
A	30	A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS YOU PERFORM.	25	27	19	
A	31	A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS SUCH AS FIXED RESISTOR SYMBOLS OR TAPPED RESISTOR SYMBOLS.	93	94	89	
A	32	A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FIXED WIRE, SLIDE TAP, RHEOSTAT, OR POTENTIOMETER.	89	90	85	
A	33	A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE OHMIC VALUE OF RESISTANCE.	92	94	86	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
A	34	A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE TOLERANCE.	84	86	79	
A	35	A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE FAILURE RATE.	28	30	24	
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	40	21	
A	37	A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT BATTERIES, FUSES, CONDUCTORS, LAMPS, OR SWITCHES	91	92	88	
A	38	A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	60	61	56	
A	39	A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	51	53	45	
A	40	A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	58	58	56	
A	41	A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	42	43	36	
A	42	A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	57	59	61	
A	43	A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	49	52	43	
A	44	A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	56	57	52	
A	45	A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	47	48	43	
A	46	A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	39	40	35	
A	47	A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	56	57	54	
A	48	A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	48	50	42	
A	49	A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	54	55	51	
A	50	A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	45	46	42	
A	51	A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	39	40	35	
B	52	B1-01 DO YOU MEASURE RESISTANCE.	94	95	94	
B	53	B1-02 DO YOU REPAIR OHMMETERS.	12	14	6	
B	54	B1-03 DO YOU MEASURE VOLTAGE.	95	95	95	
B	55	B1-04 DO YOU REPAIR VOLTMETERS.	10	11	6	MULTIMETER USES
B	56	B1-05 DO YOU REPAIR AMMETERS.	9	10	6	
B	57	B1-06 DO YOU MEASURE CURRENT.	90	90	88	
B	58	B1-07 DO YOU USE MULTIMETERS.	96	96	95	
B	59	B1-08 DO YOU DIRECTLY USE A QUANTITY OF CHARGE CALLED A COULOMB.	9	9	8	
B	60	B1-09 DO YOU READ SCHEMATICS.	95	95	95	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
B	61	B2-01 DO YOU USE OR REFER TO THE TERM EFFECTIVE VOLTAGE (RMS).	89	85	82	ALTERNATING CURRENT
B	62	B2-02 DO YOU USE OR REFER TO THE TERM PEAK TO PEAK VOLTAGE.	92	93	89	
B	63	B2-03 DO YOU USE OR REFER TO THE TERM AVERAGE VOLTAGE (DC).	84	84	82	
B	64	B2-04 DO YOU USE OR REFER TO THE TERM WAVE LENGTH.	71	75	60	
B	65	B2-05 DO YOU USE OR REFER TO THE TERM FREQUENCY.	95	95	95	
B	66	B2-06 DO YOU USE OR REFER TO THE TERM INSTANTANEOUS VALUE.	36	38	30	
B	67	B3-01 DO YOU WORK WITH INDUCTORS OR CIRCUITS CONTAINING INDUCTORS, CHOKES, OR CHOKE COILS IN YOUR PRESENT JOB.	82	83	81	INDUCTORS AND INDUCTIVE REACTANCE
B	68	B3-02 DO YOU INSPECT INDUCTORS.	83	85	80	
B	69	B3-03 DO YOU CLEAN INDUCTORS.	71	73	63	
B	70	B3-04 DO YOU ADJUST INDUCTORS.	84	85	80	
B	71	B3-05 DO YOU REMOVE OR REPLACE INDUCTORS.	86	87	82	
B	72	B3-06 DO YOU USE OR REFER TO INDUCTANCE.	73	74	69	
B	73	B3-07 DO YOU USE OR REFER TO HENRIES.	56	57	51	
B	74	B3-08 DO YOU USE OR REFER TO INDUCTIVE REACTANCE.	55	55	57	
B	75	B3-09 DO YOU USE OR REFER TO COPPER LOSS IN INDUCTORS.	13	16	4	
B	76	B3-10 DO YOU USE OR REFER TO HYSTERESIS LOSS IN INDUCTORS.	15	18	7	
B	77	B3-11 DO YOU USE OR REFER TO EDDY CURRENT LOSS IN INDUCTORS	14	18	8	
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.	15	17	8	
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.	13	15	7	
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	17	7	
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.	13	14	7	
B	82	B3-16) DO YOU CALCULATE INDUCTANCE FOR PARTICULAR INDUCTORS USING FORMULAS.	13	14	11	
B	83	B3-17 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTANCE IN SERIES.	20	21	18	
B	84	B3-18 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN PARALLEL.	20	21	18	
B	85	B3-19 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN SERIES-PARALLEL CIRCUITS.	19	20	17	
B	86	B3-20 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LAGS VOLTAGE IN AC INDUCTOR CIRCUITS.	34	38	23	
B	87	B3-21 DO YOU CALCULATE INDUCTIVE REACTANCE.	18	20	14	
B	88	B3-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO FREQUENCY.	28	29	23	
B	89	B3-23 DO YOU WORK WITH POWER INDUCTORS.	59	60	56	
B	90	B3-24 DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	77	78	74	
B	91	B3-25 DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	81	82	76	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
C	92	C1-01 DO YOU WORK WITH CAPACITORS OR CIRCUITS CONTAINING CAPACITORS IN YOUR PRESENT JOB.	83	85	76	
C	93	C1-02 DO YOU INSPECT CAPACITORS.	90	92	85	CAPACITORS AND CAPACITIVE REACTANCE
C	94	C1-03 DO YOU CLEAN CAPACITORS.	78	78	76	
C	95	C1-04 DO YOU ADJUST CAPACITORS.	88	88	85	
C	96	C1-05 DO YOU TEST CAPACITORS.	84	86	79	
C	97	C1-06 DO YOU DISCHARGE CAPACITORS.	87	88	82	
C	98	C1-07 DO YOU REMOVE OR REPLACE CAPACITORS.	90	92	87	
C	99	C1-08 DO YOU USE OR REFER TO DISTRIBUTED CAPACITANCE.	24	24	25	
C	100	C1-09 DO YOU USE OR REFER TO ORBITAL STRESS OF ELECTRONS IN A DIELECTRIC.	4	5	2	
C	101	C1-10 DO YOU USE OR REFER TO FARADS, MICROFARADS, OR PICOFARADS.	85	87	79	
C	102	C1-11 DO YOU USE OR REFER TO CAPACITANCE.	82	84	74	
C	103	C1-12 DO YOU USE OR REFER TO DIELECTRIC CONSTANT	18	20	11	
C	104	C1-13 DO YOU USE OR REFER TO WORKING VOLTAGE RATING OF CAPACITORS	69	71	62	
C	105	C1-14 DO YOU USE OR REFER TO CAPACITIVE REACTANCE	39	40	38	
C	106	C1-15 DO YOU USE OR REFER TO CAPACITOR COLOR CODES	49	49	49	
C	107	C1-16 DO YOU WORK WITH CAPACITORS IN DC CIRCUITS	90	92	86	
C	108	C1-17 DO YOU WORK WITH CAPACITORS IN AC CIRCUITS	90	92	87	
C	109	C1-18 DO YOU WORK WITH CAPACITORS IN CIRCUITS WITH BOTH DC AND AC	88	89	83	
C	110	C1-19 DO YOU WORK WITH CAPACITORS IN DON'T REMEMBER WHICH CIRCUITS	16	18	11	
C	111	C1-20 DO YOU CALCULATE CAPACITANCE FOR PARTICULAR CAPACITORS USING FORMULAS	13	15	10	
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	11	12	6	
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	12	14	7	
C	114	C1-23 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES	27	27	26	
C	115	C1-24 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN PARALLEL	27	28	26	
C	116	C1-25 DO YOU CALCULATE THE TOTAL CAPACITANCE OF CAPACITORS IN SERIES-PARALLEL CIRCUITS	25	26	24	
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	45	47	38	
C	118	C1-27 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LEADS VOLTAGE IN AC CAPACITOR CIRCUITS	31	33	25	
C	119	C1-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT CAPACITIVE REACTANCE IS INVERSELY PROPORTIONAL TO FREQUENCY	28	30	21	
C	120	C1-29 DO YOU CALCULATE CAPACITIVE REACTANCE	18	18	17	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
C 121	C1-30 DO YOU WORK WITH ROTOR-STATOR (VARIABLE) CAPACITORS	80	81	75	
C 122	C1-31 DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS	69	70	67	
C 123	C1-32 DO YOU WORK WITH ELECTROLYTIC (FIXED) CAPACITORS	89	90	86	
C 124	C1-33 DO YOU WORK WITH PAPER (FIXED) CAPACITORS	87	88	83	
C 125	C1-34 DO YOU WORK WITH MICA (FIXED) CAPACITORS	86	87	80	
C 126	C1-35 DO YOU WORK WITH CERAMIC (FIXED) CAPACITORS	87	89	82	
C 127	C1-36 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS	17	17	18	
C 128	C2-01 DO YOU WORK WITH TRANSFORMERS IN YOUR PRESENT JOB	81	82	77	
C 129	C2-02 DO YOU INSPECT TRANSFORMERS	87	88	83	
C 130	C2-03 DO YOU CLEAN TRANSFORMERS	72	73	67	
C 131	C2-04 DO YOU ADJUST TRANSFORMERS	68	70	62	TRANSFORMERS
C 132	C2-05 DO YOU TROUBLESHOOT TRANSFORMERS	81	83	76	
C 133	C2-06 DO YOU REMOVE OR REPLACE COMPLETE TRANSFORMERS	88	89	85	
C 134	C2-07 DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING	9	10	8	
C 135	C2-08 DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTION AND MUTUAL INDUCTANCE (M)	6	6	5	
C 136	C2-09 DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M	7	7	6	
C 137	C2-10 DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS	13	12	13	
C 138	C2-11 DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS	15	17	10	
C 139	C2-12 DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS	13	15	10	
C 140	C2-13 DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS	8	9	6	
C 141	C2-14 DO YOU WORK WITH AUTOTRANSFORMERS	44	45	42	
C 142	C2-15 DO YOU WORK WITH POWER TRANSFORMERS	84	84	83	
C 143	C2-16 DO YOU WORK WITH AUDIO TRANSFORMERS	81	82	80	
C 144	C2-17 DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS	81	82	77	
C 145	C2-18 DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMERS	14	16	7	
C 146	C2-19 DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE	87	87	85	
C 147	C2-20 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE	82	82	80	
C 148	C2-21 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES	77	78	75	
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	33	34	29	
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	49	52	39	
C 151	C2-24 DO YOU REFER TO BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS	85	87	80	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
C 152	C2-25 DO YOU REFER TO MULTIPLE SECONDARY-WINDINGS SCHEMATIC SYMBOLS FOR TRANSFORMERS	83	84	79	
C 153	C2-26 DO YOU REFER TO MULTIPLE TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	85	87	82	
C 154	C2-27 DO YOU REFER TO CENTER TAP SCHEMATIC SYMBOLS FOR TRANSFORMERS	86	87	82	
C 155	C2-28 DO YOU REFER TO AIR CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	63	64	62	
C 156	C2-29 DO YOU REFER TO IRON CORE SCHEMATIC SYMBOLS FOR TRANSFORMERS	66	66	65	
C 157	C2-30 DO YOU REFER TO COMBINATIONS OF THE ABOVE SCHEMATIC SYMBOLS FOR TRANSFORMERS	74	75	71	
C 158	C2-31 DO YOU DETERMINE PHASE RELATIONSHIPS BETWEEN SECONDARY AND PRIMARY VOLTAGES OF TRANSFORMERS USING SCHEMATIC SYMBOLS	48	48	48	
C 159	C2-32 DO YOU DETERMINE OR REFER TO THE TYPE OF CORE IN TRANSFORMERS YOU WORK WITH	30	31	26	
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	24	29	18	
C 161	C2-34 DO YOU USE OR REFER TO STEP-UP OR STEP-DOWN RATIOS FOR TRANSFORMERS	43	43	42	
C 162	C2-35 DO YOU CALCULATE VOLTAGE RATIOS FOR TRANSFORMERS USING TURNS RATIOS	18	22	8	
C 163	C2-36 DO YOU CALCULATE CURRENT RATIOS FOR TRANSFORMERS USING TURNS RATIOS	13	16	5	
C 164	C2-37 DOES YOUR JOB INVOLVE ANY TASKS DEALING WITH THREE PHASE TRANSFORMERS	39	41	32	
C 165	C2-38 DO YOU INSPECT THREE PHASE TRANSFORMERS	36	39	27	
C 166	C2-39 DO YOU CLEAN OR LUBRICATE THREE PHASE TRANSFORMERS	24	28	19	
C 167	C2-40 DO YOU ADJUST THREE PHASE TRANSFORMERS	22	23	15	
C 168	C2-41 DO YOU TROUBLESHOOT THREE PHASE TRANSFORMERS	33	35	24	
C 169	C2-42 DO YOU REMOVE OR REPLACE COMPLETE THREE PHASE TRANSFORMERS	36	39	25	
C 170	C2-43 DO YOU REMOVE OR REPLACE THREE PHASE TRANSFORMER PARTS SUCH AS WINDINGS	7	7	6	
C 171	C3-01 DO YOU USE OR REFER TO PERMANENT MAGNETS	58	58	58	
C 172	C3-02 DO YOU USE OR REFER TO TEMPORARY MAGNETS	45	48	37	MAGNETISM
C 173	C3-03 DO YOU USE OR REFER TO RETENTIVITY OF MAGNETIC MATERIALS	16	15	18	
C 174	C3-04 DO YOU USE OR REFER TO RELUCTANCE OF MAGNETIC MATERIALS	14	14	14	
C 175	C3-05 DO YOU USE OR REFER TO PERMEABILITY OF MAGNETIC MATERIALS	16	17	14	
C 176	C3-06 DO YOU USE OR REFER TO RESIDUAL MAGNETISM	22	23	21	
C 177	C3-07 DO YOU USE OR REFER TO MAGNETIC LINES OF FORCE OR FLUX	29	32	18	
C 178	C3-08 DO YOU USE OR REFER TO WEBER'S THEORY OF MAGNETISM	9	11	4	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
C	179	C3-09 DO YOU USE OR REFER TO DOMAIN THEORY OF MAGNETISM	9	11	2	
C	180	C3-10 DO YOU USE OR REFER TO MAGNETIC INDUCTION	27	31	15	
C	181	C3-11 DO YOU USE OR REFER TO FLUX DENSITY	15	17	10	
C	182	C3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT	50	52	42	
C	183	C3-13 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES	20	22	14	
C	184	C3-14 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE NORTH POLE OF A CURRENT CARRYING COIL	18	19	13	
D	185	D1-01 DO YOU WORK WITH RC, LR, RCL CIRCUITS IN YOUR PRESENT JOB	73	73	73	
D	186	D1-02 DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH RCL CIRCUITS	13	14	10	RCL CIRCUITS
D	187	D1-03 DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN WORKING WITH RCL CIRCUITS	11	12	10	
D	188	D1-04 DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL CIRCUITS	17	19	11	
D	189	D1-05 DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL CIRCUITS	17	18	11	
D	190	D1-06 DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH RCL CIRCUITS	13	15	8	
D	191	D1-07 DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL CIRCUITS	54	55	51	
D	192	D1-08 DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING WITH RCL CIRCUITS	35	38	26	
D	193	D1-09 DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN WORKING WITH RCL CIRCUITS	41	42	38	
D	194	D1-10 DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN WORKING WITH RCL CIRCUITS	47	48	44	
D	195	D1-11 DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN WORKING WITH RCL CIRCUITS	24	27	18	
D	196	D1-12 DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING WITH RCL CIRCUITS	21	23	17	
D	197	D1-13 DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN WORKING WITH RCL CIRCUITS	65	67	58	
D	198	D1-14 DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH RCL CIRCUITS	73	73	73	
D	199	D1-15 DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH RCL CIRCUITS	68	70	62	
D	200	D1-16 DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN WORKING WITH RCL CIRCUITS	70	72	67	
D	201	D1-17 DO YOU USE OR REFER TO HALF POWER POINTS WHEN WORKING WITH RCL CIRCUITS	62	62	62	
D	202	D1-18 DO YOU USE OR REFER TO BANDPASS REGION WHEN WORKING WITH RCL CIRCUITS	65	66	60	
D	203	D1-19 DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH RCL CIRCUITS	31	35	19	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128
D 204	D1-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS	65	65	64
D 205	D1-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS	7	8	4
D 206	D1-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS	10	12	4
D 207	D1-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS	16	18	10
D 208	D1-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS	9	9	7
D 209	D1-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS	16	18	10
D 210	D1-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS	8	10	4
D 211	D1-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS	16	18	10
D 212	D1-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS	18	20	11
D 213	D1-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS	13	15	8
D 214	D1-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS	18	20	11
D 215	D1-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS	8	9	6
D 216	D1-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD	11	12	6
D 217	D1-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW	15	17	10
D 218	D1-34 DO YOU CHECK CAPACITORS USING OHMMETERS	74	75	74
D 219	D1-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION	66	67	64
D 220	D1-36 DO YOU CHECK INDUCTORS USING OHMMETERS	70	70	70
D 221	D1-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION	63	63	61
D 222	D1-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT THETA= 0, PF = 1, AND PA = PT FOR RESONANT CIRCUITS	6	7	4
D 223	D1-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS	20	23	12
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	26	28	20
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	24	26	19
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	57	55	62
D 227	D1-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q	28	30	21
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	22	17

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
D 229	D2-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANT CIRCUITS OR TIME CONSTANTS	55	55	56	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)
D 230	D2-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS	46	47	45	
D 231	D2-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE	29	30	27	
D 232	D2-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS	20	20	19	
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)	27	27	25	
D 234	D2-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS	12	12	13	
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	11	13	7	
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	13	15	8	
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	12	13	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	18	19	14	
D 239	D3-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS IN YOUR PRESENT JOB	84	85	81	
D 240	D3-02 DO YOU INSPECT FILTER CIRCUITS	83	85	79	FILTERS
D 241	D3-03 DO YOU CLEAN FILTER CIRCUITS	71	72	67	
D 242	D3-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS	72	74	65	
D 243	D3-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT LEVEL	80	81	76	
D 244	D3-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS	77	80	69	
D 245	D3-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT	79	80	76	
D 246	D3-08 DO YOU REMOVE OR REPLACE FILTER CIRCUIT COMPONENT PARTS	74	77	68	
D 247	D3-09 DO YOU WORK WITH LOW PASS FILTERS	81	82	77	
D 248	D3-10 DO YOU WORK WITH HIGH PASS FILTERS	77	78	71	
D 249	D3-11 DO YOU WORK WITH BANDPASS FILTERS	82	83	76	
D 250	D3-12 DO YOU WORK WITH BAND-REJECT FILTERS	67	67	64	
D 251	D3-13 DON'T REMEMBER WHICH TYPE OF FILTER YOU WORK WITH	16	17	13	
D 252	D3-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATION	57	58	55	
D 253	D3-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATION	57	57	56	
D 254	D3-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATION	95	97	90	
D 255	D3-17 DON'T REMEMBER WHICH TYPE FILTER CONFIGURATION	26	26	24	
D 256	D3-18 DO THE FILTERS YOU WORK WITH USE PARALLEL RESONANT CIRCUITS	60	62	51	
D 257	D3-19 DO THE FILTERS YOU WORK WITH USE SERIES-PARALLEL CIRCUITS	61	63	54	
D 258	D3-20 DO THE FILTERS YOU WORK WITH USE SERIES RESONANT CIRCUITS	61	63	52	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
D 259	D3-21	DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT	27	26	31	
D 260	D3-22	DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC FILTERS	12	13	8	
E 261	E1-01	DO YOU WORK WITH COUPLING DEVICES IN YOUR PRESENT JOB	83	83	80	
E 262	E1-02	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH RC COUPLING	78	80	73	COUPLING
E 263	E1-03	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH IMPEDANCE COUPLING	74	75	69	
E 264	E1-04	DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH TRANSFORMER COUPLING	81	82	77	
E 265	E1-05	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM RC COUPLING	77	78	73	
E 266	E1-06	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM IMPEDANCE COUPLING	74	75	69	
E 267	E1-07	DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM TRANSFORMER COUPLING	78	79	76	
E 268	E1-08	DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS	74	76	68	
E 269	E1-09	DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS	72	73	67	
E 270	E1-10	DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS	68	71	61	
E 271	E1-11	DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS	76	77	73	
E 272	E1-12	DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUITS	17	16	19	
E 273	E2-01	IN YOUR PRESENT JOB, DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS	92	92	93	
E 274	E2-02	DO YOU SELECT TYPE OF SOLDER TO USE	77	77	79	SOLDERING
E 275	E2-03	DO YOU ADD FLUX TO CONNECTIONS	88	88	88	
E 276	E2-04	DO YOU CLEAN CONNECTIONS USING SOLVENTS	83	84	81	
E 277	E2-05	DO YOU STRIP INSULATION FROM WIRES	94	94	93	
E 278	E2-06	DO YOU CONNECT OR DISCONNECT HEAT SINKS	90	92	87	
E 279	E2-07	DO YOU BEND OR SHAPE WIRES OR LEADS	94	94	93	
E 280	E2-08	DO YOU CUT WIRES	94	94	93	
E 281	E2-09	DO YOU FILE OR SHAPE SOLDERING IRON TIPS	79	80	76	
E 282	E2-10	DO YOU TIN SOLDERING IRON TIPS	93	93	92	
E 283	E2-11	DO YOU CLEAN SOLDERING IRON TIPS	94	94	92	
E 284	E2-12	DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS	88	89	85	
E 285	E2-13	DO YOU TIN OR PRE-TIN CONDUCTORS	93	94	90	
E 286	E2-14	DO YOU INSPECT SOLDERED CONNECTIONS	93	93	93	
E 287	E2-15	DO YOU DESOLDER CONNECTIONS BY WICKING	72	73	69	
E 288	E2-16	DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS	88	89	87	
E 289	E2-17	DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS	73	73	74	
E 290	E2-18	DO YOU CRUSH COMPONENTS FOR REMOVAL	30	30	30	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
E 291	E2-19 DO YOU MAKE HARDWIRE CONNECTIONS	89	90	86	
E 292	E2-20 DO YOU MAKE PRINTED CIRCUIT BOARD CONNECTIONS	86	85	82	
E 293	E2-21 DO YOU SOLDER PASSIVE COMPONENTS SUCH AS RESISTORS OR CAPACITORS ON PRINTED CIRCUIT BOARDS	85	85	83	
E 294	E2-22 DO YOU SOLDER ACTIVE COMPONENTS SUCH AS SOLID-STATE DIODES OR TRANSISTORS ON PRINTED CIRCUIT BOARDS	83	83	85	
E 295	E3-01 DO YOU WORK WITH RELAYS ON YOUR PRESENT JOB	88	88	88	
E 296	E3-02 DO YOU ADJUST RELAYS	60	60	62	
E 297	E3-03 DO YOU CLEAN RELAYS	78	77	82	
E 298	E3-04 DO YOU INSPECT RELAYS	87	88	85	RELAYS
E 299	E3-05 DO YOU REMOVE OR REPLACE COMPLETE RELAYS	90	90	90	
E 300	E3-06 DO YOU REMOVE OR REPLACE PARTS OR RELAYS	26	26	26	
E 301	E3-07 DO YOU TROUBLESHOOT RELAYS	84	85	82	
E 302	E3-08 DO YOU STRAIGHTEN RELAY CONTACTS	70	70	70	
E 303	E3-09 DO YOU PERFORM TASKS ON RELAY CONTACTS	65	63	69	
E 304	E3-10 DO YOU PERFORM TASKS ON RELAY CORES	12	12	13	
E 305	E3-11 DO YOU PERFORM TASKS ON RELAY COILS	17	17	15	
E 306	E3-12 DO YOU PERFORM TASKS ON RELAY ARMATURES	26	27	26	
E 307	E3-13 DO YOU PERFORM TASKS ON RELAY SPRINGS	35	35	33	
E 308	E3-14 DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY OPER (NO) SCHEMATIC SYMBOLS FOR RELAYS	78	80	71	
E 309	E3-15 DO YOU USE OR REFER TO SINGLE POLE, SINGLE THROW (SPST), NORMALLY CLOSED (NC) SCHEMATIC SYMBOLS FOR RELAYS	77	80	70	
E 310	E3-16 DO YOU USE OR REFER TO SINGLE POLE, DOUBLE THROW (SPDT) SCHEMATIC SYMBOLS FOR RELAYS	78	79	76	
E 311	E3-17 DO YOU USE OR REFER TO DOUBLE POLE, DOUBLE THROW (DPDT) SCHEMATIC SYMBOLS FOR RELAYS	77	77	76	
E 312	E3-18 DO YOU USE OR REFER TO OTHER RELAY SYMBOLS SCHEMATIC SYMBOLS FOR RELAYS	72	72	73	
E 313	E3-19 DO YOU CHECK ELECTRICAL CONTINUITY OF COILS BY MEASURING RESISTANCE	80	80	79	
F 314	F1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH MICROPHONES	19	20	15	
F 315	F1-02 DO YOU INSPECT MICROPHONES	9	10	7	
F 316	F1-03 DO YOU CLEAN MICROPHONES	8	8	6	MICROPHONES
F 317	F1-04 DO YOU OPERATE MICROPHONES	19	20	15	
F 318	F1-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OR MICROPHONES	9	10	9	
F 319	F1-06 DO YOU TROUBLESHOOT DOWN TO MICROPHONE PARTS	3	3	5	
F 320	F1-07 DO YOU REMOVE OR REPLACE COMPLETE MICROPHONES	9	11	5	
F 321	F1-08 DO YOU REMOVE OR REPLACE MICROPHONE PARTS	3	2	6	
F 322	F1-09 DO YOU PERFORM TASKS ON CARBON MICROPHONES	6	7	6	
F 323	F1-10 DO YOU PERFORM TASKS ON CAPACITOR MICROPHONES	3	3	4	
F 324	F1-11 DO YOU PERFORM TASKS ON CRYSTAL MICROPHONES	2	2	1	
F 325	F1-12 DO YOU PERFORM TASKS ON DYNAMIC MICROPHONES	8	9	2	
F 326	F1-13 DO YOU PERFORM TASKS ON VELOCITY RIBBON MICROPHONES	1	1	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
F	327	F2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH SPEAKERS	32	32	32	
F	328	F2-02 DO YOU INSPECT SPEAKERS	20	22	13	
F	329	F2-03 DO YOU CLEAN SPEAKERS	15	16	12	SPEAKERS
F	330	F2-04 DO YOU OPERATE SPEAKERS	31	31	31	
F	331	F2-05 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OF SPEAKERS	25	25	25	
F	332	F2-06 DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS	4	5	2	
F	333	F2-07 DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS	21	21	20	
F	334	F2-08 DO YOU REMOVE OR REPLACE SPEAKER PARTS	3	3	1	
F	335	F2-09 DO YOU PERFORM ANY TASKS ON SPEAKER CONES	2	2	2	
F	336	F2-10 DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS	2	2	1	
F	337	F2-11 DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS	2	2	1	
F	338	F2-12 DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS	1	2	1	
F	339	F2-13 DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS	1	2	1	
F	340	F2-14 DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS	2	2	1	
F	341	F2-15 DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES	1	1	0	
F	342	F3-01 DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB	89	91	83	
F	343	F3-02 DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL CHECKS	88	90	82	
F	344	F3-03 DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR ADJUSTMENTS	87	88	82	OSCILLOSCOPES
F	345	F3-04 DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC CIRCUITS	87	88	82	
F	346	F3-05 DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY	87	88	83	
F	347	F3-06 DO YOU USE OSCILLOSCOPES TO MEASURE TIME	86	89	79	
F	348	F3-07 DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	42	44	36	
F	349	F3-08 DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	88	90	85	
F	350	F3-09 DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	78	79	74	
F	351	F3-10 DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	87	88	82	
F	352	F3-11 DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	76	77	73	
F	353	F3-12 DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	83	83	80	
G	354	G1-01 DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	88	88	86	
G	355	G1-02 DO YOU INSPECT DIODES	88	88	87	
G	356	G1-03 DO YOU REMOVE OR REPLACE DIODES	88	88	87	SEMICONDUCTOR DIODES
G	357	G1-04 DO YOU CHECK DIODES USING AN INSTRUMENT	86	86	85	
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	13	13	11	
G	360	G1-07 DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	27	27	27	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 126	SPC 127	SPC 128
G 361	G1-08	DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	62	63	58
G 362	G1-09	DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON THEIR PHYSICAL APPEARANCE	77	77	79
G 363	G1-10	DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	14	13	14
G 364	G1-11	DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	73	72	74
G 365	G1-12	DO YOU USE OR REFER TO DIODE COLOR CODING	42	44	37
G 366	G1-13	DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	3	3	4
G 367	G1-14	DO YOU USE OR REFER TO CENTRIPETAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	3	3	4
G 368	G1-15	DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	73	73	71
G 369	G1-16	DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	3	3	4
G 370	G1-17	DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	4	4	6
G 371	G1-18	DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	69	68	71
G 372	G1-19	DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAR SHELL OR ORBIT	3	4	1
G 373	G1-20	DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	3	4	1
G 374	G1-21	DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	2	3	1
G 375	G1-22	DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	3	4	2
G 376	G1-23	DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	3	4	1
G 377	G1-24	DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	79	79	77
G 378	G1-25	DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	17	20	11
G 379	G1-26	DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE INCREASES RESISTANCE DECREASES)	34	38	23
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)	14	15	11
G 381	G1-28	DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR INTERPRET CIRCUIT DIAGRAMS	62	62	63
G 382	G1-29	DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	5	7	1

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
G 383	G1-30 DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	4	5	1	
G 384	G1-31 DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	6	7	1	
G 385	G1-32 DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	4	5	1	
G 386	G1-33 DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	6	8	2	
G 387	G1-34 DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	21	22	19	
G 388	G1-35 DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	5	7	1	
G 389	G1-36 DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	5	6	1	
G 390	G1-37 DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	31	32	27	
G 391	G1-38 DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	31	32	27	
G 392	G1-39 DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	8	10	4	
G 393	G1-40 DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	8	10	4	
G 394	G1-41 DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	6	7	2	
G 395	G1-42 DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	7	9	1	
G 396	G1-43 DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	9	11	1	
G 397	G1-44 DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	77	77	80	
G 398	G1-45 DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	7	8	2	
G 399	G1-46 DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	48	46	54	
G 400	G1-47 DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	22	25	14	
G 401	G1-48 DO YOU USE OR REFER TO PEAK RECURRENT FORWARD CURRENT DIODE RATINGS	18	20	12	
G 402	G1-49 DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	21	23	15	
G 403	G1-50 DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	29	32	19	
G 404	G2-01 DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB.	86	87	83	
G 405	G2-02 DO YOU INSPECT TRANSISTORS	86	86	85	
G 406	G2-03 DO YOU REMOVE OR REPLACE TRANSISTORS	86	87	83	
G 407	G2-04 DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	82	83	80	
G 408	G2-05 DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	77	77	79	TRANSISTORS
G 409	G2-06 DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	77	77	79	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
G 410	G2-07	DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS	76	77	76	
G 411	G2-08	DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION	26	28	19	
G 412	G2-09	DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION	25	27	19	
G 413	G2-10	DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER)	47	48	43	
G 414	G2-11	DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR	26	28	20	
G 415	G2-12	DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS	85	85	83	
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	58	57	63	
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)	34	36	29	
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	46	48	39	
G 420	G2-17	DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT (ICBO) IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES	23	25	15	
G 421	G2-18	DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES	13	15	8	
G 422	G2-19	DO YOU USE OR REFER TO BETA TRANSISTOR GAINS	14	15	8	
G 423	G2-20	DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS	13	14	7	
G 424	G2-21	DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS	10	12	5	
G 425	G2-22	DO YOU CALCULATE BETA TRANSISTOR GAINS	5	6	4	
G 426	G2-23	DO YOU CALCULATE ALPHA TRANSISTOR GAINS	5	6	2	
G 427	G2-24	DO YOU CALCULATE GAMMA TRANSISTOR GAINS	4	5	2	
G 428	G3-01	DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB	76	78	73	
G 429	G3-02	DO YOU INSPECT TRANSISTOR AMPLIFIERS	78	78	77	
G 430	G3-03	DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS	71	72	69	TRANSISTOR AMPLIFIERS
G 431	G3-04	DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL	77	77	75	
G 432	G3-05	DO YOU TROUBLESHOOT TO AMPLIFIER COMPONENTS	74	74	73	
G 433	G3-06	DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER	72	72	70	
G 434	G3-07	DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS	71	71	70	
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	32	33	27	
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	16	17	13	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128
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	32	33	30
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	14	15	11
G 439	GJ-12 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	33	34	30
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	16	18	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)	6	7	5
G 442	GJ-15 DO YOU USE OR REFER TO THE OPERATING POINT Q (QUIESCENT POINT) FOR A TRANSISTOR	18	20	12
G 443	GJ-16 DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	6	7	2
G 444	GJ-17 DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	55	55	54
G 445	GJ-18 DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	42	43	39
G 446	GJ-19 DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	43	44	42
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	9	10	4
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	8	9	4
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	7	8	4
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)	17	20	8
G 451	GJ-24 DO YOU COMPUTE THE STATIC OPERATING POINT [Q] OF A TRANSISTOR AT DIFFERENT TEMPERATURES	6	7	5
G 452	GJ-25 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH EMITTER (SWAMPING) RESISTOR STABILIZATION	42	43	37
G 453	GJ-26 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH SELF-BIAS STABILIZATION	41	43	33

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128
G 454	G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH THERMISTOR STABILIZATION	40	42	35
G 455	G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH FORWARD BIAS DIODE STABILIZATION	42	43	38
G 456	G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH REVERSE BIAS DIODE STABILIZATION	42	44	38
G 457	G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH DOUBLE DIODE STABILIZATION	36	37	35
G 458	G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPING) RESISTOR STABILIZATION	51	55	42
G 459	G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	50	54	38
G 460	G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	51	54	40
G 461	G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	51	54	42
G 462	G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	51	53	42
G 463	G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	44	47	37
G 464	G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	56	57	52
G 465	G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	59	60	55
G 466	G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	54	56	49
G 467	G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	47	48	42
G 468	G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	45	47	39
G 469	G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	51	53	46
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	23	24	19
G 471	G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	27	29	21
G 472	G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	54	56	50
G 473	G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	71	73	63
G 474	G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	51	54	43
G 475	G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	56	58	50

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

			DY-TSK	SPC 126	SPC 127	SPC 128	
G	476	G3-49	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	68	71	58	
H	477	H1-01	DO YOU USE OR REFER TO VARACTORS	53	54	50	
H	478	H1-02	DO YOU USE OR REFER TO TUNNEL DIODES	52	53	48	SOLID-STATE SPECIAL PURPOSE DEVICES
H	479	H1-03	DO YOU USE OR REFER TO FIELD EFFECT TRANSISTORS (FET)	58	58	57	
H	480	H1-04	DO YOU USE OR REFER TO UNIJUNCTION TRANSISTORS	61	61	60	
H	481	H1-05	DO YOU USE OR REFER TO ZENER DIODES	85	85	86	
H	482	H1-06	DO YOU USE OR REFER TO INTEGRATED CIRCUITS	83	83	85	
H	483	H2-01	IN YOUR PRESENT JOB, DO YOU WORK WITH POWER SUPPLIES	88	87	93	
H	484	H2-02	DO YOU INSPECT POWER SUPPLIES	89	88	90	
H	485	H2-03	DO YOU CLEAN POWER SUPPLIES	82	82	81	
H	486	H2-04	DO YOU ALIGN OR ADJUST POWER SUPPLIES	87	87	87	POWER SUPPLIES
H	487	H2-05	DO YOU TROUBLESHOOT TO POWER SUPPLY CIRCUIT LEVEL	87	87	86	
H	488	H2-06	DO YOU TROUBLESHOOT TO POWER SUPPLY COMPONENTS	86	85	87	
H	489	H2-07	DO YOU REMOVE OR REPLACE COMPLETE POWER SUPPLIES	90	88	94	
H	490	H2-08	DO YOU REMOVE OR REPLACE POWER SUPPLY COMPONENTS	85	85	85	
H	491	H2-09	DO YOU WORK WITH HALF-WAVE RECTIFIERS	81	81	80	
H	492	H2-10	DO YOU WORK WITH FULL-WAVE RECTIFIERS OTHER THAN BRIDGE RECTIFIERS	81	82	79	
H	493	H2-11	DO YOU WORK WITH BRIDGE RECTIFIERS	84	84	82	
H	494	H2-12	DO YOU WORK WITH THREE-PHASE RECTIFIERS	43	42	44	
H	495	H2-13	DO YOU USE OR REFER TO INPUT VOLTAGE	87	87	86	
H	496	H2-14	DO YOU USE OR REFER TO INPUT FREQUENCY	69	70	67	
H	497	H2-15	DO YOU USE OR REFER TO PEAK OUTPUT VOLTAGE	81	81	81	
H	498	H2-16	DO YOU USE OR REFER TO AVERAGE OUTPUT VOLTAGE	76	76	79	
H	499	H2-17	DO YOU USE OR REFER TO RIPPLE AMPLITUDE	63	63	61	
H	500	H2-18	DO YOU USE OR REFER TO RIPPLE FREQUENCY	56	58	46	
H	501	H2-19	DO YOU USE OR REFER TO PEAK REVERSE (INVERSE) VOLTAGE	44	46	37	
H	502	H2-20	DO YOU USE OR REFER TO SHAPE OF OUTPUT WAVEFORMS	79	80	74	
H	503	H2-21	DO YOU USE OR REFER TO EFFECTIVE OUTPUT VOLTAGE	75	76	74	
H	504	H2-22	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE FILTERS	74	77	67	
H	505	H2-23	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE FILTERS	75	78	67	
H	506	H2-24	DO YOU WORK WITH CIRCUITS WHICH EMPLOY CAPACITIVE INPUT L-TYPE FILTERS	67	69	60	
H	507	H2-25	DO YOU WORK WITH CIRCUITS WHICH EMPLOY INDUCTIVE INPUT L-TYPE FILTERS	67	70	58	
H	508	H2-26	DO YOU WORK WITH CIRCUITS WHICH EMPLOY LC PI-TYPE FILTERS	61	62	56	
H	509	H2-27	DO YOU WORK WITH CIRCUITS WHICH EMPLOY RC PI-TYPE FILTERS	61	62	56	
H	510	H2-28	DO YOU WORK WITH CIRCUITS WHICH EMPLOY DON'T REMEMBER WHICH TYPE OF FILTER	26	25	26	
H	511	H2-29	DO YOU HAVE THE OPTION OF REPLACING ONE TYPE OF FILTER WITH A DIFFERENT TYPE FILTER	7	7	8	
H	512	H3-01	DO YOU WORK WITH OSCILLATORS IN YOUR PRESENT JOB	80	80	80	OSCILLATORS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
H	513	H3-02 DO YOU INSPECT OSCILLATORS	80	80	81	
H	514	H3-03 DO YOU ALIGN OR ADJUST OSCILLATORS	77	78	76	
H	515	H3-04 DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	76	75	76	
H	516	H3-05 DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	72	75	65	
H	517	H3-06 DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	77	78	75	
H	518	H3-07 DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	72	74	68	
H	519	H3-08 DO YOU USE OR REFER TO FEEDBACK	66	67	63	
H	520	H3-09 DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	59	60	58	
H	521	H3-10 DO YOU USE OR REFER TO AMPLITUDE STABILITY	55	57	51	
H	522	H3-11 DO YOU USE OR REFER TO FREQUENCY STABILITY	63	64	62	
H	523	H3-12 DO YOU USE OR REFER TO DAMPING	49	49	49	
H	524	H3-13 DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	61	62	61	
H	525	H3-14 DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	32	34	27	
H	526	H3-15 DO YOU USE OR REFER TO CRITICAL DAMPING	30	30	27	
H	527	H3-16 DO YOU USE OR REFER TO UNDER DAMPING	32	32	32	
H	528	H3-17 DO YOU USE OR REFER TO OVER DAMPING	32	32	32	
H	529	H3-18 DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	57	57	56	
H	530	H3-19 DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	67	69	62	
H	531	H3-20 DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	71	72	70	
H	532	H3-21 DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	18	18	19	
H	533	H3-22 DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	56	58	51	
H	534	H3-23 DO YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	55	56	50	
H	535	H3-24 DO YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	57	58	51	
H	536	H3-25 DO YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	38	40	31	
H	537	H3-26 DO YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	40	42	33	
H	538	H3-27 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	30	30	32	
I	539	I1-01 DO YOU WORK WITH MULTIVIBRATORS IN YOUR PRESENT JOB	74	75	70	
I	540	I1-02 DO YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	71	72	70	
I	541	I1-03 DO YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	69	69	68	
I	542	I1-04 DO YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	59	60	56	MULTIVIBRATORS
I	543	I1-05 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	71	72	69	
I	544	I1-06 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	67	67	67	
I	545	I1-07 DO YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	68	68	67	
I	546	I1-08 DO YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING COMPONENTS	66	67	62	
I	547	I1-09 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN LC TANK CIRCUITS	61	63	56	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 126	SPC 127	SPC 128	
I 548	I1-10	DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN RC NETWORKS	63	65	57	
I 549	I1-11	DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN CRYSTALS	60	61	57	
I 550	I1-12	DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T REMEMBER WHICH TYPE OF FDD	19	18	20	
I 551	I1-13	DO YOU WORK WITH ASTABLE MULTIVIBRATORS	63	65	55	
I 552	I1-14	DO YOU WORK WITH MONOSTABLE MULTIVIBRATORS	65	66	62	
I 553	I1-15	DO YOU WORK WITH BISTABLE MULTIVIBRATORS	67	68	63	
I 554	I1-16	DO YOU WORK WITH DON'T REMEMBER WHICH TYPE MULTIVIBRATORS	17	17	17	
I 555	I2-01	DO YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR PRESENT JOB	70	71	67	
I 556	I2-02	DO YOU WORK WITH SERIES DIODE LIMITERS	55	55	54	LIMITERS AND CLAMPERS
I 557	I2-03	DO YOU WORK WITH SHUNT DIODE LIMITERS	51	53	46	
I 558	I2-04	DO YOU WORK WITH LIMITERS WITH BIAS	49	50	45	
I 559	I2-05	DO YOU WORK WITH ZENER DIODE LIMITERS	55	57	49	
I 560	I2-06	DO YOU WORK WITH TRANSISTOR LIMITERS	54	56	48	
I 561	I2-07	DO YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS	20	20	21	
I 562	I2-08	DO YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS	49	51	42	
I 563	I2-09	DO YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS	45	48	37	
I 564	I2-10	DO YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING CIRCUIT	23	22	26	
I 565	I3-01	IN YOUR PRESENT JOB, DO YOU WORK ON EQUIPMENT WHICH CONTAINS ELECTRON TUBES	87	87	89	
I 566	I3-02	DO YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD	82	82	80	
I 567	I3-03	DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES	76	78	71	ELECTRON TUBES
I 568	I3-04	DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES	63	66	54	
I 569	I3-05	DO YOU USE SCOPES TO CHECK ELECTRON TUBES	77	78	74	
I 570	I3-06	DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES	82	82	83	
I 571	I3-07	DO YOU USE OR REFER TO CUTOFF	57	57	58	
I 572	I3-08	DO YOU USE OR REFER TO PEAK INVERSE VOLTAGE RATING	24	27	17	
I 573	I3-09	DO YOU USE OR REFER TO PEAK CURRENT RATING	26	29	18	
I 574	I3-10	DO YOU USE OR REFER TO TRANSIT TIME	22	24	15	
I 575	I3-11	DO YOU USE OR REFER TO PLATE DISSIPATION RATING	20	23	11	
I 576	I3-12	DO YOU USE OR REFER TO SATURATION	56	56	55	
I 577	I3-13	DO YOU USE OR REFER TO DC PLATE RESISTANCE	31	35	21	
I 578	I3-14	DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE RESISTANCE FOR ELECTRON TUBES	8	9	4	
I 579	I3-15	DO YOU USE OR REFER TO PLATE VOLTAGE	78	80	73	
I 580	I3-16	DO YOU USE OR REFER TO PLATE CURRENT	61	62	58	
I 581	I3-17	DO YOU USE OR REFER TO GRID VOLTAGE	75	78	68	
I 582	I3-18	DO YOU USE OR REFER TO GRID CURRENT	59	60	54	
I 583	I3-19	DO YOU USE OR REFER TO CATHODE VOLTAGE	76	78	69	
I 584	I3-20	DO YOU USE OR REFER TO CATHODE CURRENT	59	60	55	
I 585	I3-21	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)	22	27	10	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
I	586	I3-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	6	7	2	
I	587	I3-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	22	25	10	
I	588	I3-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G, WHICH IS MEASURED IN MHOS)	12	14	6	
I	589	I3-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	5	6	1	
I	590	I3-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	14	15	10	
I	591	I3-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	6	6	4	
I	592	I3-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	24	27	13	
I	593	I3-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	12	14	7	
I	594	I3-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	12	13	11	
I	595	I3-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	11	12	10	
I	596	I3-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	16	17	12	
I	597	I3-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	16	17	12	
I	598	I3-34 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER GAIN	59	60	54	
I	599	I3-35 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER EFFICIENCY	41	43	36	
I	600	I3-36 DO YOU USE TEST TUBE CHECKERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	61	63	52	
I	601	I3-37 DO YOU USE MULTIMETERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	46	48	38	
I	602	I3-38 DO YOU USE OSCILLOSCOPES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	65	67	61	
I	603	I3-39 DO YOU USE CHARACTERISTIC CURVES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	13	15	6	
I	604	I3-40 DO YOU CALCULATE ANY ELECTRON TUBE CAPACITANCES SUCH AS INPUT CAPACITANCE	10	10	11	
I	605	I3-41 DO YOU USE OR REFER TO TUBE SOCKET NOTATION	81	83	77	
I	606	I3-42 DO YOU USE OR REFER TO PIN NUMBERING SYSTEMS	85	85	83	
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	12	12	13	
I	608	I3-44 DO YOU USE OR REFER TO TUBE SUBSTITUTION MATERIAL SUCH AS MANUALS OR CHARTS	51	49	55	
J	609	J1-01 DO YOU WORK WITH ELECTRON TUBE AMPLIFIERS OR CIRCUITS IN YOUR PRESENT JOB	79	81	74	ELECTRON TUBE AMPLIFIERS AND CIRCUITS
J	610	J1-02 DO YOU DETERMINE THE CLASS OF OPERATION FOR ELECTRON TUBE AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	33	34	31	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		BY-TSK	SPC 126	SPC 127	SPC 128	
J 611	J1-03	DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	56	58	51	
J 612	J1-04	DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	69	72	61	
J 613	J1-05	DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	54	57	45	
J 614	J1-06	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	65	67	56	
J 615	J1-07	DO YOU TROUBLESHOOT OR REPAIR DON'T KNOW WHICH TYPE OF AMPLIFIER	25	29	26	
J 616	J2-01	DO YOU WORK WITH GAS TUBES (HOT CATHODE OR COLD CATHODE)	69	69	68	
J 617	J2-02	DO YOU WORK WITH CATHODE-RAY TUBES	65	66	62	SPECIAL PURPOSE ELECTRON TUBES
J 618	J2-03	DO YOU USE OR REFER TO THE CHARACTERISTICS OF BEAM POWER TUBES	17	18	13	
J 619	J2-04	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH BEAM POWER TUBES ARE USED	28	28	26	
J 620	J2-05	DO YOU USE OR REFER TO THE CHARACTERISTICS OF THYRATRONS	43	45	39	
J 621	J2-06	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH THYRATRONS ARE USED	65	65	65	
J 622	J2-07	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTRON GUNS OF CATHODE-RAY TUBES (CRT)	40	40	39	
J 623	J2-08	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROMAGNETIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	45	46	40	
J 624	J2-09	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	39	41	36	
J 625	J2-10	DO YOU USE OR REFER TO PHOSPHOR SCREENS	39	43	27	
J 626	J2-11	DO YOU USE OR REFER TO AQUADAG COATINGS	29	30	27	
J 627	J2-12	DO YOU USE OR REFER TO ELECTRON OPTICS	16	18	12	
J 628	J2-13	DO YOU USE OR REFER TO PERSISTENCE	33	33	33	
J 629	J2-14	DO YOU USE OR REFER TO DECAY TIMES	26	27	23	
J 630	J2-15	DO YOU USE OR REFER TO FLUORESCENCE	27	30	18	
J 631	J2-16	DO YOU USE OR REFER TO PHOSPHORESCENCE	30	33	20	
J 632	J3-01	DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	89	89	88	HETERODYNING, MODULATION, AND DEMODULATION
J 633	J3-02	DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	78	78	77	
J 634	J3-03	DO YOU PERFORM TASKS ON FREQUENCY MIXERS	82	83	77	
J 635	J3-04	DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS IN YOUR WORK WITH TRANSMIT OR RECEIVE SYSTEMS	72	75	61	
J 636	J3-05	DO YOU PERFORM TASKS ON REACTANCE MODULATORS	44	46	39	
J 637	J3-06	DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	68	69	63	
K 638	K1-01	DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	73	72	74	
K 639	K1-02	DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	71	71	71	AM SYSTEMS
K 640	K1-03	DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	69	70	63	
K 641	K1-04	DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	69	70	67	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
K 692	K1-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	72	72	70	
K 693	K1-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	71	71	69	
K 694	K1-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	71	72	70	
K 695	K1-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	70	71	67	
K 696	K1-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	69	71	62	
K 697	K1-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	68	70	62	
K 698	K1-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	68	70	62	
K 699	K1-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	66	68	60	
K 650	K1-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	68	70	62	
K 651	K1-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	69	71	63	
K 652	K1-15 DO YOU PERFORM TASKS ON DETECTORS	68	70	61	
K 653	K1-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE	14	14	12	
K 654	K1-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	42	43	37	
K 655	K1-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	51	52	46	
K 656	K1-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	69	71	64	
K 657	K1-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	66	67	62	
K 658	K1-21 DO YOU USE OR REFER TO 2ND HARMONIC DISTORTION	44	46	37	
K 659	K1-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	53	57	44	
K 660	K1-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	17	18	14	
K 661	K1-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	31	35	21	
K 662	K1-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	40	43	32	
K 663	K1-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	36	38	31	
K 664	K1-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	57	60	50	
K 665	K1-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	71	73	65	
K 666	K2-01 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	74	73	77	
K 667	K2-02 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	76	74	77	FM SYSTEMS
K 668	K2-03 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	71	72	69	
K 669	K2-04 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	72	72	74	
K 670	K2-05 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	75	74	77	
K 671	K2-06 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	71	70	74	
K 672	K2-07 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	74	73	74	
K 673	K2-08 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	72	71	74	
K 674	K2-09 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	65	66	63	
K 675	K2-10 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	67	68	64	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
K 676	K2-11 DO YOU PERFORM TASKS ON DRIVERS (INTERMEDIATE AMPLIFIERS)	67	67	65	
K 677	K2-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	68	67	70	
K 678	K2-13 DO YOU PERFORM TASKS ON RF AMPLIFIERS	70	70	69	
K 679	K2-14 DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	66	67	64	
K 680	K2-15 DO YOU PERFORM TASKS ON IF AMPLIFIERS	70	71	67	
K 681	K2-16 DO YOU PERFORM TASKS ON LIMITERS	68	68	68	
K 682	K2-17 DO YOU PERFORM TASKS ON FREQUENCY DISCRIMINATORS	67	68	67	
K 683	K2-18 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM TRANSMITTERS	69	67	73	
K 684	K2-19 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SCHEMATIC DIAGRAMS OF FM RECEIVERS	72	71	73	
K 685	K3-01 DO YOU CONVERT DECIMAL (BASE 10) NUMBERS TO OCTAL (BASE 8) NUMBERS	13	15	7	
K 686	K3-02 DO YOU CONVERT DECIMAL NUMBERS TO BINARY (BASE 2) NUMBERS	28	29	25	NUMBERING SYSTEMS
K 687	K3-03 DO YOU CONVERT OCTAL NUMBERS TO DECIMAL NUMBERS	12	14	6	
K 688	K3-04 DO YOU CONVERT OCTAL NUMBERS TO BINARY NUMBERS	13	14	8	
K 689	K3-05 DO YOU CONVERT BINARY NUMBERS TO DECIMAL NUMBERS	28	30	23	
K 690	K3-06 DO YOU CONVERT BINARY NUMBERS TO OCTAL NUMBERS	14	15	11	
K 691	K3-07 DO YOU ADD BINARY NUMBERS TO GET A SUM	26	28	18	
K 692	K3-08 DO YOU SUBTRACT BINARY NUMBERS USING THE END-AROUND-CARRY METHOD	17	19	10	
K 693	K3-09 DO YOU SUBTRACT BINARY NUMBERS USING THE DIRECT SUBTRACTION METHOD	20	22	14	
K 694	K3-10 DO YOU ADD OCTAL NUMBERS TO GET A SUM	12	14	5	
L 695	L1-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO LOGIC FUNCTIONS	51	52	50	
L 696	L1-02 DO YOU CONSTRUCT TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	17	19	10	LOGIC FUNCTIONS
L 697	L1-03 DO YOU CONSTRUCT TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	16	18	10	
L 698	L1-04 DO YOU CONSTRUCT TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	16	18	10	
L 699	L1-05 DO YOU CONSTRUCT TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS OR GATES	10	10	7	
L 700	L1-06 DO YOU USE OR REFER TO TRUTH TABLES FOR AND LOGIC SYMBOLS OR GATES	28	31	18	
L 701	L1-07 DO YOU USE OR REFER TO TRUTH TABLES FOR OR LOGIC SYMBOLS OR GATES	28	31	18	
L 702	L1-08 DO YOU USE OR REFER TO TRUTH TABLES FOR AND OR OR LOGIC SYMBOLS WITH STATE INDICATORS	27	30	18	
L 703	L1-09 DO YOU USE OR REFER TO TRUTH TABLES FOR EXCLUSIVE OR LOGIC SYMBOLS	27	31	14	
L 704	L1-10 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR AND GATES	47	48	43	
L 705	L1-11 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR OR GATES	47	48	43	
L 706	L1-12 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR NAND OR NOR GATES	47	48	43	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
L 707	L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	46	47	38	
L 708	L2-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAMS, OR LOGIC CIRCUITS	38	37	30	BOOLEAN EQUATIONS
L 709	L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	10	11	6	
L 710	L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	7	9	1	
L 711	L2-04 DO YOU DRAW LOGIC DIAGRAMS FROM GIVEN BOOLEAN EQUATIONS	9	11	4	
L 712	L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	31	33	26	
L 713	L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF TROUBLESHOOTING DIGITAL CIRCUITS	15	18	6	
L 714	L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	15	18	6	
L 715	L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	25	27	19	
L 716	L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	12	14	6	
L 717	L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	32	34	24	
L 718	L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	13	15	7	
L 719	L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	18	19	14	
L 720	L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	37	40	30	
L 721	L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	38	41	29	
L 722	L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	38	40	29	
L 723	L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	36	39	29	
L 724	L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	35	37	27	
L 725	L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	36	39	29	
L 726	L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	21	24	13	
L 727	L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	26	28	21	
L 728	L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	26	28	21	
L 729	L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	34	37	26	
L 730	L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	27	29	21	
L 731	L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	27	28	21	
L 732	L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	8	10	4	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
L 733	L3-01	DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	42	45	33	
L 734	L3-02	DO YOU USE OR REFER TO UP-COUNTERS	39	42	27	COUNTERS
L 735	L3-03	DO YOU USE OR REFER TO DOWN-COUNTERS	36	40	26	
L 736	L3-04	DO YOU USE OR REFER TO SERIAL COUNTERS	34	37	24	
L 737	L3-05	DO YOU USE OR REFER TO PARALLEL COUNTERS	29	31	21	
L 738	L3-06	DO YOU USE OR REFER TO RING COUNTERS	19	20	14	
L 739	L3-07	DO YOU USE OR REFER TO DECADE COUNTERS	26	27	23	
L 740	L3-08	DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	24	27	15	
L 741	L3-09	DO YOU USE OR REFER TO DOWN CLOCKS	34	38	21	
L 742	L3-10	DO YOU USE OR REFER TO UP CLOCKS	35	38	24	
L 743	L3-11	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	28	31	17	
L 744	L3-12	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	28	30	20	
L 745	L3-13	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	23	25	17	
L 746	L3-14	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	17	19	12	
L 747	L3-15	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	22	25	15	
L 748	L3-16	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	27	30	17	
L 749	L3-17	DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	23	27	12	
L 750	L3-18	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	19	20	14	
L 751	L3-19	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	19	20	15	
L 752	L3-20	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTERS	17	18	12	
L 753	L3-21	DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	15	17	11	
L 754	L3-22	DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	7	8	6	
L 755	L3-23	DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	14	15	11	
L 756	L3-24	DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	16	18	11	
M 757	M1-01	DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	76	78	70	
M 758	M1-02	DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	72	74	68	
M 759	M1-03	DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	60	60	60	TIMING CIRCUITS
M 760	M1-04	DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	58	60	55	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
M 761	M1-05 DO YOU WORK WITH BLOCKING OSCILLATORS	71	71	70	
M 762	M1-06 DO YOU USE OR REFER TO RISE TIME	69	70	64	
M 763	M1-07 DO YOU USE OR REFER TO FALL OR FLYBACK TIME	61	62	61	
M 764	M1-08 DO YOU USE OR REFER TO SWEEP TIME	74	75	69	
M 765	M1-09 DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	71	72	68	
M 766	M1-10 DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	69	70	68	
M 767	M1-11 DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	62	62	62	
M 768	M1-12 DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	69	70	67	
M 769	M2-01 DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	82	85	75	
M 770	M2-02 DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	80	82	74	USE OF SIGNAL GENERATORS
M 771	M2-03 DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL GENERATORS	69	72	57	
M 772	M2-04 DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	66	67	63	
M 773	M2-05 DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	59	60	57	
M 774	M2-06 DO YOU USE AUDIO SINE-WAVE GENERATORS	69	70	63	
M 775	M2-07 DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	54	54	54	
M 776	M2-08 DO YOU USE RF GENERATORS LESS THAN 1,000 MH	69	72	61	
M 777	M2-09 DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	68	72	57	
M 778	M2-10 DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	64	67	56	
M 779	M3-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR GENERATORS	66	66	67	
M 780	M3-02 DO YOU INSPECT MOTORS	67	66	68	MOTORS AND GENERATORS
M 781	M3-03 DO YOU CLEAN OR LUBRICATE MOTORS	58	58	58	
M 782	M3-04 DO YOU OPERATE MOTORS	64	63	65	
M 783	M3-05 DO YOU REMOVE OR REPLACE COMPLETE MOTORS	65	64	67	
M 784	M3-06 DO YOU REMOVE OR REPLACE MOTOR PARTS	24	27	21	
M 785	M3-07 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF MOTORS	63	62	65	
M 786	M3-08 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	19	20	13	
M 787	M3-09 DO YOU PERFORM ANY TASKS ON FIELD COILS	8	8	6	
M 788	M3-10 DO YOU PERFORM ANY TASKS ON ARMATURES	11	12	7	
M 789	M3-11 DO YOU PERFORM ANY TASKS ON ROTORS	13	14	8	
M 790	M3-12 DO YOU PERFORM ANY TASKS ON BRUSHES	21	23	14	
M 791	M3-13 DO YOU PERFORM ANY TASKS ON SLIP RINGS	15	17	8	
M 792	M3-14 DO YOU PERFORM ANY TASKS ON COMMUTATORS	12	13	8	
M 793	M3-15 DO YOU PERFORM ANY TASKS ON POLE PIECES	9	10	8	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
N 794	M3-16 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OF THE FORCE OR TORQUE CREATED BY A MOTOR	9	9	7	
N 795	M3-17 DO YOU DETERMINE OR MEASURE THE DIRECTION OF THE MECHANICAL FORCE OR TORQUE CREATED BY A MOTOR	15	17	7	
N 796	M3-18 DO YOU DETERMINE OR MEASURE THE MAGNITUDE OR DIRECTION OF THE INDUCED VOLTAGE IN MOTORS	10	12	5	
N 797	M3-19 DO YOU WORK WITH SYNCHRONOUS MOTORS	51	52	45	
N 798	M3-20 DO YOU WORK WITH INDUCTION MOTORS	44	45	38	
N 799	M3-21 DO YOU WORK WITH SPLIT-PHASE MOTORS	41	45	27	
N 800	M3-22 DO YOU WORK WITH SOME COMBINATION OF THE ABOVE MOTORS	44	45	43	
N 801	M3-23 DO YOU INSPECT GENERATORS	22	21	23	
N 802	M3-24 DO YOU CLEAN OR LUBRICATE GENERATORS	19	20	19	
N 803	M3-25 DO YOU OPERATE GENERATORS	22	22	23	
N 804	M3-26 DO YOU REMOVE OR REPLACE COMPLETE GENERATORS	17	17	18	
N 805	M3-27 DO YOU REMOVE OR REPLACE GENERATOR PARTS	8	8	8	
N 806	M3-28 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS OF GENERATORS	18	17	20	
N 807	M3-29 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF GENERATORS	9	9	8	
N 808	N1-01 DO YOU WORK WITH METERS IN YOUR PRESENT JOB	86	86	87	
N 809	N1-02 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF PERMANENT MAGNETS	28	30	23	
N 810	N1-03 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF MOVING COILS	30	33	23	METER MOVEMENTS
N 811	N1-04 DO YOU CONCEPTUALIZE OR CONSIDER THE FUNCTIONS OF SPIRAL SPRINGS	25	27	18	
N 812	N1-05 DO YOU READ METER SCALES	86	87	86	
N 813	N1-06 DO YOU EXTEND THE RANGE OF AMMETERS	44	46	36	
N 814	N1-07 DO YOU ZERO OHMMETERS	86	86	86	
N 815	N1-08 DO YOU ZERO AMMETERS	65	66	61	
N 816	N1-09 DO YOU EXTEND THE RANGE OF VOLTMETERS	56	57	54	
N 817	N1-10 DO YOU USE OR REFER TO VOLTMETER SENSITIVITY (EXPRESSED IN UNITS OF OHMS PER VOLT)	61	65	51	
N 818	N2-01 DO YOU WORK WITH SATURABLE REACTORS OR MAGNETIC AMPLIFIERS IN YOUR PRESENT JOB	24	28	13	
N 819	N2-02 DO YOU INSPECT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	21	24	11	SATURABLE REACTORS AND MAGNETIC AMPLIFIERS
N 820	N2-03 DO YOU CLEAN MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	20	23	11	
N 821	N2-04 DO YOU ADJUST MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	17	20	8	
N 822	N2-05 DO YOU TROUBLESHOOT MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	21	24	12	
N 823	N2-06 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIERS OR SATURABLE REACTORS	21	23	12	
N 824	N2-07 DO YOU REMOVE OR REPLACE MAGNETIC AMPLIFIER OR SATURABLE REACTOR COMPONENTS	14	17	6	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
N	825	N2-08 DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	7	8	2	
N	826	N2-09 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	12	13	7	
N	827	N2-10 DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR WINDINGS OR LOAD RESISTORS OF SINGLE WINDING SATURABLE REACTORS	16	18	11	
N	828	N2-11 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT WAVEFORMS FOR MAGNETIC AMPLIFIERS	12	14	7	
N	829	N2-12 DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE REACTORS	6	7	4	
N	830	N2-13 DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN SATURABLE REACTORS	7	8	4	
N	831	N2-14 DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE REACTORS	8	9	4	
N	832	N2-15 DO YOU USE OR REFER TO POINT OF SATURATION IN SATURABLE REACTORS	10	11	5	
N	833	N2-16 DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC SYMBOLS	16	18	7	
N	834	N3-01 DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT JOB	77	78	71	
N	835	N3-02 DO YOU USE OR REFER TO TRANSIENT INTERVALS	38	38	36	
N	836	N3-03 DO YOU USE OR REFER TO PULSE WIDTH (PW)	78	78	75	WAVESHAPING
N	837	N3-04 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	72	73	70	CIRCUITS
N	838	N3-05 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	76	78	73	
N	839	N3-06 DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	66	66	65	
N	840	N3-07 DO YOU USE OR REFER TO INTEGRATING CIRCUITS	66	67	63	
N	841	N3-08 DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT	55	56	52	
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	28	29	27	
N	843	N3-10 DO YOU WORK WITH SQUARE WAVE GENERATORS	67	68	64	
N	844	N3-11 DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	57	58	55	
O	845	O1-01 DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR PRESENT JOB	10	12	4	
O	846	O1-02 DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	8	10	4	
O	847	O1-03 DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	8	9	4	SINGLE SIDEBAND
O	848	O1-04 DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	8	9	2	SYSTEMS
O	849	O1-05 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE SYSTEMS	8	9	4	
O	850	O1-06 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE COMPONENTS	7	9	2	
O	851	O1-07 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE SYSTEMS	8	9	4	
O	852	O1-08 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE COMPONENTS	7	9	2	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
0 853	01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	6	7	2	
0 854	01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	7	8	2	
0 855	01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	7	8	2	
0 856	01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	6	8	2	
0 857	01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	6	7	2	
0 858	01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	4	5	2	
0 859	01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	7	8	2	
0 860	01-16 DO YOU PERFORM TASKS ON SSB MIXERS	7	8	2	
0 861	01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	6	8	2	
0 862	01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	6	8	2	
0 863	01-19 DO YOU PERFORM TASKS ON SSB RF AMPLIFIERS	7	8	2	
0 864	01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	6	8	1	
0 865	01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	7	8	2	
0 866	01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	6	7	2	
0 867	01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB SYSTEM STAGES	2	2	0	
0 868	01-24 DO YOU USE OR REFER TO SELECTIVE FADING	4	5	0	
0 869	01-25 DO YOU USE OR REFER TO PEAK POWER	7	9	2	
0 870	01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	7	9	2	
0 871	01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	5	7	0	
0 872	01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB TRANSMITTERS	6	8	1	
0 873	01-29 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB TRANSMITTER SCHEMATIC DIAGRAMS	7	8	4	
0 874	01-30 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB RECEIVER SCHEMATIC DIAGRAMS	7	8	4	
0 875	02-01 DO YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	69	71	64	
0 876	02-02 DO YOU INSPECT PULSE MODULATION SYSTEMS	70	72	64	PULSE MODULATION SYSTEMS
0 877	02-03 DO YOU CLEAN PULSE MODULATION SYSTEMS	67	69	61	
0 878	02-04 DO YOU ALIGN PULSE MODULATION SYSTEMS	68	70	62	
0 879	02-05 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	70	72	64	
0 880	02-06 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	67	69	62	
0 881	02-07 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	69	71	63	
0 882	02-08 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	67	68	62	
0 883	02-09 DO YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	53	56	43	
0 884	02-10 DO YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	37	39	30	
0 885	02-11 DO YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	36	40	25	
0 886	02-12 DO YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	39	42	31	
0 887	02-13 DO YOU WORK ON LINE PULSING MODULATION SYSTEMS	22	23	18	
0 888	02-14 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	23	23	23	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
0 889	02-15 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER SUPPLIES	63	65	57	
0 890	02-16 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM CHARGING CHOKES AND CHARGING DIODES	53	55	44	
0 891	02-17 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE FORMING NETWORKS	64	66	56	
0 892	02-18 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TIMERS	57	60	46	
0 893	02-19 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM SWITCHES SUCH AS GAS THYRATRONS	48	48	48	
0 894	02-20 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM PULSE TRANSFORMERS	62	63	57	
0 895	02-21 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM TRANSMITTER TUBES	63	65	58	
0 896	02-22 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM RF AMPLIFIERS	64	65	58	
0 897	02-23 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM FREQUENCY CONVERTERS	59	60	56	
0 898	02-24 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM IF AMPLIFIERS	65	66	60	
0 899	02-25 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DETECTORS	63	65	55	
0 900	02-26 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM VIDEO AMPLIFIERS	62	64	57	
0 901	02-27 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM POWER VIDEO AMPLIFIERS	52	54	46	
0 902	02-28 DO YOU PERFORM TASKS ON PULSE MODULATION SYSTEM DON'T REMEMBER WHICH PULSE MODULATION SYSTEM STAGES	13	15	7	
0 903	02-29 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY (PRF)	68	70	63	
0 904	02-30 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	60	63	52	
0 905	02-31 DO YOU USE OR REFER TO PULSE WIDTH (PW)	68	69	63	
0 906	02-32 DO YOU USE OR REFER TO PULSE SHAPE	67	69	61	
0 907	02-33 DO YOU USE OR REFER TO PEAK POWER	67	68	62	
0 908	02-34 DO YOU USE OR REFER TO AVERAGE POWER	59	62	50	
0 909	02-35 DO YOU CALCULATE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	49	51	43	
0 910	02-36 DO YOU MEASURE PULSE RECURRENCE TIME (PRT) OR PULSE RECURRENCE FREQUENCY (PRF)	63	65	58	
0 911	02-37 DO YOU USE FORMULAS TO CALCULATE AVERAGE POWER OR PEAK POWER OF PULSE MODULATION TRANSMIT SYSTEMS	40	42	35	
0 912	02-38 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION TRANSMITTER SCHEMATIC DIAGRAMS	66	68	60	
0 913	02-39 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH PULSE MODULATION RECEIVER SCHEMATIC DIAGRAMS	67	69	62	
0 914	03-01 DO YOU WORK WITH ANTENNAS IN YOUR PRESENT JOB	90	92	82	
0 915	03-02 DO YOU INSPECT ANTENNAS	90	92	82	ANTENNAS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 126	SPC 127	SPC 128
0 916	03-03 DO YOU CLEAN ANTENNAS	86	88	79
0 917	03-04 DO YOU PHYSICALLY ALIGN ANTENNAS	61	62	57
0 918	03-05 DO YOU ELECTRICALLY ALIGN ANTENNAS	53	53	55
0 919	03-06 DO YOU TROUBLESHOOT TO ANTENNAS	88	91	80
0 920	03-07 DO YOU TROUBLESHOOT TO ANTENNA COMPONENTS	59	61	54
0 921	03-08 DO YOU REMOVE OR INSTALL ANTENNAS	90	92	82
0 922	03-09 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	59	61	54
0 923	03-10 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	13	13	12
0 924	03-11 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	12	14	6
0 925	03-12 DO YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	10	12	7
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	13	15	8
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	12	14	7
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	12	13	7
0 929	03-16 DO YOU WORK WITH HERTZ ANTENNAS	30	31	26
0 930	03-17 DO YOU WORK WITH MARCONI ANTENNAS	22	22	20
0 931	03-18 DO YOU WORK WITH BROADSIDE ARRAYS	25	25	24
0 932	03-19 DO YOU WORK WITH END-FIRE ARRAYS	22	22	24
0 933	03-20 DO YOU WORK WITH CARDIOID ARRAYS	53	54	52
0 934	03-21 DO YOU WORK WITH COLLINEAR ARRAYS	25	26	21
0 935	03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	12	13	8
0 936	03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	6	7	4
0 937	03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	23	26	12
0 938	03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	10	11	10
0 939	03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	9	10	5
0 940	03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	8	9	5
0 941	03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	32	32	35
0 942	03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	28	28	27
0 943	03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	11	11	10
0 944	03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR SPECIFIC WAVELENGTHS	6	7	4

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
O	945	03-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	28	28	26	
O	946	03-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	24	25	20	
O	947	03-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	29	32	23	
O	948	03-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	35	33	39	
O	949	03-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	71	73	69	
O	950	03-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	62	63	61	
O	951	03-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	17	17	18	
O	952	03-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	48	49	44	
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	63	64	58	TRANSMISSION LINES
P	954	P1-02 DO YOU REFER TO OR USE COPPER LOSS OR I2R LOSS IN TRANSMISSION LINES	8	9	5	
P	955	P1-03 DO YOU REFER TO OR USE SKIN EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	16	18	10	
P	956	P1-04 DO YOU REFER TO OR USE RADIATION LOSS IN TRANSMISSION LINES	28	30	19	
P	957	P1-05 DO YOU USE OR REFER TO DIELECTRIC LOSS IN TRANSMISSION LINES	17	19	10	
P	958	P1-06 DO YOU USE OR REFER TO LEAKAGE LOSSES IN TRANSMISSION LINES	21	24	10	
P	959	P1-07 DO YOU WORK WITH TWISTED PAIR TRANSMISSION LINES	14	15	11	
P	960	P1-08 DO YOU WORK WITH TWIN LEAD TRANSMISSION LINES	13	15	7	
P	961	P1-09 DO YOU WORK WITH OPEN TWO-WIRE TRANSMISSION LINES	10	12	4	
P	962	P1-10 DO YOU WORK WITH FLEXIBLE COAXIAL CABLE TRANSMISSION LINES	62	63	56	
P	963	P1-11 DO YOU WORK WITH RIGID COAXIAL CABLE TRANSMISSION LINES	40	40	42	
P	964	P1-12 DO YOU TROUBLESHOOT TRANSMISSION LINES	59	61	55	
P	965	P1-13 DO YOU ANALYZE VOLTAGE OR CURRENT WAVEFORMS IN TRANSMISSION LINES TO DETERMINE THE TYPE OF TERMINATION (OPEN, SHORTED, CAPACITIVE, INDUCTIVE)	14	15	13	
P	966	P1-14 DO YOU SELECT APPROPRIATE TRANSMISSION LINES TERMINATIONS TO ACHIEVE DESIRED WAVEFORMS	11	13	7	
P	967	P1-15 DO YOU USE OR REFER TO SCHEMATIC SYMBOLS FOR LINE TERMINATIONS IN TERMS OF CIRCUIT TERMINATIONS	27	28	25	
P	968	P1-16 DO YOU MEASURE STANDING WAVE RATIOS (SR) OF TRANSMISSION LINES	47	48	42	
P	969	P1-17 DO YOU CALCULATE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	20	23	11	
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	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 126	SPC 127	SPC 128	
P 971	P1-19 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING MATCHING TRANSFORMERS	20	22	13	
P 972	P1-20 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING DELTA MATCHING	11	13	7	
P 973	P1-21 DO YOU SELECT THE TYPE OF TRANSMISSION LINE NEEDED FOR PARTICULAR JOBS WITHOUT REFERRING TO TECHNICAL DATA	7	8	5	
P 974	P1-22 DO YOU USE OR REFER TO THE TERM CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	22	21	23	
P 975	P1-23 DO YOU CALCULATE THE CHARACTERISTIC IMPEDANCE (ZO) OF TRANSMISSION LINES	6	7	2	
P 976	P1-24 DO YOU USE OR REFER TO THE TERM CUTOFF FREQUENCY OF TRANSMISSION LINES	9	9	7	
P 977	P1-25 DO YOU USE OR REFER TO THE TERM VELOCITY FACTOR (K) OF TRANSMISSION LINES	4	5	4	
P 978	P1-26 DO YOU COMPUTE THE ELECTRICAL LENGTH OF TRANSMISSION LINES FOR PARTICULAR FREQUENCIES	8	8	8	
P 979	P1-27 DO YOU CONSTRUCT TRANSMISSION LINES OF PARTICULAR ELECTRICAL LENGTH FOR GIVEN FREQUENCIES	10	11	10	
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	13	13	11	
P 981	P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	15	16	12	
P 982	P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	26	29	18	
P 983	P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	13	13	14	
P 984	P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	67	67	65	
P 985	P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	67	67	67	WAVEGUIDES AND CAVITY RESONATORS
P 986	P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	56	56	57	
P 987	P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	26	27	25	
P 988	P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	20	20	21	
P 989	P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	61	60	62	
P 990	P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	22	23	20	
P 991	P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	58	57	58	
P 992	P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	61	62	61	
P 993	P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	60	60	60	
P 994	P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	63	63	61	
P 995	P2-12 DO YOU REMOVE OR INSTALL E BENDS	32	33	29	
P 996	P2-13 DO YOU REMOVE OR INSTALL H BENDS	32	33	29	
P 997	P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	41	41	39	
P 998	P2-15 DO YOU REMOVE OR INSTALL CHOKE JOINTS	20	21	15	
P 999	P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	19	21	15	
P1000	P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	54	53	57	
P1001	P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	42	42	44	
P1002	P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	13	14	8	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128
P1003	P2-20 DO YOU USE OR REFER TO "B" WALL OF WAVEGUIDES	12	13	8
P1004	P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	12	12	11
P1005	P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	11	12	8
P1006	P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	10	10	8
P1007	P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	7	7	7
P1008	P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	6	7	6
P1009	P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	8	8	7
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	8	10	2
P1011	P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .8 WAVELENGTHS IN SIZE, WITH .35 USED AS AN AVERAGE	6	7	4
P1012	P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	11	12	7
P1013	P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	5	5	5
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	5	5	5
P1015	P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	5	6	4
P1016	P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	4	4	4
P1017	P2-34 DO YOU USE OR REFER TO THE SPACE QUADRATURE OF "E" OR "H" LINES IN WAVEGUIDES	4	4	4
P1018	P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	29	29	31
P1019	P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	32	33	31
P1020	P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	27	26	29
P1021	P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	40	42	35
P1022	P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	23	23	23
P1023	P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	6	5	6
P1024	P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	4	4	5

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
P1025	P2-42 DO YOU DETERMINE THE POSITIONING OR SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	4	3	5	
P1026	P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	18	17	20	
P1027	P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	32	32	32	
P1028	P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	26	26	25	
P1029	P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	35	35	35	
P1030	P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	28	29	24	
P1031	P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	24	23	26	
P1032	P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	20	22	14	
P1033	P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	40	41	35	
P1034	P3-01 IN YOUR PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR MAGNETRONS	54	54	56	MICROWAVE AMPLIFIERS AND OSCILLATORS
P1035	P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	21	22	19	
P1036	P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	13	14	12	
P1037	P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	13	13	11	
P1038	P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	22	23	19	
P1039	P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	9	11	5	
P1040	P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	9	10	7	
P1041	P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	20	22	13	
P1042	P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	11	12	7	
P1043	P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	49	50	49	
P1044	P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT)	13	14	11	
P1045	P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	6	7	4	
P1046	P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	6	6	5	
P1047	P3-14 DO YOU WORK WITH MAGNETRONS	51	50	54	
P1048	P3-15 DO YOU INSPECT KLYSTRONS OR TWT	47	47	48	
P1049	P3-16 DO YOU CLEAN KLYSTRONS OR TWT	35	35	33	
P1050	P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	38	38	39	
P1051	P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	48	48	50	
P1052	P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	46	47	45	
P1053	P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	42	42	40	
P1054	P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	50	49	52	
P1055	P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR TWT COMPONENTS	12	12	14	
P1056	P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	8	8	6	
P1057	P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	8	8	6	
P1058	P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	8	8	6	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK	SPC 126	SPC 127	SPC 128
P1059 P3-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	8	8	5
P1060 P3-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	7	8	6
P1061 P3-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	7	8	6
P1062 P3-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	7	8	6
P1063 P3-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	7	8	6
P1064 P3-31 DO YOU INSPECT MAGNETRONS	50	50	52
P1065 P3-32 DO YOU CLEAN MAGNETRONS	40	41	37
P1066 P3-33 DO YOU ADJUST MAGNETRONS	37	37	35
P1067 P3-34 DO YOU TUNE MAGNETRONS	38	40	33
P1068 P3-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	48	48	46
P1069 P3-36 DO YOU TROUBLESHOOT MAGNETRONS	43	45	39
P1070 P3-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	51	50	54
P1071 P3-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	8	9	6
P1072 P3-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	10	11	7
P1073 P3-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	8	9	5
P1074 P3-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	8	10	9
P1075 P3-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	11	13	5
P1076 P3-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	6	7	2
P1077 P3-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER GRIDS	6	7	4
P1078 P3-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS BUNCHER CAVITIES	6	7	4
P1079 P3-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	11	12	10
P1080 P3-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	13	14	12
P1081 P3-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REPELLER (REFLECTOR) PLATES	33	34	30
P1082 P3-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	30	32	23
P1083 P3-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	20	22	15
P1084 P3-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	32	32	30
P1085 P3-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	19	20	14
P1086 P3-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	28	29	24
P1087 P3-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	30	32	25

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 126	SPC 127	SPC 128	
P1088	P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON OUTPUT LEADS	28	30	24	
P1089	P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES FILAMENTS	11	11	12	
P1090	P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES CATHODES	12	11	13	
P1091	P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MODULATOR GRIDS	10	10	10	
P1092	P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ANODES	11	11	11	
P1093	P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES HELIXES	6	6	6	
P1094	P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES COLLECTORS	10	9	12	
P1095	P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES MAGNETS	9	9	10	
P1096	P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TRAVELING-WAVE TUBES ATTENUATORS	11	11	11	
P1097	P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE CIRCULATORS	5	5	4	
P1098	P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL CAVITIES	6	5	6	
P1099	P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER CAVITIES	4	4	4	
P1100	P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR DIODES	7	7	7	
P1101	P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE ISOLATORS	5	5	4	
P1102	P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-BIAS BATTERIES	3	3	4	
P1103	P3-70 DO YOU PERFORM TASKS ON ANODES	9	9	10	
P1104	P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS	7	7	7	
P1105	P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS	9	9	8	
P1106	P3-73 DO YOU PERFORM TASKS ON HEATER LEADS	9	10	8	
P1107	P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES	12	13	6	
P1108	P3-75 DO YOU PERFORM TASKS ON CATHODES	10	10	12	
P1109	P3-76 DO YOU PERFORM TASKS ON MAGNETS	10	11	8	
Q1110	Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS	26	28	17	
Q1111	Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS	29	33	18	
Q1112	Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT REGISTERS	30	34	17	REGISTERS
Q1113	Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE REGISTERS	26	30	14	
Q1114	Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	26	30	14	
Q1115	Q1-06 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF REGISTERS	22	24	14	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 124	SPC 127	SPC 128	
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	25	28	15	
Q1117	Q2-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR STORAGE DEVICES IN YOUR PRESENT JOB	33	36	26	
Q1118	Q2-02 DO YOU USE OR REFER TO DELAY LINES	33	36	24	STORAGE DEVICES
Q1119	Q2-03 DO YOU USE OR REFER TO MAGNETIC CORES	13	14	10	
Q1120	Q2-04 DO YOU USE OR REFER TO MAGNETIC DRUMS	8	8	5	
Q1121	Q2-05 DO YOU USE OR REFER TO MAGNETIC TAPES	9	10	8	
Q1122	Q2-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED OR MEMORY SYSTEMS	12	13	8	
Q1123	Q2-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY SYSTEMS	7	7	5	
Q1124	Q2-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS	6	7	4	
Q1125	Q2-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES	20	22	14	
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	19	22	11	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	8	4	
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	5	6	4	
Q1129	Q3-04 DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS	7	8	4	
Q1130	Q3-05 DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	8	6	
Q1131	Q3-06 DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	8	8	6	
Q1132	Q3-07 DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	8	9	5	
Q1133	Q3-08 DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	8	6	
Q1134	Q3-09 DO YOU PERFORM DON'T REMEMBER WHICH FUNCTION TASKS ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS	7	8	2	
Q1135	Q3-10 DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D CONVERTERS	7	8	2	
Q1136	Q3-11 DO YOU USE OR REFER TO HOLD FUNCTION OF A/D CONVERTERS	8	9	2	
Q1137	Q3-12 DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D CONVERTERS	8	9	2	
Q1138	Q3-13 DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D CONVERTERS	8	10	4	
Q1139	Q3-14 DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-DIGITAL (A/D) CONVERTERS	8	8	5	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	BY-TSK	SPC 126	SPC 127	SPC 128	
R1140	R1-01 DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB	63	63	63	PHANTASTRONS
R1141	R2-01 IN YOUR PRESENT JOB DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS	33	36	29	
R1142	R2-02 DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS	30	32	24	SCHMITT TRIGGERS
R1143	R2-03 DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS	27	28	24	
R1144	R3-01 IN YOUR PRESENT JOB DO YOU FABRICATE MULTICONDUCTOR CABLES	72	75	61	CABLE FABRICATION
R1145	R3-02 DO YOU FABRICATE COAXIAL CABLES	82	82	80	
S1146	S1-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS	38	41	31	
S1147	S1-02 DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS	12	13	6	INPUT/OUTPUT DEVICES
S1148	S1-03 DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA	6	7	2	
S1149	S2-01 DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB	6	7	5	PHOTO SENSITIVE DEVICES
S1150	S3-01 IN YOUR PRESENT JOB DO YOU WORK WITH CHOPPER CIRCUITS	42	40	49	
S1151	S3-02 DO YOU MEASURE EXCITATION FREQUENCIES	18	19	13	
S1152	S3-03 DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS	18	19	14	SYNCHRONOUS VIBRATIONS (CHOPPER CIRCUITS)
S1153	S3-04 DO YOU USE OR REFER TO EXCITATION FREQUENCIES	20	22	15	
S1154	S3-05 DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS	17	18	14	
S1155	S3-06 DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	32	31	36	
S1156	S3-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	33	32	36	
S1157	S3-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	36	34	42	
S1158	S3-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION	36	35	39	
T1159	T1-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS	1	2	0	
T1160	T1-02 DO YOU INSPECT INFRARED SYSTEMS	1	1	0	INFRARED
T1161	T1-03 DO YOU CLEAN INFRARED SYSTEMS	1	1	0	
T1162	T1-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS	1	1	0	
T1163	T1-05 DO YOU OPERATE INFRARED SYSTEMS	1	1	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	1	1	0	
T1167	T1-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS	1	1	0	
T1168	T1-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS	1	1	0	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		DY-TSK	SPC 126	SPC 127	SPC 128	
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	1	1	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	1	1	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	1	1	0	
T1175	T1-17	DO YOU USE OR REFER TO ABSORPTION	0	0	0	
T1176	T1-18	DO YOU USE OR REFER TO SCATTERING	1	1	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	1	1	0	
T1180	T1-22	DO YOU PERFORM TASKS ON ERECTOR LENSES	1	1	0	
T1181	T1-23	DO YOU PERFORM TASKS ON OCULAR LENSES	1	1	0	
T1182	T1-24	DO YOU PERFORM TASKS ON CORRECTION LENSES	0	0	0	
T1183	T1-25	DO YOU PERFORM TASKS ON FILTERS	1	1	0	
T1184	T1-26	DO YOU PERFORM TASKS ON SPHERICAL MIRRORS	1	1	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	1	1	1	
T1187	T2-02	DO YOU INSPECT LASER SYSTEMS	1	0	1	
T1188	T2-03	DO YOU CLEAN LASER SYSTEMS	1	0	1	LASERS
T1189	T2-04	DO YOU OPERATE LASER SYSTEMS	1	1	1	
T1190	T2-05	DO YOU OPERATE LASER SYSTEMS	1	0	1	
T1191	T2-06	DO YOU TROUBLESHOOT WIRE CONNECTIONS OF LASER SYSTEMS	1	0	1	
T1192	T2-07	DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER SYSTEMS	1	1	1	
T1193	T2-08	DO YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER SYSTEMS	1	0	1	
T1194	T2-09	DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER SYSTEMS	1	0	1	
T1195	T2-10	DO YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER SYSTEMS	0	0	1	
T1196	T2-11	DO YOU USE OR REFER TO ANGSTROMS (A)	0	0	1	
T1197	T2-12	DO YOU USE OR REFER TO ELECTRON ENERGY LEVELS	1	0	1	
T1198	T2-13	DO YOU USE OR REFER TO GROUND STATE	1	0	1	
T1199	T2-14	DO YOU USE OR REFER TO EXCITED STATE	1	0	1	
T1200	T2-15	DO YOU USE OR REFER TO PACKET OF RADIATION	1	1	1	
T1201	T2-16	DO YOU USE OR REFER TO PHOTONS	1	0	1	
T1202	T2-17	DO YOU USE OR REFER TO SPONTANEOUS EMISSION	0	0	1	
T1203	T2-18	DO YOU USE OR REFER TO STIMULATED EMISSION	0	0	1	
T1204	T2-19	DO YOU USE OR REFER TO COHERENCE OR INCOHERENCE	1	0	1	
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 126	SPC 127	SPC 128	
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	15	12	
T1221	T3-02	DO YOU INSPECT DVST OR MMST	12	12	12	DISPLAY TUBES
T1222	T3-03	DO YOU CLEAN DVST OR MMST	10	10	11	
T1223	T3-04	DO YOU ADJUST OR CALIBRATE DVST OR MMST	10	10	12	
T1224	T3-05	DO YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	13	14	12	
T1225	T3-06	DO YOU TROUBLESHOOT DVST OR MMST CIRCUITS	11	11	11	
T1226	T3-07	DO YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES OR UNITS	11	11	12	
T1227	T3-08	DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	7	7	6	
T1228	T3-09	DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF MMST	2	2	2	
T1229	T3-10	DO YOU PERFORM TASKS ON FLOOD GUNS	6	6	4	
T1230	T3-11	DO YOU PERFORM TASKS ON WRITE GUNS	5	5	2	
T1231	T3-12	DO YOU PERFORM TASKS ON ATTACK GUNS	2	2	1	
T1232	T3-13	DO YOU PERFORM TASKS ON ERASE GUNS	6	7	5	
T1233	T3-14	DO YOU PERFORM TASKS ON STORAGE GRIDS	6	6	5	
U1234	U1-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY PROGRAMMING TASKS	7	8	4	
U1235	U1-02	DO YOU USE OR REFER TO DECIMAL SYSTEMS	3	3	1	PROGRAMMING
U1236	U1-03	DO YOU USE OR REFER TO PROGRAMS	4	4	2	
U1237	U1-04	DO YOU USE OR REFER TO HEXIDECIMAL SYSTEMS	1	1	0	
U1238	U1-05	DO YOU USE OR REFER TO 8-4-2-1 SYSTEMS	1	2	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	4	5	2	
U1241	U1-08	DO YOU USE OR REFER TO TIME-SHARING	1	2	0	
U1242	U1-09	DO YOU USE OR REFER TO DATA WORDS	4	4	4	
U1243	U1-10	DO YOU USE OR REFER TO ADDRESS WORDS	3	3	2	
U1244	U1-11	DO YOU USE OR REFER TO ADDRESS/SUBADDRESS	1	2	0	
U1245	U1-12	DO YOU USE OR REFER TO STEERING/INFORMATION	2	3	1	
U1246	U1-13	DO YOU USE OR REFER TO INFORMATION WORDS	3	3	4	
U1247	U1-14	DO YOU PERFORM TASKS ON SINGLE LEVEL PROGRAMMING	5	5	2	
U1248	U1-15	DO YOU PERFORM TASKS ON MULTI-LEVEL PROGRAMMING	2	3	1	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

	DY-TSK	SPC 124	SPC 127	SPC 128	
U1249	U1-16 DO YOU PERFORM TASKS ON INPUT DEVICES	4	5	1	
U1250	U1-17 DO YOU PERFORM TASKS ON STORAGE DEVICES	4	5	1	
U1251	U1-18 DO YOU PERFORM TASKS ON ARITHMETIC SECTIONS	2	2	1	
U1252	U1-19 DO YOU PERFORM TASKS ON CONTROL SECTIONS	3	4	0	
U1253	U1-20 DO YOU PERFORM TASKS ON OUTPUT DEVICES	3	3	0	
U1254	U1-21 DO YOU PERFORM TASKS ON POWER SUPPLIES	3	5	0	
U1255	U2-01 DO YOU USE DECIBELS TO EXPRESS AMPLIFICATION AND ATTENUATION	81	82	79	
U1256	U2-02 DO YOU USE LOGARITHMS TO COMPUTE OUTPUT POWER IN DECIBELS	19	22	13	DB AND POWER RATIOS
U1257	U2-03 DO YOU USE LOGARITHMS TO COMPUTE ATTENUATION IN DECIBELS	21	23	13	
U1258	U2-04 DUMMY TASK TO IDENTIFY INCUMBENTS WHO PERFORMED NO TASKS	1	2	1	

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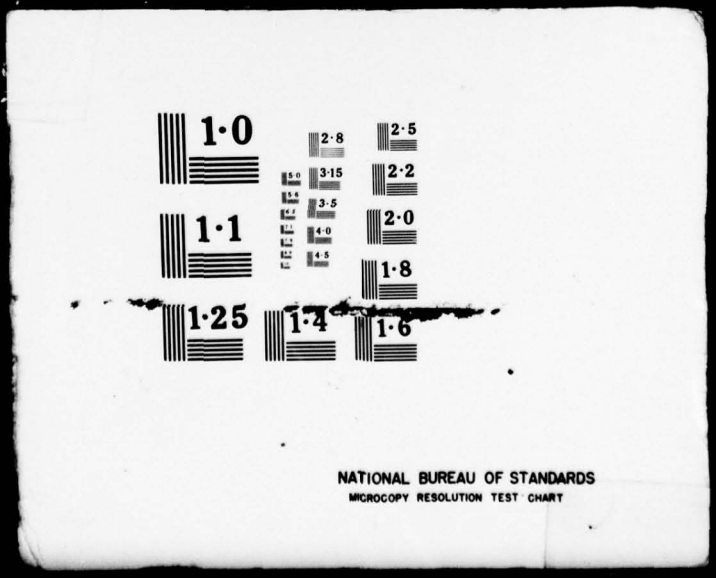
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INFORMATION

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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 Avionic Navigation System Specialist (AFSC 32851). 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:

Installs, maintains, troubleshoots, and repairs avionic electronic navigation systems equipment and test equipment. Performs preventive maintenance on avionic navigation equipment. Maintains inspection and maintenance records. Supervises avionic navigation equipment personnel.