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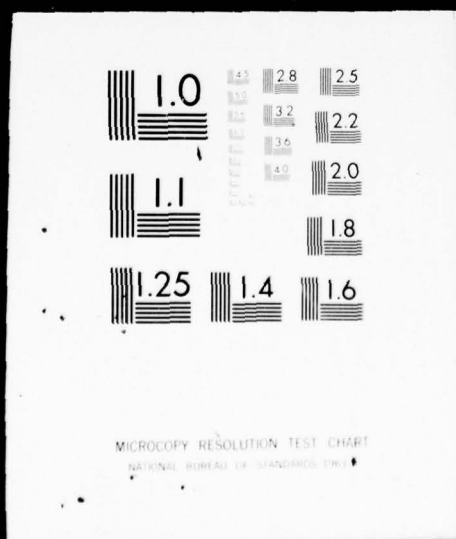
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OCCUPATIONAL SURVEY REPORT
ELECTRONIC PRINCIPLES

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COMMUNICATIONS ELECTRONICS SYSTEMS
SPECIALIST

AFSC 30456

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OCCUPATIONAL SURVEY BRANCH
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PREFACE

This report presents a summary of the results of a detailed Air Force Electronic Principles Survey of the Communications Electronics Systems Specialist, AFSC 30456.

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 Harold T. Welch. 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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Chief, Occupational Survey Branch
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ELECTRONIC PRINCIPLES OCCUPATIONAL SURVEY REPORT
COMMUNICATIONS ELECTRONICS SYSTEMS SPECIALIST
AFSC 30456

INTRODUCTION

↓ This report summarizes the results of the administration of the Electronic Principles Inventory to airmen assigned as Communications Electronics Systems Specialist (AFSC 30456). 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 30456 airmen worldwide. Responses from 59 individuals represented 40 percent of the total of all AFSC 30456 personnel. Table 2 shows the percentage distribution by major command of the survey incumbents.

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TABLE 1
EPI SUBJECT AREAS

<u>SEQUENCE OF SUBJECT AREAS</u>	<u>SUBJECT AREA TITLE</u>	<u>BEGINNING ITEM NUMBER</u>	<u>GPSUM PAGE NUMBER</u>
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

<u>SEQUENCE OF SUBJECT AREAS</u>	<u>SUBJECT AREA TITLE</u>	<u>BEGINNING ITEM NUMBER</u>	<u>GPSUM PAGE NUMBER</u>
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	O845	30
44	PULSE MODULATION SYSTEMS	O875	31
45	ANTENNAS	O914	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

<u>COMMAND</u>	30456	
	<u>PERCENT ASSIGNED</u>	<u>PERCENT OF SAMPLE</u>
AFCS	95	86
ATC	5	7
AFSC	0	5
OTHERS	<u>0</u>	<u>2</u>
TOTAL	100	100

Total Assigned - 148
Total Sampled - 59
Percent Sampled - 40%

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 four 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 Multimeter Uses (p. 3) and Soldering (p. 11) to low in areas such as Infrared (pp. 41-42) and Lasers (p. 42). Additional AFSC 30456 data can be obtained upon request to the Chief, Occupational Survey Branch (OMY).

APPENDIX

PCT NIMS RESPONDING YES BY SELECTED GRPS

GPSUMR PAGE 1

1 TABULATION OF ELECTRONIC PRINCIPLES UTILIZATION DATA FOR SELECTED GROUPS
IN THE JONSA CARLEN FIELD.

1 MEMBERS ON THE FOLLOWING GROUPS WERE REQUESTED

GROUP IDENTITY =	SPC176	ALL AIRMEN DAFSC 30456	CONTAINING	59 MEMBERS
GROUP IDENTITY =	SPC177	ALL AIRMEN DAFSC 30456	CONTAINING	34 MEMBERS
GROUP IDENTITY =	SPC178	ALL AIRMEN DAFSC 30456	CONTAINING	25 MEMBERS
GROUP IDENTITY =	SPC179	ALL AIRMEN DAFSC 30456	CONTAINING	51 MEMBERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

	SPC	SPC	SPC	SPC	SPC	
	176	177	178	179		
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.	92	94	88	90		MATHEMATICS
A 2 A1-02 DO YOU USE PUBLICATIONS, SUCH AS A TECHNICAL ORDERS OR MAINTENANCE MANUALS, IN WHICH IT IS NECESSARY FOR YOU TO MULTIPLY OR DIVIDE BY A POWER OF 10 BEFORE YOU CAN APPLY THE INFORMATION FROM THE PUBLICATION IN A USEFUL WAY ON THE JOB.	53	50	56	55		
A 3 A1-03 DO YOU REARRANGE AND SOLVE FORMULAS OR EQUATIONS.	42	44	40	39		
A 4 A1-04 DO YOU CALCULATE THE SQUARE ROOT OF A QUANTITY.	24	18	32	25		
A 5 A1-05 DO YOU SOLVE FOR UNKNOWN QUANTITIES.	32	26	40	35		
A 6 A1-06 DO YOU CONVERT NUMBERS TO LOGARITHMS.	32	18	52	33		
A 7 A1-07 DO YOU USE LOGARITHM TABLES IN ANY TYPE OF CALCULATIONS.	27	18	40	27		
A 8 A1-08 DO YOU SOLVE QUADRATIC EQUATIONS.	10	9	12	10		
A 9 A1-09 DO YOU USE THE NATURAL SYSTEM OF LOGARITHMS.	19	9	32	20		
A 10 A1-10 DO YOU PERFORM CALCULATIONS ON VECTOR QUANTITIES.	20	12	32	22		
A 11 A1-11 DO YOU WORK WITH TRIGONOMETRIC FUNCTIONS SUCH AS SINE, COSINE, OR TANGENT.	24	12	40	24		
A 12 A1-12 DO YOU DETERMINE AREAS OF PLANE FIGURES.	8	6	12	10		
A 13 A1-13 DO YOU SOLVE OR USE SIMULTANEOUS EQUATIONS.	15	12	20	16		
A 14 A1-14 DO YOU SOLVE OR USE PROPORTIONS.	29	21	40	31		
A 15 A2-01 DO YOU USE THE TERM VOLTAGE OR VOLT (V).	97	94	100	98		DIRECT CURRENT AND VOLTAGE
A 16 A2-02 DO YOU USE THE TERM ELECTROMOTIVE FORCE (EMF).	49	41	60	51		
A 17 A2-03 DO YOU USE THE TERM OHM.	98	97	100	100		
A 18 A2-04 DO YOU USE THE TERM ION.	46	41	52	47		
A 19 A2-05 DO YOU USE THE TERM DYNE.	20	18	24	22		
A 20 A2-06 DO YOU USE THE TERM AMPERE.	97	94	100	98		
A 21 A2-07 DO YOU USE THE TERM NEUTRON.	29	29	28	29		
A 22 A2-08 DO YOU USE THE TERM COULOMB.	29	26	32	31		
A 23 A2-09 DO YOU USE THE TERM PROTON.	27	29	24	29		
A 24 A3-01 DO YOU WORK WITH RESISTORS IN YOUR PRESENT JOB.	92	85	100	90		RESISTANCE
A 25 A3-02 DO YOU INSPECT RESISTORS.	93	94	92	92		
A 26 A3-03 DO YOU CLEAN RESISTORS.	76	71	84	76		
A 27 A3-04 DO YOU ADJUST RESISTORS.	93	94	92	92		
A 28 A3-05 DO YOU CHECK OHMIC VALUE ON RESISTORS.	92	88	96	92		
A 29 A3-06 DO YOU REMOVE OR REPLACE RESISTORS.	76	68	88	76		
A 30 A3-07 DO YOU USE OR REFER TO TEMPERATURE COEFFICIENTS FOR RESISTORS ON ANY TASKS YOU PERFORM.	41	35	48	43		
A 31 A3-08 DO YOU USE OR REFER TO RESISTOR SYMBOLS SUCH AS FIXED RESISTOR SYMBOLS OR TAPPED RESISTOR SYMBOLS.	90	85	96	88		
A 32 A3-09 DO YOU IDENTIFY OR CLASSIFY THE RESISTORS YOU WORK WITH AS CARBON, FIXED WIRE, SLIDE TAP, WHEOSTAT, OR POTENTIOMETER.	80	74	88	80		
A 33 A3-10 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE OHMIC VALUE OF RESISTANCE.	88	82	96	88		

PCT MANS RESPONDING 'YES' BY SELECTED GRPS

GPSUM8 PAGE 3

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

04-15A

	SPC	SPC	SPC	SPC
	176	177	178	179
A 34 A3-11 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE TOLERANCE.	83	76	92	84
A 35 A3-12 DO YOU USE RESISTOR COLOR CODES WHICH INDICATE FAILURE RATE.	27	24	32	27
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.	37	44	28	39
A 37 A3-14 DO YOU USE OR REFER TO THE SCHEMATIC SYMBOLS WHICH REPRESENT BATTERIES, FUSES, CONDUCTORS, LAMPS, OR SWITCHES	93	88	100	94
A 38 A3-15 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES RESISTIVE CIRCUITS.	56	53	60	59
A 39 A3-16 DO YOU CALCULATE TOTAL CURRENT FOR SERIES RESISTIVE CIRCUITS.	53	50	56	57
A 40 A3-17 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES RESISTIVE CIRCUITS.	56	47	68	61
A 41 A3-18 DO YOU CALCULATE POWER DISSIPATION FOR SERIES RESISTIVE CIRCUITS.	49	41	60	53
A 42 A3-19 DO YOU CALCULATE TOTAL RESISTANCE FOR SERIES PARALLEL RESISTIVE CIRCUITS.	51	47	60	55
A 43 A3-20 DO YOU CALCULATE TOTAL CURRENT FOR SERIES PARALLEL RESISTIVE CIRCUITS.	47	41	56	51
A 44 A3-21 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	49	41	60	53
A 45 A3-22 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR SERIES PARALLEL RESISTIVE CIRCUITS.	46	38	56	49
A 46 A3-23 DO YOU CALCULATE POWER DISSIPATION FOR SERIES PARALLEL RESISTIVE CIRCUITS.	47	41	56	51
A 47 A3-24 DO YOU CALCULATE TOTAL RESISTANCE FOR PARALLEL RESISTIVE CIRCUITS.	51	47	56	53
A 48 A3-25 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RESISTIVE CIRCUITS.	51	47	56	53
A 49 A3-26 DO YOU CALCULATE INDIVIDUAL VOLTAGE DROPS FOR PARALLEL RESISTIVE CIRCUITS.	49	41	60	53
A 50 A3-27 DO YOU CALCULATE INDIVIDUAL BRANCH CURRENTS FOR PARALLEL RESISTIVE CIRCUITS.	47	41	56	49
A 51 A3-28 DO YOU CALCULATE POWER DISSIPATION FOR PARALLEL RESISTIVE CIRCUITS.	47	41	56	51
B 52 B1-01 DO YOU MEASURE RESISTANCE.	97	94	100	96
B 53 B1-02 DO YOU REPAIR OHMMETERS.	19	21	16	20
B 54 B1-03 DO YOU MEASURE VOLTAGE.	98	97	100	98
B 55 B1-04 DO YOU REPAIR VOLTMETERS.	17	18	16	20
B 56 B1-05 DO YOU REPAIR AMMETERS.	17	18	16	20
B 57 B1-06 DO YOU MEASURE CURRENT.	90	88	92	88
B 58 B1-07 DO YOU USE MULTIMETERS.	98	97	100	98
B 59 B1-08 DO YOU DIRECTLY USE A QUANTITY OF CHARGE CALLED A COULOMB.	20	21	20	24
B 60 B1-09 DO YOU READ SCHEMATICS.	98	97	100	98

MULTIMETER USES

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

		SPC	SPC	SPC	SPC	
		176	177	178	179	
B 61	82-01 DO YOU USE OR REFER TO THE TERM EFFECTIVE VOLTAGE (RMS).	83	85	80	84	ALTERNATING CURRENT
B 62	82-02 DO YOU USE OR REFER TO THE TERM PEAK TO PEAK VOLTAGE.	90	88	92	90	
B 63	82-03 DO YOU USE OR REFER TO THE TERM AVERAGE VOLTAGE (DC).	85	82	88	82	
B 64	82-04 DO YOU USE OR REFER TO THE TERM WAVE LENGTH.	78	79	76	76	
B 65	82-05 DO YOU USE OR REFER TO THE TERM FREQUENCY.	98	97	100	98	INDUCTORS AND INDUCTIVE REACTANCE
B 66	82-06 DO YOU USE OR REFER TO THE TERM INSTANTANEOUS VALUE.	54	47	44	53	
B 67	83-01 DO YOU WORK WITH INDUCTORS OR CIRCUITS CONTAINING INDUCTORS, CHOKES, OR CHOKE COILS IN YOUR PRESENT JOB.	78	85	68	76	
B 68	83-02 DO YOU INSPECT INDUCTORS.	71	76	64	69	
B 69	83-03 DO YOU CLEAN INDUCTORS.	59	62	56	63	
B 70	83-04 DO YOU ADJUST INDUCTORS.	58	65	48	59	
B 71	83-05 DO YOU REMOVE OR REPLACE INDUCTORS.	61	62	60	61	
B 72	83-06 DO YOU USE OR REFER TO INDUCTANCE.	61	68	52	65	
B 73	83-07 DO YOU USE OR REFER TO HENRIES.	49	56	40	49	
B 74	83-08 DO YOU USE OR REFER TO INDUCTIVE REACTANCE.	47	50	44	51	
B 75	83-09 DO YOU USE OR REFER TO COPPER LOSS IN INDUCTORS.	17	15	20	18	
B 76	83-10 DO YOU USE OR REFER TO HYSTERESIS LOSS IN INDUCTORS.	15	15	16	18	
B 77	83-11 DO YOU USE OR REFER TO EDDY CURRENT LOSS IN INDUCTORS.	15	15	16	18	
B 78	83-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTANCE IS PROPORTIONAL TO THE SQUARE OF THE NUMBER OF TURNS OF THE COIL.	22	21	24	22	
B 79	83-13 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.	15	18	12	16	
B 80	83-14 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE INDUCTANCE OF A COIL IS INVERSELY PROPORTIONAL TO ITS LENGTH.	17	18	16	18	
B 81	83-15 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.	19	21	16	18	
B 82	83-16 DO YOU CALCULATE INDUCTANCE FOR PARTICULAR INDUCTORS USING FORMULAS.	17	18	16	20	
B 83	83-17 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTANCE IN SERIES.	25	21	32	29	
B 84	83-18 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN PARALLEL.	27	24	32	31	
B 85	83-19 DO YOU CALCULATE THE TOTAL INDUCTANCE FOR INDUCTORS IN SERIES-PARALLEL CIRCUITS.	25	18	36	29	
B 86	83-20 DO YOU USE OR REFER TO THE GENERAL RULE THAT CURRENT LAGS VOLTAGE IN AC INDUCTOR CIRCUITS.	37	41	32	43	
B 87	83-21 DO YOU CALCULATE INDUCTIVE REACTANCE.	27	24	32	31	
B 88	83-22 DO YOU USE OR REFER TO THE GENERAL RULE THAT INDUCTIVE REACTANCE IS DIRECTLY PROPORTIONAL TO FREQUENCY.	29	32	24	33	
B 89	83-23 DO YOU WORK WITH POWER INDUCTORS.	46	50	40	49	
B 90	83-24 DO YOU WORK WITH AUDIO FREQUENCY INDUCTORS.	59	65	52	61	
B 91	83-25 DO YOU WORK WITH RADIO FREQUENCY INDUCTORS.	64	71	56	65	

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	178	179	
C 121 C1-J0 DO YOU WORK WITH ROTOR-STATOR (VARIABLE) CAPACITORS	73	74	68	75	
C 122 C1-J1 DO YOU WORK WITH COMPRESSION (TRIMMER) CAPACITORS	59	59	60	65	
C 123 C1-J2 DO YOU WORK WITH ELECTROLYTIC (FIXED) CAPACITORS	80	76	84	80	
C 124 C1-J3 DO YOU WORK WITH PAPER (FIXED) CAPACITORS	64	68	68	71	
C 125 C1-J4 DO YOU WORK WITH MICA (FIXED) CAPACITORS	73	71	74	75	
C 126 C1-J5 DO YOU WORK WITH CERAMIC (FIXED) CAPACITORS	78	76	80	78	
C 127 C1-J6 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF CAPACITORS	25	26	24	25	
C 128 C2-01 DO YOU WORK WITH TRANSFORMERS IN YOUR PRESENT JOB	80	82	76	78	
C 129 C2-02 DO YOU INSPECT TRANSFORMERS	83	85	80	82	
C 130 C2-03 DO YOU CLEAN TRANSFORMERS	71	76	64	73	
C 131 C2-04 DO YOU ADJUST TRANSFORMERS	59	59	60	61	
C 132 C2-05 DO YOU TROUBLESHOOT TRANSFORMERS	71	76	64	73	
C 133 C2-06 DO YOU REMOVE OR REPLACE COMPLETE TRANSFORMERS	76	74	80	80	
C 134 C2-07 DO YOU REMOVE OR REPLACE TRANSFORMER PARTS, SUCH AS THE PRIMARY WINDING	10	12	8	12	
C 135 C2-08 DO YOU MAKE A DISTINCTION BETWEEN MUTUAL INDUCTANCE AND MUTUAL INDUCTANCE (M)	14	18	8	14	
C 136 C2-09 DO YOU USE THE SYMBOL FOR MUTUAL INDUCTANCE, M	10	12	8	12	
C 137 C2-10 DO YOU REFER TO OR USE THE COEFFICIENT OF COUPLING WHEN WORKING WITH TRANSFORMERS	19	21	16	22	
C 138 C2-11 DO YOU CALCULATE TURNS RATIOS FOR TRANSFORMERS USING CURRENT OR VOLTAGE RATIOS	20	18	24	24	
C 139 C2-12 DO YOU REFER TO REFLECTED IMPEDANCE WHEN WORKING WITH TRANSFORMERS	17	21	12	18	
C 140 C2-13 DO YOU CALCULATE IMPEDANCE INTERACTIONS FOR TRANSFORMERS	15	12	20	18	
C 141 C2-14 DO YOU WORK WITH AUTOTRANSFORMERS	54	44	68	61	
C 142 C2-15 DO YOU WORK WITH POWER TRANSFORMERS	80	82	76	82	
C 143 C2-16 DO YOU WORK WITH AUDIO TRANSFORMERS	75	74	76	76	
C 144 C2-17 DO YOU WORK WITH RADIO FREQUENCY TRANSFORMERS	73	74	72	75	
C 145 C2-18 DO YOU WORK WITH DON'T REMEMBER WHAT TYPE OF TRANSFORMERS	12	18	4	10	
C 146 C2-19 DO YOU CHECK TRANSFORMERS FOR OPEN WINDINGS BY MEASURING RESISTANCE	69	76	60	71	
C 147 C2-20 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING RESISTANCE	64	76	56	69	
C 148 C2-21 DO YOU CHECK TRANSFORMERS FOR SHORTED WINDINGS BY MEASURING OUTPUT VOLTAGES	63	65	60	67	
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	34	38	28	35	
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	34	38	32	37	
C 151 C2-24 DO YOU REFER TO BASIC TRANSFORMER SCHEMATIC SYMBOLS FOR TRANSFORMERS	84	88	84	88	

TRANSFORMERS

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

GPSUMD PAGE 7

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

SPC SPC SPC SPC
176 177 178 179

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

MAGNETISM

SPC SPC SPC SPC
176 177 178 179
69 68 72 71
74 76 80 80
78 76 80 80
63 68 56 65
64 68 60 67
63 71 52 63
42 41 44 47
32 35 28 37
29 29 28 31
41 44 36 43
20 15 28 24
17 12 24 20
66 68 64 69
58 53 64 63
37 44 28 41
39 41 36 43
51 47 56 57
54 50 60 59
10 15 4 12
41 41 40 41
39 35 44 41
12 12 12 14
12 12 12 14
15 15 16 16
14 16 12 14
31 26 36 31
10 9 12 12

PCT MARS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

GPSUMB PAGE 8

DT-Y5A

	SPC	SPC	SPC	SPC	SPC	SPC
	176	177	178	179		
C 179 C3-09 DO YOU USE OR REFER TO DOMAIN THEORY OF MAGNETISM	14	12	16	16		
C 180 C3-10 DO YOU USE OR REFER TO MAGNETIC INDUCTION	29	32	24	31		
C 181 C3-11 DO YOU USE OR REFER TO FLUX DENSITY	20	24	16	22		
C 182 C3-12 DO YOU USE OR REFER TO THE GENERAL RULE THAT FOR	34	41	24	39		
MAGNETIC POLES, LIKE POLES REPEL AND UNLIKE POLES ATTRACT						
C 183 C3-13 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE	32	35	28	33		
DIRECTION OF MAGNETIC FIELDS ABOUT STRAIGHT WIRES						
C 184 C3-14 DO YOU USE THE LEFT HAND THUMB RULE TO FIND THE NORTH	32	32	32	31		
POLE OF A CURRENT CARRYING COIL						
U 185 D1-01 DO YOU WORK WITH RCL RCL CIRCUITS IN YOUR	59	65	52	61		
PRESENT JOB						
U 186 D1-02 DO YOU USE OR REFER TO VECTORS WHEN WORKING WITH MCL	17	18	16	20		RCL CIRCUITS
CIRCUITS						
U 187 D1-03 DO YOU USE OR REFER TO PYTHAGOREAN THEOREM WHEN	14	9	20	16		
WORKING WITH RCL CIRCUITS						
U 188 D1-04 DO YOU USE OR REFER TO SINE WHEN WORKING WITH RCL	17	15	20	20		
CIRCUITS						
U 189 D1-05 DO YOU USE OR REFER TO COSINE WHEN WORKING WITH RCL	17	15	20	20		
CIRCUITS						
U 190 D1-06 DO YOU USE OR REFER TO TANGENT WHEN WORKING WITH MCL	14	12	16	16		
CIRCUITS						
U 191 D1-07 DO YOU USE OR REFER TO WATTS WHEN WORKING WITH RCL	64	71	56	69		
CIRCUITS						
U 192 D1-08 DO YOU USE OR REFER TO TRUE POWER (PT) WHEN WORKING	42	41	44	47		
WITH RCL CIRCUITS						
U 193 D1-09 DO YOU USE OR REFER TO MAXIMUM POWER (PM) WHEN	44	50	36	49		
WORKING WITH RCL CIRCUITS						
U 194 D1-10 DO YOU USE OR REFER TO AVERAGE POWER (PAVE) WHEN	47	50	44	51		
WORKING WITH RCL CIRCUITS						
U 195 D1-11 DO YOU USE OR REFER TO APPARENT POWER (PA) WHEN	41	47	32	45		
WORKING WITH RCL CIRCUITS						
U 196 D1-12 DO YOU USE OR REFER TO POWER FACTOR (PF) WHEN WORKING	32	38	24	37		
WITH RCL CIRCUITS						
U 197 D1-13 DO YOU USE OR REFER TO RESONANT CIRCUITS WHEN	53	56	48	57		
WORKING WITH RCL CIRCUITS						
U 198 D1-14 DO YOU USE OR REFER TO BANDWIDTH WHEN WORKING WITH	66	74	56	69		
RCL CIRCUITS						
U 199 D1-15 DO YOU USE OR REFER TO SELECTIVITY WHEN WORKING WITH	59	68	48	65		
RCL CIRCUITS						
U 200 D1-16 DO YOU USE OR REFER TO RESONANT FREQUENCY WHEN	54	56	52	59		
WORKING WITH RCL CIRCUITS						
U 201 D1-17 DO YOU USE OR REFER TO HALF POWER POINTS WHEN	41	38	44	47		
WORKING WITH RCL CIRCUITS						
U 202 D1-18 DO YOU USE OR REFER TO BANDPASS REGION WHEN WORKING	51	50	52	55		
WITH RCL CIRCUITS						
U 203 D1-19 DO YOU USE OR REFER TO CIRCUIT Q WHEN WORKING WITH	37	32	32	37		
RCL CIRCUITS						

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

SPC SPC SPC SPC
176 177 178 179

U 404 DI-20 DO YOU USE OR REFER TO TANK CIRCUITS WHEN WORKING WITH RCL CIRCUITS 46 50 40 49

U 405 DI-21 DO YOU DETERMINE VALUES OF TRIGONOMETRIC FUNCTIONS USING FORMULAS 15 15 16 18

U 406 DI-22 DO YOU DRAW VOLTAGE, CURRENT, OR IMPEDANCE VECTOR DIAGRAMS FOR CIRCUITS 12 12 12 14

U 407 DI-23 DO YOU CALCULATE TOTAL IMPEDANCE FOR CAPACITIVE CIRCUITS 22 21 24 25

U 408 DI-24 DO YOU CALCULATE PHASE ANGLES BETWEEN IMPEDANCE AND RESISTANCE IN CAPACITIVE CIRCUITS 15 12 20 18

U 409 DI-25 DO YOU CALCULATE TOTAL IMPEDANCE FOR SERIES RCL CIRCUITS 19 15 24 22

U 410 DI-26 DO YOU CALCULATE IMPEDANCE ANGLES FOR SERIES RCL CIRCUITS 10 15 4 12

U 411 DI-27 DO YOU CALCULATE APPARENT POWER (PA) FOR SERIES RCL CIRCUITS 15 15 16 18

U 412 DI-28 DO YOU CALCULATE TRUE POWER (PT) FOR SERIES RCL CIRCUITS 20 15 28 24

U 413 DI-29 DO YOU CALCULATE POWER FACTORS (PF) FOR SERIES RCL CIRCUITS 19 15 24 22

U 414 DI-30 DO YOU CALCULATE TOTAL CURRENT FOR PARALLEL RCL CIRCUITS 20 15 28 24

U 415 DI-31 DO YOU CALCULATE IMPEDANCE ANGLES FOR PARALLEL RCL CIRCUITS 12 15 8 14

U 416 DI-32 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING THE ASSUMED VOLTAGE METHOD 17 15 20 20

U 417 DI-33 DO YOU CALCULATE TOTAL IMPEDANCE FOR PARALLEL RCL CIRCUITS USING OHM'S LAW 20 15 28 24

U 418 DI-34 DO YOU CHECK CAPACITORS USING OHMMETERS 58 62 52 61

U 419 DI-35 DO YOU CHECK CAPACITORS USING SUBSTITUTION 44 47 40 47

U 420 DI-36 DO YOU CHECK INDUCTORS USING OHMMETERS 56 62 48 59

U 421 DI-37 DO YOU CHECK INDUCTORS USING SUBSTITUTION 44 47 40 47

U 422 DI-38 DO YOU USE OR REFER TO THE GENERAL RULE THAT $\theta = \phi - \alpha$ AND $\phi = \alpha - \theta$ FOR RESONANT CIRCUITS 12 9 16 14

U 423 DI-39 DO YOU CALCULATE RESONANT FREQUENCIES FOR RCL CIRCUITS 19 15 24 22

U 424 DI-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 24 26 20 27

U 425 DI-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 22 21 24 25

U 426 DI-42 DO YOU USE OR REFER TO THE GENERAL RULE THAT HALF POWER POINTS ARE AT 70.7 PERCENT OF THE PEAK CURRENT VALUE 39 32 48 41

U 427 DI-43 DO YOU USE OR REFER TO THE GENERAL RULE THAT BANDWIDTH IS INVERSELY PROPORTIONAL TO Q 31 29 32 33

U 428 DI-44 DO YOU DETERMINE HOW CHANGES IN FREQUENCY, RESISTANCE, CAPACITANCE, OR INDUCTANCE WILL AFFECT CURRENT OR PHASE ANGLES FOR RCL CIRCUITS 20 18 24 24

PCT MRS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC 176	SPC 177	SPC 178	SPC 179	SERIES AND PARALLEL RESONANCE (TIME CONSTANTS)
U 429 02-01 IN YOUR PRESENT JOB, DO YOU WORK WITH, USE, OR REFER TO SERIES OR PARALLEL RESONANT CIRCUITS ON TIME CONSTANTS	37	32	44	41	
U 430 02-02 DO YOU WORK WITH, USE, OR REFER TO TIME CONSTANTS	27	21	36	31	
U 431 02-03 DO YOU WORK WITH, USE, OR REFER TO AVAILABLE VOLTAGE	20	18	24	24	
U 432 02-04 DO YOU WORK WITH, USE, OR REFER TO TRANSIENT INTERVALS	17	18	16	20	
U 433 02-05 DO YOU USE OR REFER TO THE GENERAL RULE THAT A CAPACITOR IS FULLY CHARGED (OR DISCHARGED) AFTER FIVE (5) TIME CONSTANTS (TC)	27	15	44	31	
U 434 02-06 DO YOU USE OR REFER TO UNIVERSAL TIME CONSTANT CHARTS	14	15	12	16	
U 435 02-07 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CIRCUIT CURRENT OR COMPONENT VOLTAGES AFTER A SPECIFIC TIME FOR RC OR LR CIRCUITS	12	9	16	14	
U 436 02-08 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	12	9	16	14	
U 437 02-09 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE COMPONENT VALUES REQUIRED FOR CIRCUIT CURRENT AND COMPONENT VOLTAGES TO REACH SPECIFIC VALUES IN SPECIFIC TIMES	15	9	24	18	
U 438 02-10 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	81	76	88	86	
U 439 03-01 DO YOU WORK WITH CIRCUITS USED AS FILTERS IN YOUR PRESENT JOB	68	68	68	71	FILTERS
U 440 03-02 DO YOU INSPECT FILTER CIRCUITS	63	68	56	65	
U 441 03-03 DO YOU CLEAN FILTER CIRCUITS	66	71	60	69	
U 442 03-04 DO YOU ALIGN OR ADJUST FILTER CIRCUITS	54	59	48	59	
U 443 03-05 DO YOU TROUBLESHOOT TO THE FILTER CIRCUIT LEVEL	36	41	28	37	
U 444 03-06 DO YOU TROUBLESHOOT TO COMPONENT PARTS	73	71	76	78	
U 445 03-07 DO YOU REMOVE OR REPLACE THE COMPLETE FILTER CIRCUIT	32	41	20	35	
U 446 03-08 DO YOU REMOVE OR REPLACE FILTER CIRCUIT COMPONENT PARTS	76	71	84	78	
U 447 03-09 DO YOU WORK WITH LOW PASS FILTERS	76	71	84	78	
U 448 03-10 DO YOU WORK WITH HIGH PASS FILTERS	81	76	68	84	
U 449 03-11 DO YOU WORK WITH HANDPASS FILTERS	73	65	84	76	
U 450 03-12 DO YOU WORK WITH BAND-REJECT FILTERS	15	26	0	16	
U 451 03-13 DON'T REMEMBER WHICH TYPE OF FILTER YOU WORK WITH	44	44	44	47	
U 452 03-14 DO YOU WORK WITH L-SECTION FILTER CONFIGURATION	42	41	44	47	
U 453 03-15 DO YOU WORK WITH T-SECTION FILTER CONFIGURATION	37	35	40	41	
U 454 03-16 DO YOU WORK WITH PI-SECTION FILTER CONFIGURATION	32	38	24	33	
U 455 03-17 DON'T REMEMBER WHICH TYPE FILTER CONFIGURATION	47	44	52	53	
U 456 03-18 DO THE FILTERS YOU WORK WITH USE PARALLEL RESONANT CIRCUITS	44	44	44	49	
U 457 03-19 DO THE FILTERS YOU WORK WITH USE SERIES-PARALLEL CIRCUITS	49	44	56	53	
U 458 03-20 DO THE FILTERS YOU WORK WITH USE SERIES RESONANT CIRCUITS					

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSA

	SPC	SPC	SPC	SPC	SPC	
	176	177	178	179		
U 459 03-21 DON'T REMEMBER WHICH TYPE OF BASIC CIRCUIT	32	41	20	33		
U 460 03-22 DO YOU USE EQUATIONS OR FORMULAS TO DETERMINE CAPACITANCE OR INDUCTANCE VALUES REQUIRED FOR SPECIFIC FILTERS	15	12	20	18		
E 261 E1-01 DO YOU WORK WITH COUPLING DEVICES IN YOUR PRESENT JOB	68	71	64	69		
E 262 E1-02 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH RC COUPLING	59	56	64	63		COUPLING
E 263 E1-03 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH IMPEDANCE COUPLING	54	53	56	57		
E 264 E1-04 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH TRANSFORMER COUPLING	63	62	64	67		
E 265 E1-05 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM RC COUPLING	53	50	56	57		
E 266 E1-06 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM IMPEDANCE COUPLING	51	53	48	51		
E 267 E1-07 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM TRANSFORMER COUPLING	56	56	56	59		
E 268 E1-08 DO YOU WORK WITH DIRECTLY COUPLED CIRCUITS	49	50	48	53		
E 269 E1-09 DO YOU WORK WITH CAPACITIVE-RESISTIVE COUPLED CIRCUITS	51	50	52	55		
E 270 E1-10 DO YOU WORK WITH CAPACITIVE-INDUCTIVE COUPLED CIRCUITS	54	53	56	59		
E 271 E1-11 DO YOU WORK WITH TRANSFORMER COUPLED CIRCUITS	58	56	60	61		
E 272 E1-12 DON'T REMEMBER WHICH TYPE OF COUPLING CIRCUITS	20	29	8	20		
E 273 E2-01 IN YOUR PRESENT JOB, DO YOU PERFORM SOLDERING TECHNIQUES OR INSPECT OR EVALUATE SOLDERED CONNECTIONS	92	91	92	92		
E 274 E2-02 DO YOU SELECT TYPE OF SOLDER TO USE	78	76	80	76		SOLDERING
E 275 E2-03 DO YOU ADD FLUX TO CONNECTIONS	75	74	76	73		
E 276 E2-04 DO YOU CLEAN CONNECTIONS USING SOLVENTS	80	79	80	82		
E 277 E2-05 DO YOU STRIP INSULATION FROM WIRES	93	91	96	92		
E 278 E2-06 DO YOU CONNECT OR DISCONNECT HEAT SINKS	90	88	92	80		
E 279 E2-07 DO YOU BEND OR SHAPE WIRES OR LEADS	95	94	96	94		
E 280 E2-08 DO YOU CUT WIRES	93	91	96	92		
E 281 E2-09 DO YOU FILE OR SHAPE SOLDERING IRON TIPS	85	82	88	84		
E 282 E2-10 DO YOU TIN SOLDERING IRON TIPS	92	91	92	94		
E 283 E2-11 DO YOU CLEAN SOLDERING IRON TIPS	95	94	96	94		
E 284 E2-12 DO YOU CLEAN ELECTRICAL SURFACES USING ERASERS	83	79	88	84		
E 285 E2-13 DO YOU TIN OR PRE-TIN CONDUCTORS	83	79	88	82		
E 286 E2-14 DO YOU INSPECT SOLDERED CONNECTIONS	95	94	96	94		
E 287 E2-15 DO YOU DESOLDER CONNECTIONS BY WICKING	76	74	76	75		
E 288 E2-16 DO YOU DESOLDER CONNECTIONS USING VACUUM DESOLDERING TOOLS	71	59	88	75		
E 289 E2-17 DO YOU CUT COMPONENT LEADS TO REMOVE COMPONENTS	61	68	52	63		
E 290 E2-18 DO YOU CRUSH COMPONENTS FOR REMOVAL	22	32	8	25		

PLT MEMS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

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DY-TSA

		SPC	SPC	SPC	SPC	
		174	177	178	179	
F 327 F2-01	IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH SPEAKERS	73	71	76	73	SPEAKERS
F 328 F2-02	DO YOU INSPECT SPEAKERS	58	56	60	57	
F 329 F2-03	DO YOU CLEAN SPEAKERS	46	44	48	47	
F 330 F2-04	DO YOU OPERATE SPEAKERS	66	62	72	67	
F 331 F2-05	DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS BUT DO NOT TROUBLESHOOT DOWN TO COMPONENT PARTS OF SPEAKERS	59	56	64	61	
F 332 F2-06	DO YOU TROUBLESHOOT DOWN TO SPEAKER PARTS	19	18	20	20	
F 333 F2-07	DO YOU REMOVE OR REPLACE COMPLETE SPEAKERS	59	56	64	61	
F 334 F2-08	DO YOU REMOVE OR REPLACE SPEAKER PARTS	15	18	12	16	
F 335 F2-09	DO YOU PERFORM ANY TASKS ON SPEAKER CONES	14	12	16	14	
F 336 F2-10	DO YOU PERFORM ANY TASKS ON SPEAKER SPIDERS	5	9	0	4	
F 337 F2-11	DO YOU PERFORM ANY TASKS ON SPEAKER FIELD COILS	7	7	4	6	
F 338 F2-12	DO YOU PERFORM ANY TASKS ON SPEAKER VOICE COILS	8	9	8	8	
F 339 F2-13	DO YOU PERFORM ANY TASKS ON SPEAKER PERMANENT MAGNETS	8	9	8	8	
F 340 F2-14	DO YOU PERFORM ANY TASKS ON SPEAKER ELECTROMAGNETS	8	9	8	8	
F 341 F2-15	DO YOU PERFORM ANY TASKS ON SPEAKER SOFT IRON CORES	7	9	4	6	
F 342 F3-01	DO YOU USE OSCILLOSCOPES IN YOUR PRESENT JOB	97	94	100	96	
F 343 F3-02	DO YOU USE OSCILLOSCOPES TO PERFORM OPERATIONAL CHECKS	93	94	92	92	OSCILLOSCOPES
F 344 F3-03	DO YOU USE OSCILLOSCOPES TO PERFORM ALIGNMENTS OR ADJUSTMENTS	93	91	96	96	
F 345 F3-04	DO YOU USE OSCILLOSCOPES TO TROUBLESHOOT ELECTRONIC CIRCUITS	86	82	92	90	
F 346 F3-05	DO YOU USE OSCILLOSCOPES TO MEASURE FREQUENCY	85	82	88	84	
F 347 F3-06	DO YOU USE OSCILLOSCOPES TO MEASURE TIME	73	71	76	75	
F 348 F3-07	DO YOU USE OSCILLOSCOPES TO OBSERVE LISAJOUS PATTERNS	51	56	44	53	
F 349 F3-08	DO YOU USE OSCILLOSCOPES TO OBSERVE SIGNALS WHILE UTILIZING ATTENUATOR PROBES	84	85	88	86	
F 350 F3-09	DO YOU USE OSCILLOSCOPES TO MAKE FREQUENCY OR TIME MEASUREMENTS USING DELAY TIME MULTIPLIERS	42	44	40	43	
F 351 F3-10	DO YOU USE OSCILLOSCOPES TO MEASURE AC VOLTAGE	81	79	84	82	
F 352 F3-11	DO YOU USE OSCILLOSCOPES TO MEASURE OR OBSERVE SIGNALS AFTER FIRST ADJUSTING THE GAIN AND DC BAL CONTROLS	78	74	84	80	
F 353 F3-12	DO YOU USE OSCILLOSCOPES TO MEASURE DC VOLTAGE	86	85	88	88	
G 354 G1-01	DO YOU WORK WITH SEMICONDUCTOR DIODES IN YOUR PRESENT JOB	80	76	84	78	SEMICONDUCTOR DIODES
G 355 G1-02	DO YOU INSPECT DIODES	71	74	68	73	
G 356 G1-03	DO YOU REMOVE OR REPLACE DIODES	66	68	64	71	
G 357 G1-04	DO YOU CHECK DIODES USING AN INSTRUMENT	66	65	68	69	
G 358 G1-05	DO YOU USE ENERGY LEVEL DIAGRAMS IN YOUR WORK WITH DIODES	17	18	16	20	
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 LIAS RESISTANCE	17	21	12	18	
G 360 G1-07	DO YOU COMPUTE FORWARD OR REVERSE BIAS RESISTANCE FOR DIODES	25	24	28	27	

PCT MMS RESPONDING YES BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

01-TSK

	SPC 176	SPC 177	SPC 178	SPC 179
G 361 G1-08 DO YOU USE OR REFER TO THE GENERAL RULE THAT TEMPERATURE CAN AFFECT THE OPERATION OF DIODES	58	56	60	57
G 362 G1-09 DO YOU IDENTIFY SEMICONDUCTOR DIODES AS OPPOSED TO OTHER ELECTRONIC COMPONENTS, SUCH AS RESISTORS, BASED ON THEIR PHYSICAL APPEARANCE	66	62	72	67
G 363 G1-10 DO YOU REFER TO OR DO YOU DETERMINE THE GENERAL EFFECTS OF DOPING ON CURRENT FLOW	25	26	24	25
G 364 G1-11 DO YOU USE OR REFER TO MEASUREMENTS OF FORWARD BIAS RESISTANCE	49	50	48	53
G 365 G1-12 DO YOU USE OR REFER TO DIODE COLOR CODING	31	29	32	27
G 366 G1-13 DO YOU USE OR REFER TO CENTRIFUGAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	10	9	12	12
G 367 G1-14 DO YOU USE OR REFER TO CENTRIPITAL FORCE OF AN ELECTRON IN ORBIT AROUND A NUCLEUS	10	9	12	12
G 368 G1-15 DO YOU USE OR REFER TO DIODE NUMBERING SYSTEM, SUCH AS IN 538	51	47	56	53
G 369 G1-16 DO YOU USE OR REFER TO KINETIC ENERGY OF AN ELECTRON MOVING IN ORBIT	8	9	8	10
G 370 G1-17 DO YOU USE OR REFER TO POTENTIAL ENERGY OF AN ELECTRON MOVING IN ORBIT	8	9	8	10
G 371 G1-18 DO YOU USE OR REFER TO MEASUREMENTS OF REVERSE BIAS RESISTANCE	46	44	48	49
G 372 G1-19 DO YOU USE OR REFER TO NUMBER OF ELECTRONS IN A PARTICULAR SHELL OR ORBIT	12	12	12	14
G 373 G1-20 DO YOU USE OR REFER TO PERMISSIBLE ENERGY LEVELS OF AN ORBITING ELECTRON	10	12	8	12
G 374 G1-21 DO YOU USE OR REFER TO FORBIDDEN ENERGY LEVELS OF AN ORBITING ELECTRON	10	12	8	12
G 375 G1-22 DO YOU USE OR REFER TO VALENCE ELECTRONS (THOSE IN THE OUTERMOST SHELL)	12	12	12	14
G 376 G1-23 DO YOU USE OR REFER TO ATOMIC NUMBER (TOTAL NUMBER OF ELECTRONS IN ATOM)	12	12	12	14
G 377 G1-24 DO YOU USE OR REFER TO SYMBOLS ON THE DIODE WHICH INDICATE THE CATHODE END	64	62	68	65
G 378 G1-25 DO YOU NEED TO KNOW WHICH MATERIALS ARE USED IN THE CONSTRUCTION OF DIODES SUCH AS GERMANIUM OR SILICON	31	32	28	33
G 379 G1-26 DO YOU NEED TO KNOW THAT SEMICONDUCTORS HAVE NEGATIVE TEMPERATURE COEFFICIENTS OF RESISTANCE (AS TEMPERATURE INCREASES RESISTANCE DECREASES)	32	29	36	31
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)	22	21	24	24
G 381 G1-28 DO YOU DETERMINE WHETHER PN JUNCTION DIODES ARE FORWARD BIASED OR REVERSE BIASED WHEN YOU READ OR INTERPRET CIRCUIT DIAGRAMS	56	53	60	55
G 382 G1-29 DO YOU USE OR REFER TO VALENCE BAND IN SEMICONDUCTOR MATERIALS	12	9	16	14

PCI MMS RESPONDING 'YES' BY SELECTED GMP'S

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

Task	SPC	SPC	SPC	SPC
	176	177	178	179
6 383 G1-30 DO YOU USE OR REFER TO FORBIDDEN BAND IN SEMICONDUCTOR MATERIALS	8	9	8	10
6 384 G1-31 DO YOU USE OR REFER TO CONDUCTION BAND IN SEMICONDUCTOR MATERIALS	10	9	12	12
6 385 G1-32 DO YOU USE OR REFER TO COVALENT BONDING IN SEMICONDUCTOR MATERIALS	12	9	16	14
6 386 G1-33 DO YOU USE OR REFER TO ELECTRON-HOLE PAIR CREATED IN SEMICONDUCTORS	15	15	16	16
6 387 G1-34 DO YOU USE OR REFER TO ELECTRON FLOW OR HOLE FLOW IN SEMICONDUCTORS	22	18	28	24
6 388 G1-35 DO YOU USE OR REFER TO DONOR IMPURITY IN SEMICONDUCTORS	14	15	16	18
6 389 G1-36 DO YOU USE OR REFER TO ACCEPTOR IMPURITY IN SEMICONDUCTORS	15	15	16	18
6 390 G1-37 DO YOU USE OR REFER TO P-TYPE SEMICONDUCTOR MATERIAL	34	32	36	37
6 391 G1-38 DO YOU USE OR REFER TO N-TYPE SEMICONDUCTOR MATERIAL	34	32	36	37
6 392 G1-39 DO YOU USE OR REFER TO MAJORITY CARRIERS IN SEMICONDUCTORS	17	15	20	20
6 393 G1-40 DO YOU USE OR REFER TO MINORITY CARRIERS IN SEMICONDUCTORS	17	15	20	20
6 394 G1-41 DO YOU USE OR REFER TO JUNCTION RECOMBINATION IN SEMICONDUCTORS	14	12	16	16
6 395 G1-42 DO YOU USE OR REFER TO DEPLETION REGION IN SEMICONDUCTORS	19	18	20	22
6 396 G1-43 DO YOU USE OR REFER TO RELATIONSHIP BETWEEN BARRIER WIDTH AND DIFFERENCE OF POTENTIAL	15	15	16	18
6 397 G1-44 DO YOU USE OR REFER TO THE 10:1 BACK TO FRONT RESISTANCE RATIO FOR DIODES	36	29	44	35
6 398 G1-45 DO YOU USE OR REFER TO BARRIER HEIGHT IN SEMICONDUCTORS	10	9	12	12
6 399 G1-46 DO YOU USE OR REFER TO DIODE SUBSTITUTION INFORMATION	41	41	40	41
6 400 G1-47 DO YOU USE OR REFER TO MAXIMUM AVERAGE FORWARD CURRENT DIODE RATINGS	34	26	44	37
6 401 G1-48 DO YOU USE OR REFER TO PIAK RECURRENT FORWARD CURRENT DIODE RATINGS	29	26	32	31
6 402 G1-49 DO YOU USE OR REFER TO MAXIMUM SURGE CURRENT DIODE RATINGS	34	29	40	37
6 403 G1-50 DO YOU USE OR REFER TO PIAK REVERSE (INVERSE) VOLTAGE DIODE RATINGS	37	32	44	41
6 404 G2-01 DO YOU WORK WITH TRANSISTORS IN YOUR PRESENT JOB.	73	71	76	73
6 405 G2-02 DO YOU INSPECT TRANSISTORS	69	68	72	69
6 406 G2-03 DO YOU REMOVE OR REPLACE TRANSISTORS	61	59	68	65
6 407 G2-04 DO YOU CHECK TRANSISTORS USING AN INSTRUMENT	64	62	68	67
6 408 G2-05 DO YOU USE OR REFER TO EMITTER - BASE (EB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	54	53	60	57
6 409 G2-06 DO YOU USE OR REFER TO COLLECTOR - BASE (CB) FORWARD AND REVERSE RESISTANCE MEASUREMENTS	54	53	64	59

TRANSISTORS

PCT MEMS RESPONDING *YES* BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

GPSUM2 PAGE 16

DY-TSK

SPC SPC SPC SPC
176 177 178 179

G *10 G2-07 DO YOU USE OR REFER TO EMITTER - COLLECTOR (EC) RESISTANCE MEASUREMENTS 56 53 60 57

G *11 G2-08 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE EMITTER - BASE JUNCTION 29 26 32 31

G *12 G2-09 DO YOU USE OR REFER TO HOW BIASING AFFECTS THE PHYSICAL BARRIER WIDTH OF THE COLLECTOR - BASE JUNCTION 29 26 32 31

G *13 G2-10 DO YOU USE OR REFER TO THE PHYSICAL SIZE OF THE TRANSISTOR STRUCTURE (COLLECTOR, BASE AND EMITTER) 49 41 60 53

G *14 G2-11 DO YOU USE OR REFER TO LEAKAGE CURRENT (ICBO) IN A TRANSISTOR 27 32 20 31

G *15 G2-12 DO YOU USE OR REFER TO TRANSISTOR SCHEMATIC SYMBOLS 73 68 80 73

G *16 G2-13 DO YOU USE OR REFER TO TRANSISTOR NOTATION SUCH AS 71 65 80 71

G *17 G2-14 DO YOU USE OR REFER TO TRANSISTOR SUBSTITUTION INFORMATION 47 53 40 51

G *18 G2-15 DO YOU USE OR REFER TO THE GENERAL RULE THAT THE TRANSISTOR BASE CURRENT IS NORMALLY SIGNIFICANTLY SMALLER THAN THE EMITTER CURRENT IE USUALLY IB BEING 2 TO 8 PERCENT OF IE) 36 41 28 41

G *19 G2-16 DO YOU USE THE INFORMATION THAT THE EFFECT OF EMITTER BASE VOLTAGE ON BASE CURRENT IS THE CONTROLLING FACTOR FOR TRANSISTORS 41 41 40 45

G *20 G2-17 DO YOU USE THE GENERAL RULE THAT LEAKAGE CURRENT IN A TRANSISTOR INCREASES AS TEMPERATURE INCREASES 29 35 20 33

G *21 G2-18 DO YOU USE OR REFER TO TRANSISTOR CHARACTERISTIC CURVES 24 29 16 25

G *22 G2-19 DO YOU USE OR REFER TO BETA TRANSISTOR GAINS 15 12 20 18

G *23 G2-20 DO YOU USE OR REFER TO ALPHA TRANSISTOR GAINS 12 12 12 14

G *24 G2-21 DO YOU USE OR REFER TO GAMMA TRANSISTOR GAINS 12 12 12 14

G *25 G2-22 DO YOU CALCULATE BETA TRANSISTOR GAINS 8 6 12 10

G *26 G2-23 DO YOU CALCULATE ALPHA TRANSISTOR GAINS 8 6 12 10

G *27 G2-24 DO YOU CALCULATE GAMMA TRANSISTOR GAINS 8 6 12 10

G *28 G2-01 DO YOU WORK WITH TRANSISTOR AMPLIFIERS IN YOUR PRESENT JOB 71 71 72 73

G *29 G3-02 DO YOU INSPECT TRANSISTOR AMPLIFIERS 68 68 68 69

G *30 G3-03 DO YOU ALIGN OR ADJUST TRANSISTOR AMPLIFIERS 69 68 72 71

G *31 G3-04 DO YOU TROUBLESHOOT TO THE AMPLIFIER CIRCUIT LEVEL 63 62 64 65

G *32 G3-05 DO YOU TROUBLESHOOT TO A PLIFIER COMPONENTS 53 53 52 55

G *33 G3-06 DO YOU REMOVE OR REPLACE THE COMPLETE AMPLIFIER 68 65 72 71

G *34 G3-07 DO YOU REMOVE OR REPLACE AMPLIFIER COMPONENTS 41 38 44 43

G *35 G3-08 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR CURRENT WHICH RESULTS FROM A CHANGE IN BASE CURRENT 20 26 12 24

G *36 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 19 24 12 22

TRANSISTOR
AMPLIFIERS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC
	176	177	178	179
G 437 G3-10 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN COLLECTOR VOLTAGE WHICH RESULTS FROM A CHANGE IN BASE CURRENT	24	29	16	27
G 438 G3-11 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	22	26	16	22
G 439 G3-12 DO YOU USE OR REFER TO (COMMON EMITTER) THE CHANGE IN BASE CURRENT WHICH RESULTS FROM AN INPUT SIGNAL	24	32	12	24
G 440 G3-13 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	19	24	12	20
G 441 G3-14 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)	15	21	8	18
G 442 G3-15 DO YOU USE OR REFER TO THE OPERATING POINT Q (QUIESCENT POINT) FOR A TRANSISTOR	19	24	12	22
G 443 G3-16 DO YOU CALCULATE THE SPECIFIC QUIESCENT POINT FOR A PARTICULAR TRANSISTOR	12	15	8	14
G 444 G3-17 DO YOU MEASURE VOLTAGE GAIN USED IN THE COMMON EMITTER CONFIGURATION	49	53	44	49
G 445 G3-18 DO YOU MEASURE CURRENT GAIN USED IN THE COMMON EMITTER CONFIGURATION	42	44	40	43
G 446 G3-19 DO YOU MEASURE POWER GAIN USED IN THE COMMON EMITTER CONFIGURATION	46	44	48	47
G 447 G3-20 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 IN COLLECTOR VOLTAGE TO DETERMINE THE VOLTAGE GAIN	10	12	8	12
G 448 G3-21 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	10	12	8	12
G 449 G3-22 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	15	18	12	18
G 450 G3-23 DO YOU NEED TO KNOW THAT MORE COLLECTOR CURRENT IS GENERATED WITH LESS COLLECTOR VOLTAGE AS TEMPERATURE INCREASES (THIS AFFECTS THE STATIC OPERATING POINT EQ OF THE TRANSISTOR)	19	24	12	20
G 451 G3-24 DO YOU COMPUTE THE STATIC OPERATING POINT EQ OF A TRANSISTOR AT DIFFERENT TEMPERATURES	10	12	8	12
G 452 G3-25 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH EMITTER (SWAMPING) RESISTOR STABILIZATION	29	32	24	29
G 453 G3-26 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH SELF-BIAS STABILIZATION	29	32	24	29

PCT MEMS RESPONDING "YES" BY SELECTED GNPS

GPSUMB PAGE 18

TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC
	176	177	178	179
G 454 G3-27 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH THERMISTOR STABILIZATION	27	32	20	27
G 455 G3-28 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH FORWARD BIAS DIODE STABILIZATION	31	32	28	31
G 456 G3-29 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH REVERSE BIAS DIODE STABILIZATION	31	32	28	31
G 457 G3-30 DO YOU IDENTIFY ON SCHEMATIC DIAGRAMS AND RELATE TO THE ACTUAL CIRCUITRY THE COMPONENTS ASSOCIATED WITH DOUBLE DIODE STABILIZATION	27	35	16	27
G 458 G3-31 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM EMITTER (SWAMPLING) RESISTOR STABILIZATION	29	26	32	31
G 459 G3-32 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM SELF-BIAS STABILIZATION	29	26	32	31
G 460 G3-33 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM THERMISTOR STABILIZATION	31	26	36	31
G 461 G3-34 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM FORWARD BIAS DIODE STABILIZATION	32	26	40	33
G 462 G3-35 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM REVERSE BIAS DIODE STABILIZATION	32	26	40	33
G 463 G3-36 DO YOU TROUBLESHOOT CIRCUITS WHICH HAVE COMPONENTS WHICH PERFORM DOUBLE DIODE STABILIZATION	27	29	24	29
G 464 G3-37 DO YOU IDENTIFY AMPLITUDE DISTORTION FOR TRANSISTOR CIRCUITS	31	24	40	35
G 465 G3-38 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF AMPLITUDE DISTORTION	31	32	28	33
G 466 G3-39 DO YOU IDENTIFY FREQUENCY DISTORTION FOR TRANSISTOR CIRCUITS	39	32	48	41
G 467 G3-40 DO YOU IDENTIFY PHASE DISTORTION FOR TRANSISTOR CIRCUITS	34	35	32	35
G 468 G3-41 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF PHASE DISTORTION	27	26	28	27
G 469 G3-42 DO YOU TROUBLESHOOT TRANSISTOR CIRCUITS TO FIND THE CAUSES OF FREQUENCY DISTORTION	34	26	44	35
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	19	24	12	20
G 471 G3-44 DO YOU DETERMINE THE CLASS OF OPERATION FOR AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	29	32	24	31
G 472 G3-45 DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	22	18	28	24
G 473 G3-46 DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	54	53	56	59
G 474 G3-47 DO YOU TROUBLESHOOT OR REPAIR COMPLEMENTARY SYMMETRY CIRCUITS	34	24	48	37
G 475 G3-48 DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	34	32	36	37

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TSK		SPC	SPC	SPC	SPC
		176	177	178	179
M 513	M3-02 DO YOU INSPECT OSCILLATORS	80	76	84	78
M 514	M3-03 DO YOU ALIGN OR ADJUST OSCILLATORS	88	88	88	88
M 515	M3-04 DO YOU REMOVE OR REPLACE COMPLETE OSCILLATORS	46	82	92	88
M 516	M3-05 DO YOU REMOVE OR REPLACE OSCILLATOR COMPONENTS	31	35	24	33
M 517	M3-06 DO YOU TROUBLESHOOT TO OSCILLATOR CIRCUIT LEVEL	73	71	76	75
M 518	M3-07 DO YOU TROUBLESHOOT TO OSCILLATOR COMPONENTS	27	26	28	29
M 519	M3-08 DO YOU USE OR REFER TO FEEDBACK	58	59	56	61
M 520	M3-09 DO YOU USE OR REFER TO FREQUENCY DETERMINING DEVICES (FDD)	61	59	64	61
M 521	M3-10 DO YOU USE OR REFER TO AMPLITUDE STABILITY	64	62	68	67
M 522	M3-11 DO YOU USE OR REFER TO FREQUENCY STABILITY	75	74	76	76
M 523	M3-12 DO YOU USE OR REFER TO DAMPING	32	32	32	33
M 524	M3-13 DO YOU USE OR REFER TO REGENERATIVE FEEDBACK	53	53	52	55
M 525	M3-14 DO YOU USE OR REFER TO PIEZOELECTRIC EFFECT	24	29	16	25
M 526	M3-15 DO YOU USE OR REFER TO CRITICAL DAMPING	22	21	24	22
M 527	M3-16 DO YOU USE OR REFER TO UNDER DAMPING	22	21	24	24
M 528	M3-17 DO YOU USE OR REFER TO OVER DAMPING	22	21	24	24
M 529	M3-18 DO YOU WORK WITH OSCILLATORS WHICH USE LC TANK CIRCUITS AS FDD	47	50	44	51
M 530	M3-19 DO YOU WORK WITH OSCILLATORS WHICH USE RC NETWORKS AS FDD	51	56	44	53
M 531	M3-20 DO YOU WORK WITH OSCILLATORS WHICH USE CRYSTALS AS FDD	73	74	72	71
M 532	M3-21 DO YOU WORK WITH OSCILLATORS WHICH USE DON'T REMEMBER WHICH TYPE OF FDD	31	32	28	33
M 533	M3-22 DO YOU WORK WITH SERIES HARTLEY SINUSOIDAL OSCILLATORS	29	32	24	29
M 534	M3-23 DO YOU WORK WITH SHUNT HARTLEY SINUSOIDAL OSCILLATORS	27	29	24	29
M 535	M3-24 DO YOU WORK WITH COLPITTS SINUSOIDAL OSCILLATORS	27	29	24	29
M 536	M3-25 DO YOU WORK WITH CLAPP SINUSOIDAL OSCILLATORS	24	26	20	25
M 537	M3-26 DO YOU WORK WITH BUTLER SINUSOIDAL OSCILLATORS	27	29	24	29
M 538	M3-27 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE OF OSCILLATORS	61	71	48	63
I 539	I1-01 DO YOU WORK WITH MULTIPLICATORS IN YOUR PRESENT JOB	47	47	48	49
I 540	I1-02 DO YOU INSPECT WAVE GENERATING OR SHAPING CIRCUITS	39	34	40	41
I 541	I1-03 DO YOU ALIGN OR ADJUST WAVE GENERATING OR SHAPING CIRCUITS	41	41	40	43
I 542	I1-04 DO YOU CALIBRATE WAVE GENERATING OR SHAPING CIRCUITS	31	26	36	33
I 543	I1-05 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUITS	36	32	40	37
I 544	I1-06 DO YOU TROUBLESHOOT TO WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	27	26	28	29
I 545	I1-07 DO YOU REMOVE OR REPLACE COMPLETE WAVE GENERATING OR SHAPING CIRCUITS	41	41	40	43
I 546	I1-08 DO YOU REMOVE OR REPLACE WAVE GENERATING OR SHAPING CIRCUIT COMPONENTS	24	24	24	25
I 547	I1-09 DO YOU WORK WITH MULTIPLICATORS WHICH CONTAIN LC TANK CIRCUITS	27	32	20	29

MULTIPLICATORS

PCI MEMS RESPONDING 'YES' BY SELECTED GMS

TASK GROUP SUMMARY
MEMBER MEMBERS PERFORMING

04-TSK

SPC SPC SPC SPC
176 177 178 179

1 548 11-10 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN MC
NETWORKS
1 549 11-11 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN
CRYSTALS
1 550 11-12 DO YOU WORK WITH MULTIVIBRATORS WHICH CONTAIN DON'T
REMEMBER WHICH TYPE OF FDO
1 551 11-13 DO YOU WORK WITH ASTABLE MULTIVIBRATORS
1 552 11-14 DO YOU WORK WITH MONOSTABLE MULTIVIBRATORS
1 553 11-15 DO YOU WORK WITH BISTABLE MULTIVIBRATORS
1 554 11-16 DO YOU WORK WITH DON'T REMEMBER WHICH TYPE
MULTIVIBRATORS
1 555 12-01 DO YOU WORK WITH LIMITERS OR CLAMPERS IN YOUR
PRESENT JOB
1 556 12-02 DO YOU WORK WITH SERIES DIODE LIMITERS
1 557 12-03 DO YOU WORK WITH SHUNT DIODE LIMITERS
1 558 12-04 DO YOU WORK WITH LIMITERS WITH BIAS
1 559 12-05 DO YOU WORK WITH ZENER DIODE LIMITERS
1 560 12-06 DO YOU WORK WITH TRANSISTOR LIMITERS
1 561 12-07 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF LIMITERS
1 562 12-08 DO YOU WORK WITH BASIC DIODE CLAMPING CIRCUITS
1 563 12-09 DO YOU WORK WITH DIODE CLAMPING CIRCUITS WITH BIAS
1 564 12-10 DO YOU WORK WITH DON'T KNOW WHICH TYPE OF CLAMPING
CIRCUIT

LIMITERS AND
CLAMPERS

1 565 13-01 IN YOUR PRESENT JOB, DO YOU WORK ON EQUIPMENT WHICH
CONTAINS ELECTRON TUBES
1 566 13-02 DO YOU CHECK ELECTRON TUBES TO SEE IF THEY ARE GOOD
1 567 13-03 DO YOU USE TUBE TESTERS TO CHECK ELECTRON TUBES
1 568 13-04 DO YOU USE MULTIMETERS TO CHECK ELECTRON TUBES
1 569 13-05 DO YOU USE SCOPES TO CHECK ELECTRON TUBES
1 570 13-06 DO YOU USE SUBSTITUTION TO CHECK ELECTRON TUBES
1 571 13-07 DO YOU USE OR REFER TO CUTOFF
1 572 13-08 DO YOU USE OR REFER TO PEAK INVERSE VOLTAGE RATING
1 573 13-09 DO YOU USE OR REFER TO PEAK CURRENT RATING
1 574 13-10 DO YOU USE OR REFER TO TRANSIT TIME
1 575 13-11 DO YOU USE OR REFER TO PLATE DISSIPATION RATING
1 576 13-12 DO YOU USE OR REFER TO SATURATION
1 577 13-13 DO YOU USE OR REFER TO DC PLATE RESISTANCE
1 578 13-14 DO YOU COMPUTE ACTUAL VALUES OF THE DC PLATE
RESISTANCE FOR ELECTRON TUBES
1 579 13-15 DO YOU USE OR REFER TO PLATE VOLTAGE
1 580 13-16 DO YOU USE OR REFER TO PLATE CURRENT
1 581 13-17 DO YOU USE OR REFER TO GRID VOLTAGE
1 582 13-18 DO YOU USE OR REFER TO GRID CURRENT
1 583 13-19 DO YOU USE OR REFER TO CATHODE VOLTAGE
1 584 13-20 DO YOU USE OR REFER TO CATHODE CURRENT
1 585 13-21 DO YOU USE OR REFER TO THE TRIODE AMPLIFICATION
FACTOR (THE AMPLIFICATION FACTOR FOR TRIODES IS DEFINED AS
THE RATIO OF CHANGE IN PLATE VOLTAGE TO A CHANGE IN GRID
VOLTAGE)

ELECTRON TUBES

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

GPSUMS PAGE 22

DT-TSK

	SPC 176	SPC 177	SPC 178	SPC 179
1 586 13-22 DO YOU CALCULATE ACTUAL VALUES OF TRIODE AMPLIFICATION FACTORS	3	3	4	4
1 587 13-23 DO YOU USE OR REFER TO MULTIGRID (TETRODE, PENTODE, ETC) AMPLIFICATION FACTORS	3	3	4	4
1 584 13-24 DO YOU USE OR REFER TO ELECTRON TUBE TRANSCONDUCTANCE (G _m WHICH IS MEASURED IN MHOS)	3	3	4	4
1 589 13-25 DO YOU CALCULATE ACTUAL VALUES OF ELECTRON TUBE TRANSCONDUCTANCES	5	3	8	6
1 590 13-26 DO YOU USE OR REFER TO THE ELECTRON TUBE PARAMETER CALLED AC PLATE RESISTANCE	7	6	8	8
1 591 13-27 DO YOU CALCULATE ACTUAL VALUES OF AC PLATE RESISTANCE	3	3	4	4
1 592 13-28 DO YOU USE OR REFER TO ELECTRON TUBE INTERELECTRODE CAPACITANCE	7	6	8	8
1 593 13-29 DO YOU USE OR REFER TO CHARACTERISTIC CURVES IN YOUR WORK WITH ELECTRON TUBES	7	6	8	8
1 594 13-30 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE VOLTAGE FOR A SPECIFIED BIAS	8	9	8	10
1 595 13-31 DO YOU USE CHARACTERISTIC CURVES TO SELECT PLATE CURRENT FOR A SPECIFIED BIAS	8	9	8	10
1 596 13-32 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR CUTOFF	8	9	8	10
1 597 13-33 DO YOU USE CHARACTERISTIC CURVES TO SELECT BIAS REQUIRED FOR SATURATION	8	9	8	10
1 598 13-34 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER GAIN	12	12	12	14
1 599 13-35 DO YOU USE OR REFER TO ELECTRON TUBE AMPLIFIER EFFICIENCY	12	12	12	14
1 600 13-36 DO YOU USE TEST TUBE CHECKERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	5	3	8	6
1 601 13-37 DO YOU USE MULTIMETERS TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	7	6	8	8
1 602 13-38 DO YOU USE OSCILLOSCOPES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	8	9	8	10
1 603 13-39 DO YOU USE CHARACTERISTIC CURVES TO DETERMINE ELECTRON TUBE AMPLIFIER GAIN	8	9	8	10
1 604 13-40 DO YOU CALCULATE ANY ELECTRON TUBE CAPACITANCES SUCH AS INPUT CAPACITANCE	7	9	4	8
1 605 13-41 DO YOU USE OR REFER TO TUBE SOCKET NOTATION	10	12	8	12
1 606 13-42 DO YOU USE OR REFER TO PIN NUMBERING SYSTEMS	10	12	8	12
1 607 13-43 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	5	6	4	6
1 608 13-44 DO YOU USE OR REFER TO TUBE SUBSTITUTION MATERIAL SUCH AS MANUALS OR CHARTS	4	9	8	10
1 609 13-45 DO YOU WORK WITH ELECTRON TUBE AMPLIFIERS OR CIRCUITS IN YOUR PRESENT JOB	15	12	20	16
1 610 13-46 DO YOU DETERMINE THE CLAS OF OPERATION FOR ELECTRON TUBE AMPLIFIERS IN ORDER TO TROUBLESHOOT AMPLIFIER CIRCUITS	14	9	20	16

ELECTRON TUBE
AMPLIFIERS
AND CIRCUITS

PCT MEMS RESPONDING 'YES' BY SELECTED GMP'S

GPSUMS PAGE 23

TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING

0Y-TSA

SPC SPC SPC SPC
176 177 178 179

J 611	J1-03	DO YOU TROUBLESHOOT OR REPAIR PARAPHASE AMPLIFIERS	8	6	12	10
J 612	J1-04	DO YOU TROUBLESHOOT OR REPAIR PUSH-PULL AMPLIFIERS	7	6	8	8
J 613	J1-05	DO YOU TROUBLESHOOT OR REPAIR COMPOUND-CONNECTED AMPLIFIERS	5	3	8	6
J 614	J1-06	DO YOU TROUBLESHOOT OR REPAIR CASCADE-CONNECTED AMPLIFIERS	5	3	8	6
J 615	J1-07	DO YOU TROUBLESHOOT OR REPAIR DON'T KNOW WHICH TYPE OF AMPLIFIER	3	3	4	4
J 616	J2-01	DO YOU WORK WITH GAS TUBES (HOT CATHODE OR COLD CATHODE)	8	6	12	10
J 617	J2-02	DO YOU WORK WITH CATHODE-RAY TUBES	19	12	28	22
J 618	J2-03	DO YOU USE OR REFER TO THE CHARACTERISTICS OF BEAM POWER TUBES	15	6	28	16
J 619	J2-04	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH BEAM POWER TUBES ARE USED	12	3	24	12
J 620	J2-05	DO YOU USE OR REFER TO THE CHARACTERISTICS OF THYRATONS	7	6	8	8
J 621	J2-06	DO YOU TROUBLESHOOT OR REPAIR CIRCUITS IN WHICH THYRATONS ARE USED	7	6	8	8
J 622	J2-07	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTRON GUNS OF CATHODE-RAY TUBES (CRT)	10	3	20	12
J 623	J2-08	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROMAGNETIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	7	3	12	8
J 624	J2-09	DO YOU USE OR REFER TO THE PRINCIPLES OF OPERATION OF ELECTROSTATIC DEFLECTION SYSTEMS OF CATHODE-RAY TUBES (CRT)	5	3	8	6
J 625	J2-10	DO YOU USE OR REFER TO PHOSPHOR SCREENS	15	9	24	18
J 626	J2-11	DO YOU USE OR REFER TO AQUADAG COATINGS	3	3	4	4
J 627	J2-12	DO YOU USE OR REFER TO ELECTRON OPTICS	3	3	4	4
J 628	J2-13	DO YOU USE OR REFER TO PERSISTENCE	14	9	20	16
J 629	J2-14	DO YOU USE OR REFER TO DECAY TIMES	8	6	12	10
J 630	J2-15	DO YOU USE OR REFER TO FLUORESCENCE	12	12	12	14
J 631	J2-16	DO YOU USE OR REFER TO PHOSPHORESCENCE	7	9	4	8
J 632	J3-01	DO YOU WORK ON TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	95	91	100	94
J 633	J3-02	DO YOU PERFORM TASKS ON FREQUENCY CONVERTERS	93	88	100	92
J 634	J3-03	DO YOU PERFORM TASKS ON FREQUENCY MIXERS	86	79	96	84
J 635	J3-04	DO YOU USE OR REFER TO THE HETERODYNING OF SIGNALS IN YOUR WORK WITH TRANSMIT OR RECEIVE SYSTEMS	66	56	80	67
J 636	J3-05	DO YOU PERFORM TASKS ON HEATANCE MODULATORS	34	29	40	35
J 637	J3-06	DO YOU PERFORM TASKS ON MODULATED OSCILLATORS	58	50	68	61
J 638	J3-07	DO YOU WORK ON AM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	15	24	4	14
J 639	J3-08	DO YOU INSPECT AM TRANSMIT OR RECEIVE SYSTEMS	19	24	12	18
J 640	J3-09	DO YOU CLEAN AM TRANSMIT OR RECEIVE SYSTEMS	19	24	12	18
J 641	J3-10	DO YOU ALIGN OR ADJUST AM TRANSMIT OR RECEIVE SYSTEMS	17	24	8	16

SPECIAL PURPOSE
ELECTRON TUBES

HETERODYNING,
MODULATION, AND
DEMODULATION

AM SYSTEMS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC
	176	177	178	179
K 042 KI-05 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE SYSTEMS	17	24	8	16
K 043 KI-06 DO YOU TROUBLESHOOT TO AM TRANSMIT OR RECEIVE COMPONENTS	15	18	12	14
K 044 KI-07 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE SYSTEMS	17	24	8	16
K 045 KI-08 DO YOU REMOVE OR REPLACE AM TRANSMIT OR RECEIVE COMPONENTS	14	18	8	12
K 046 KI-09 DO YOU PERFORM TASKS ON RF OSCILLATORS	19	24	12	18
K 047 KI-10 DO YOU PERFORM TASKS ON RF AMPLIFIERS	17	24	8	16
K 048 KI-11 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	19	24	12	18
K 049 KI-12 DO YOU PERFORM TASKS ON POWER AMPLIFIERS	15	21	8	16
K 050 KI-13 DO YOU PERFORM TASKS ON LOCAL OSCILLATORS	17	24	8	16
K 051 KI-14 DO YOU PERFORM TASKS ON IF AMPLIFIERS	17	24	8	16
K 052 KI-15 DO YOU PERFORM TASKS ON DETECTORS	17	24	8	16
K 053 KI-16 DO YOU PERFORM TASKS ON DON'T REMEMBER WHICH AM STAGE	8	9	8	10
K 054 KI-17 DO YOU USE OR REFER TO AMPLITUDE STABILIZATION IN TRANSMITTERS	14	18	8	14
K 055 KI-18 DO YOU USE OR REFER TO FREQUENCY STABILIZATION IN TRANSMITTERS	15	21	8	16
K 056 KI-19 DO YOU USE OR REFER TO SENSITIVITY OF RECEIVERS	19	24	12	18
K 057 KI-20 DO YOU USE OR REFER TO SELECTIVITY OF RECEIVERS	19	24	12	18
K 058 KI-21 DO YOU USE OR REFER TO 2.0 HARMONIC DISTORTION	14	15	12	14
K 059 KI-22 DO YOU USE OR REFER TO BANDPASS DISTORTION	15	18	12	16
K 060 KI-23 DO YOU USE OR REFER TO SQUARE LAW DISTORTION	10	12	8	12
K 061 KI-24 DO YOU USE OR REFER TO CO-CHANNEL INTERFERENCE	10	12	8	12
K 062 KI-25 DO YOU USE OR REFER TO IMAGE FREQUENCIES IN RECEIVERS	14	18	8	14
K 063 KI-26 DO YOU USE OR REFER TO SIGNAL TO IMAGE RATIOS OR IMAGE REJECTION RATIOS	12	15	8	12
K 064 KI-27 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM TRANSMITTER SCHEMATIC DIAGRAMS	12	15	8	12
K 065 KI-28 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH AM RECEIVER SCHEMATIC DIAGRAMS	17	21	12	16
K 066 KI-29 DO YOU WORK WITH FM TRANSMIT OR RECEIVE SYSTEMS IN YOUR PRESENT JOB	96	97	100	100
K 067 KI-30 DO YOU INSPECT FM TRANSMIT OR RECEIVE SYSTEMS	97	97	96	98
K 068 KI-31 DO YOU CLEAN FM TRANSMIT OR RECEIVE SYSTEMS	90	94	84	90
K 069 KI-32 DO YOU ALIGN FM TRANSMIT OR RECEIVE SYSTEMS	98	97	100	100
K 070 KI-33 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE SYSTEMS	97	97	96	98
K 071 KI-34 DO YOU TROUBLESHOOT TO FM TRANSMIT OR RECEIVE COMPONENTS	81	82	80	82
K 072 KI-35 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE SYSTEMS	95	97	92	96
K 073 KI-36 DO YOU REMOVE OR REPLACE FM TRANSMIT OR RECEIVE COMPONENTS	81	79	88	84
K 074 KI-37 DO YOU PERFORM TASKS ON AUDIO AMPLIFIERS	81	82	80	82
K 075 KI-38 DO YOU PERFORM TASKS ON FREQUENCY MULTIPLIERS	83	79	88	84

FM SYSTEMS

PCT HHS RESPONDING YES BY SELECTED GRPS

LAST GROUP SUMMARY
PLACING MEMBERS PERFORMING

07-158

[illegible]

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

		SPC	SP	SPC	SPC		
		176	177	178	179		
DY-TSK				37	47	24	37
L 707	L1-13 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR EXCLUSIVE OR GATES	34	32	36	35		
RELATING TO BOOLEAN EQUATIONS, LOGIC DIAGRAM, OR LOGIC CIRCUITS							
L 709	L2-02 DO YOU DRAW LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUITS	8	15	0	10		
L 710	L2-03 DO YOU CONSTRUCT TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	8	15	0	10		
L 711	L2-04 DO YOU DRAW LOGIC DIAGRAM FROM GIVEN BOOLEAN EQUATIONS	10	18	0	12		
L 712	L2-05 DO YOU MEASURE INPUTS OR OUTPUTS OF LOGIC GATES	27	29	24	27		
L 713	L2-06 DO YOU DEVELOP OR ANALYZE BOOLEAN EQUATIONS IN THE PROCESS OF TROUBLESHOOTING DIGITAL CIRCUITS	12	18	4	12		
L 714	L2-07 DO YOU ANALYZE LOGIC CIRCUITS BY USING BOOLEAN ALGEBRA	12	18	4	14		
L 715	L2-08 DO YOU USE OR REFER TO LOGIC SYMBOLS FOR DIRECT COUPLED TRANSISTOR LOGIC (DCTL) CIRCUIT GATES	17	21	12	18		
L 716	L2-09 DO YOU USE OR REFER TO TRUTH TABLES FOR CURRENT MODE LOGIC (CML) CIRCUITS	8	15	0	10		
L 717	L2-10 DO YOU USE OR REFER TO LOGIC DIAGRAMS CONSISTING OF MORE THAN ONE GATE	29	32	24	31		
L 718	L2-11 DO YOU COMPUTE SUM AND CARRY EXPRESSIONS FOR SERIAL HALF OR FULL ADDER LOGIC DIAGRAMS	12	15	8	12		
L 719	L2-12 DO YOU TRACE DATA FLOW THROUGH PARALLEL FULL ADDER LOGIC DIAGRAMS	14	18	8	14		
L 720	L2-13 DO YOU WORK WITH ASTABLE (FREE RUNNING) MULTIVIBRATORS	27	32	20	29		
L 721	L2-14 DO YOU WORK WITH BISTABLE (FLIP-FLOP) MULTIVIBRATORS	32	32	32	33		
L 722	L2-15 DO YOU WORK WITH MONOSTABLE (ONE-SHOT) MULTIVIBRATORS	37	35	28	35		
L 723	L2-16 DO YOU USE OR REFER TO FLIP-FLOP MULTIVIBRATOR SYMBOLS	32	32	32	33		
L 724	L2-17 DO YOU USE OR REFER TO SINGLE-SHOT MULTIVIBRATOR SYMBOLS	31	32	28	33		
L 725	L2-18 DO YOU USE OR REFER TO FLIP-FLOP CIRCUIT DIAGRAMS	32	32	32	35		
L 726	L2-19 DO YOU USE OR REFER TO FLIP-FLOP TRUTH TABLES	22	26	16	24		
L 727	L2-20 DO YOU USE OR REFER TO COMPLEMENTED FLIP-FLOP LOGIC SYMBOLS	24	29	16	25		
L 728	L2-21 DO YOU USE OR REFER TO COMPLEMENTING FLIP-FLOP LOGIC SYMBOLS	24	29	16	25		
L 729	L2-22 DO YOU MEASURE OUTPUT WAVESHAPES OF LOGIC CIRCUITS	34	29	40	35		
L 730	L2-23 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTED FLIP-FLOP SCHEMATIC DIAGRAMS	27	26	28	27		
L 731	L2-24 DO YOU TRACE DATA FLOW THROUGH COMPLEMENTING FLIP-FLOP SCHEMATIC DIAGRAMS	27	26	28	27		
L 732	L2-25 DO YOU CONSTRUCT TRUTH TABLES FOR J-K FLIP-FLOP LOGIC SYMBOLS	15	18	12	18		

BOOLEAN EQUATIONS

PCT RUNS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TSK

		SPC	SPC	SPC	SPC	SPC	
		176	177	178	179		
L 733	L3-01 DO YOU WORK WITH DIGITAL COUNTERS IN YOUR PRESENT JOB	42	41	44	47		COUNTERS
L 734	L3-02 DO YOU USE OR REFER TO UP-COUNTERS	37	38	36	41		
L 735	L3-03 DO YOU USE OR REFER TO DOWN-COUNTERS	32	32	32	37		
L 736	L3-04 DO YOU USE OR REFER TO SERIAL COUNTERS	32	38	24	35		
L 737	L3-05 DO YOU USE OR REFER TO PARALLEL COUNTERS	25	29	20	29		
L 738	L3-06 DO YOU USE OR REFER TO RING COUNTERS	24	29	16	27		
L 739	L3-07 DO YOU USE OR REFER TO DECADE COUNTERS	29	32	24	33		
L 740	L3-08 DO YOU USE OR REFER TO COUNT DETECT CIRCUITS	22	29	12	25		
L 741	L3-09 DO YOU USE OR REFER TO DOWN CLOCKS	32	38	24	37		
L 742	L3-10 DO YOU USE OR REFER TO UP CLOCKS	32	38	24	37		
L 743	L3-11 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	24	29	16	27		
L 744	L3-12 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	22	29	12	25		
L 745	L3-13 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF DECADE COUNTERS	25	29	20	29		
L 746	L3-14 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF RING COUNTERS	24	29	16	27		
L 747	L3-15 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	20	26	12	24		
L 748	L3-16 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF SHIFT REGISTERS	24	26	20	27		
L 749	L3-17 DO YOU TRACE DATA FLOW THROUGH LOGIC DIAGRAMS OF OTHER TYPE OF COUNTERS	25	26	24	29		
L 750	L3-18 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR UP-COUNTERS HAVING COMPLEMENTED FLIP-FLOPS	15	21	8	18		
L 751	L3-19 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP- OR DOWN-COUNTERS HAVING COMPLEMENTING FLIP-FLOPS	14	18	8	16		
L 752	L3-20 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR SERIAL UP-COUNTERS FEEDING A PARALLEL STORAGE REGISTER	12	15	8	14		
L 753	L3-21 DO YOU COMPUTE THE BINARY COUNT AFTER SPECIFIC INPUT PULSES FOR OTHER TYPES OF COUNTERS	17	21	12	20		
L 754	L3-22 DO YOU CONSTRUCT TRUTH TABLES FROM LOGIC DIAGRAMS OF DECADE COUNTERS	7	9	4	8		
L 755	L3-23 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP IN RING COUNTERS FOR SPECIFIC INPUT PULSES	14	12	16	16		
L 756	L3-24 DO YOU DETERMINE THE APPROPRIATE AND GATE NECESSARY IN COUNT DETECT CIRCUITS TO INDICATE A REQUIRED COUNT	8	9	8	10		
M 757	M1-01 DO YOU WORK WITH SAWTOOTH WAVE GENERATORS	51	50	52	47		
M 758	M1-02 DO YOU WORK WITH TRAPEZOIDAL WAVE GENERATORS	34	35	32	35		
M 759	M1-03 DO YOU WORK WITH PULSED OSCILLATORS WITH REGENERATIVE FEEDBACK	42	35	52	41		TIMING CIRCUITS
M 760	M1-04 DO YOU WORK WITH PULSED OSCILLATORS WITHOUT REGENERATIVE FEEDBACK	42	38	48	45		

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC	SPC	
	176	177	178	179		
M 761 M1-05 DO YOU WORK WITH BLOCKING OSCILLATORS	32	32	32	35		
M 762 M1-06 DO YOU USE OR REFER TO RISE TIME	54	50	60	55		
M 763 M1-07 DO YOU USE OR REFER TO FALL OR FLYBACK TIME	51	53	48	51		
M 764 M1-08 DO YOU USE OR REFER TO SLEEP TIME	64	62	68	65		
M 765 M1-09 DO YOU USE OR REFER TO ELECTRICAL LENGTH OF SAWTOOTH WAVEFORMS	51	47	56	51		
M 766 M1-10 DO YOU USE OR REFER TO PHYSICAL LENGTH OF SAWTOOTH WAVEFORMS	44	47	40	47		
M 767 M1-11 DO YOU USE OR REFER TO LINEAR SLOPE OF SAWTOOTH WAVEFORMS	44	44	44	45		
M 768 M1-12 DO YOU USE OR REFER TO GATE LENGTH OF SAWTOOTH WAVEFORMS	49	44	56	51		
M 769 M2-01 DO YOU USE SIGNAL GENERATORS IN YOUR PRESENT JOB	95	97	92	94		
M 770 M2-02 DO YOU PERFORM OPERATIONAL CHECKS WHILE USING SIGNAL GENERATORS	95	97	92	94		USE OF SIGNAL GENERATORS
M 771 M2-03 DO YOU PERFORM PERIODIC MAINTENANCE SUCH AS ADJUSTING, ALIGNING, OR CALIBRATING WHILE USING SIGNAL GENERATORS	76	79	72	78		
M 772 M2-04 DO YOU TROUBLESHOOT TO AN ASSEMBLY OR SUBASSEMBLY WHILE USING SIGNAL GENERATORS	75	79	68	76		
M 773 M2-05 DO YOU TROUBLESHOOT TO THE SMALLEST REPLACEABLE COMPONENT WHILE USING SIGNAL GENERATORS	34	38	28	35		
M 774 M2-06 DO YOU USE AUDIO SINE-WAVE GENERATORS	81	79	84	80		
M 775 M2-07 DO YOU USE AUDIO NON-SINUSOIDAL WAVE GENERATORS SUCH AS SQUARE WAVE, TRIANGLE, PULSE, OR SPIKE	56	65	44	55		
M 776 M2-08 DO YOU USE RF GENERATORS LESS THAN 1,000 MH	81	82	84	86		
M 777 M2-09 DO YOU USE RF GENERATORS GREATER THAN 1,000 MH	80	76	84	78		
M 778 M2-10 DO YOU USE OTHER SPECIAL PURPOSE OR MULTI-FUNCTION GENERATORS	76	71	84	80		
M 779 M3-01 IN YOUR PRESENT JOB, DO YOU PERFORM ANY TASKS DEALING WITH ALTERNATING CURRENT OR DIRECT CURRENT MOTORS OR GENERATORS	56	53	60	59		MOTORS AND GENERATORS
M 780 M3-02 DO YOU INSPECT MOTORS	58	53	64	61		
M 781 M3-03 DO YOU CLEAN OR LUBRICATE MOTORS	56	50	64	59		
M 782 M3-04 DO YOU OPERATE MOTORS	56	50	64	59		
M 783 M3-05 DO YOU REMOVE OR REPLACE COMPLETE MOTORS	54	50	60	57		
M 784 M3-06 DO YOU REMOVE OR REPLACE MOTOR PARTS	29	29	28	33		
M 785 M3-07 DO YOU TROUBLESHOOT AS FAR AS CHECKING WIRE CONNECTIONS ON MOTORS	54	47	64	59		
M 786 M3-08 DO YOU TROUBLESHOOT DOWN TO COMPONENT PARTS OF MOTORS	25	29	20	27		
M 787 M3-09 DO YOU PERFORM ANY TASKS ON FIELD COILS	20	29	8	22		
M 788 M3-10 DO YOU PERFORM ANY TASKS ON ARMATURES	19	26	8	22		
M 789 M3-11 DO YOU PERFORM ANY TASKS ON MOTORS	20	29	8	24		
M 790 M3-12 DO YOU PERFORM ANY TASKS ON BRUSHES	29	32	24	33		
M 791 M3-13 DO YOU PERFORM ANY TASKS ON SLIP RINGS	24	29	16	27		
M 792 M3-14 DO YOU PERFORM ANY TASKS ON COMMUTATORS	24	32	12	27		
M 793 M3-15 DO YOU PERFORM ANY TASKS ON POLE PIECES	20	26	12	24		

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TS*

SPC SPC SPC SPC
176 177 178 179

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

METER MOVEMENTS

SATURABLE REACTORS
AND MAGNETIC
AMPLIFIERS

PCT MMS RESPONDING 'YES' BY SELECTED GMPs

GPSUMB PAGE 30

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	178	179	
N 025 N2-08 DO YOU USE OR REFER TO HYSTERESIS CURVES OR LOOPS	8	9	8	10	
N 026 N2-09 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT	10	6	16	12	
WAVEFORMS ACROSS REACTOR WINDINGS ON LOAD RESISTORS OF					
SINGLE WINDING SATURABLE REACTORS					
N 027 N2-10 DO YOU MEASURE OUTPUT WAVEFORMS ACROSS REACTOR	14	9	20	14	
WINDINGS ON LOAD RESISTORS OF SINGLE WINDING SATURABLE					
REACTORS					
N 028 N2-11 DO YOU INTERPRET SCHEMATIC DRAWINGS TO DEVELOP OUTPUT	8	6	12	8	
WAVEFORMS FOR MAGNETIC AMPLIFIERS					
N 029 N2-12 DO YOU USE OR REFER TO COERCIVE FORCE IN SATURABLE	5	6	4	6	
REACTORS					
N 030 N2-13 DO YOU USE OR REFER TO RESIDUAL MAGNETISM IN	5	6	4	6	
SATURABLE REACTORS					
N 031 N2-14 DO YOU USE OR REFER TO FLUX DENSITY IN SATURABLE	10	9	12	12	
REACTORS					
N 032 N2-15 DO YOU USE OR REFER TO POINT OF SATURATION IN	12	6	20	12	
SATURABLE REACTORS					
N 033 N2-16 DO YOU USE OR REFER TO SATURABLE REACTOR SCHEMATIC	17	15	20	18	
SYMBOLS					
N 034 N3-01 DO YOU WORK WITH WAVESHAPING CIRCUITS IN YOUR PRESENT	54	47	64	55	
JOB					
N 035 N3-02 DO YOU USE OR REFER TO TRANSIENT INTERVALS	41	24	64	43	WAVESHAPING
N 036 N3-03 DO YOU USE OR REFER TO PULSE WIDTH (PW)	46	32	64	47	CIRCUITS
N 037 N3-04 DO YOU USE OR REFER TO PULSE RECURRENCE TIME (PRT)	39	29	52	39	
N 038 N3-05 DO YOU USE OR REFER TO PULSE RECURRENCE FREQUENCY	41	32	52	43	
(PRF)					
N 039 N3-06 DO YOU USE OR REFER TO DIFFERENTIATING CIRCUITS	41	26	60	41	
N 040 N3-07 DO YOU USE OR REFER TO INTEGRATING CIRCUITS	47	38	60	47	
N 041 N3-08 DO YOU USE OR REFER TO THE CLASSIFICATION OF TIME	34	24	52	37	
CONSTANTS (TC) AS LONG, MEDIUM, OR SHORT					
N 042 N3-09 DO YOU DETERMINE WHETHER AN LR OR RC CIRCUIT IS	19	15	24	22	
DIFFERENTIATING OR INTEGRATING BASED ON THE TIME CONSTANT					
AND OUTPUT CONFIGURATION					
N 043 N3-10 DO YOU WORK WITH SQUARE WAVE GENERATORS	41	38	44	41	
N 044 N3-11 DO YOU WORK WITH RECTANGULAR WAVE GENERATORS	32	35	28	35	
N 045 N3-01 DO YOU WORK ON SINGLE SIDEBAND SYSTEMS IN YOUR	17	6	32	16	
PRESENT JOB					
N 046 N1-02 DO YOU INSPECT SSB TRANSMIT OR RECEIVE SYSTEMS	20	9	36	20	SINGLE SIDEBAND
N 047 N1-03 DO YOU CLEAN SSB TRANSMIT OR RECEIVE SYSTEMS	19	9	32	18	SYSTEMS
N 048 N1-04 DO YOU ALIGN SSB TRANSMIT OR RECEIVE SYSTEMS	20	9	36	20	
N 049 N1-05 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE	19	9	32	18	
SYSTEMS					
N 050 N1-06 DO YOU TROUBLESHOOT TO SSB TRANSMIT OR RECEIVE	19	9	32	18	
COMPONENTS					
N 051 N1-07 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE	17	9	28	16	
SYSTEMS					
N 052 N1-08 DO YOU REMOVE OR REPLACE SSB TRANSMIT OR RECEIVE	19	9	32	18	
COMPONENTS					

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TSK		SPC	SPC	SPC	SPC
		176	177	178	179
0	53 01-09 DO YOU PERFORM TASKS ON SSB AUDIO AMPLIFIERS	15	6	28	14
0	54 01-10 DO YOU PERFORM TASKS ON SSB BALANCED MODULATORS	15	6	28	14
0	55 01-11 DO YOU PERFORM TASKS ON SSB CARRIER OSCILLATORS	17	9	28	16
0	56 01-12 DO YOU PERFORM TASKS ON SSB LC FILTERS	14	6	24	14
0	57 01-13 DO YOU PERFORM TASKS ON SSB CRYSTAL FILTERS	14	6	24	14
0	58 01-14 DO YOU PERFORM TASKS ON SSB MECHANICAL FILTERS	14	6	24	12
0	59 01-15 DO YOU PERFORM TASKS ON SSB OSCILLATORS	17	9	28	16
0	60 01-16 DO YOU PERFORM TASKS ON SSB MIXERS	17	9	28	16
0	61 01-17 DO YOU PERFORM TASKS ON SSB DRIVERS	17	9	28	16
0	62 01-18 DO YOU PERFORM TASKS ON SSB POWER AMPLIFIERS	17	9	28	16
0	63 01-19 DO YOU PERFORM TASKS ON SSB RF AMPLIFIERS	15	6	28	14
0	64 01-20 DO YOU PERFORM TASKS ON SSB FREQUENCY CONVERTERS	15	6	28	14
0	65 01-21 DO YOU PERFORM TASKS ON SSB IF AMPLIFIERS	15	6	28	14
0	66 01-22 DO YOU PERFORM TASKS ON SSB DEMODULATORS	17	9	28	16
0	67 01-23 DO YOU PERFORM TASKS ON SSB DON'T REMEMBER WHICH SSB	7	3	12	8
SYSTEM STAGES					
0	68 01-24 DO YOU USE OR REFER TO SELECTIVE FADING	5	0	12	6
0	69 01-25 DO YOU USE OR REFER TO PEAK POWER	10	0	24	10
0	70 01-26 DO YOU USE OR REFER TO FREQUENCY STABILITY	15	6	28	14
0	71 01-27 DO YOU USE OR REFER TO RESPONSE CURVES FOR BANDWIDTH FILTERS	12	3	24	12
TRANSMITTERS					
0	72 01-28 DO YOU CALCULATE PEAK POWER OR EFFECTIVE POWER OF SSB	12	0	28	12
0	73 01-29 DO YOU TRACE SIGNALS OR CURRENT PATHS THROUGH SSB	15	6	28	14
0	74 01-30 DO YOU TRACE SIGNALS ON CURRENT PATHS THROUGH SSB	15	6	28	14
RECEIVER SCHEMATIC DIAGRAMS					
0	75 02-01 DO YOU WORK ON PULSE MODULATION SYSTEMS IN YOUR PRESENT JOB	20	21	20	20
PULSE MODULATION SYSTEMS					
0	76 02-02 DO YOU INSPECT PULSE MODULATION SYSTEMS	22	24	20	22
0	77 02-03 DO YOU CLEAN PULSE MODULATION SYSTEMS	22	24	20	22
0	78 02-04 DO YOU ALIGN PULSE MODULATION SYSTEMS	20	21	20	20
0	79 02-05 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEMS	20	21	20	20
0	80 02-06 DO YOU TROUBLESHOOT TO PULSE MODULATION SYSTEM COMPONENTS	19	18	20	16
PULSE MODULATION SYSTEMS					
0	81 02-07 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEMS	17	18	16	18
0	82 02-08 DO YOU REMOVE OR REPLACE PULSE MODULATION SYSTEM COMPONENTS	15	12	20	16
PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS					
0	83 02-09 DO YOU WORK ON PULSE-AMPLITUDE MODULATION (PAM) SYSTEMS	15	18	12	16
PULSE-DURATION MODULATION (PDM) SYSTEMS					
0	84 02-10 DO YOU WORK ON PULSE-DURATION MODULATION (PDM) SYSTEMS	12	9	16	14
PULSE-POSITION MODULATION (PPM) SYSTEMS					
0	85 02-11 DO YOU WORK ON PULSE-POSITION MODULATION (PPM) SYSTEMS	12	9	16	14
PULSE-CODE MODULATION (PCM) SYSTEMS					
0	86 02-12 DO YOU WORK ON PULSE-CODE MODULATION (PCM) SYSTEMS	17	15	20	16
LINE PULSING MODULATION SYSTEMS					
0	87 02-13 DO YOU WORK ON LINE PULSING MODULATION SYSTEMS	10	9	12	12
DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM					
0	88 02-14 DO YOU WORK ON DON'T REMEMBER WHICH TYPE OF MODULATION SYSTEM	14	15	12	12

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

0Y-TSK

SPC SPC SPC SPC
176 177 178 179

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

SPC SPC SPC SPC
176 177 178 179

ANTENNAS

BY-TASK

	SPC 176	SPC 177	SPC 178	SPC 179
U 916 03-03 DO YOU CLEAN ANTENNAS				
U 917 03-04 DO YOU PHYSICALLY ALIGN ANTENNAS	69	62	80	73
U 918 03-05 DO YOU ELECTRICALLY ALIGN ANTENNAS	54	44	72	61
U 919 03-06 DO YOU TROUBLESHOOT TO ANTENNAS	56	59	52	57
U 920 03-07 DO YOU REMOVE OR INSTALL ANTENNAS	73	68	80	78
U 921 03-08 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	59	50	72	63
U 922 03-09 DO YOU REMOVE OR REPLACE COMPONENTS OF ANTENNAS	37	32	44	41
U 923 03-10 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF E OR ELECTRIC FIELD LINES	51	44	60	55
U 924 03-11 DO YOU USE OR REFER TO TECHNICAL DATA CONTAINING REPRESENTATIONS OF H OR MAGNETIC FIELD LINES	31	24	40	31
U 925 03-12 DO YOU DETERMINE THE DIRECTION OF THE MAGNETIC LINES IN RELATION TO THE ELECTRIC LINES OF FORCE FOR ANTENNAS	29	21	40	29
U 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	24	18	32	25
U 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	17	18	16	20
U 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	17	18	16	20
U 929 03-16 DO YOU WORK WITH HERTZ ANTENNAS	12	12	12	14
U 930 03-17 DO YOU WORK WITH MARCONI ANTENNAS	7	6	8	8
U 931 03-18 DO YOU WORK WITH BROADSIDE ARRAYS	5	6	4	4
U 932 03-19 DO YOU WORK WITH END-FIRE ARRAYS	5	6	4	6
U 933 03-20 DO YOU WORK WITH CIRCULAR ARRAYS	3	3	4	4
U 934 03-21 DO YOU WORK WITH COLLINER ARRAYS	12	9	16	14
U 935 03-22 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC INDUCTION FIELDS WHEN WORKING WITH ANTENNAS	15	18	12	16
U 936 03-23 DO YOU MEASURE ELECTROMAGNETIC INDUCTION FIELDS OF ANTENNAS	12	15	8	14
U 937 03-24 DO YOU USE OR REFER TO THE TERM ELECTROMAGNETIC RADIATION FIELDS WHEN WORKING WITH ANTENNAS	27	26	28	25
U 938 03-25 DO YOU MEASURE ELECTROMAGNETIC RADIATION FIELDS OF ANTENNAS	17	18	16	18
U 939 03-26 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA RADIATION	17	15	20	18
U 940 03-27 DO YOU USE OR REFER TO THE TIME PHASE OF ELECTRIC (E) AND MAGNETIC (H) COMPONENTS IN ANTENNA INDUCTION FIELD	15	15	16	16
U 941 03-28 ARE ANY OF THE ANTENNAS YOU WORK ON LINEARLY POLARIZED	17	21	12	20
U 942 03-29 ARE ANY OF THE ANTENNAS YOU WORK ON CIRCULARLY POLARIZED	71	65	80	73
U 943 03-30 DO YOU MEASURE OR DETERMINE THE POLARITY OF ANTENNAS YOU WORK ON	15	15	16	18
U 944 03-31 DO YOU CONSTRUCT, OR MAKE THE CALCULATIONS NECESSARY TO CONSTRUCT, ANTENNAS OF CORRECT LENGTH FOR SPECIFIC WAVELENGTHS	8	9	8	10

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

01-TSK

	SPC 176	SPC 177	SPC 178	SPC 179
Q 945 Q3-32 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS	15	9	24	10
Q 946 Q3-33 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS DIRECTORS	19	18	20	22
Q 947 Q3-34 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN PARASITIC ELEMENTS SERVING AS REFLECTORS	22	18	28	25
Q 948 Q3-35 DO THE ANTENNA ARRAYS YOU WORK WITH CONTAIN DON'T REMEMBER WHAT KIND OF ELEMENTS	25	29	20	25
Q 949 Q3-36 DO YOU WORK ON UNIDIRECTIONAL ANTENNAS	59	56	64	61
Q 950 Q3-37 DO YOU WORK ON BIDIRECTIONAL ANTENNAS	17	18	16	18
Q 951 Q3-38 DO YOU WORK ON DON'T REMEMBER THE DIRECTIONALITY	14	15	12	14
Q 952 Q3-39 DO YOU WORK WITH ROTAR ANTENNA ARRAYS	37	41	32	41
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 CABLEGUIDES AS TRANSMISSION LINES)	58	59	56	59
P 954 P1-02 DO YOU REFER TO OR USE CUPPER LOSS OR IZR LOSS IN TRANSMISSION LINES	8	9	8	10
P 955 P1-03 DO YOU REFER TO OR USE SALT EFFECTS OF HIGH FREQUENCY CURRENTS IN TRANSMISSION LINES	20	12	32	20
P 956 P1-04 DO YOU REFER TO OR USE RADIATION LOSS IN TRANSMISSION LINES	27	21	36	25
P 957 P1-05 DO YOU USE OR REFER TO DIELECTRIC LOSS IN TRANSMISSION LINES	14	12	16	16
P 958 P1-06 DO YOU USE OR REFER TO LEAKAGE LOSSES IN TRANSMISSION LINES	19	15	24	22
P 959 P1-07 DO YOU WORK WITH TWISTED PAIR TRANSMISSION LINES	25	26	24	27
P 960 P1-08 DO YOU WORK WITH TWIN LEAD TRANSMISSION LINES	25	24	28	29
P 961 P1-09 DO YOU WORK WITH OPEN TWO-WIRE TRANSMISSION LINES	17	18	16	18
P 962 P1-10 DO YOU WORK WITH FLEXIBLE COAXIAL CABLE TRANSMISSION LINES	56	56	56	57
P 963 P1-11 DO YOU WORK WITH RIGID COAXIAL CABLE TRANSMISSION LINES	46	47	44	45
P 964 P1-12 DO YOU TROUBLESHOOT TRANSMISSION LINES	51	50	52	53
P 965 P1-13 DO YOU ANALYZE VOLTAGE OR CURRENT WAVEFORMS IN TRANSMISSION LINES TO DETERMINE THE TYPE OF TERMINATION (OPEN, SHORTED, CAPACITIVE, INDUCTIVE)	12	12	12	12
P 966 P1-14 DO YOU SELECT APPROPRIATE TRANSMISSION LINES TERMINATIONS TO ACHIEVE DESIRED WAVEFORMS	17	18	16	18
P 967 P1-15 DO YOU USE OR REFER TO SCHEMATIC SYMBOLS FOR LINE TERMINATIONS IN TERMS OF CIRCUIT TERMINATIONS	36	35	36	37
P 968 P1-16 DO YOU MEASURE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	42	44	40	45
P 969 P1-17 DO YOU CALCULATE STANDING WAVE RATIOS (SWR) OF TRANSMISSION LINES	22	21	24	24
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	14	18	8	16

TRANSMISSION
LINES

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING

0Y-TSK

	SPC 176	SPC 177	SPC 178	SPC 179
P 771 P1-19 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING MATCHING TRANSFORMERS	31	32	28	29
P 772 P1-20 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING DELTA MATCHING	14	55	12	16
P 773 P1-21 DO YOU SELECT THE TYPE OF TRANSMISSION LINE NEEDED FOR PARTICULAR JOBS WITHOUT REFERRING TO TECHNICAL DATA	12	15	8	14
P 774 P1-22 DO YOU USE OR REFER TO THE TERM CHARACTERISTIC IMPEDANCE (Z0) OF TRANSMISSION LINES	25	24	28	29
P 775 P1-23 DO YOU CALCULATE THE CHARACTERISTIC IMPEDANCE (Z0) OF TRANSMISSION LINES	10	9	12	12
P 776 P1-24 DO YOU USE OR REFER TO THE TERM CUTOFF FREQUENCY OF TRANSMISSION LINES	14	12	16	14
P 777 P1-25 DO YOU USE OR REFER TO THE TERM VELOCITY FACTOR (K) OF TRANSMISSION LINES	7	9	4	8
P 778 P1-26 DO YOU COMPUTE THE ELECTRICAL LENGTH OF TRANSMISSION LINES FOR PARTICULAR FREQUENCIES	8	9	8	8
P 779 P1-27 DO YOU CONSTRUCT TRANSMISSION LINES OF PARTICULAR ELECTRICAL LENGTH FOR GIVEN FREQUENCIES	3	3	4	4
P 780 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	5	6	4	6
P 781 P1-29 DO YOU WORK WITH NONRESONANT (FLAT) TRANSMISSION LINES	15	12	20	16
P 782 P1-30 DO YOU WORK WITH RESONANT TRANSMISSION LINES	20	21	20	22
P 783 P1-31 DO YOU WORK WITH TRANSMISSION LINES WHICH ARE MATCHED TO LOADS USING STUB MATCHING	12	12	12	14
P 784 P2-01 DO YOU WORK WITH WAVEGUIDES OR CAVITY RESONATORS IN YOUR PRESENT JOB	73	66	80	76
P 785 P2-02 DO YOU INSPECT WAVEGUIDES OR CAVITY RESONATORS	66	62	72	69
P 786 P2-03 DO YOU CLEAN WAVEGUIDES OR CAVITY RESONATORS	53	44	64	57
P 787 P2-04 DO YOU BEND WAVEGUIDES OR CAVITY RESONATORS	20	26	12	24
P 788 P2-05 DO YOU TWIST WAVEGUIDES OR CAVITY RESONATORS	20	26	12	24
P 789 P2-06 DO YOU PRESSURIZE WAVEGUIDES OR CAVITY RESONATORS	59	47	76	61
P 790 P2-07 DO YOU PURGE WAVEGUIDES OR CAVITY RESONATORS	47	38	60	47
P 791 P2-08 DO YOU TROUBLESHOOT WAVEGUIDES OR CAVITY RESONATORS	49	44	56	51
P 792 P2-09 DO YOU REMOVE OR INSTALL COMPLETE WAVEGUIDES	56	47	68	59
P 793 P2-10 DO YOU REMOVE OR INSTALL WAVEGUIDE SECTIONS	59	50	72	63
P 794 P2-11 DO YOU REMOVE OR INSTALL DUMMY LOADS	63	53	76	65
P 795 P2-12 DO YOU REMOVE OR INSTALL E BENDS	49	38	64	51
P 796 P2-13 DO YOU REMOVE OR INSTALL H BENDS	49	38	64	51
P 797 P2-14 DO YOU REMOVE OR INSTALL OTHER BENDS	41	32	52	43
P 798 P2-15 DO YOU REMOVE OR INSTALL CHOKES JOINTS	29	24	36	31
P 799 P2-16 DO YOU REMOVE OR INSTALL ROTATING JOINTS	53	44	64	53
P1000 P2-17 DO YOU REMOVE OR INSTALL DIRECTIONAL COUPLERS	59	53	68	61
P1001 P2-18 DO YOU REMOVE OR INSTALL BIDIRECTIONAL COUPLERS	47	47	48	47
P1002 P2-19 DO YOU USE OR REFER TO "A" WALL OF WAVEGUIDES	17	18	16	18

WAVEGUIDES AND
CAVITY RESONATORS

PCT MMS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING

BY-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	178	179	
P1003 P2-20 DO YOU USE OR REFER TO "H" WALL OF WAVEGUIDES	17	18	16	18	
P1004 P2-21 DO YOU USE OR REFER TO CUTOFF FREQUENCY OF WAVEGUIDES	27	24	32	29	
P1005 P2-22 DO YOU USE OR REFER TO FREQUENCY-DETERMINING WALL OF WAVEGUIDES	17	21	12	20	
P1006 P2-23 DO YOU USE OR REFER TO POWER-DETERMINING WALL OF WAVEGUIDES	14	18	8	16	
P1007 P2-24 DO YOU USE OR REFER TO ELECTRIC FIELD BOUNDARY CONDITIONS	17	15	20	20	
P1008 P2-25 DO YOU USE OR REFER TO MAGNETIC FIELD BOUNDARY CONDITIONS	17	15	20	20	
P1009 P2-26 DO YOU USE OR REFER TO DUPLEXER FIELD BOUNDARY CONDITIONS	15	15	16	18	
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	12	18	4	14	
P1011 P2-28 DO YOU USE OR REFER TO THE GENERAL RULE THAT MOST "A" WALLS RANGE FROM .2 TO .5 WAVELENGTHS IN SIZE, WITH .35 USED AS AN AVERAGE	8	9	8	10	
P1012 P2-29 ARE YOU CONCERNED WITH THE MATERIAL (SUCH AS BRASS) WHICH WAVEGUIDES ARE MADE OF	19	21	16	22	
P1013 P2-30 DO YOU COMPUTE THE LENGTH OF A WAVEGUIDE FOR SPECIFIC INSTALLATION	14	9	20	16	
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	22	21	24	24	
P1015 P2-32 DO YOU USE OR REFER TO THE TIME PHASE OF PEAK "E" OR "H" LINES IN WAVEGUIDES	15	15	16	16	
P1016 P2-33 DO YOU MEASURE THE TIME PHASE OF "E" OR "H" LINES IN WAVEGUIDES	10	12	8	10	
P1017 P2-34 DO YOU USE OR REFER TO THE SPACE QUANTUMATURE OF "E" OR "H" LINES IN WAVEGUIDES	14	15	12	14	
P1018 P2-35 ARE HIGH POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	25	21	32	27	
P1019 P2-36 ARE LOW POWER PROBES USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	22	21	24	24	
P1020 P2-37 ARE LOOPS USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	20	21	20	24	
P1021 P2-38 ARE APERTURES (WINDOWS OR IRISES) USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	42	35	52	43	
P1022 P2-39 ARE DON'T REMEMBER THE KIND OF ENERGY COUPLING USED ON WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	24	29	16	24	
P1023 P2-40 DO YOU DETERMINE WHERE PROBES SHOULD BE MOUNTED IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	8	9	8	10	
P1024 P2-41 DO YOU DETERMINE THE POSITIONING OF LOOPS IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	7	7	4	8	

PCT MARKS RESPONDING 'YES' BY SELECTED GRPS

GPSUMB PAGE 37

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	178	179	
PI025 P2-42 DO YOU DETERMINE THE POSITIONING ON SIZE OF APERTURES IN WAVEGUIDES OR CAVITY RESONATORS WITHOUT REFERRING TO TECHNICAL DATA	5	6	4	6	
PI026 P2-43 ARE CHOKE JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	17	12	24	20	
PI027 P2-44 ARE ROTATING JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	49	44	56	49	
PI028 P2-45 ARE DON'T REMEMBER THE KIND OF JOINTS USED IN WAVEGUIDES OR CAVITY RESONATORS YOU WORK WITH	17	21	12	20	
PI029 P2-46 DO YOU TUNE CAVITY RESONATORS USING CAPACITIVE TUNING	19	18	20	22	
PI030 P2-47 DO YOU TUNE CAVITY RESONATORS USING INDUCTIVE TUNING	17	18	16	20	
PI031 P2-48 DO YOU TUNE CAVITY RESONATORS USING VOLUME TUNING	17	15	20	20	
PI032 P2-49 DO YOU TUNE CAVITY RESONATORS USING DON'T REMEMBER THE METHOD OF TUNING	12	12	12	12	
PI033 P2-50 DO YOU MEASURE THE FREQUENCY OF SIGNALS IN CAVITY RESONATORS	19	21	16	20	
PI034 P3-01 IN YOUR PRESENT JOB DO YOU WORK WITH KLYSTRONS, TRAVELING WAVE TUBES (TWT), PARAMETRIC AMPLIFIERS, OR MAGNETRONS	64	53	80	67	MICROWAVE AMPLIFIERS AND OSCILLATORS
PI035 P3-02 DO YOU USE OR REFER TO INTERELECTRODE CAPACITANCE	17	12	24	20	
PI036 P3-03 DO YOU USE OR REFER TO ELECTRON TRANSIT TIME	17	15	20	20	
PI037 P3-04 DO YOU USE OR REFER TO LEAD INDUCTANCE	22	18	28	25	
PI038 P3-05 DO YOU USE OR REFER TO RF LOSSES IN EXTERNAL CIRCUITRY	41	35	48	45	
PI039 P3-06 DO YOU USE OR REFER TO PRINCIPLE OF ELECTRON VELOCITY MODULATION	32	18	52	35	
PI040 P3-07 DO YOU USE OR REFER TO ELECTRON BUNCHING	39	32	48	39	
PI041 P3-08 DO YOU WORK WITH TWO-CAVITY KLYSTRONS	27	24	32	29	
PI042 P3-09 DO YOU WORK WITH THREE-CAVITY KLYSTRONS	29	32	24	33	
PI043 P3-10 DO YOU WORK WITH REFLEX KLYSTRONS	37	26	52	41	
PI044 P3-11 DO YOU WORK WITH TRAVELING-WAVE TUBES (TWT) AMPLIFIERS	61	50	76	63	
PI045 P3-12 DO YOU WORK WITH NONDEGENERATIVE PARAMETRIC AMPLIFIERS	47	41	56	49	
PI046 P3-13 DO YOU WORK WITH UP-CONVERTER PARAMETRIC AMPLIFIERS	17	21	12	20	
PI047 P3-14 DO YOU WORK WITH MAGNETRONS	8	9	8	10	
PI048 P3-15 DO YOU INSPECT KLYSTRONS OR TWT	61	53	72	63	
PI049 P3-16 DO YOU CLEAN KLYSTRONS OR TWT	51	44	60	55	
PI050 P3-17 DO YOU TUNE KLYSTRONS OR TWT ELECTRICALLY	36	35	36	37	
PI051 P3-18 DO YOU TUNE KLYSTRONS OR TWT MECHANICALLY	53	44	64	55	
PI052 P3-19 DO YOU PERFORM OPERATIONAL CHECKS OF KLYSTRONS OR TWT	59	50	72	61	
PI053 P3-20 DO YOU TROUBLESHOOT KLYSTRONS OR TWT	54	47	64	59	
PI054 P3-21 DO YOU REMOVE OR REPLACE COMPLETE KLYSTRON OR TWT	63	53	76	65	
PI055 P3-22 DO YOU REMOVE OR REPLACE KLYSTRON OR TWT COMPONENTS	25	24	28	24	
PI056 P3-23 DO YOU INSPECT PARAMETRIC AMPLIFIERS	59	50	72	63	
PI057 P3-24 DO YOU CLEAN PARAMETRIC AMPLIFIERS	54	44	68	61	
PI058 P3-25 DO YOU ADJUST PARAMETRIC AMPLIFIERS	61	50	76	65	

PCT MEMS RESPONDING 'YES' BY SELECTED GRPS

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TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	177	178	179
PI059 P3-26 DO YOU TUNE PARAMETRIC AMPLIFIERS	59	50	72	63	
PI060 P3-27 DO YOU PERFORM OPERATIONAL CHECKS OF PARAMETRIC AMPLIFIERS	58	50	68	63	
PI061 P3-28 DO YOU TROUBLESHOOT PARAMETRIC AMPLIFIERS	59	50	72	63	
PI062 P3-29 DO YOU REMOVE OR REPLACE COMPLETE PARAMETRIC AMPLIFIER	61	50	76	65	
PI063 P3-30 DO YOU REMOVE OR REPLACE PARAMETRIC AMPLIFIER COMPONENTS	58	47	72	61	
PI064 P3-31 DO YOU INSPECT MAGNETRONS	7	6	8	8	
PI065 P3-32 DO YOU CLEAN MAGNETRONS	7	6	8	8	
PI066 P3-33 DO YOU ADJUST MAGNETRONS	7	6	8	8	
PI067 P3-34 DO YOU TUNE MAGNETRONS	7	6	8	8	
PI068 P3-35 DO YOU PERFORM OPERATIONAL CHECKS OF MAGNETRONS	7	6	8	8	
PI069 P3-36 DO YOU TROUBLESHOOT MAGNETRONS	7	6	8	8	
PI070 P3-37 DO YOU REMOVE OR REPLACE COMPLETE MAGNETRON	7	6	8	8	
PI071 P3-38 DO YOU REMOVE OR REPLACE MAGNETRON COMPONENTS	5	6	4	4	
PI072 P3-39 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS COLLECTOR PLATES	27	26	28	29	
PI073 P3-40 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER CAVITIES	20	21	20	22	
PI074 P3-41 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATCHER GRIDS	19	21	16	20	
PI075 P3-42 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS FEEDBACK LOOPS	19	21	16	20	
PI076 P3-43 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS DRIFT SPACES	14	15	12	14	
PI077 P3-44 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS HUNCHER GRIDS	19	21	16	20	
PI078 P3-45 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS HUNCHER CAVITIES	15	15	16	16	
PI079 P3-46 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CONTROL GRIDS	20	21	20	22	
PI080 P3-47 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF TWO-CAVITY KLYSTRONS CATHODES	27	26	28	29	
PI081 P3-48 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON REFLECTOR (ELECTRO) PLATES	24	24	24	25	
PI082 P3-49 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRIDS	24	24	24	25	
PI083 P3-50 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON GRID CAVITY GAPS	19	18	20	20	
PI084 P3-51 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON RESONANT CAVITIES	24	26	20	25	
PI085 P3-52 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON MAGNETIC COUPLING LOOPS	19	18	20	20	
PI086 P3-53 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON FILAMENTS	27	26	28	29	
PI087 P3-54 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF REFLEX KLYSTRON CATHODES	27	26	28	29	

PCT MEMBERS RESPONDING "YES" BY SELECTED GROUPS

GROUPS PAGE 39

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DT-TSK

SPC SPC SPC SPC
176 177 178 179

PI068 P3-55 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
REFLEX KLYSTRON OUTPUT LEADS 25 24 28 27
PI089 P3-56 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES FILAMENTS 53 47 60 53
PI090 P3-57 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES CATHODES 51 44 60 51
PI091 P3-58 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES MODULATOR GRIDS 32 26 40 33
PI092 P3-59 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES ANODES 51 44 60 53
PI093 P3-60 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES HELICALS 49 47 52 49
PI094 P3-61 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES COLLECTORS 51 44 60 53
PI095 P3-62 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES MAGNETS 49 44 56 51
PI096 P3-63 DO YOU USE OR REFER TO THE OPERATING PRINCIPLES OF
TRAVELING-WAVE TUBES ATTENUATORS 46 41 52 49
PI097 P3-64 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE
CIRCULATORS 31 35 24 33
PI098 P3-65 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER SIGNAL
CAVITIES 31 32 28 31
PI099 P3-66 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER IDLER
CAVITIES 20 29 8 22
PI100 P3-67 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER VARACTOR
DIODES 53 41 68 57
PI101 P3-68 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER FERRITE
ISOLATORS 32 32 32 33
PI102 P3-69 DO YOU PERFORM TASKS ON PARAMETRIC AMPLIFIER REVERSE-
BIAS BATTERIES 19 21 16 18
PI103 P3-70 DO YOU PERFORM TASKS ON ANODES 7 6 8 8
PI104 P3-71 DO YOU PERFORM TASKS ON ANODE COOLING PINS 7 6 8 8
PI105 P3-72 DO YOU PERFORM TASKS ON COUPLING LOOPS 7 6 8 8
PI106 P3-73 DO YOU PERFORM TASKS ON HEATER LEADS 7 6 8 8
PI107 P3-74 DO YOU PERFORM TASKS ON RESONANT CAVITIES 7 6 8 8
PI108 P3-75 DO YOU PERFORM TASKS ON CATHODES 7 6 8 8
PI109 P3-76 DO YOU PERFORM TASKS ON MAGNETS 7 6 8 8
GI110 Q1-01 DO YOU USE OR REFER TO STORAGE REGISTERS 19 21 16 18
GI111 Q1-02 DO YOU USE OR REFER TO SHIFT REGISTERS 22 21 24 22
GI112 Q1-03 DO YOU USE OR REFER TO LOGIC SYMBOLS OF SHIFT
REGISTERS 22 21 24 22
GI113 Q1-04 DO YOU USE OR REFER TO LOGIC SYMBOLS OF STORAGE
REGISTERS 19 21 16 18
GI114 Q1-05 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF
SHIFT REGISTERS 20 18 24 22
GI115 Q1-06 DO YOU TRACE THE DATA FLOW THROUGH LOGIC DIAGRAMS OF
OTHER TYPE OF REGISTERS 14 15 12 14

REGISTERS

PCT MEMBERS RESPONDING 'YES' BY SELECTED GRPS

GPSUM PAGE 40

TASK GROUP SUMMARY PERCENT MEMBERS PERFORMING

DY-TSK

SPC SPC SPC SPC
174 177 178 179

41116 41-07 DO YOU DETERMINE THE STATE OF EACH FLIP-FLOP OF A
SHIFT REGISTER AFTER A SPECIFIED NUMBER OF SHIFT PULSES
HAVE PASSED

15 18 12 16

41117 42-01 DO YOU WORK WITH DIGITAL COUNTERS, REGISTERS, OR
STORAGE DEVICES IN YOUR PRESENT JOB

20 24 16 22

41118 42-02 DO YOU USE OR REFER TO DELAY LINES

8 12 4 8

41119 42-03 DO YOU USE OR REFER TO MAGNETIC CORES

0 0 0 0

41120 42-04 DO YOU USE OR REFER TO MAGNETIC DRUMS

0 0 0 0

41121 42-05 DO YOU USE OR REFER TO MAGNETIC TAPES

0 0 0 0

41122 42-06 DO YOU USE OR REFER TO ACCESS TIME OR SPEED ON
MEMORY SYSTEMS

2 0 4 2

41123 42-07 DO YOU USE OR REFER TO WORD CAPACITY OF MEMORY
SYSTEMS

3 3 4 2

41124 42-08 DO YOU USE OR REFER TO VOLATILITY OF MEMORY SYSTEMS

2 0 4 2

41125 42-09 DO YOU USE OR REFER TO LOGIC SYMBOL OF DELAY LINES

8 9 8 8

41126 43-01 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

42 41 44 43

41127 43-02 DO YOU COMPUTE OUTPUT VOLTAGES FOR ELECTROMECHANICAL
DIGITAL-TO-ANALOG (D/A) CONVERTERS FOR GIVEN INPUT
VOLTAGES

12 12 12 12

41128 43-03 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 DENOMINATIONS OF THE
RESISTORS

3 6 0 4

41129 43-04 DO YOU COMPUTE ANALOG VOLTAGES FOR GIVEN BINARY
COUNTS IN ELECTRONIC DIGITAL-TO-ANALOG (D/A) CONVERTERS

7 9 4 8

41130 43-05 DO YOU PERFORM SAMPLE FUNCTION TASKS ON VARIABLE TIME
ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS

10 9 12 4

41131 43-06 DO YOU PERFORM HOLD FUNCTION TASKS ON VARIABLE TIME
ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS

10 6 16 10

41132 43-07 DO YOU PERFORM COMPARE FUNCTION TASKS ON VARIABLE
TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS

10 9 12 4

41133 43-08 DO YOU PERFORM DIGITIZE FUNCTION TASKS ON VARIABLE
TIME ANALOG-TO-DIGITAL (A/D) CONVERTER CIRCUITS

8 6 12 8

41134 43-09 DO YOU PERFORM DUMP REMEMBER WHICH FUNCTION TASKS
ON VARIABLE TIME ANALOG-TO-DIGITAL (A/D) CONVERTER
CIRCUITS

12 15 8 12

41135 43-10 DO YOU USE OR REFER TO SAMPLE FUNCTION OF A/D
CONVERTERS

12 15 8 10

41136 43-11 DO YOU USE OR REFER TO HOLD FUNCTION OF A/D
CONVERTERS

10 9 12 10

41137 43-12 DO YOU USE OR REFER TO COMPARE FUNCTION OF A/D
CONVERTERS

12 15 8 10

41138 43-13 DO YOU USE OR REFER TO DIGITAL FUNCTION OF A/D
CONVERTERS

19 12 28 20

41139 43-14 DO YOU PERFORM ANY TASKS ON MECHANICAL ANALOG-TO-
DIGITAL (A/D) CONVERTERS

12 15 6 14

DIGITAL TO
ANALOG CONVERTERS

STORAGE DEVICES

PCT MRS RESPONDING 'YES' BY SELECTED GNPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

		SPC	SPC	SPC	SPC
		176	177	178	179
K1140 R1-01 DO YOU WORK WITH PHANTASTRON CIRCUITRY IN YOUR PRESENT JOB		2	0	4	2
K1141 R2-01 IN YOUR PRESENT JOB DO YOU WORK WITH SCHMITT TRIGGER CIRCUITS		41	35	48	43
K1142 R2-02 DO YOU TRACE DATA FLOW THROUGH SCHMITT TRIGGER SCHEMATIC DIAGRAMS		37	29	48	39
K1143 R2-03 DO YOU USE OR REFER TO SCHMITT TRIGGER LOGIC SYMBOLS		36	32	40	37
K1144 R3-01 IN YOUR PRESENT JOB DO YOU FABRICATE MULTICOMDUCTOR CABLES		46	44	48	51
K1145 R3-02 DO YOU FABRICATE COAXIAL CABLES		64	59	72	69
S1146 S1-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY TASKS ON VISUAL READOUT SYSTEMS		41	44	36	43
S1147 S1-02 DO YOU PERFORM ANY TASKS ON NIXIE LIGHTS OR NIXIE LIGHT DECODER SYSTEMS		22	24	20	25
S1148 S1-03 DO YOU ANALYZE NIXIE LIGHT DECODER SYSTEMS USING BOOLEAN ALGEBRA		8	12	4	10
S1149 S2-01 DO YOU WORK WITH PHOTO TUBES IN YOUR PRESENT JOB		10	18	0	12
S1150 S3-01 IN YOUR PRESENT JOB DO YOU WORK WITH CHOPPER CIRCUITS		15	12	20	18
S1151 S3-02 DO YOU MEASURE EXCITATION FREQUENCIES		7	6	8	8
S1152 S3-03 DO YOU MEASURE VOLTAGE-CURRENT PHASE RELATIONSHIPS		8	6	12	10
S1153 S3-04 DO YOU USE OR REFER TO EXCITATION FREQUENCIES		7	6	8	8
S1154 S3-05 DO YOU USE OR REFER TO VOLTAGE-CURRENT PHASE RELATIONSHIPS		10	6	16	12
S1155 S3-06 DO YOU USE SERVOS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION		15	15	16	18
S1156 S3-07 DO YOU USE DETECTORS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION		14	15	12	16
S1157 S3-08 DO YOU USE ERROR SIGNAL DEVICES IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION		14	15	12	16
S1158 S3-09 DO YOU USE COMPARISON CIRCUITS IN CONJUNCTION WITH CHOPPER CIRCUIT OPERATION		15	18	12	16
T1159 T1-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH INFRARED SYSTEMS		0	0	0	0
T1160 T1-02 DO YOU INSPECT INFRARED SYSTEMS		0	0	0	0
T1161 T1-03 DO YOU CLEAN INFRARED SYSTEMS		0	0	0	0
T1162 T1-04 DO YOU ADJUST OR CALIBRATE INFRARED SYSTEMS		0	0	0	0
T1163 T1-05 DO YOU OPERATE INFRARED SYSTEMS		0	0	0	0
T1164 T1-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF INFRARED SYSTEMS		0	0	0	0
T1165 T1-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF INFRARED SYSTEMS		0	0	0	0
T1166 T1-08 DO YOU TROUBLESHOOT DOWN TO INFRARED SYSTEM COMPONENT PARTS		0	0	0	0
T1167 T1-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF INFRARED SYSTEMS		0	0	0	0
T1168 T1-10 DO YOU REMOVE OR REPLACE INFRARED SYSTEM COMPONENT PARTS		0	0	0	0

PHOTO SENSITIVE DEVICES

SYNCHRONOUS VIBRATIONS
(CHOPPER CIRCUITS)

INFRARED

PCT MMMS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMINGSPC SPC SPC SPC
176 177 178 179

DY-TSK

T1169 T1-11 DO YOU USE OR REFER TO FAR REGION
 T1170 T1-12 DO YOU USE OR REFER TO INTERMEDIATE REGION
 T1171 T1-13 DO YOU USE OR REFER TO NEAR REGION
 T1172 T1-14 DO YOU USE OR REFER TO MICRON
 T1173 T1-15 DO YOU USE OR REFER TO GRAY BODIES
 T1174 T1-16 DO YOU USE OR REFER TO BLACK BODIES
 T1175 T1-17 DO YOU USE OR REFER TO ABSORPTION
 T1176 T1-18 DO YOU USE OR REFER TO SCATTERING
 T1177 T1-19 DO YOU USE OR REFER TO ABSOLUTE ZERO
 T1178 T1-20 DO YOU PERFORM TASKS ON HLITZ
 T1179 T1-21 DO YOU PERFORM TASKS ON TARGET BUTTONS
 T1180 T1-22 DO YOU PERFORM TASKS ON EJECTOR LENSES
 T1181 T1-23 DO YOU PERFORM TASKS ON OCULAR LENSES
 T1182 T1-24 DO YOU PERFORM TASKS ON CORRECTION LENSES
 T1183 T1-25 DO YOU PERFORM TASKS ON FILTERS
 T1184 T1-26 DO YOU PERFORM TASKS ON SPHERICAL MIRRORS
 T1185 T1-27 DO YOU PERFORM TASKS ON PLANE MIRRORS
 T1186 T2-01 DOES YOUR PRESENT JOB INVOLVE ANY TASKS DEALING WITH

LASERS

T1187 T2-02 DO YOU INSPECT LASER SYSTEMS
 T1188 T2-03 DO YOU CLEAN LASER SYSTEMS
 T1189 T2-04 DO YOU OPERATE LASER SYSTEMS
 T1190 T2-05 DO YOU OPERATE LASER SYSTEMS
 T1191 T2-06 DO YOU TROUBLESHOOT WIRE CONNECTIONS OF

LASER SYSTEMS

T1192 T2-07 DO YOU TROUBLESHOOT MAJOR ASSEMBLIES OF LASER

SYSTEMS

T1193 T2-08 DO YOU TROUBLESHOOT TO COMPONENT PARTS OF LASER

SYSTEMS

T1194 T2-09 DO YOU REMOVE OR REPLACE MAJOR ASSEMBLIES OF LASER

SYSTEMS

T1195 T2-10 DO YOU REMOVE OR REPLACE COMPONENT PARTS OF LASER

SYSTEMS

T1196 T2-11 DO YOU USE OR REFER TO ANGSTROMS (A)

T1197 T2-12 DO YOU USE OR REFER TO ELECTRON ENERGY LEVELS

T1198 T2-13 DO YOU USE OR REFER TO GROUND STATE

T1199 T2-14 DO YOU USE OR REFER TO EXCITED STATE

T1200 T2-15 DO YOU USE OR REFER TO PACKET OF RADIATION

T1201 T2-16 DO YOU USE OR REFER TO PHOTONS

T1202 T2-17 DO YOU USE OR REFER TO SPONTANEOUS EMISSION

T1203 T2-18 DO YOU USE OR REFER TO STIMULATED EMISSION

T1204 T2-19 DO YOU USE OR REFER TO COHERENCE OR INCOHERENCE

T1205 T2-20 DO YOU USE OR REFER TO INVERSION LEVEL

T1206 T2-21 DO YOU USE OR REFER TO MONOCHROMATIC

T1207 T2-22 DO YOU WORK WITH ACTIVE MATERIALS

T1208 T2-23 DO YOU WORK WITH PUMPING SOURCES

T1209 T2-24 DO YOU WORK WITH FULL SILVERED (100% REFLECTIVE)

MIRRORS

PCT MANS RESPONDING 'YES' BY SELECTED GRPS

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK		SPC	SPC	SPC	SPC	SPC	SPC
		176	177	178	179	176	177
T1210	T2-25 DO YOU WORK WITH HALF SILVERED (928 REFLECTIVE) MIRRORS	0	0	0	0		
T1211	T2-26 DO YOU WORK WITH MELICAL FLASHTUBES	0	0	0	0		
T1212	T2-27 DO YOU WORK WITH RUBY	0	0	0	0		
T1213	T2-28 DO YOU WORK WITH HELIUM-NEON	0	0	0	0		
T1214	T2-29 DO YOU WORK WITH HELIUM-REMION	0	0	0	0		
T1215	T2-30 DO YOU WORK WITH XENON	0	0	0	0		
T1216	T2-31 DO YOU WORK WITH CESIUM-HELIUM	2	3	0	2		
T1217	T2-32 DO YOU WORK WITH ARGON	0	0	0	0		
T1218	T2-33 DO YOU WORK WITH NEODYMIUM IN GLASS	0	0	0	0		
T1219	T2-34 DO YOU WORK WITH GALLIUM ARSENIDE	0	0	0	0		
T1220	T3-01 IN YOUR PRESENT JOB DO YOU WORK WITH DISPLAY TUBES, SUCH AS DIRECT VIEW STORAGE (DVST) OR MULTIPLE MONE STORAGE TUBES (MMST)	7	12	0	8		
T1221	T3-02 DO YOU INSPECT DVST OR MMST	7	12	0	8		DISPLAY TUBES
T1222	T3-03 DO YOU CLEAN DVST OR MMST	7	12	0	8		
T1223	T3-04 DO YOU ADJUST OR CALIBRATE DVST OR MMST	3	6	0	4		
T1224	T3-05 DO YOU OPERATE SYSTEMS THAT CONTAIN DVST OR MMST	7	12	0	8		
T1225	T3-06 DO YOU TROUBLESHOOT DVST OR MMST CIRCUITS	0	0	0	0		
T1226	T3-07 DO YOU REMOVE OR REPLACE DVST OR MMST TUBES FROM MAJOR ASSEMBLIES ON UNITS	0	0	0	0		
T1227	T3-08 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF DVST	0	0	0	0		
T1228	T3-09 DO YOU PERFORM TASKS THAT MAKE IT NECESSARY TO NAME THE VARIOUS ELEMENTS OF MMST	0	0	0	0		
T1229	T3-10 DO YOU PERFORM TASKS ON FLOOD GUNS	2	3	0	2		
T1230	T3-11 DO YOU PERFORM TASKS ON WHITE GUNS	0	0	0	0		
T1231	T3-12 DO YOU PERFORM TASKS ON ATTACK GUNS	0	0	0	0		
T1232	T3-13 DO YOU PERFORM TASKS ON ERASE GUNS	2	3	0	2		
T1233	T3-14 DO YOU PERFORM TASKS ON STORAGE GRIDS	2	3	0	2		
T1234	T3-01 IN YOUR PRESENT JOB DO YOU PERFORM ANY PROGRAMMING TASKS	0	0	0	0		
U1235	U1-02 DO YOU USE OR REFER TO DECIMAL SYSTEMS	2	3	0	2		PROGRAMMING
U1236	U1-03 DO YOU USE OR REFER TO PROGRAMS	2	3	0	2		
U1237	U1-04 DO YOU USE OR REFER TO HEXADECIMAL SYSTEMS	2	3	0	2		
U1238	U1-05 DO YOU USE OR REFER TO 8-4-2-1 SYSTEMS	2	3	0	2		
U1239	U1-06 DO YOU USE OR REFER TO FOUR SYSTEMS	2	3	0	2		
U1240	U1-07 DO YOU USE OR REFER TO BINARY SYSTEMS	2	3	0	2		
U1241	U1-08 DO YOU USE OR REFER TO TIME-SHARING	2	3	0	2		
U1242	U1-09 DO YOU USE OR REFER TO DATA WORDS	2	3	0	2		
U1243	U1-10 DO YOU USE OR REFER TO ADDRESS WORDS	2	3	0	2		
U1244	U1-11 DO YOU USE OR REFER TO ADDRESS/SUBADDRESS	3	3	0	4		
U1245	U1-12 DO YOU USE OR REFER TO STEERING/INFORMATION	2	3	0	2		
U1246	U1-13 DO YOU USE OR REFER TO INFORMATION WORDS	2	3	0	2		
U1247	U1-14 DO YOU PERFORM TASKS ON SINGLE LEVEL PROGRAMMING	0	0	0	0		
U1248	U1-15 DO YOU PERFORM TASKS ON MULTI-LEVEL PROGRAMMING	0	0	0	0		

PLT MEMS RESPONDING 'YES' BY SELECTED GMPs

GPSUMS PAGE 44

TASK GROUP SUMMARY
PERCENT MEMBERS PERFORMING

DY-TSK

	SPC	SPC	SPC	SPC	SPC
	176	177	178	179	
U1449 U1-16 DO YOU PERFORM TASKS ON INPUT DEVICES	2	3	0	2	
U1450 U1-17 DO YOU PERFORM TASKS ON STORAGE DEVICES	2	3	0	2	
U1451 U1-18 DO YOU PERFORM TASKS ON ARITHMETIC SECTIONS	2	3	0	2	
U1452 U1-19 DO YOU PERFORM TASKS ON CONTROL SECTIONS	3	3	4	4	
U1453 U1-20 DO YOU PERFORM TASKS ON OUTPUT DEVICES	3	3	4	4	
U1454 U1-21 DO YOU PERFORM TASKS ON POWER SUPPLIES	3	3	4	4	
U1455 U2-01 DO YOU USE DECIBELS TO EXPRESS AMPLIFICATION AND ATTENUATION	93	88	100	94	
U1256 U2-02 DO YOU USE LOGARITHMS TO COMPUTE OUTPUT POWER IN DECIBELS	47	44	52	47	
U1457 U2-03 DO YOU USE LOGARITHMS TO COMPUTE ATTENUATION IN DECIBELS	47	44	52	47	DB AND POWER RATIOS
U1458 U2-04 DUMMY TASK TO IDENTIFY INCUMBENTS WHO PERFORMED NO TASKS	0	0	0	0	U

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COMMUNICATIONS ELECTRONICS SYSTEMS SPECIALIST AFSC 30456.(U)
SEP 77 T J O'CONNOR, H T WELCH

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MICROCOPY RESOLUTION TEST CHART

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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 Communications Electronics Systems Specialist (AFSC 30456). The report gives a detailed listing of the technical tasks and knowledge needed to perform the jobs within the specialty or career ladder. 2, CONTINUED		

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→ This specialty has the following functions:

Analyzes data to determine spacecraft communications transponder operational readiness; calculates timing and orbital parameters for communications spacecraft acquisition and tracking; establishes a communications link with the distant earth terminal via the communications spacecraft; operates the earth terminal control console and continuously monitors the systems performance indicators; performs detailed repair and modification of earth terminal equipment; and implements earth terminal operation/maintenance activities in accordance with operational directives. →

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