

MAINTENANCE MANUAL

CQP8000

VOLUME II

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CQP8000
MAINTENANCE MANUAL
VOLUME II

APPENDIX:
GRAPHICAL SYMBOLS
COLOUR CODE

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VOLUME I

DIAGRAMS & PARTS LISTS OVERVIEWS - VHF
a EXPLODED VIEW & PART NUMBERS
b ELECTRICAL DIAGRAMS & PARTS LIST

1

DIAGRAMS & PARTS LISTS OVERVIEWS
a EXPLODED VIEW & PART NUMBERS
b ELECTRICAL DIAGRAMS & PARTS LIST

2

CONTROLLER FLEX
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SINGLE-UNIT RAPID-CHARGE BATTERY CHARGER

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8

REMOTE SPEAKER MICROPHONE

9

PUBLIC SAFETY MICROPHONE

10

SCHEMATIC AND CIRCUIT BOARD NOTES

CQP8000

GENERAL DIAGRAM NOTES

- Unless otherwise stated, resistances are in ohms ($k = 1000$), capacitances less than 1 are in microfarads, and capacitances 1 or greater are in picofarads.
- DC Voltages are measured from point indicated to chassis ground using DC Multimeter or equivalent. Transmitter measurements should be made with a 0.29 μH RF Choke in series with voltage probe to prevent circuit loading.
- Reference designations are assigned in the following manner:

UNITS SERIES = RECEIVER
100 SERIES = TRANSMITTER
200 SERIES = VCO & SYNTHESIZER
300 SERIES = MISCELLANEOUS
400 SERIES = CONTROLLER FLEX
700 SERIES = DTMF
900 SERIES = MULTICALL

- Interconnect tie point legend:

(A) B + TO MOTHER BOARD
(B) CONTROLLER FLEX B +
(5V REG) REGULATED 5 V
(D) TO DTMF CIRCUIT
(M1) METERING POINTS M1, M2, M3
(R) RECEIVE 10 V
(RS) RECEIVE 5 V
(S) TO SYNTHESIZER BOARD
(T) TRANSMIT 10 V
(TS) TRANSMIT 5 V
(T) TO CONTROLLER FLEX
(U) TO UNIVERSAL CONNECTOR
(*) TO FRONT COVER
(V1) REGULATED 8 V

VOLTAGE OVERLAY AND WAVEFORM NOTES

- Note 1. AC Voltage readings in dBm are made via a 1 pF capacitor into the 50 ohm adapter of an RF mV meter. RX readings are made with -20 dBm carrier signal into remote port. TX readings made with remote port into 50 ohms.
- Note 2. AC Voltage readings in mV are made via a high impedance RF mV meter.
- Note 3. These readings obtained by S/C Base of Q102 to ground.
- Note 4. This reading is obtained by putting a 47 ohm resistor across C31 to reduce low injection feed through.

DIAGRAMS AND PARTS LISTS OVERVIEW

CQP8000 - VHF

DESCRIPTION	NO.
SCHEMATIC AND CIRCUIT BOARD NOTES	61.754-E
2, 8 & 16 CHANNELS MECHANICAL PARTS LIST	MPL405.485
2, 8 & 16 CHANNELS EXPLODED VIEW AND PART NUMBERS	M405.485
2 & 5 WATT TRANSCEIVER COMPONENT LAYOUT	D405.074
2 & 5 WATT TRANSCEIVER ELECTRICAL DIAGRAM	D405.021
1W/2W/5W TRANSCEIVER PARTS LIST	X405.330
2W/5W TRANSCEIVER PARTS LIST	X405.029
CONTROLLER FLEX COMPONENT LAYOUT	D405.023
CONTROLLER FLEX ELECTRICAL DIAGRAM	D405.022
CONTROLLER FLEX PARTS LIST	X405.060
VOLUME POT. FLEX FREQUENCY SWITCH FLEX PTT/B + FLEX COMP	D405.043
DTMF FRONT COVER EXPLODED VIEW & PARTS LIST	M405.706
DTMF FRONT COVER STANDARD + ANI ELECTRICAL DIAGRAM & COMPONENT LAYOUT	D405.472
DTMF FRONT COVER STANDARD + ANI PARTS LIST	X405.475
DTMF FRONT COVER CONTINUOUS TONE ELECTRICAL DIAGRAM + COMPONENT LAYOUT	D405.473
DTMF FRONT COVER CONTINUOUS TONE PARTS LIST	X405.474
DTMF FRONT COVER EXPLODED VIEW & PARTS LISTS	M405.484
DTMF FRONT COVER PARTS LIST	X405.061
DTMF CIRCUIT BOARD & FLEX ASSEMBLY	D405.063
MULTICALL FRONT COVER EXPLODED VIEW & PARTS LIST	M405.483
MULTICALL FRONT COVER PARTS LIST	X405.065
MULTICALL CIRCUIT BOARD & FLEX ASSEMBLY ELECTRICAL DIAGRAM	D405.064

DIAGRAMS AND PART LISTS OVERVIEW

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MULTICALL FRONT COVER PART LIST	X405.065
MULTICALL CIRCUIT BOARD & FLEX ASSEMBLY	D405.064

CQP8000 VHF

Mechanical Parts List

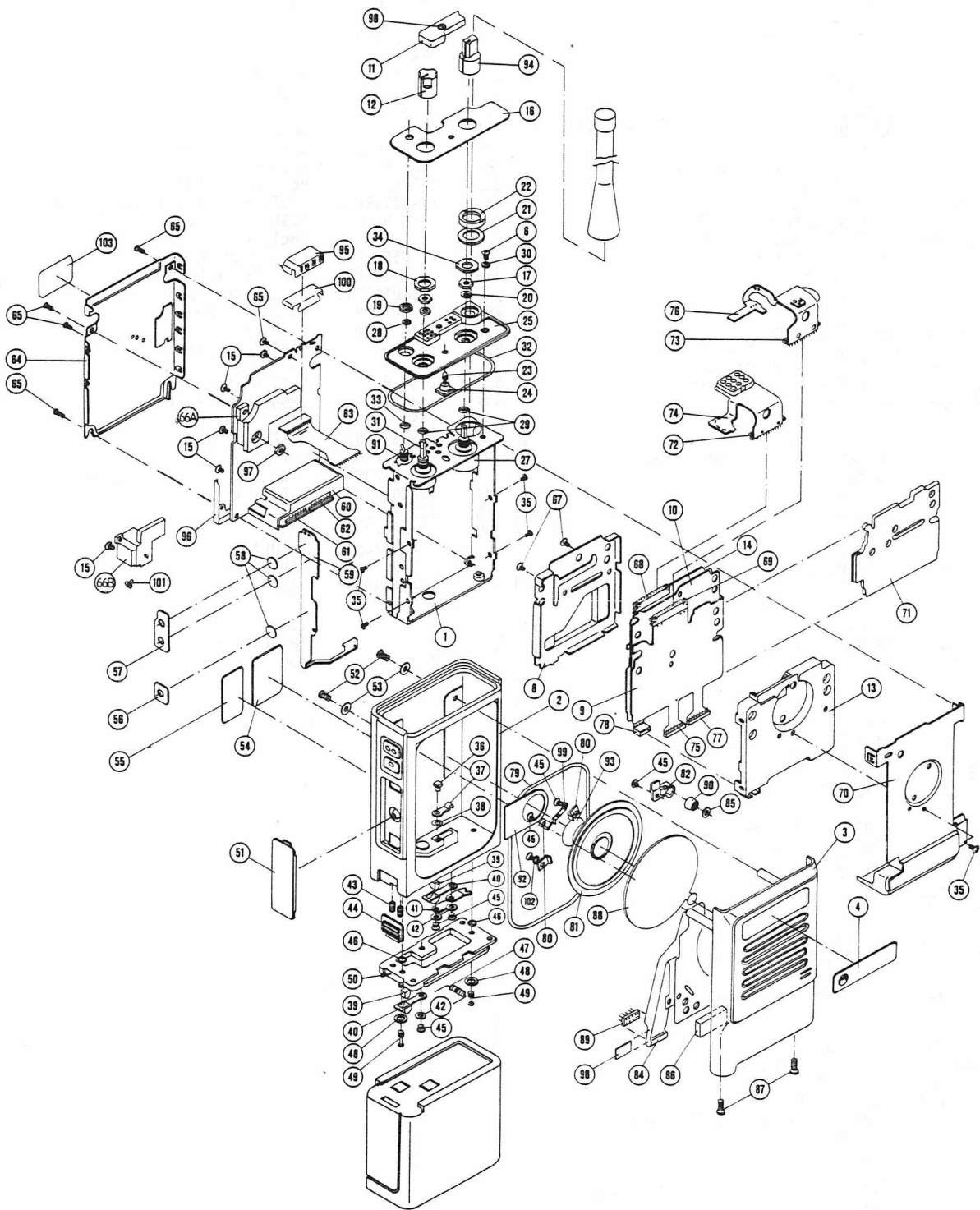
Exploded View

MECHANICAL PARTS LIST FOR CQP8000 VHF 2, 8, 16 CHANNEL

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
1	0105956M63	ASSEMBLY, Frame	1	45	0300139982	SCREW, Philips Hd. 2-56x5/32"	7
2	NHN6419A	KIT, Housing; includes items 36 thru 51	1	46	3205082E03	GASKET, O-Ring	2
3	NTN4956A	KIT, Front Cover; includes items 45, 79 thru 86	1	47	See Note	FUSE (F1)	1
4	3305260Q01	NAMEPLATE, Front	1	48	0400009761	LOCKWASHER, Split #4	2
5	.....	Not used		49	0305941K01	Screw captive; 4-40	2
6	0300136785	SCREW, Phillips; 4-40 x 3/16"	1	50	6405531P02	PLATE, Base	1
7	NTN5374A	KIT, Controller Flex; includes items 8, 9, 10, 13, 14, 67, 68, 69, 75, 77, 78	1	51	4505535P01	LEVER, PTT	1
8	0105952P34	SHIELD, Bottom	1	52	0305137Q01	SCREW, Philips Hd.; 4-40x1/2"	2
9	.....	ASSEMBLY, Controller Flex; part of item 7		53	0484345A06	WASHER, Seal	2
10	.....	SHIELD, Center; Top Carrier side; part of item 7	1	54	.....	LABEL, FCC	1
11	0102706J99	AS.BL, Dust Cover, Screw & Seal	1	55	.....	LABEL, FM	1
12	0105951N79	ASSEMBLY, Knob; VOLUME	1	56	3205231Q01	SEAL, Dome (PTT); part of item 59	1
13	1505182S01	CARRIER, Top; Controller Flex	1	57	3205196Q01	SEAL, Dome (Mon); part of item 59	1
14	.....	SHIELD, Center; Bottom Carrier Side; part of item 7	1	58	3905834K04	CONTACT, Snap Dome; part of item 59	1
15	0300136771	SCREW, Phillips; 2-56 x 3/16"	4	59	0105951N40	ASSEMBLY, B+/PTT Flex; incl. items 56, 57, 58	1
16	1305676R01/	ESCUTCHEON, 2-channel	1	60	See Note	(P/O U201)	1
	1305676R03/	ESCUTCHEON, 8-channel	1	61	See Note	PLUG (P3)	1
	1305676R06	ESCUTCHEON, 16-channel	1	62	See Note	PLUG (P4)	1
17	0205629L01	NUT, Hex	2	63	See Note	FLEX, Connector (P/O of U1)	1
18	0405534R01	WASHER, Flat; Octagonal	1	64	0102704J75	ASSEMBLY, Main Back Shield	1
19	0205163Q01	NUT, Spanner	1	65	0300136772	SCREW, Philips Hd. 2-56x5/16"	5
20	0405162Q02	WASHER, Flat; Volume Pot and Frequency Switch	1	66A	2605532P01	HEATSINK (5W radios)	1
21	0405216L04	WASHER, Flat	1	66B	0300238620	HEATSINK (1W and 2W radios)	1
22	0205765L02	NUT, Spanner	1	67	0300138620	SCREW, Philips; 2-56 x 5/16"	2
23	See Note	LED, Bicolor (CR301A, 301B)	1	68	See Note	JACK (J2)	1
24	3205157Q01	SEAL, LED	1	69	See Note	JACK (J1)	1
25	0105951N41	ASSEMBLY, Control Top	1	70	0102700J17	ASSEMBLY, Front Shield	1
26	Not Used			71	1405264Q01	INSULATOR Flex	1
27	See Note	SWITCH, Frequency (S2)	1	72	See Note	PLUG (P2)	1
28	0405162Q01	WASHER, Flat	1	73	See Note	PLUG (P1)	1
29	3205082E01	GASKET, O-Ring	2	74	0105956M66	ASSEMBLY, Volume Pot Flex	1
30	0484345A06	WASHER, Seal	1	75	See Note	JACK (J3)	1
31	See Note	SWITCH / POT, On-Off / Volume (S1/R140)	1	76	0105956M68	ASSEMBLY Frequency Flex	1
32	3205141Q02	GASKET O-Ring	1	77	See Note	JACK (J4)	1
33	3205141Q03	GASKET, O-Ring; Mode Select Switch	1	78	See Note	JACK (J5)	1
34	0405218Q01/	WASHER, Flat; Octagonal (2- & 8-channel)	1	79	3205141Q01	GASKET, O-Ring	1
35	0300140369	SCREW, Flat Hd.; 2-56 x 1/8"	4	80	4205140Q01	CLAMP, Speaker	3
36	4605945K05	CONTACT STUD, Battery	1	81	See Note	SPEAKER (LS1)	1
37	3905127Q01	CONTACT, B+	1	82	4202036J01	RETAINER, Microphone	1
38	3205082E24	GASKET, O-Ring	1	83	Not used		1
39	0705830C02	SUPPORT, Contact	2	84	See Note	ASSEMBLY, Microphone Flex (MK1); includes item 90	1
40	3905421C07	CONTACT, Battery	2	85	7505564S01	PAD, Microphone Boot	1
41	2905124Q01	LUG	2	86	7505501R03	PAD, Front Cover	1
42	0400002625	LOCKWASHER, Split #2	3	87	0300140041	SCREW, Philips; 2-56 x 1/4"	2
43	4105944K01	SPRING, Battery Latch	2	88	0105958N94	ASSEMBLY, Speaker Felt	1
44	5505536P01	LATCH	1	89	See Note	PLUG (P5)	1
				90	.....	CARTRIDGE, Microphone; part of item 84	1
				91	See Note	SWITCH (S3)	1
				92	1405299Q01	INSULATOR, Speaker	1
				93	7505501R02	PAD, Speaker	1
				94	0105950N92	ASSEMBLY, Knob	1
				95	2605494R01	SHIELD, I-F	1
				96	2605123S01	SHIELD, PC BOARD; Bottom	1

MECHANICAL PARTS LIST FOR CQP8000 VHF 2, 8, 16 CHANNEL

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
97	0200007007	NUT, Hex (for Q104 5W radios only)	1				
98	7505501R04	PAD	1				
99	3905178S01	CONTACT	1				
100	1405140S01	INSULATOR	1				
101	0300139685	SCREW, Phillips, 2-56x5/32"	1				
102	0484345A06	WASHER, Seal	1				
103	5405758R01	LABEL, Instruction	1				
		NOTE: Refer to Electrical Parts List for Parts No. and Description					



**CQP8000 VHF 2, 8 & 16 CHANNELS
EXPLODED VIEW AND PARTS NUMBERS**

M405.485/3

DATE: 11/29/1988

Pos	Code No	Description	Qt
1	0105956M63	ASSEMBLY, Frame	1
2	NHN6419A	KIT, Housing; includes items 36 thru 51	1
3	NTN4956A	KIT, Front Cover; includes items 4, 45, 79 thru 86	1
4	3305260Q06	NAMEPLATE, Front	1
5	.....	Not used	1
6	0300136785	SCREW, Phillips; 4-40 x 3/16"	1
7	NTN5374A	KIT, Controller Flex; includes items 8, 9, 10, 13, 14, 67, 68, 69, 75, 77, 78	1
8	0105952P34	SHIELD, Bottom	1
9	.....	ASSEMBLY, Controller Flex; part of item 7	1
10	.....	SHIELD, Center; Top Carrier Side; part of item 7	1
11	1505102S01	COVER, Dust	1
12	0105951N79	ASSEMBLY, Knob; VOLUME	1
13	1505182S01	CARRIER, Top; Controller Flex	1
14	.....	SHIELD, Center; Bottom Carrier Side; part of item 7	1
15	0300136771	SCREW, Phillips; 2-56 x 3/16"	4
32	3205141Q02	GASKET O-Ring	1
16	1305676R03/	ESCUTCHEON, 2-channel	1
	1305676R03/	ESCUTCHEON, 8-channel	1
	1305676R06	ESCUTCHEON, 16-channel	1
17	0205629L01	NUT, Hex	2
18	0405534R01	WASHER, Flat; Octagonal	1
19	0205163Q01	NUT, Spanner	1
20	0405162Q02	WASHER, Flat; Volume Pot and Freq. Switch	1
21	0405216L04	WASHER, Flat	1
22	0205765L02	NUT, Spanner	1
23	See Note	LED, Bicolor (CR301A, 301B)	1
24	3205157Q01	SEAL, LED	1
25	0105951N41	ASSEMBLY, Control Top	1
26	Not Used		1
27	See Note	SWITCH, Frequency (S2)	1
28	0405162Q01	WASHER, Flat	1
29	3205082E01	GASKET, O-Ring	2
30	0484345A06	WASHER, Seal	1
31	See Note	SWITCH / POT, On-Off / Volume (S1/R140)	1
33	3205141Q03	GASKET, O-Ring; Mode Select Switch	1
34	0405218Q01/	WASHER, Flat; Octagonal	1
	0405534R01	(2- & 8-channel)	1
35	0300140369	SCREW, Flat Hd.; 2-56 x 1/8"	4
36	4605945K05	CONTACT STUD, Battery	1
37	3905127Q01	CONTACT, B+	1
38	3205082E24	GASKET, O-Ring	1
39	0705830C02	SUPPORT, Contact	2
40	3905421C07	CONTACT, Battery	2
41	2905124Q01	LUG	2
42	0400002625	LOCKWASHER, Split #2	3
43	4105944K01	SPRING, Battery Latch	2
44	5505536P01	LATCH	1
45	0300139982	SCREW, Phillips Hd.; 2-56 x 5/32"	7
46	3205082E03	GASKET, O-Ring	2
47	See Note	FUSE (F1)	1
48	0400009761	LOCKWASHER, Split #4	2
49	0305941K01	Screw captive; 4-40	2
50	6405531P02	PLATE, Base	1
51	4505535P01	LEVER, PTT	1
52	0305137Q01	SCREW, Phillips Hd.; 4-40 x 1/2"	2
53	0484345A06	WASHER, Seal	2
54	.....	LABEL, FCC	1
55	.....	LABEL, FM	1
56	3205231Q01	SEAL, Dome (PTT); part of item 59	1
57	3205196Q01	SEAL, Dome (Mon); part of item 59	1
58	3905834K04	CONTACT, Snap Dome; part of item 59	1
59	0105951N40	ASSEMBLY, B+/PTT Flex; includes items 56, 57, 58 (P/O U201)	1
60	See Note	PLUG (P3)	1
61	See Note	PLUG (P4)	1
62	See Note	FLEX, Connector (P/O of U1)	1
63	See Note	ASSEMBLY, Main Back Shield	1
64	0105953N75	SCREW, Phillips Hd.; 2-56 x 5/16"	5
65	0300136772	HEATSINK (5W radios)	1
66A	2605532P01	HEATSINK (1W and 2W radios)	1
66B	0300238620		1

Pos	Code No	Description	Qt
67	0300138620	SCREW, Phillips; 2-56 x 5/16"	2
68	See Note	JACK (J2)	1
69	See Note	JACK (J1)	1
70	0102700J17	ASSEMBLY, Front Shield	1
71	1405264Q01	INSULATOR Flex	1
72	See Note	PLUG (P2)	1
73	See Note	PLUG (P1)	1
74	0105956M66	ASSEMBLY, Volume Pot Flex	1
75	See Note	JACK (J3)	1
76	0105956M68	ASSEMBLY Frequency Flex	1
77	See Note	JACK (J4)	1
78	See Note	JACK (J5)	1
79	3205141Q01	GASKET, O-Ring	1
80	4205140Q01	CLAMP, Speaker	3
81	See Note	SPEAKER (LS1)	1
82	4205136S01	RETAINER, Microphone	1
83	1405299L01	BOOT, Microphone; part of item 98	1
84	See Note	ASSEMBLY, Microphone Flex (MK1); includes item 90	1
85	7505564S01	PAD, Microphone Boot	1
86	7505501R03	PAD, Front Cover	1
87	0300140041	SCREW, Phillips; 2-56 x 1/4"	2
88	0105958N94	ASSEMBLY, Speaker Felt	1
89	See Note	PLUG (P5)	1
90	.....	CARTRIDGE, Microphone; part of item 84	1
91	See Note	SWITCH (S3)	1
92	1405299Q01	INSULATOR, Speaker	1
93	7505501R02	PAD, Speaker	1
94	0105950N92	ASSEMBLY, Knob	1
95	2605120S01	SHIELD, I-F	1
96	2605123S01	SHIELD, PC BOARD; Bottom	1
97	0200007007	NUT, Hex (for Q104 5W radios only)	1
98	0305103S01	SCREW, Captive	1
99	3905178S01	CONTACT	1
100	1405140S01	INSULATOR	1
101	0300139685	SCREW, Phillips, 2-56x5/32"	1
102	0484345A06	WASHER, Seal	1

NOTE:
Refer to Electrical Parts List
for Parts Number and Description

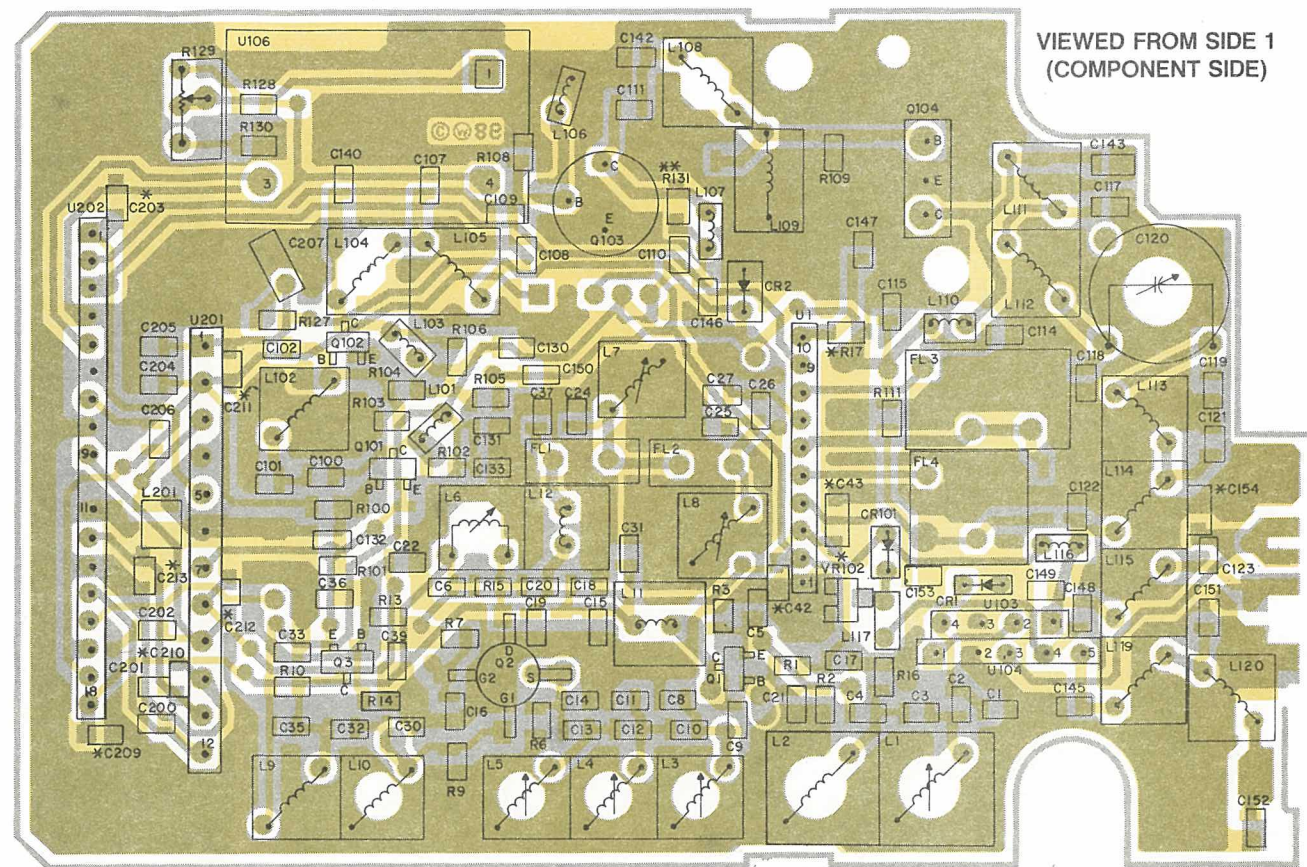
TRANSCEIVER VHF

Component Layout

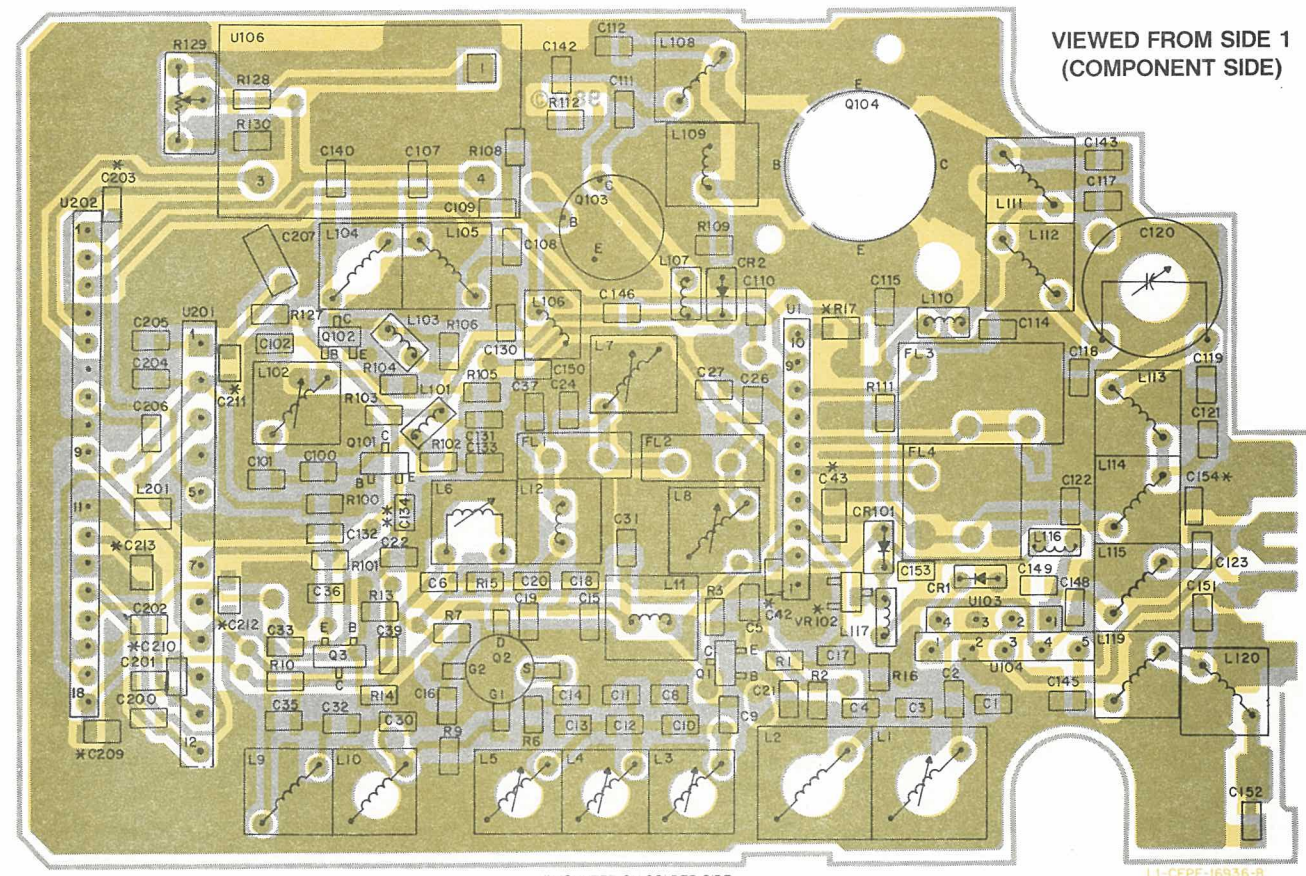
Electrical Diagram

Parts List

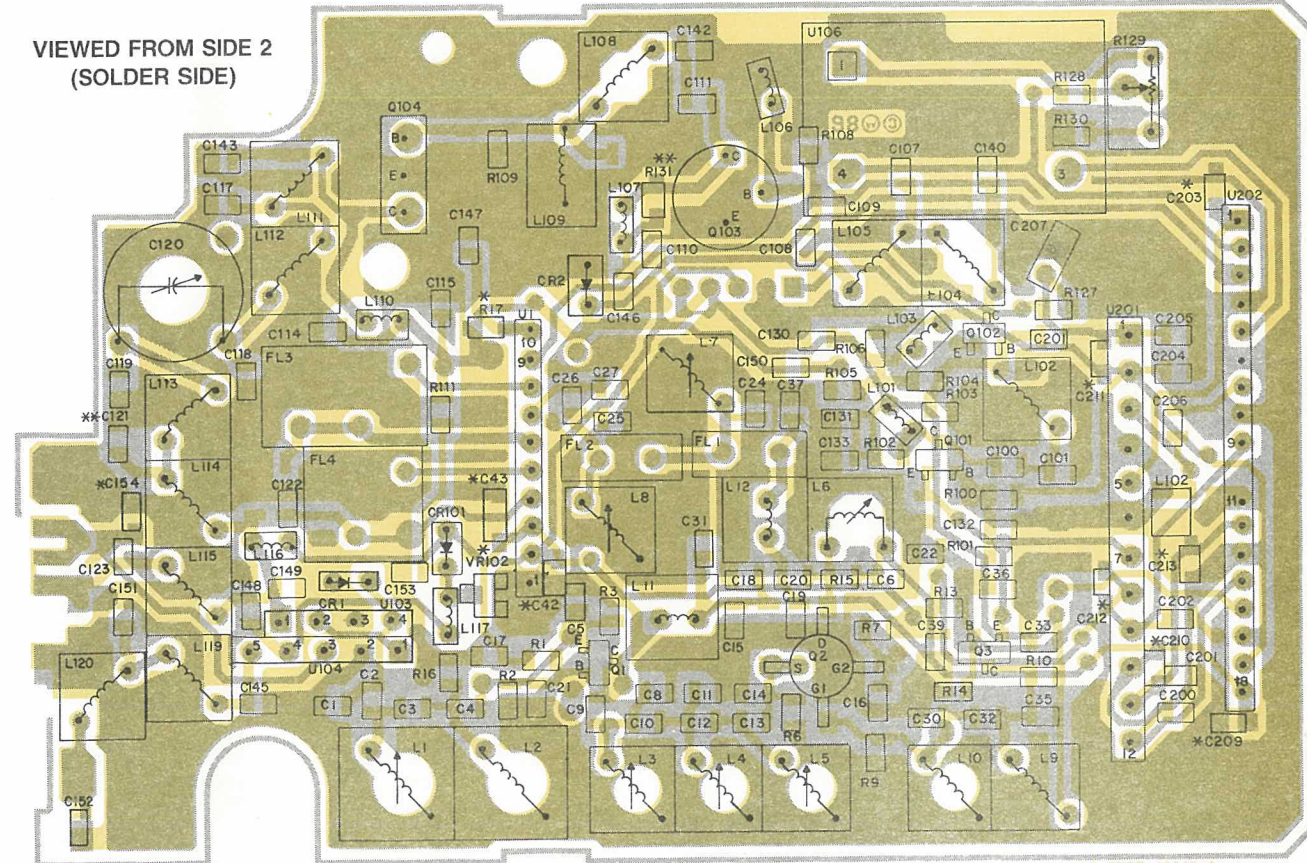
2 WATT



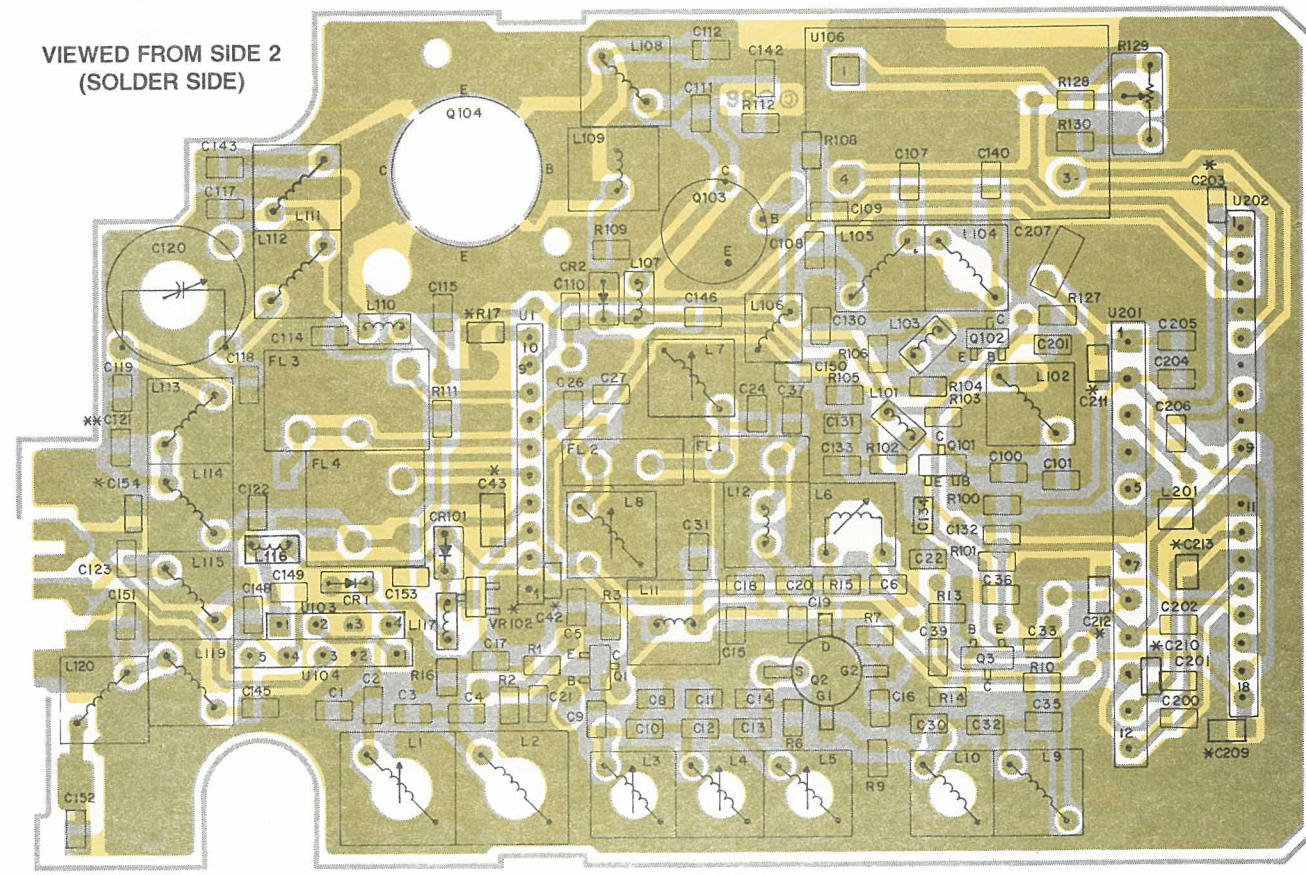
5 WATT



VIEWED FROM SIDE 2
(SOLDER SIDE)



VIEWED FROM SIDE 2
(SOLDER SIDE)



CQP8000 VHF TRANSCEIVER
COMPONENT LAYOUT

D405.074/2

DOC. ISSUE 06/19/89

PARTS LIST FOR CQP8000 VHF 1/2 WATT & 5 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	NUD6971B	136-150.8 MHz, 5W, 20/25 kHz	L	C020	2113740A27	CAP 8.2 \pm 0.25pF (H)	1
	NUD6972B	146-162 MHz, 5W, 20/25 kHz	M	C021	2113740A75	CAP 680pF \pm 5%; 50V (L,M)	1
	NUD6973B	157-174 MHz, 5W, 20/25 kHz	H	C021	2113741A17	CAP 680pF \pm 10% (H)	1
	NUD6961B	136-150.8 MHz, 1W/2W 20/25kHz	L	C022	2113740A43	CAP 8200pF \pm 5%; 50V	1
	NUD6962B	146-162 MHz, 1W/2W, 20/25 kHz	M	C024	2160523A35	CAP 18pF \pm 5% 50V	1
	NUD6963B	157-174 MHz, 1W/2W, 20/25 kHz	H	C026	2113740A40	CAP 30pF \pm 5% 50V	1
	NUD6901B	136-150.8 MHz, 5W, 12.5 kHz	L	C027	2113740A40	CAP 30pF \pm 5% 50V	1
	NUD6902B	146-162 MHz, 5W, 12.5 kHz	M	C030	2113740A18	CAP 4.3 \pm 0.25pF (L)	1
	NUD6903B	157-174 MHz, 5W, 12.5 kHz	H	C030	2113740A21	CAP 5.6 \pm 0.25pF (M)	1
	NUD6891B	136-150.8 MHz, 1W/2W, 12.5 kHz	L	C030	2113740A27	CAP 8.2 \pm 0.25pF (H)	1
	NUD6892B	146-162 MHz, 1W/2W, 12.5 kHz	M	C031	2113740A21	CAP 680pF \pm 5%; 50V (L,M)	1
	NUD6893B	157-174 MHz, 1W/2W, 12.5 kHz	H	C031	2113741A17	CAP 680pF \pm 10% (H)	1
C001	2160520S09	CAP 22pF \pm 5% 50V (L)	1	C032	2113740A05	CAP 1.2 \pm 0.25pF	1
C001	2113740A42	CAP 36pF \pm 5% 50V (M)	1	C033	2113740A75	CAP 680pF \pm 5%; 50V (L,M)	1
C001	2113740A23	CAP 6.2 \pm 0.25pF (H, 12.5kHz)	1	C033	2113741A17	CAP 680pF \pm 10% (H)	1
C001	2113740A39	CAP 27pF \pm 5% 50V (H, 20/25kHz)	1	C035	2113740A21	CAP 5.6 \pm 0.25pF (L)	1
C002	2113740A32	CAP 13pF \pm 5% 50V (L)	1	C035	2113740A23	CAP 6.2 \pm 0.25pF (M)	1
C002	2113740A37	CAP 22pF \pm 5% 50V (M)	1	C035	2113740A27	CAP 8.2 \pm 0.25pF (H)	1
C002	2113740A21	CAP 5.6 \pm 0.25pF (H, 12.5kHz)	1	C036	2113740A75	CAP 680pF \pm 5%; 50V (L,M)	1
C002	2113740A27	CAP 8.2 \pm 0.25pF (H, 20/25kHz)	1	C036	2113741A17	CAP 680pF \pm 10% (H)	1
C003	2113740A15	CAP 3.3 \pm 0.25pF (L)	1	C037	2160520S01	CAP 10pF \pm 0.25%; 50V (L)	1
C003	2113740A19	CAP 4.7 \pm 0.25pF (M)	1	C037	2160523F15	CAP 10pF \pm 5%; 50V (M,H)	1
C003	2113740A11	CAP 2.2 \pm 0.25pF (H, 12.5kHz)	1	C039	2113741A39	CAP 8200pF \pm 5%; 50V	1
C003	2113740A13	CAP 2.7 \pm 0.25pF (H, 20/25kHz)	1	C042	2113740A67	CAP 330pF \pm 5%; 50V	1
C004	2113740A34	CAP 16pF \pm 5% 50V (L),(H,20/25kHz)	1	C043	2113741B49	CAP 0.015 μ F \pm 10%	1
C004	2113740A35	CAP 18pF \pm 5% 50V (M)	1	C100	2113740A12	CAP 2.4 \pm 0.25pF (L,2W)	1
C004	2113740A32	CAP 13pF \pm 5% 50V (H, 12.5kHz)	1	C100	2113740A11	CAP 2.2 \pm 0.25pF (L,5W)	1
C005	2113740A36	CAP 20pF \pm 5% 50V (L)	1	C100	2113740A10	CAP 2 \pm 0.25pF (M),(H,2W)	1
C005	2113740A33	CAP 15pF \pm 5% 50V (M)	1	C100	2113740A08	CAP 1.6 \pm 0.25pF (H,5W)	1
C005	2113740A34	CAP 16pF \pm 5% 50V (H)	1	C101	2113740A36	CAP 20pF \pm 5%; 50V (M),(L,2W)	1
C006	2113741A43	CAP 8200pF \pm 5% 50V	1	C101	2113740A38	CAP 24pF \pm 5%; 50V (L,5W)	1
C008	2113740A23	CAP 6.2 \pm 0.25pF	1	C101	2113740A35	CAP 18pF \pm 5%; 50V (H,2W)	1
C009	2113740A21	CAP 680pF \pm 5% 50V (L)(M)	1	C101	2113740A33	CAP 15pF \pm 5%; 50V (H,5W)	1
C009	2113741A17	CAP 680pF \pm 10% (H)	1	C102	2113740A41	CAP 33pF \pm 5%; 50V (L,2W)	1
C010	2113740A04	CAP 1.1 \pm 0.25pF (L)	1	C102	2113740A38	CAP 24pF \pm 5%; 50V (L,5W)(M,5W)	1
C010	2113740A03	CAP 1.0 \pm 0.25pF (M,H)	1	C102	2113740A37	CAP 22pF \pm 5%; 50V (H,2W)	1
C011	2113740A25	CAP 7.5 \pm 0.25pF (L)	1	C102	2113740A40	CAP 30pF \pm 5%; 50V (M,2W)(H,5W)	1
C011	2113740A23	CAP 6.2 \pm 0.25pF (M)	1	C107	2113740A49	CAP 56pF \pm 5%; 50V (H)(L,2W)	1
C011	2113740A24	CAP 6.8 \pm 0.25pF (H)	1	C107	2113740A52	CAP 75pF \pm 5%; 50V (L,5W)	1
C012	2113740A04	CAP 1.1 \pm 0.25pF (L)	1	C107	2113740A48	CAP 51pF \pm 5%; 50V (M,2W)	1
C012	2113740A03	CAP 1.0 \pm 0.25pF (M,H)	1	C107	2113740A51	CAP 68pF \pm 5%; 50V (M,5W)	1
C013	2113740A32	CAP 13pF \pm 5%; 50V (L,H)	1	C108	2113740A67	CAP 330pF \pm 5%; 50V	1
C013	2113740A31	CAP 12pF \pm 5%; 50V (M)	1	C109	2113740A43	CAP 39pF \pm 5%; 50V (L,2W)	1
C014	2113740A32	CAP 13pF \pm 5%; 50V (L)	1	C109	2113740A40	CAP 30pF \pm 5%; 50V (L,5W)(M,5W)	1
C014	2113740A29	CAP 10pF \pm 5%; 50V (M)	1	C109	2113740A42	CAP 36pF \pm 5%; 50V (M,2W)	1
C014	2160520S02	CAP 11pF \pm 5%; 50V (H)	1	C109	2113740A41	CAP 33pF \pm 5%; 50V (H)	1
C015	2113741A43	CAP 8200pF \pm 5%; 50V	1	C110	2160521G37	CAP 0.1 μ F +80-20%	1
C016	2113740A75	CAP 680pF \pm 5%; 50V (L,M)	1	C111	2113740A46	CAP 47pF \pm 5%; 50V(L,2W),(M,2W)	1
C016	2113741A17	CAP 680 \pm 10% (H)	1	C111	2113740A48	CAP 51pF \pm 5%; 50V (L,5W)	1
C017	2113740A75	CAP 680pF \pm 5%; 50V (L,M)	1	C111	2113740A44	CAP 43pF \pm 5%; 50V (M,5W)	1
C017	2113741A17	CAP 680 \pm 10% (H)	1	C111	2113740A43	CAP 39pF \pm 5%; 50V (H)	1
C018	2113741A43	CAP 8200pF \pm 5%; 50V	1	C112	2113740A54	CAP 91pF \pm 5%; 50V	1
C019	2113740A43	CAP 39pF \pm 5% 50V (L)	1			(5W MODELS ONLY)	
C019	2160523F22	CAP 39pF \pm 5% 50V (M)	1	C114	2113740A67	CAP 330pF \pm 5%; 50V (L),(M),(H,2W)	1
C019	2160523F44	CAP 43pF \pm 5% 50V (H)	1	C114	2160521G37	CAP 0.1 μ F +80-20% (H,5W)	1
C020	2113740A19	CAP 4.7 \pm 0.25pF (L)	1	C115	2160521G37	CAP 0.1 μ F +80-20% (L),(M),(H,2W)	1
C020	2113740A23	CAP 6.2 \pm 0.25pF (M)	1	C115	2113740A67	CAP 330pF \pm 5% 50V (H,5W)	1

PARTS LIST FOR CQP8000 VHF 1/2 WATT & 5 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
C117	2113740A51	CAP 68pF ±5%; 50V (L,2W)	1	C146	2113740A67	CAP 330pF ±5% 50V (2W MODELS),(H,5W)	1
C117	2113740A55	CAP 100pF ±5%; 50V (L,5W)	1	C146	2160521G37	CAP 0.1μF +80-20% (M,5W)	1
C117	2113740A49	CAP 56pF ±5%; 50V (M,2W)	1	C147	2113740A67	CAP 330pF ±5%; 50V (2W MODELS ONLY)	1
C117	2113740A53	CAP 82pF ±5%; 50V (M,5W)	1	C148	2113740A67	CAP 330pF ±5%; 50V	1
C117	2113740A46	CAP 47pF ±5%; 50V (H,2W)	1	C149	2113740A35	CAP 18pF ±5%; 50V (M)(L,2W)	1
C117	2113740A52	CAP 75pF ±5%; 50V (H,5W)	1	C149	2113740A37	CAP 22pF ±5%; 50V (L,5W)	1
C118	2113740A37	CAP 22pF ±5%; 50V (L,2W)	1	C149	2113740A32	CAP 13pF ±5%; 50V (H,2W)	1
C118	2113740A35	CAP 18pF ±5%; 50V (L,5W)	1	C149	2113740A33	CAP 15pF ±5%; 50V (H,5W)	1
C118	2113740A36	CAP 20pF ±5%; 50V (M,2W)	1	C150	2113740A67	CAP 330pF ±5%; 50V	1
C118	2113740A31	CAP 12pF ±5%; 50V (M,5W)	1	C151	2113740A50	CAP 62pF ±5%; 50V (L)	1
C118	2113740A32	CAP 13pF ±5%; 50V (H,5W)	1	C151	2113740A43	CAP 39pF ±5%; 50V (M)	1
C118	2113740A33	CAP 15pF ±5%; 50V (H,2W)	1	C151	2113740A46	CAP 47pF ±5%; 50V (H)	1
C119	2113740A38	CAP 24pF ±5%; 50V (L,2W)	1	C152	2113740A39	CAP 27pF ±5%; 50V (M,2W)	1
C119	2113740A33	CAP 15pF ±5%; 50V (L,5W)	1	C152	2113740A37	CAP 22pF ±5%; 50V (L,5W)	1
C119	2113740A37	CAP 22pF ±5%; 50V (M,2W)	1	C152	2113740A35	CAP 18pF ±5%; 50V (M)	1
C119	2113740A31	CAP 12pF ±5%; 50V (M,5W)	1	C152	2113740A33	CAP 15pF ±5%; 50V (H)	1
C119	2113740A36	CAP 20pF ±5%; 50V (H,2W)	1	C153	2113740A67	CAP 330pF ±5%; 50V	1
C119	2113740A27	CAP 8.2pF ±5%; 50V (H,5W)	1	C154	2113741B49	CAP 0.015μF ±10%	1
C120	2005568P01	CAP TRIMMER, 5.5-65pF	1	C200	2113741A25	CAP 1500pF ±5%; 50V	1
C121	2113740A43	CAP 39pF ±5%; 50V (M)	1	C201	2113741A25	CAP 1500pF ±5%; 50V	1
C121	2113740A42	CAP 36pF ±5%; 50V (H)	1	C202	2113741A25	CAP 1500pF ±5%; 50V	1
C122	2113740A36	CAP 20pF ±5%; 50V (L)	1	C203	2113740A67	CAP 330pF ±5%; 50V	1
C122	2113740A35	CAP 18pF ±5%; 50V (M,2W)	1	C204	2160521G37	CAP 0.1μF +80-20%	1
C122	2113740A33	CAP 15pF ±5%; 50V(M,5W),(H,5W)	1	C205	2113740A67	CAP 330pF ±5%; 50V	1
C122	2113740A32	CAP 13pF ±5%; 50V (H,2W)	1	C206	2113740A67	CAP 330pF ±5%; 50V	1
C123	2113740A36	CAP 20pF ±5%; 50V (M)(L,2W)	1	C207	2305458G12	CAP 33μF 16V	1
C123	2113740A35	CAP 18pF ±5%; 50V (H)(L,5W)	1	C209	2113741A21	CAP 1000pF ±5%; 50V	1
C130	2113740A67	CAP 330pF ±5%; 50V (L,2W),(M,2W),(H)	1	C210	2113741A25	CAP 1500pF ±5%; 50V	1
C130	2113741A33	CAP 3300pF ±5%; 50V (L,5W),(M,5W)	1	C211	2113741A25	CAP 1500pF ±5%; 50V	1
C131	2113740A67	CAP 330pF ±5%; 50V	1	C212	2113741A25	CAP 1500pF ±5%; 50V	1
C132	2113740A67	CAP 330pF ±5%; 50V (L,2W),(M,2W),(H)	1	C213	2113741A25	CAP 1500pF ±5%; 50V	1
C132	2113740A75	CAP 680pF ±5%; 50V (L,5W),(M,5W)	1	CR01	4883654H08	DIO SILICON	1
C133	2160521G37	CAP 0.1μF +80-20%	1	CR02	4805490G02	DIO SILICON	1
C134	2113740A18	CAP 4.3 ±0.25pF (H,5W MODELS ONLY)	1	CR10	4805454H01	DIO SILICON	1
C140	2113740A18	CAP 4.3 ±0.25pF (L,2W)	1	F001	6505214E02	FUSE AXIAL 5-AMP	1
C140	2113740A19	CAP 4.7 ±0.25pF (L,5W)	1	FL01	4805245J20	CRYSTAL FILTER 53.55MHz	1
C140	2113740A14	CAP 3pF ±5%; 50V (M,2W)	1	FL01	4805245J19	CRYSTAL FILTER 53.55MHz (12.5kHz CHANNEL SPACING ONLY)	1
C140	2113740A13	CAP 3.3 ±0.25pF (H),(M,5W)	1	FL02	4805245J20	CRYSTAL FILTER 53.55MHz	1
C142	2113740A42	CAP 36pF ±5%; 50V (L,2W)	1	FL02	4805245J19	CRYSTAL FILTER 53.55MHz (12.5kHz CHANNEL SPACING ONLY)	1
C142	2113740A49	CAP 56pF ±5%; 50V (L,5W)	1	FL03	9105726Q03	CERAMIC FILTER 450kHz	1
C142	2113740A38	CAP 24pF ±5%; 50V (M,2W)	1	FL04	9105726Q02	CERAMIC FILTER 450kHz	1
C142	2113740A44	CAP 43pF ±5%; 50V (M,5W)	1	FL04	9105726Q04	CERAMIC FILTER 450kHz (12.5kHz CHANNEL SPACING ONLY)	1
C142	2113740A35	CAP 18pF ±5%; 50V (H,2W)	1	L001	2405669G13	COIL RF 5-1/2 TURNS SPACEWOUND (L)(H,12.5kHz)	1
C142	2113740A39	CAP 27pF ±5%; 50V (H,5W)	1	L001	2405669G12	COIL RF 4-1/2 TURNS SPACEWOUND (M)(H,20/25kHz)	1
C143	2113740A33	CAP 15pF ±5%; 50V (L,2W)	1	L002	2405669G31	COIL RF 5-1/2 TURNS SPACEWOUND (L)(H,12.5kHz)	1
C143	2113740A37	CAP 22pF ±5%; 50V (L,5W)	1	L002	2456669G30	COIL RF 4-1/2 TURNS SPACEWOUND (M)(H,20/25kHz)	1
C143	2113740A31	CAP 12pF ±5%; 50V (M,2W)	1	L003	2405523P29	COIL RF 9-1/2 TURNS CLOSEWOUND WITH CORE (L)	1
C143	2113740A35	CAP 18pF ±5%; 50V (M,5W)	1				
C143	2113740A34	CAP 16pF ±5%; 50V (H,5W)	1				
C143	2113740A29	CAP 10pF ±5%; 50V (H,2W)	1				
C145	2113740A36	CAP 20pF ±5%; 50V (L)	1				
C145	2113740A34	CAP 16pF ±5%; 50V (M)	1				
C145	2113740A32	CAP 13pF ±5%; 50V (H)	1				

PARTS LIST FOR CQP8000 VHF 1/2 WATT & 5 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
L003	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND WITH CORE (M)(H)	1	L114	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L004	2405523P29	COIL RF 9-1/2 TURNS CLOSEWOUND WITH CORE (L)	1	L115	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (L) (M)	1
L004	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND WITH CORE (M)(H)	1	L115	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L005	2405523P29	COIL RF 9-1/2 TURNS CLOSEWOUND WITH CORE (L)	1	L116	2482723H38	COIL RF 1.2μH CHOKE	1
L005	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND WITH CORE (M)(H)	1	L117	2482723H38	COIL RF 1.2μH CHOKE	1
L006	2405063H13	COIL RF TUNABLE 1.2μH CHOKE	1	L119	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (L) (M)	1
L007	2405063H05	COIL RF TUNABLE 0.4μF CHOKE	1	L119	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L008	2405063H05	COIL RF TUNABLE 0.4μF CHOKE	1	L120	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (L) (M)	1
L009	2405523P28	COIL RF 6-1/2 TURNS SPACEWOUND (L)	1	L120	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L009	2405523P10	COIL RF 5-1/2 TURNS SPACEWOUND (M)	1	L201	2405452C70	COIL RF 190μH CHOKE	1
L009	2405523P09	COIL RF 4-1/2 TURNS SPACEWOUND (H)	1	LS01	5005155Q03	TRANSDUCER	1
L010	2405523P10	COIL RF 5-1/2 TURNS SPACEWOUND (L)	1	MK01	0105956P37	MICROPHONE ASSEMBLY:	1
L010	2405523P09	COIL RF 4-1/2 TURNS SPACEWOUND (M)	1	P001	2805572P01	CONNECTOR FLEX TOP 13-PIN	1
L010	2405523P08	COIL RF 3-1/2 TURNS SPACEWOUND (H)	1	P002	2805572P01	CONNECTOR FLEX TOP 13-PIN	1
L011	2482723H38	COIL RF 1.2μH CHOKE	1	P003	2805144Q01	CONNECTOR SYNTHESIZER 7-PIN	1
L012	2505129Q02	COIL RF 1.2μH CHOKE PRECISION	1	P004	2805572P01	CONNECTOR SYNTHESIZER 7-PIN	1
L101	2482723H28	COIL RF 0.29μH CHOKE (2W)(H,5W)	1	P005	2805433R02	CONNECTOR FRONT COVER	1
L101	0105951P49	ASSY. 0.29μH CHOKE (L,5W)(M,5W)	1	P006	2805247Q01	CONNECTOR I-F	1
L102	2405523P28	COIL RF 6-1/2 TURNS SPACEWOUND	1	P007	-----	NOT FIELD REPLACEABLE, ORDER TOP CONTROL PANEL ASM. 0105951N41	
L103	2482723H38	COIL RF 1.2μH CHOKE	1	Q001	4805218N08	TSTR NPN	1
L104	2405523P32	COIL RF 9-1/2 TURNS CLOSEWOUND	1	Q002	4805452G08	TSTR DUAL GATE MOSFET TYPE M52G08	1
L105	2405523P07	COIL RF 2-1/2 TURNS SPACEWOUND	1	Q003	4805218N09	TSTR NPN	1
L106	2405913C01	COIL RF 3-TURN FERRITE BEAD	1	Q101	4805218N09	TSTR NPN	1
L107	0105951P49	COIL RF 0.29μH CHOKE (2W MODELS)	1	Q102	4805218N09	TSTR NPN	1
L107	0105951P48	COIL RF 0.85μH CHOKE (5W MODELS)	1	Q103	4805474G37	TSTR NPN TYPE M74G37	1
L108	2405523P07	COIL RF 2-1/2 TURNS SPACEWOUND (2W MODELS)	1	Q104	4805452G06	TSTR NPN TYPE M52G06 (2W MODELS)	1
L108	2405559P09	COIL RF 1-1/2 TURNS AIRWOUND (5W MODELS)	1	Q104	4805474G33	TSTR NPN TYPE M74G33 (5W MODELS)	1
L109	2405913C01	COIL RF 3-TURN FERRITE BEAD	1	R001	0660076A67	RES 5.6K	1
L110	0105951P48	COIL RF 0.85μH CHOKE	1	R002	0660076A87	RES 38K	1
L111	2405559P07	COIL RF 2-1/2 TURNS AIRWOUND (2W MODELS)	1	R003	0660076A59	RES 2.7K	1
L111	2405559P08	COIL RF 1-1/2 TURNS AIRWOUND (5W MODELS)	1	R006	0660076A49	RES 1K	1
L112	2405559P11	COIL RF 4-1/2 TURNS AIRWOUND (L)(M)(H,2W)	1	R007	0660076A73	RES 10K	1
L112	2405559P21	COIL RF 4-1/2 TURNS AIRWOUND (H,5W)	1	R009	0660076A45	RES 680 ±5% 1/10W	1
L113	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (L) (M)	1	R010	0660076A56	RES 2K	1
L113	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1	R013	0660076A71	RES 8.2K	1
L114	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M) (H,2W)	1	R014	0660076A84	RES 30K	1
				R015	0660076A71	RES 8.2K	1
				R016	0660076A36	RES 300 ±5% 1/10W (L)20/25kHz	1
				R016	0660076A31	RES 180 ±5% 1/10W (M)20/25kHz	1
				R016	0660076A43	RES 560 ±5% 1/10W (H)20/25kHz	1
				R017	0660076A25	RES 100 ±5% 1/10W	1
				R100	0660076A71	RES 8.2K	1
				R101	0660076A84	RES 30K	1
				R102	0660076A65	RES 4.7K (L) (M) (H,2W)	1
				R102	0660076A59	RES 2.7K (H,5W)	1
				R103	0660076A69	RES 6.8K (L) (M,5W)(H,5W)	1
				R103	0660076A68	RES 6.2K (M,2W) (H,2W)	1

PARTS LIST FOR CQP8000 VHF 1/2 WATT & 5 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
R104	0660076A80	RES 20K (L,2W)	1		2605524P03	CAN FOR L111 THRU L115,	1
R104	0660076A84	RES 30K (M,2W)	1			L119,L120 AND L108 (5W MODELS)	
R104	0660076A79	RES 18K (H, 2W)	1		2605532P01	HEAT SINK FOR Q104 (5W MODELS)	1
R104	0660076A82	RES 24K (5W)	1		2605578P01	HEAT SINK FOR Q104 (2W MODELS)	1
R105	0660076A25	RES 100 ±5% 1/10W (L) (M, 2W)	1		2605696R01	SHIELD ANTENNA SWITCH	1
R105	0660076A26	RES 110 ±5% 1/10W (M,5W)	1		2605820D07	CAN FOR L001, L002	1
R105	0660076A32	RES 200 ±5% 1/10W (H)	1		2683379H01	HEAT SINK FOR Q103	1
R106	0660076A75	RES 12K (L)	1		3905130N01	CONTACT STRIP	1
R106	0660076A67	RES 5.6K (M, 2W)(H,2W)	1		3905509R02	CONTACT	1
R106	0660076A73	RES 10K (M, 5W)	1		7505295B07	PAD FOR FL001, FL002	1
R106	0660076A65	RES 4.7K (H, 5W)	1		7505695R01	CUSHION FOR U106	1
R108	0660076A17	RES 47 ±5% 1/10W (2W)	1				
R108	0660076A25	RES 100 ±5% 1/10W (L,5W)	1				
R108	0660076A23	RES 82 ±5% 1/10W (M,5W)(H,5W)	1				
R109	0660076A17	RES 47 ±5% 1/10W	1				
		(L,2W)(M,2W)(H)					
R109	0660076A07	RES 18 ±5% 1/10W (L,5W)	1				
R109	0660076A09	RES 22 ±5% 1/10W (M,5W)	1				
R111	0660076A46	RES 750 ±5% 1/10W	1				
R112	0660076A29	RES 150 ±5% 1/10W (5W MODELS)	1				
R112	-----	NOT USED ON 2W MODELS					
R127	0660076A29	RES 150 ±5% 1/10W	1				
R128	0660076A71	RES 8.2K	1				
R129	1805559S02	RES POT. 50K	1				
R130	0660076A87	RES 39K	1				
R131	0660076A36	RES 300 ±5% 1/10W	1				
		(L, 2W MODELS ONLY)					
R140	1805100Q03	RES POT. 5K	1				
S001	-----	SWITCH ON/OFF PART OF R140	1				
S002	4005148Q02	SWITCH 2- & 8-CHANNEL RADIOS	1				
S002	4005265Q02	SWITCH 16-CHANNEL RADIOS	1				
S003	4005101Q01	SWITCH TOGGLE SPDT	1				
U001	5102001J06	I-F	1				
U001	5102001J07	I-F	1				
		(12.5kHz CHANNEL SPACING ONLY)					
U103	5105822P51	ANTENNA SWITCH	1				
U104	5105822P64	ANTENNA SELECTOR (2W)	1				
U104	5105729E93	ANTENNA SELECTOR (5W)	1				
U106	5105729E52	REF OSCILLATOR	1				
U106	5105729E72	REF OSC.	1				
		(12.5kHz CHAN. SPAC. ONLY)					
U201	5105822P61	VCO (L)	1				
U201	5105822P60	VCO (M)	1				
U201	5105822P59	VCO (H)	1				
U202	5102001J03	SYNTHESIZER	1				
VR102	4805129M61	DIO ZENER 18V	1				
		NON REFERENCED ITEMS					
	0200007007	NUT HEX 8-32 X 1/4" X 3/32"	1				
		(FOR Q104 5W MODELS)					
	0300136771	SCREW PHILLIPS 2-56 X 3/16"	1				
		(FOR Q104 HEATSINK)					
	0705196A04	BOOT FOR FL1 AND FL2	1				
	0705766R01	SUPPORT RUBBER	1				
	1400861196	INSULATOR FOR Q103	1				
	1405496R01	INSULATOR (IF)	1				
	2605116S01	SHIELD P.A. MODULE	1				
	2605494R01	SHIELD I-F MODULE	1				
	2605524P01	CAN FOR L011, L012	1				

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Pos	Code No	Description	Qt	Pos	Code No	Description	Qt
	NUD6972A	146-162 MHz, 5W, 20/25 kHz	M	C109	2160520B12	CAP 30pF ±5%; 50V (M,5W)	1
	NUD6973A	157-174 MHz, 5W, 20/25 kHz	H	C109	2160520B13	CAP 33pF ±5%; 50V (H)	1
	NUD6962A	146-162 MHz, 1W/2W, 20/25 kHz	M	C110	2160521G37	CAP 0.1μF ±10-20%	1
	NUD6963A	157-174 MHz, 1W/2W, 20/25 kHz	M	C111	2160520B17	CAP 47pF ±5%; 50V (M,2W)	1
	NUD6902A	146-162 MHz, 5W, 12.5 kHz	H	C111	2160520B16	CAP 39pF ±5%; 50V (M,5W), (H,2W)	1
	NUD6903A	157-174 MHz, 5W, 12.5 kHz	H	C111	2160520B15	CAP 39pF ±5%; 50V (H,5W)	1
	NUD6892A	146-162 MHz, 1W/2W, 12.5 kHz	M	C112	2160520B24	CAP 91pF ±5%; 50V (5W MODELS ONLY)	1
	NUD6893A	157-174 MHz, 1W/2W, 12.5 kHz	H	C114	2160520C13	CAP 330pF ±5%; 50V (M), (H,2W)	1
		CAPACITOR, Fixed:pF ±5% 50V unless stated		C114	2160521G37	CAP 0.1μF ±10-20%	1
C001	2160520B14	CAP 36pF ±0.25pF (M)	1	C115	2160521G37	CAP 0.1μF ±10-20%	1
C001	2160520B11	CAP 27pF ±5% 50V (H)	1	C115	2160520C13	CAP 330pF ±5% 50V (H,5W)	1
C002	2160520B09	CAP 22pF ±5% 50V (M)	1	C117	2160520B19	CAP 56pF ±5%; 50V (M,2W)	1
C002	2160520A23	CAP 8.2 ±0.25pF (H)	1	C117	2160520B23	CAP 82pF ±5%; 50V (M,5W)	1
C003	2160520A17	CAP 4.7 ±0.25pF (M)	1	C117	2160520B17	CAP 47pF ±5%; 50V (H,2W)	1
C003	2160520A11	CAP 2.7 ±0.25pF (H)	1	C117	2160520B22	CAP 75pF ±5%; 50V (H,5W)	1
C004	2160520B07	CAP 18pF ±5% 50V (M)	1	C118	2160520B08	CAP 20pF ±5%; 50V (M,2W)	1
C004	2160520B06	CAP 16pF ±5% 50V (H)	1	C118	2160520B03	CAP 12pF ±5%; 50V (M,5W)	1
C005	2160521B05	CAP 15pF ±5% 50V (M)	1	C118	2160520B04	CAP 13pF ±5%; 50V (H,5W)	1
C005	2160520B06	CAP 16pF ±5% 50V (H)	1	C118	2160520B05	CAP 15pF ±5%; 50V (H,2W)	1
C006	2160520A24	CAP 8200pF ±5% 50V	1	C119	2160520B09	CAP 22pF ±5%; 50V (M,2W)	1
C008	2160520A20	CAP 6.2 ±0.25pF	1	C119	2160520B03	CAP 12pF ±5%; 50V (M,5W)	1
C009	2160520C21	CAP 680pF ±5% 50V (M)	1	C119	2160520B08	CAP 20pF ±5%; 50V (H,2W)	1
C009	2160521C11	CAP 680pF ±10% (H)	1	C119	2160520A23	CAP 8.2pF ±5%; 50V (H,5W)	1
C010	2160520A01	CAP 1.0 ±0.25pF	1	C120	2005588P01	CAP TRIMMER, 5.5-55pF	1
C011	2160520B20	CAP 6.2 ±0.25pF (M)	1	C121	2160520B15	CAP 39pF ±5%; 50V (M)	1
C011	2160521A21	CAP 6.8 ±0.25pF (H)	1	C121	2160520B14	CAP 36pF ±5%; 50V (H)	1
C012	2160520A01	CAP 1.0 ±0.25pF	1	C122	2160520B07	CAP 18pF ±5%; 50V (M,2W)	1
C013	2160521B03	CAP 12pF ±5%; 50V (M)	1	C122	2160520B05	CAP 15pF ±5%; 50V (M,5W), (H,5W)	1
C013	2160520B04	CAP 13pF ±5%; 50V (H)	1	C122	2160520B04	CAP 13pF ±5%; 50V (H,2W)	1
C014	2160520B01	CAP 10pF ±5%; 50V (M)	1	C123	2160520B09	CAP 22pF ±5%; 50V (M,2W)	1
C014	2160520S02	CAP 11pF ±5%; 50V (H)	1	C123	2160520B08	CAP 20pF ±5%; 50V (M,5W)	1
C015	2160520A24	CAP 8200pF ±5%; 50V	1	C123	2160520B07	CAP 18pF ±5%; 50V (H)	1
C016	2160520C21	CAP 680pF ±5%; 50V (M)	1	C130	2160520C13	CAP 330pF ±5%; 50V (M,2W), (H)	1
C017	2160520C21	CAP 680pF ±5%; 50V (M)	1	C130	2160520A19	CAP 3300pF ±5%; 50V (M,5W)	1
C016	2160521C11	CAP 680pF ±10% (H)	1	C131	2160520C13	CAP 330pF ±5%; 50V (M,2W), (H)	1
C017	2160521C11	CAP 680pF ±10% (H)	1	C132	2160520C13	CAP 330pF ±5%; 50V (M,2W), (H)	1
C018	2160520A24	CAP 8200pF ±5%; 50V	1	C132	2160520C21	CAP 680pF ±5%; 50V (M,5W)	1
C019	2160523F22	CAP 39pF ±5% 50V (M)	1	C133	2160521G37	CAP 0.1μF +80-20%	1
C019	2160520F44	CAP 43pF ±5% 50V (H)	1	C134	2160520A16	CAP 4.3 ±0.25pF (H,5W MODELS ONLY)	1
C020	2160520A17	CAP 4.7 ±0.25pF (M)	1	C140	2160520A12	CAP 3pF ±5%; 50V (M,2W)	1
C020	2160520A23	CAP 8.2 ±0.25pF (H)	1	C140	2160520A13	CAP 3.3 ±0.25pF (5W), (H,2W)	1
C021	2160520C21	CAP 680pF ±5%; 50V (M)	1	C142	2160520B10	CAP 24pF ±5%; 50V (M,2W)	1
C021	2160521C11	CAP 680pF ±10% (H)	1	C142	2160520B16	CAP 43pF ±5%; 50V (M,5W)	1
C022	2160520A24	CAP 8200pF ±5%; 50V	1	C142	2160520B07	CAP 18pF ±5%; 50V (H,2W)	1
C024	2160523F45	CAP 13pF ±5% 50V	1	C142	2160520B11	CAP 27pF ±5%; 50V (H,5W)	1
C025	2160523F40	CAP 2.7 ±0.25pF (M)	1	C143	2160520B03	CAP 12pF ±5%; 50V (M,2W)	1
C025	2160523F06	CAP 3pF ±5% 50V (H)	1	C143	2160520B07	CAP 18pF ±5%; 50V (M,5W)	1
C026	2160520B10	CAP 24pF ±5% 50V	1	C143	2160520B06	CAP 16pF ±5%; 50V (H,5W)	1
C027	2160523F15	CAP 10pF ±5% 50V	1	C143	2160520B01	CAP 10pF ±5%; 50V (H,2W)	1
C030	2160520A19	CAP 5.6 ±0.25pF (M)	1	C145	2160520B06	CAP 16pF ±5%; 50V (M)	1
C030	2160520A23	CAP 8.2 ±0.25pF (H)	1	C145	2160520B04	CAP 13pF ±5%; 50V (H)	1
C031	2160520C21	CAP 680pF ±5%; 50V (M)	1	C146	2160520C13	CAP 330pF ±5% 50V(2W MODELS), (H,5W)	1
C031	2160521C11	CAP 680pF ±10% (H)	1	C146	2160521G37	CAP 0.1μF +80-20% (M,5W)	1
C032	2160520A03	CAP 1.2 ±0.25pF	1	C147	2160520C13	CAP 330pF ±5%; 50V	1
C033	2160520C21	CAP 680pF ±5%; 50V (M)	1	C148	2160520C13	CAP 330pF ±5%; 50V	1
C033	2160521C11	CAP 680pF ±10% (H)	1	C149	2160520B07	CAP 18pF ±5%; 50V (M)	1
C035	2160520A20	CAP 6.2 ±0.25pF (M)	1	C149	2160520B04	CAP 13pF ±5%; 50V (H,2W)	1
C035	2160520A23	CAP 8.2 ±0.25pF (H)	1	C149	2160520B05	CAP 15pF ±5%; 50V (H,5W)	1
C036	2160520C21	CAP 680pF ±5%; 50V (M)	1	C150	2160520C13	CAP 330pF ±5%; 50V	1
C036	2160521C11	CAP 680pF ±10% (H)	1	C151	2160520B15	CAP 39pF ±5%; 50V (M)	1
C037	2160523F15	CAP 10pF ±5%; 50V	1	C151	2160520B17	CAP 47pF ±5%; 50V (H)	1
C039	2160521A24	CAP 8200pF ±5%; 50V	1	C152	2160520B07	CAP 18pF ±5%; 50V (M)	1
C040	2160520C01	CAP 100pF ±5%; 50V	1	C152	2160520B05	CAP 15pF ±5%; 50V (H)	1
C041	2160520C01	CAP 100pF ±5%; 50V	1	C153	2160520C13	CAP 330pF ±5%; 50V	1
C042	2160520C13	CAP 330pF ±5%; 50V	1	C154	2111032A23	CAP 0.015μF ±10%	1
C043	2111103A23	CAP 0.015μF ±10%	1	C200	2160521A15	CAP 1500pF ±5%; 50V	1
C100	2160520A08	CAP 2 ±0.25pF (2W), (M,5W)	1	C201	2160521A15	CAP 1500pF ±5%; 50V	1
C100	2160520A05	CAP 1.5 ±0.25pF (H,5W)	1	C202	2160521A15	CAP 1500pF ±5%; 50V	1
C101	2160520B08	CAP 20pF ±5%; 50V (M)	1	C203	2160520C13	CAP 330pF ±5%; 50V	1
C101	2160520B07	CAP 18 ±0.25pF (H)	1	C204	2160521G37	CAP 0.1μF +80-20%	1
C102	2160520B10	CAP 24pF ±5%; 50V (M,5W)	1	C205	2160520C13	CAP 330pF ±5%; 50V	1
C102	2160520B09	CAP 22pF ±5%; 50V (H)	1	C206	2160520C13	CAP 330pF ±5%; 50V	1
C102	2160520B12	CAP 30pF ±5%; 50V (M,2W)	1	C207	2305458G12	CAP 33μ 16V	1
C107	2160520B19	CAP 56pF ±5%; 50V (H,5W)	1	C209	2160521A13	CAP 1000pF ±5%; 50V	1
C107	2160520B18	CAP 51pF ±5%; 50V (M,2W)	1	C210	2160521A15	CAP 1500pF ±5%; 50V	1
C107	2160520B21	CAP 68pF ±5%; 50V (M,5W)	1	C211	2160521A15	CAP 1500pF ±5%; 50V	1
C107	2160520B19	CAP 30pF ±5%; 50V (H,2W)	1	C212	2160521A15	CAP 1500pF ±5%; 50V	1
C108	2160520C03	CAP 330pF ±5%; 50V	1	C213	2160521A15	CAP 1500pF ±5%; 50V	1
C109	2160520B14	CAP 36pF ±5%; 50V (M,2W)	1	C301	2160520B23	CAP 82pF ±5%; 50V	1
				C302	2160520B23	CAP 82pF ±5%; 50V	1
				C303	2160520B23	CAP 82pF ±5%; 50V	1

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Pos	Code No	Description	Qt
C204	2160521G37	CAP 0.1μF +80-20%	1
C205	2160520C13	CAP 330pF ±5%; 50V	1
C206	2160520C13	CAP 330pF ±5%; 50V	1
C207	2305458G12	CAP 33μF 16V	1
C209	2160521A13	CAP 1000pF ±5%; 50V	1
C210	2160521A15	CAP 1500pF ±5%; 50V	1
C211	2160521A15	CAP 1500pF ±5%; 50V	1
C212	2160521A15	CAP 1500pF ±5%; 50V	1
C213	2160521A15	CAP 1500pF ±5%; 50V	1
C301	2160520B23	CAP 82pF ±5%; 50V	1
C302	2160520B23	CAP 82pF ±5%; 50V	1
C303	2160520B23	CAP 82pF ±5%; 50V	1
C304	2160520B19	CAP 56pF ±5%; 50V	1
C305	2160520B19	CAP 56pF ±5%; 50V	1
C306	2160520B23	CAP 82pF ±5%; 50V	1
C307	2160520B23	CAP 82pF ±5%; 50V	1
C309	2160520B23	CAP 82pF ±5%; 50V	1
C310	2160520C13	CAP 330pF ±5%; 50V	1
C311	2160520B23	CAP 82pF ±5%; 50V	1
CR001	4883654H06	DIO SILICON	1
CR002	4805490G02	DIO SILICON	1
CR101	4805454H01	DIO SILICON	1
CR102	4805129M61	DIO 18V ZENER	1
CR301A	4805729G24	DIO LED BICOLOR	1
CR301B	4805729G24	DIO LED BICOLOR	1
E101	7683960B04	CORE FERRITE BEAD	1
E102	7683960B01	CORE FERRITE BEAD	1
F001	6505214E02	FUSE AXIAL 5-AMP	1
FL001	4805245J20	CRYSTAL FILTER 53.55MHZ	1
FL001	4805245J19	CRYSTAL FILTER 53.55MHZ	1
FL002	4805245J20	CRYSTAL FILTER 53.55MHZ	1
FL002	4805245J19	CRYSTAL FILTER 53.55MHZ	1
		(12.5kHz CHANNEL SPACING ONLY)	
FL003	9105726Q03	CERAMIC FILTER 450kHz	1
FL004	9105726Q02	CERAMIC FILTER 450kHz	1
FL004	9105726Q04	CERAMIC FILTER 450kHz	1
		(12.5kHz CHANNEL SPACING ONLY)	
L001	2456669G12	COIL RF 4-1/2 TURNS SPACEWOUND	1
L002	2456669G30	COIL RF 4-1/2 TURNS SPACEWOUND	1
L003	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND	1
L004	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND	1
L005	2405523P18	COIL RF 8-1/2 TURNS CLOSEWOUND	1
		WITH CORE	
L006	2405063H13	COIL RF TUNABLE 1.2μH CHOKE	1
L007	2405063H05	COIL RF TUNABLE 0.4μF CHOKE	1
L008	2405063H05	COIL RF TUNABLE 0.4μF CHOKE	1
L009	2405523P10	COIL RF 5-1/2 TURNS SPACEWOUND (M)	1
L009	2405523P09	COIL RF 4-1/2 TURNS SPACEWOUND (H)	1
L010	2405523P09	COIL RF 4-1/2 TURNS SPACEWOUND (M)	1
L010	2405523P08	COIL RF 3-1/2 TURNS SPACEWOUND (H)	1
L011	2482723H38	COIL RF 1.2μH CHOKE	1
L012	2505129Q02	COIL RF 1.2μH CHOKE PRECISION	1
L101	2482723H28	COIL RF 0.29μH CHOKE	1
L102	2405523P06	COIL RF 6-1/2 TURNS SPACEWOUND	1
L103	2482723H38	COIL RF 1.2μH CHOKE	1
L104	2405523P32	COIL RF 9-1/2 TURNS CLOSEWOUND	1
L105	2405523P07	COIL RF 2-1/2 TURNS SPACEWOUND	1
L106	2405913C01	COIL RF 3-TURN FERRITE BEAD	1
L107	2482723H28	COIL RF 0.29μH CHOKE (2W MODELS)	1
L107	2482723H13	COIL RF 0.85μH CHOKE (5W MODELS)	1
L108	2405523P07	COIL RF 2-1/2 TURNS SPACEWOUND	1
L108	2405559P09	COIL RF 1-1/2 TURNS AIRWOUND	1
L109	2405913C01	COIL RF 3-TURN FERRITE BEAD	1
L110	2482723H13	COIL RF 0.85μH CHOKE	1
L111	2405559P07	COIL RF 2-1/2 TURNS AIRWOUND	1
L112	2405559P11	COIL RF 4-1/2 TURNS AIRWOUND (M)	1
L113	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M)	1
		(H,2W)	
L114	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M)	1
		(H,2W)	
L113	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H,5W)	1
L114	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H,5W)	1
L115	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M)	1
L115	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L116	2482723H38	COIL RF 1.2μH CHOKE	1
L117	2482723H38	COIL RF 1.2μH CHOKE	1
L119	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M)	1
L120	2405559P01	COIL RF 6-1/2 TURNS AIRWOUND (M)	1
L119	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L120	2405559P02	COIL RF 5-1/2 TURNS AIRWOUND (H)	1
L201	2405452C70	COIL RF 190μH CHOKE	1
LS01	5005155Q03	TRANSDUCER	1

Pos	Code No	Description	Qt
MK01	0105956P37	MICROPHONE ASSEMBLY:	1
		PLUG:	
P001	-----	NOT FIELD REPLACEABLE, ORDER	
		FREQ. SWITCH FLEX ASM. 0105956M68	
P002	-----	NOT FIELD REPLACEABLE, ORDER	
		VOLUME POT FLEX ASM. 0105956M66	
P003	-----	NOT FIELD REPLACEABLE, ORDER	
		SYNTHESIZER U202	
P004	-----	NOT FIELD REPLACEABLE, ORDER	
		SYNTHESIZER U202	
P005	-----	NOT FIELD REPLACEABLE, ORDER	
		MICROPHONE ASM. 0105956M62	
P006	-----	NOT FIELD REPLACEABLE, ORDER	
		I-F MODULE U1	
P007	-----	NOT FIELD REPLACEABLE, ORDER	
		TOP CONTROL PANEL ASM. 0105951N41	
Q001	4805218N08	TSTR NPN	1
Q002	4805452G08	TSTR DUAL GATE MOSFET TYPE M52G08	1
Q003	4805218N09	TSTR NPN	1
Q101	4805218N09	TSTR NPN	1
Q102	4805218N09	TSTR NPN	1
Q103	4805474G37	TSTR NPN TYPE M74G37	1
Q104	4805452G06	TSTR NPN TYPE M52G06 (2W MODELS)	1
Q104	4805474G33	TSTR NPN TYPE M74G33 (5W MODELS)	1
		RESISTOR	
		FIXED OHM ±5% 1/10W UNLESS STATED	
R001	0660076A67	RES 5.6K	1
R002	0660076A87	RES 38K	1
R003	0660076A59	RES 2.7K	1
R006	0660076A49	RES 1K	1
R007	0660076A73	RES 10K	1
R009	0660076A45	RES 680	1
R010	0660076A56	RES 2K	1
R013	0660076A71	RES 8.2K	1
R014	0660076A84	RES 30K	1
R015	0660076A71	RES 8.2K	1
R016	0660076A43	RES 560	1
R017	0660076A25	RES 100	1
R100	0660076A71	RES 8.2K	1
R101	0660076A84	RES 30K	1
R102	0660076A65	RES 4.7K	1
R103	0660076A68	RES 6.2K (2W MODELS)	1
R103	0660076A69	RES 6.8K (5W MODELS)	1
R104	0660076A84	RES 30K (2W MODELS)	1
R104	0660076A82	RES 24K (5W MODELS)	1
R104	0660076A79	RES 18K (H, 2W)	1
R105	0660076A25	RES 100 (M, 2W)	1
R105	0660076A26	RES 110 (5W MODELS)	1
R105	0660076A32	RES 200 (H, 2W)	1
R106	0660076A67	RES 5.6K (M, 2W), (H)	1
R106	0660076A73	RES 10K (M, 5W)	1
R108	0660076A17	RES 47 (2W)	1
R108	0660076A23	RES 82 (5W)	1
R109	0660076A17	RES 47 (2W)	1
R109	0660076A09	RES 22 (M, 5W)	1
R111	0660076A46	RES 750	1
R112	0660076A29	RES 150 (5W MODELS)	1
		NOT USED ON 2W MODELS	
R127	0660076A29	RES 150	1
R128	0660076A71	RES 8.2K	1
R129	1805581P01	RES POT. 50K	1
R130	0660076A87	RES 39K	1
R131	0660076A25	RES 100 (H, 2W MODELS ONLY)	1
R140	1805100Q03	RES POT. 5K	1
S001	-----	SWITCH ON/OFF PART OF R140	1
S002	4005265Q01	SWITCH 2- & 8-CHANNEL RADIOS	1
S002	4005265Q02	SWITCH 16-CHANNEL RADIOS	1
S003	4005101Q01	SWITCH TOGGLE SPDT	1
S301	3905834K01	SWITCH SNAP DOME MONITOR	1
S302	3905834K01	SWITCH SNAP DOME PTT	1
S303	3905834K01	SWITCH SNAP DOME MONITOR	1
U001	5105849S01	I-F	1
U001	5105729E90	I-F (12.5kHz CHANNEL SPACING ONLY)	1
U103	5105822P51	ANTENNA SWITCH	1
U104	5105822P64	ANTENNA SELECTOR (2W)	1
U104	5105729E93	ANTENNA SELECTOR (5W)	1
U106	5105729E52	REF OSCILLATOR	1
U106	5105729E72	REF OSC. (12.5kHz CHAN. SPAC. ONLY)	1
U201	5105822P60	VCO (M)	1
U201	5105822P59	VCO (H)	1
U202	5105822P76	SYNTHESIZER	1
VR102	4805129M61	DIO ZENER 18V	1
VR301	4805129M42	DIO ZER 5.6V	1

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Pos	Code No	Description	Qt	Pos	Code No	Description	Qt
		NON REFERENCED ITEMS					
	0200007007	NUT HEX 8-32 X 1/4" X 3/32"	1				
		(FOR Q104 5W MODELS)					
	0300136771	SCREW PHILLIPS 2-56 X 3/16"	1				
		(FOR Q104 HEATSINK)					
	0705196A04	BOOT FOR FL1 AND FL2	1				
	0705766R01	SUPPORT RUBBER	1				
	1400861196	INSULATOR FOR Q103	1				
	1405238Q01	INSULATOR FOR U106	1				
	1405496B01	INSULATOR (I-F)	1				
	2605116S01	SHIELD P.A. MODULE	1				
	2605494B01	SHIELD I-F MODULE	1				
	2605524P01	CAN FOR L011, L012	1				
	2605524P03	CAN FOR L111 THRU L115,L119,L120	1				
		AND L108 (5W MODELS)					
	2605532P01	HEAT SINK FOR Q104 (5W MODELS)	1				
	2605578P01	HEAT SINK FOR Q104 (2W MODELS)	1				
	2605820D07	CAN FOR L001, L002	1				
	2683379H01	HEAT SINK FOR Q103	1				
	3905130N01	CONTACT STRIP	1				
	3905509R02	CONTACT	1				
	7505295B07	PAD FOR FLO01, FLO02	1				
	7505695R01	CUSHION FOR U106	1				
	8405589P02	PC BOARD (2W)	1				
	8405591P02	PC BOARD (5W)	1				

Electrical Parts List

M = 146-162MHz

H = 157-174MHz

TPLF-3554-O

REFERENCE SYMBOL	PART NO.	DESCRIPTION
		CAPACITOR, Fixed: pF±5%
C1	2160520B14 or 2160520B11	50V unless stated 36 ±0.25pF (M) 27 (H)
C2	2160520B09 or 2160520A23	22 (M) 8.2 ± 0.25pF (H)
C3	2160520A17 or 2160520A11	4.7 ±0.25pF (M) 2.7 ±0.25pF (H)
C4	2160520B07 or 2160520B06	18 (M) 16 (H)
C5	2160520B05 or 2160520B06	15 (M) 16 (H)
C6	2160520A24	8200
C8	2160520A20 or 2160520A20	6.2 ±0.25pF (M) 6.2 ±0.25pF (H)
C9	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C10	2160520A01	1.0 ±0.25pF
C11	2160520A20 or 2160520A21	6.2 ±0.25pF (M) 6.8 ±0.25pF (H)
C12	2160520A01	1.0 ±0.25pF
C13	2160520B03 or 2160520B04	12 (M) 13 (H)
C14	2160520B01 or 2160520S02	10 (M) 11 (H)
C15	2160520A24	8200
C16, 17	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C18	2160520A24	8200
C19	2160523F22 or 2160523F44	39 (M) 43 (H)
C20	2160520A17 or 2160520A23	4.7 ±0.25pF (M) 8.2 ±0.25pF (H)
C21	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C22	2160521A24	8200
C24	2160523F45	13
C25	2160523F40 or 2160523F06	2.7 ±0.25pF (M) 3 (H)
C26	2160520B10	24
C27	2160523F15	10
C30	2160520A19 or 2160520A23	5.6 ±0.25pF (M) 8.2 ±0.25pF (H)
C31	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C32	2160520A03	1.2 ±0.25pF
C33	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C35	2160520A20 or 2160520A23	6.2 ±0.25pF (M) 8.2 ±0.25pF (H)
C36	2160520C21 or 2160521C11	680 (M) 680 ±10% (H)
C37	2160523F15	10
C39	2160521A24	8200
C40, 41	2160520C01	100
C42	2160520C13	330
C43	2111103A23	0.015µF±10%
C100	2160520A08 or 2160520A05	2 ±0.25pF (2W), (M, 5W) 1.5 ±0.25pF (H, 5W)
C101	2160520B08 or 2160520B07	20 (M) 18 ±0.25pF (H)
C102	2160520B10 or 2160520B09	24 (M, 5W) 22 (H)
C107	2160520B12 or 2160520B19 or 2160520B18 or 2160520B21 or 2160520B19	30 (M, 2W) 56 (H, 5W) 51 (M, 2W) 68 (M, 5W) 56 (H, 2W)
C108	2160520C13	330
C109	2160520B14 or 2160520B12 or 2160520B13	36 (M, 2W) 30 (M, 5W) 33 (H)
C110	2160521G37	0.1µF + 10 - 20%
C111	2160520B17 or 2160520B16 or 2160520B15	47 (M, 2W) 39 (M, 5W), (H, 2W) 39 (H, 5W)
C112	2160520B24	91 (5W Models only)
C114	2160520C13 or 2160521G37	330 (M), (H, 2W) 0.1µF + 10 - 20% (H, 5W)
C115	2160521G37 or 2160520C13	0.1µF + 10 - 20% (M), (H, 2W) 330 (H, 5W)
C117	2160520B19 or 2160520B23 or 2160520B17 or 2160520B22	56 (M, 2W) 82 (M, 5W) 47 (H, 2W) 75 (H, 5W)
C118	2160520B08 or 2160520B03 2160520B04 2160520B05 2160520B09	20 (M, 2W) 12 (M, 5W) 13 (H, 5W) 15 (H, 2W) 22 (M, 2W)
C119	or 2160520B03 or 2160520B08 or 2160520A23	12 (M, 5W) 20 (H, 2W) 8.2 (H, 5W)
C120	2005588P01	Trimmer, 5.5-55pF
C121	2160520B15 or 2160520B14	39 (M) 36 (H)
C122	2160520B07 or 2160520B05 or 2160520B04	18 (M, 2W) 15 (M, 5W), (H, 5W) 13 (H, 2W)
C123	2160520B09 or 2160520B08 or 2160520B07	22 (M, 2W) 20 (M, 5W) 18 (H)
C130	2160520C13 or 2160520A19	330 (M, 2W), (H) 3300 (M, 5W)
C131	2160520C13	330
C132	2160520C13 or 2160520C21	330 (M, 2W), (H) 680 (M, 5W)
C133	2160521G37	0.1µF + 80 - 20%
C134	2160520A16	4.3 ± 0.25pF (H, 5W Models only)
C140	2160520A12 or 2160520A13	3 (M, 2W) 3.3 ±0.25pF (5W), (H, 2W)
C142	2160520B10 or 2160520B16 or 2160520B07 or 2160520B11	24 (M, 2W) 43 (M, 5W) 18 (H, 2W) 27 (H, 5W)
C143	2160520B03 or 2160520B07 or 2160520B06 or 2160520B01	12 (M, 2W) 18 (M, 5W) 16 (H, 5W) 10 (H, 2W)
C145	2160520B06 or 2160520B04	16 (M) 13 (H)
C146	2160520C13 or 2160521G37	330 (2W Models) (H, 5W) 0.1µF + 80 - 20% (M, 5W)
C147, 148	2160520C13	330
C149	2160520B07 or 2160520B04 or 2160520B05	18 (M) 13 (H, 2W) 15 (H, 5W)
C150	2160520C13	330
C151	2160520B15 or 2160520B17	39 (M) 47 (H)
C152	2160520B07 or 2160520B05	18 (M) 15 (H)
C153	2160520C13	330
C154	2111032A23	0.015µF ± 10%
C200 thru 202	2160521A15	1500
C204	2160521G37	0.1µF + 80 - 20%
C203, 205, 206	2160520C13	330
C207	2305458G12	33µF; 16V
C209	2160521A13	1000
C210 thru 213	2160521A15	1500
C301 thru 303	2160520B23	82
C304, 305	2160520B19	56
C306, 307	2160520B23	82
C309, 311	2160520B23	82
C310	2160520C13	330
CR1	4883654H06	DIODE: See Note 1
CR2	4805490G02	Silicon
CR101	4805454H01	Silicon
CR102	4805129M61	Silicon
CR301A, 301B	4805729G24	18V, ZENER
E101	7683960B04	LED, Bicolor
E102	7683960B01	CORE:
F1	6505214E02	Ferrite Bead
FL1, 2	4805245J20 4805245J19	Ferrite Bead
FL3	9105725Q03	FUSE:
FL4	9105726Q02 9105726Q04	Axial, 5-Amp.
L1	2405669G12	FILTER:
L2	2405669G30	Crystal, 53.55MHz
		Crystal, 53.55MHz
		(12.5 kHz channel spacing only)
		Ceramic, 450kHz
		Ceramic, 450kHz
		Ceramic, 450kHz
		(12.5 kHz channel spacing only)
		COIL, RF: unless stated
		4-1/2 turns, spacewound
		4-1/2 turns, spacewound

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L3, 4, 5	2405523P18	8-1/2 turns, closewound; with core
L6	2405063H13	Tunable, 1.2μH Choke
L7, 8	2405063H05	Tunable, 0.4μH Choke
L9	2405523P10	5-1/2 turns, spacewound (M)
L10	or 2405523P09	4-1/2 turns, spacewound (H)
L11	2405523P09	4-1/2 turns, spacewound (M)
L12	or 2405523P08	3-1/2 turns, spacewound (H)
L101	2482723H38	1.2μH Choke
L102	2505129Q02	1.2μH Choke, precision
L103	2482723H28	0.29μH Choke
L104	2405523P28	6-1/2 turns, spacewound
L105	2482723H38	1.2μH Choke
L106	2405523P32	9-1/2 turns, closewound
L107	2405523P07	2-1/2 turns, spacewound
L108	2405913C01	3-turn ferrite bead
	2482723H28	0.29μH Choke (2W Models)
	or 2482723H13	0.85μH Choke (5W Models)
	2405523P07	2-1/2 turns, spacewound (2W)
	or 2405559P09	1-1/2 turns, airwound (5W Models)
L109	2405913C01	3-turn ferrite bead
L110	2482723H13	.085μH Choke
L111	2405559P07	2-1/2 turns, airwound
L112	2405559P11	4-1/2 turns, airwound (M)
L113, 114	2405559P01	6-1/2 turns, airwound (M) (H, 2W)
L115	or 2405559P02	5-1/2 turns, airwound (H, 5W)
L116, 117	2405559P01	6-1/2 turns, airwound (M)
L119, 120	or 2405559P02	5-1/2 turns, airwound (H)
	2482723H38	1.2μH Choke
L201	2405559P01	6-1/2 turns, airwound (M)
LS1	or 2405559P02	5-1/2 turns, airwound (H)
MS1	2405452C70	190μH Choke
	5005155Q03	TRANSDUCER
	0105956P37	MICROPHONE ASSEMBLY:
P1	-----	PLUG:
P2	-----	Not field replaceable, order Freq. Switch Flex Assembly 0105956M68
P3, 4	-----	Not field replaceable, order Volume Pot Flex Assembly 0105956M66
P5	-----	Not field replaceable, order Synthesizer U202
P6	-----	Not field replaceable, order Microphone Assembly 0105956M62
P7	-----	Not field replaceable, order I-F module U1
Q1	4805218N08	Not field replaceable, order Top Control Panel Assembly 0105951N41
Q2	4805452G08	TRANSISTOR: See Note II
Q3	4805218N09	NPN
Q101, 102	4805218N09	Dual Gate MOSFET;
Q103	4805474G37	Type M52G08
Q104	4805452G06	NPN
	or 4805474G33	NPN; Type M74G37
		NPN; Type M52G06 (2W Models)
		NPN; Type M74G33 (5W Models)
		RESISTOR, Fixed: W ± 5%; 1/10W unless stated
R1	0660076A67	5.6k
R2	0660076A87	38k
R3	0660076A59	2.7k
R6	0660076A49	1k
R7	0660076A73	10k
R9	0660076A45	680
R10	0660076A56	2k
R13	0660076A71	8.2k
R14	0660076A84	30k
R15	0660076A71	8.2k
R16	0660076A43	560
R17	0660076A25	100
R100	0660076A71	8.2k
R101	0660076A84	30k
R102	0660076A65	4.7k
R103	0660076A68	6.2k (2W Models)
	or 0660076A69	6.8k (5W Models)
R104	0660076A84	30k (M, 2W)
	or 0660076A82	24k (5W Models)
	or 0660076A79	18k (H, 2W)
R105	0660076A25	100 (M, 2W)
	or 0660076A26	110 (5W Models)

R106	or 0660076A32	200 (H, 2W)
R108	0660076A67	5.6k (M, 2W), (H)
R109	or 0660076A73	10k (M, 5W)
	0660076A17	47 (2W)
	or 0660076A23	82 (5W)
	0660076A17	47 (M, 2W), (H)
R111	or 0660076A09	22 (M, 5W)
R112	0660076A46	750
	0660076A29	150 (5W Models)
	or -----	Not used on 2W Models
R127	0660076A29	150
R128	0660076A71	8.2k
R129	1805581P01	Pot., 50k
R130	0660076A87	39k
R131	0660076A25	100 (H, 2W Models only)
R140	1805100Q03	Pot., 5k
S1	-----	SWITCH:
S2	4005265Q01	On/Off, Part of R140
	or 4005265Q02	2- & 8-channel radios
S3	4005101Q01	16-channel radios
S301	3905834K01	Toggle, SPDT
S302	3905834K01	Snap Dome, Monitor
S303	3905834K01	Snap Dome, PTT
		Snap Dome, Monitor
		CIRCUIT MODULE:
		See Note I
U1	5105849S01	I-F
	5105729E90	I-F (12.5kHz channel spacing only)
U103	5105822P51	Antenna Switch
U104	5105822P64	Antenna Selector (2W)
	or 5105729E93	Antenna Selector (5W)
U106	5105729E52	Ref. Oscillator
	5105729E72	Ref. Oscillator (12.5kHz channel spacing only)
U201	5105822P60	VCO (M)
	or 5105822P59	VCO (H)
U202	5105822P76	Synthesizer
VR102	4805129M61	DIODE: See Note I
VR301	4805129M42	Zener, 18V
		Zener, 5.6V

NONREFERENCED ITEMS

0200007007	NUT, Hex; 8-32 X 1/4" X 3/32" (for Q104, 5W Models)
0300136771	SCREW, Phillips; 2-56 X 3/16" (for Q104 heatsink)
0705196A04	BOOT, for FL1, FL2
0705766R01	SUPPORT, Rubber
1400861196	INSULATOR, for Q103
1405238Q01	INSULATOR, for U106
1405496B01	INSULATOR (I-F)
2605116S01	SHIELD, P.A. Output
2605494B01	SHIELD, I-F Module
2605524P01	CAN, for L11, L12
2605524P03	CAN, for L111 thru L115, L119, L120, and L108 (5W Models)
2605532P01	HEAT SINK, for Q104 (5W Models)
2605578P01	HEAT SINK, for Q104 (2W Models)
2605820D07	CAN, for L1, L2
2683379H01	HEAT SINK, for Q103
3905130N01	CONTACT STRIP
3905509R02	CONTACT
7505295B07	PAD, for FL1, FL2
7505695R01	CUSHION, for U106
8405589P02	PC BOARD (2W)
8405591P02	PC BOARD (5W)

NOTES:

- For optimum performance, order replacement diodes, transistors, and circuit modules by Motorola part number only.
- When ordering crystal units, specify carrier frequency, crystal frequency, crystal type number, and Motorola part number.

* Not field replaceable, order microphone flex assembly 0105956P37.

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DIAGRAMS AND PARTS LISTS OVERVIEW

CQP8000 - UHF

DESCRIPTION	NO.
SCHEMATIC AND CIRCUIT BOARD NOTES	61.754-E
2, 8 & 16 CHANNELS MECHANICAL PARTS LIST	MPL405.525
2, 8 & 16 CHANNELS EXPLODED VIEW AND PART NUMBERS	M405.525
TRANSCEIVER LOW POWER (4 WATT) COMPONENT LAYOUT	D405.041
HIGH POWER (4 WATT) TRANSCEIVER	D405.040
TRANSCEIVER LOW POWER (2 WATT) COMPONENT LAYOUT	D405.038
HIGH POWER (2 WATT) TRANSCEIVER ELECTRICAL DIAGRAM	D405.037
2W/4W TRANSCEIVER PARTS LIST	X405.059
CONTROLLER FLEX COMPONENT LAYOUT	D405.023
CONTROLLER FLEX ELECTRICAL DIAGRAM	D405.022
CONTROLLER FLEX PARTS LIST	X405.060
VOLUME POT. FLEX FREQUENCY SWITCH FLEX PTT/B + FLEX COMP	D405.043
DTMF FRONT COVER EXPLODED VIEW & PART NUMBERS	M405.706
DTMF FRONT COVER STANDARD + ANI ELECTRICAL DIAGRAM +	D405.472
DTMF FRONT COVER STANDARD + ANI PARTS LIST	X405.475
DTMF FRONT COVER CONTINUOUS TONE ELECTRICAL DIAGRAM +	D405.473
COMPONENT LAYOUT	
DTMF FRONT COVER CONTINUOUS TONE PARTS LIST	X405.474
DTMF FRONT COVER EXPLODED VIEW & PARTS LISTS	M405.484
DTMF FRONT COVER PARTS LIST	X405.061
DTMF CIRCUIT BOARD & FLEX ASSEMBLY	D405.063
MULTICALL FRONT COVER EXPLODED VIEW & PARTS LIST	M405.483
MULTICALL FRONT COVER PARTS LIST	X405.065
MULTICALL CIRCUIT BOARD & FLEX ASSEMBLY ELECTRICAL DIAGRAM +	D405.064
COMPONENT LAYOUT	

CQP8000 UHF

Mechanical Parts List

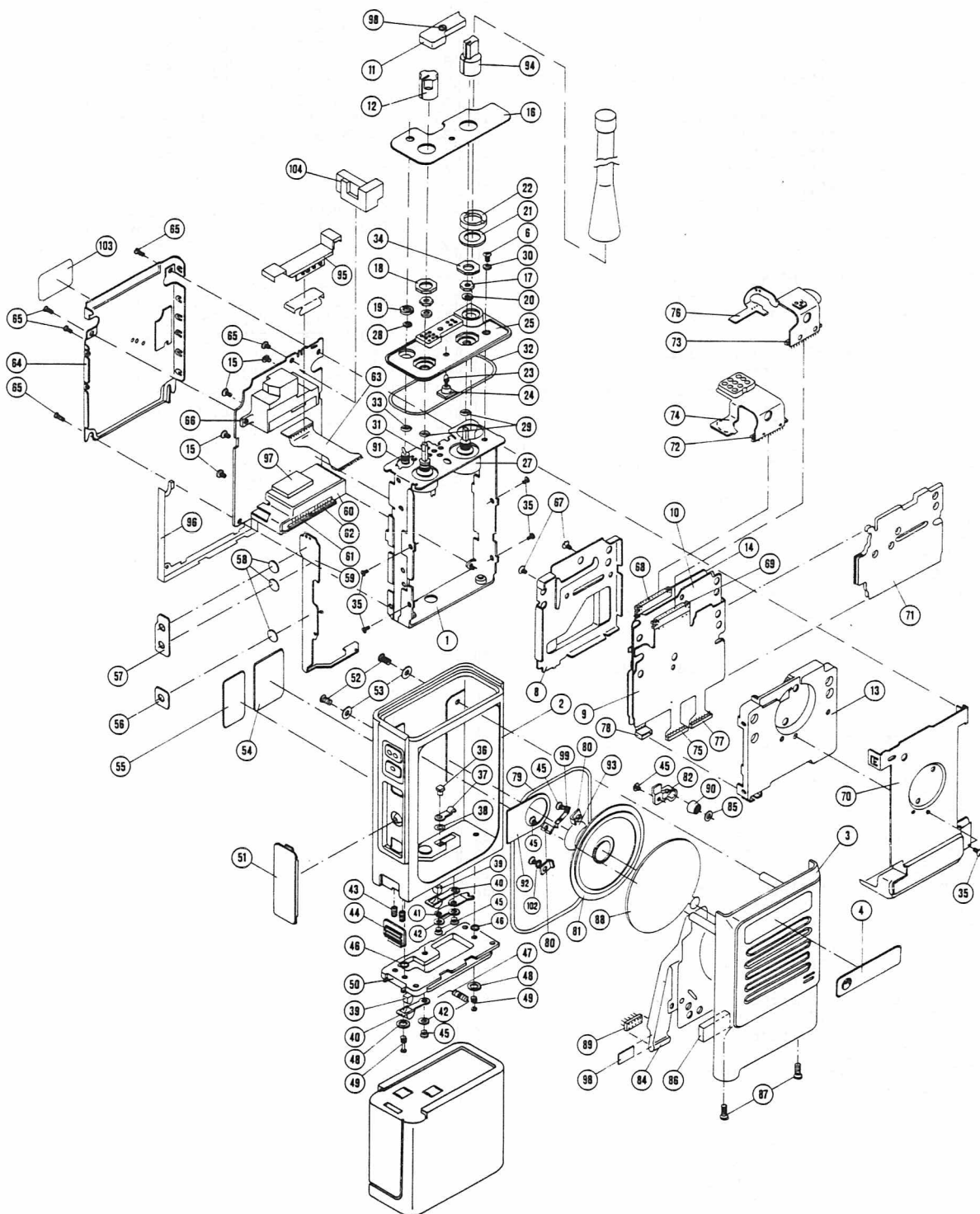
Exploded View

MECHANICAL PARTS LIST FOR CQP8000 UHF 2, 8, 16 CHANNEL

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
1	0105956M63	ASSEMBLY, Frame	1	42	0400002625	LOCKWASHER, Split #2	3
2	NHN6419A	KIT, Housing; includes items 36 thru 51	1	43	4105944K01	SPRING, Battery Latch	2
3	NTN4956A	KIT, Front Cover; includes items 4, 45, 79 thru 86	1	44	5505536P01	LATCH	1
4	3305260Q06	NAMEPLATE, Front	1	45	0300139982	SCREW, Philips Hd. 2-56 x 5/32"	7
5	.....	Not used		46	3205082E03	GASKET, O-Ring	2
6	0300136785	SCREW, Philips; 4-40 x 3/16"	1	47	See Note	FUSE (F1)	1
7	NTN5374A	KIT, Controller Flex; includes items 8, 9, 10, 13, 14, 67, 68, 69, 75, 77, 78	1	48	0400009761	LOCKWASHER, Split #4	2
8	0102700J04	SHIELD, Bottom	1	49	0305941K01	Captive; 4-40	2
9	.....	ASSEMBLY, Controller Flex; part of item 7		50	6405531P02	PLATE, Base	1
10	.....	SHIELD, Center; Top Carrier side; part of item 7	1	51	4505535P01	LEVER, PTT	1
11	0102706J99	ASSEMBLY, Dust Cover, Screw & Seal	1	52	0305137Q01	SCREW, Philips Hd.; 4-40 x 1/2"	2
12	0105951N79	ASSEMBLY, Knob; VOLUME	1	53	0484345A06	WASHER, Seal	2
13	1505182S01	CARRIER, Top; Controller Flex	1	54	.....	LABEL, FCC	1
14	.....	SHIELD, Center; Bottom Carrier Side; part of item 7	1	55	.....	LABEL, FM	1
15	0300136771	SCREW, Philips; 2-56 x 3/16"	4	56	3205231Q01	SEAL, Dome (PTT); part of item 59	1
16	1305676R03/	ESCUTCHEON, 2-channel	1	57	3205196Q01	SEAL, Dome (Mon); part of item 59	1
17	1305676R03/	ESCUTCHEON, 8-channel	1	58	3905834K04	CONTACT, Snap Dome; part of item 59	1
18	1305676R06	ESCUTCHEON, 16-channel	1	59	0105951N40	ASSEMBLY, B+/PTT Flex; includes items 56, 57, 58	1
19	0205629L01	NUT, Hex	2	60	See Note	(P/O U201)	1
20	0405534R01	WASHER, Flat; Octagonal	1	61	See Note	PLUG (P3)	1
21	0205163Q01	NUT, Spanner	1	62	See Note	PLUG (P4)	1
22	0405162Q02	WASHER, WASHER, Flat; Volume Pot and Freq. Switch	1	63	See Note	FLEX, Connector (P/O of U1)	1
23	0405216L04	WASHER, Flat	1	64	0102704J74	ASSEMBLY, Main Back Shield	1
24	0205765L02	NUT, Spanner	1	65	0300136772	SCREW, Philips Hd. 2-56 x 5/16"	5
25	See Note	LED, Bicolor (CR301A, 301B)	1	66	See Note	RF PA (U102)	1
26	3205131S01	SEAL, LED	1	67	0300138620	SCREW, Philips; 2-56 x 5/16"	2
27	0105951N41	ASSEMBLY, Control Top	1	68	See Note	JACK (J2)	1
28	Not Used			69	See Note	JACK (J1)	1
29	See Note	SWITCH, Frequency (S2)	1	70	0102700J17	ASSEMBLY, Front Shield	1
30	0405162Q01	WASHER, Flat	1	71	1405264Q01	INSULATOR Flex	1
31	3205082E01	GASKET, O-Ring	2	72	See Note	PLUG (P2)	1
32	0484345A06	WASHER, Seal	1	73	See Note	PLUG (P1)	1
33	See Note	SWITCH / POT, On-Off / Volume (S1/R140)	1	74	0105956M66	ASSEMBLY, Volume Pot Flex	1
34	3205141Q02	GASKET O-Ring	1	75	See Note	JACK (J3)	1
35	3205141Q03	GASKET, O-Ring; Mode Select Switch	1	76	0105956M68	ASSEMBLY Frequency Flex	1
36	0405218Q01	WASHER, Flat; Octagonal (2- & 8-channel)	1	77	See Note	JACK (J4)	1
37	0405534R01	WASHER, Flat; Octagonal (16-channel)	1	78	See Note	JACK (J5)	1
38	0300140369	SCREW, Flat Hd.; 2-56 x 1/8"	1	79	3205141Q01	GASKET, O-Ring	1
39	4605945K05	CONTACT STUD, Battery	1	80	4205140Q01	CLAMP, Speaker	3
40	3905127Q01	CONTACT, B+	1	81	See Note	SPEAKER (LS1)	1
41	3205082E24	GASKET, O-Ring	1	82	4205136S01	RETAINER, Microphone	1
42	0705830C02	SUPPORT, Contact	2	83	Not used		
43	3905421C07	CONTACT, Battery	2	84	See Note	ASSEMBLY, Microphone Flex (MK1); includes item 90	1
44	2905124Q01	LUG	2	85	7505564S01	PAD, Microphone Boot	1
				86	7505501R03	PAD, Front Cover	1
				87	0300140041	SCREW, Philips; 2-56 x 1/4"	2
				88	0105958N94	ASSEMBLY, Speaker Felt	1
				89	See Note	PLUG (P5)	1
				90	.....	CARTRIDGE, Microphone; part of item 84	1
				91	See Note	SWITCH (S3)	1
				92	1405299Q01	INSULATOR, Speaker	1
				93	7505501R02	PAD, Speaker	1
				94	0105950N92	ASSEMBLY, Knob	1

MECHANICAL PARTS LIST FOR CQP8000 UHF 2, 8, 16 CHANNEL

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
95	0105953P82	SHIELD, I-F/PA	1				
96	2605123S01	SHIELD, PC BOARD; Bottom	1				
97	0105953P91	ASSEMBLY, Buffer Shield	1				
98	7505501R04	PAD	1				
99	3905178S01	CONTACT	1				
100	1405140S01	INSULATOR	1				
101	.....	Not Used					
102	0484345A06	WASHER, Seal	1				
103	5405758R01	LABEL, Instruction	1				
104	See Note	ASSEMBLY, Antenna Switch	1				
		NOTE: Refer to Electrical Parts List for Parts No. and Description					



**CQP8000 UHF 2, 8 & 16 CHANNELS
EXPLODED VIEW AND PARTS NUMBERS**

M405.525/2

DATE: 10/28/1988

Pos	Code No	Description	Qt	Pos	Code No	Description	Qt
1	0105956M63	ASSEMBLY, Frame	1	69	See Note	JACK (J1)	1
2	NHN6419A	KIT, Housing; includes items 36 thru 51	1	70	0102700J17	ASSEMBLY, Front Shield	1
3	NTN4956A	KIT, Front Cover; includes items 4, 45, 79 thru 86	1	71	1405264Q01	INSULATOR Flex	1
4	3305260Q06	NAMEPLATE, Front	1	72	See Note	PLUG (P2)	1
5	.....	Not used	1	73	See Note	PLUG (P1)	1
6	0300136785	SCREW, Philips; 4-40 x 3/16"	1	74	0105956M66	ASSEMBLY, Volume Pot Flex	1
7	NTN5374A	KIT, Controller Flex; includes items 8, 9, 10, 13, 14, 67, 68, 69, 75, 77, 78	1	75	See Note	JACK (J3)	1
8	0105952P34	SHIELD, Bottom	1	76	0105956M68	ASSEMBLY Frequency Flex	1
9	.....	ASSEMBLY, Controller Flex; part of item 7	1	77	See Note	JACK (J4)	1
10	.....	SHIELD, Center; Top Carrier Side; part of item 7	1	78	See Note	JACK (J5)	1
11	1505102S01	COVER, Dust	1	79	3205141Q01	GASKET, O-Ring	1
12	0105951N79	ASSEMBLY, Knob; VOLUME	1	80	4205140Q01	CLAMP, Speaker	3
13	1505182S01	CARRIER, Top; Controller Flex	1	81	See Note	SPEAKER (LS1)	1
14	.....	SHIELD, Center; Bottom Carrier Side; part of item 7	1	82	4205136S01	RETAINER, Microphone	1
15	0300136771	SCREW, Philips; 2-56 x 3/16"	4	83	1405299L01	BOOT, Microphone; part of item 98	1
16	1305676R03/	ESCUTCHEON, 2-channel	1	84	See Note	ASSEMBLY, Microphone Flex (MK1); includes item 90	1
17	1305676R03/	ESCUTCHEON, 8-channel	1	85	7505564S01	PAD, Microphone Boot	1
18	1305676R06	ESCUTCHEON, 16-channel	1	86	7505501R03	PAD, Front Cover	1
19	0205629L01	NUT, Hex	2	87	0300140041	SCREW, Philips; 2-56 x 1/4"	2
20	0405534R01	WASHER, Flat; Octagonal	1	88	0105958N94	ASSEMBLY, Speaker Felt	1
21	0205163Q01	NUT, Spanner	1	90	.....	CARTRIDGE, Microphone; part of item 84	1
22	0405162Q02	WASHER, WASHER, Flat; Volume Pot and Freq. Switch	1	91	See Note	SWITCH (S3)	1
23	0405216L04	WASHER, Flat	1	92	1405299Q01	INSULATOR, Speaker	1
24	0205765L02	NUT, Spanner	1	93	7505501R02	PAD, Speaker	1
25	See Note	LED, Bicolor (CR301A, 301B)	1	94	0105950N92	ASSEMBLY, Knob	1
26	3205157Q01	SEAL, LED	1	95	2605120S01	SHIELD, I-F	1
27	0105951N41	ASSEMBLY, Control Top	1	96	2605123S01	SHIELD, PC BOARD; Bottom	1
28	Not Used		1	97	0200007007	NUT, Hex (for Q104 5W radios only)	1
29	See Note	SWITCH, Frequency (S2)	1	98	0305103S01	SCREW, Captive	1
30	0405162Q01	WASHER, Flat	1	99	3905178S01	CONTACT	1
31	3205082E01	GASKET, O-Ring	2	100	1405140S01	INSULATOR	1
32	0484345A06	WASHER, Seal	1	101	.....	Not Used	1
33	See Note	SWITCH / POT, On-Off / Volume (S1/R140)	1	102	0484345A06	WASHER, Seal	1
34	3205141Q02	GASKET O-Ring	1			NOTE:	
35	3205141Q03	GASKET, O-Ring; Mode Select Switch	1			Refer to Electrical Parts List for Parts Number and Description	
36	0405218Q01/	WASHER, Flat; Octagonal (2- & 8-channel)	1				
37	0405534R01	SCREW, Flat Hd.; 2-56 x 1/8"	1				
38	0300140369		1				
39	4605945K05	CONTACT STUD, Battery	1				
40	3905127Q01	CONTACT, B+	1				
41	3205082E24	GASKET, O-Ring	1				
42	0705830C02	SUPPORT, Contact	2				
43	3905421C07	CONTACT, Battery	2				
44	2905124Q01	LUG	2				
45	0400002625	LOCKWASHER, Split #2	3				
46	4105944K01	SPRING, Battery Latch	2				
47	5505536P01	LATCH	1				
48	0300139982	SCREW, Philips Hd.; 2-56 x 5/32"	7				
49	3205082E03	GASKET, O-Ring	2				
50	See Note	FUSE (F1)	1				
51	0400009761	LOCKWASHER, Split #4	2				
52	0305941K01	Captive; 4-40	2				
53	6405531P02	PLATE, Base	1				
54	4505535P01	LEVER, PTT	1				
55	0305137Q01	SCREW, Philips Hd.; 4-40 x 1/2"	2				
56	0484345A06	WASHER, Seal	2				
57	.....	LABEL, FCC	1				
58	.....	LABEL, FM	1				
59	3205231Q01	SEAL, Dome (PTT); part of item 59	1				
60	3205196Q01	SEAL, Dome (Mon); part of item 59	1				
61	3905834K04	CONTACT, Snap Dome; part of item 59	1				
62	0105951N40	ASSEMBLY, B+/PTT Flex; includes items 56, 57, 58	1				
63	See Note	(P/O U201)	1				
64	See Note	PLUG (P3)	1				
65	See Note	PLUG (P4)	1				
66	See Note	FLEX, Connector (P/O of U1)	1				
67	0105953N75	ASSEMBLY, Main Back Shield	1				
68	0300136772	SCREW, Philips Hd.; 2-56 x 5/16"	5				
	See Note	RF PA (U102)	1				
	0300138620	SCREW, Philips; 2-56 x 5/16"	2				
	See Note	JACK (J2)	1				

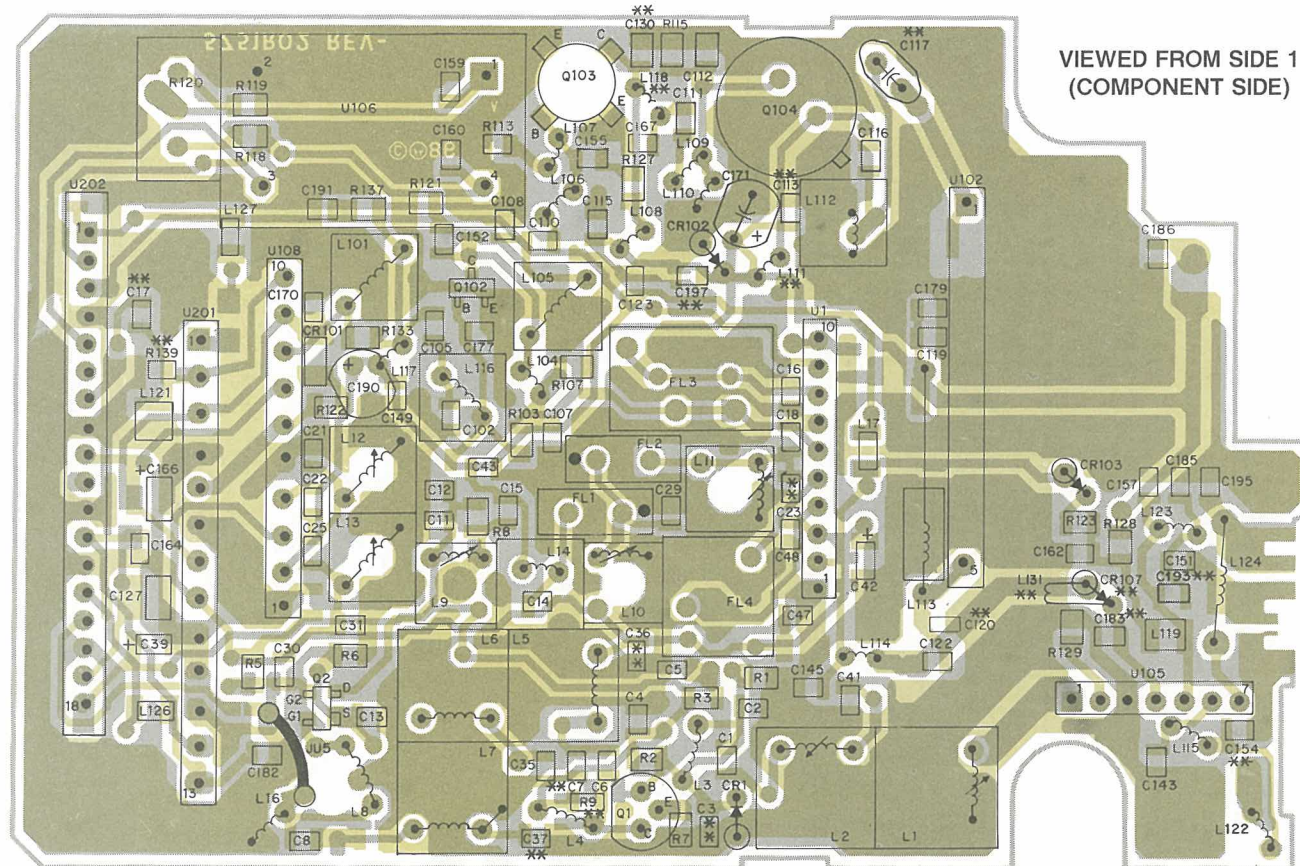
TRANSCEIVER UHF

Component Layouts

Electrical Diagrams

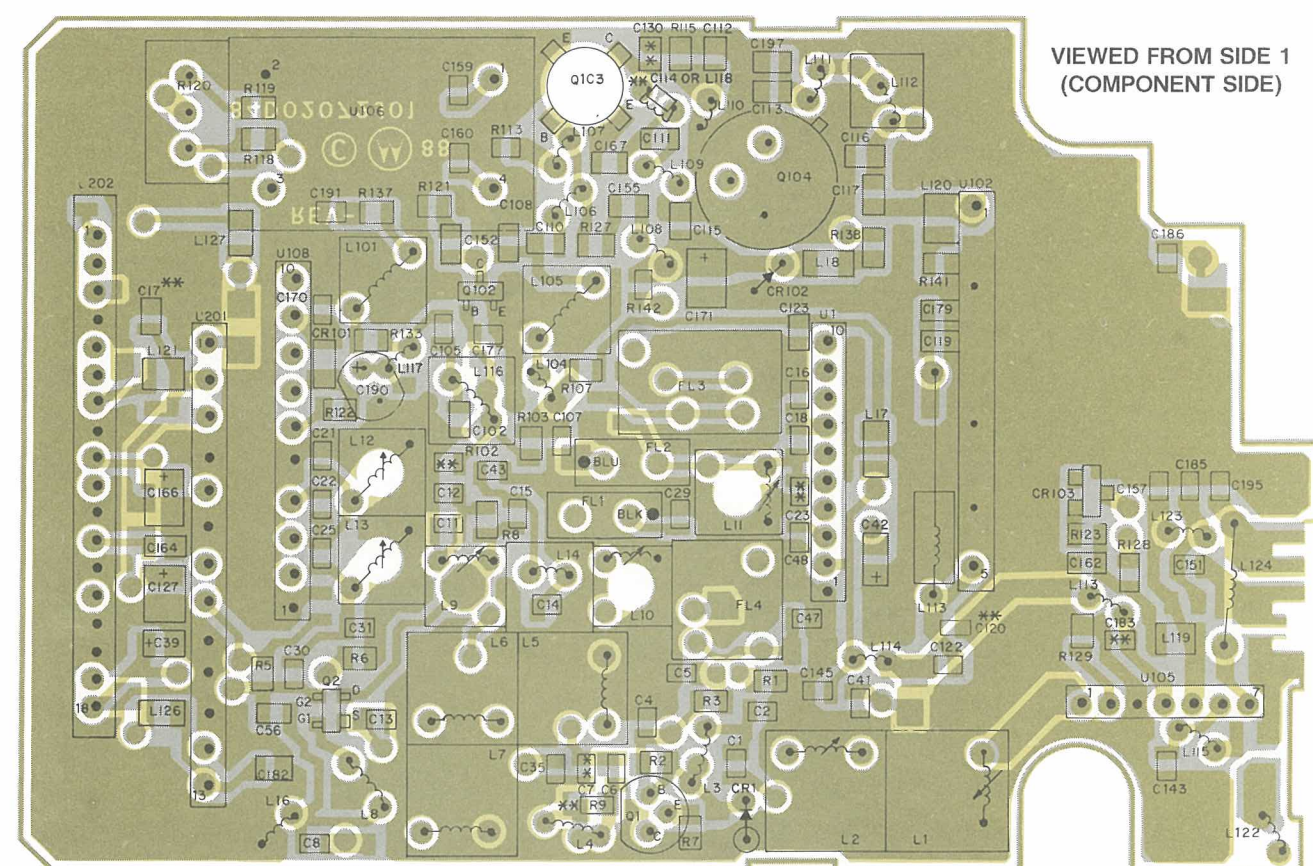
Parts List

VIEWED FROM SIDE 1
(COMPONENT SIDE)



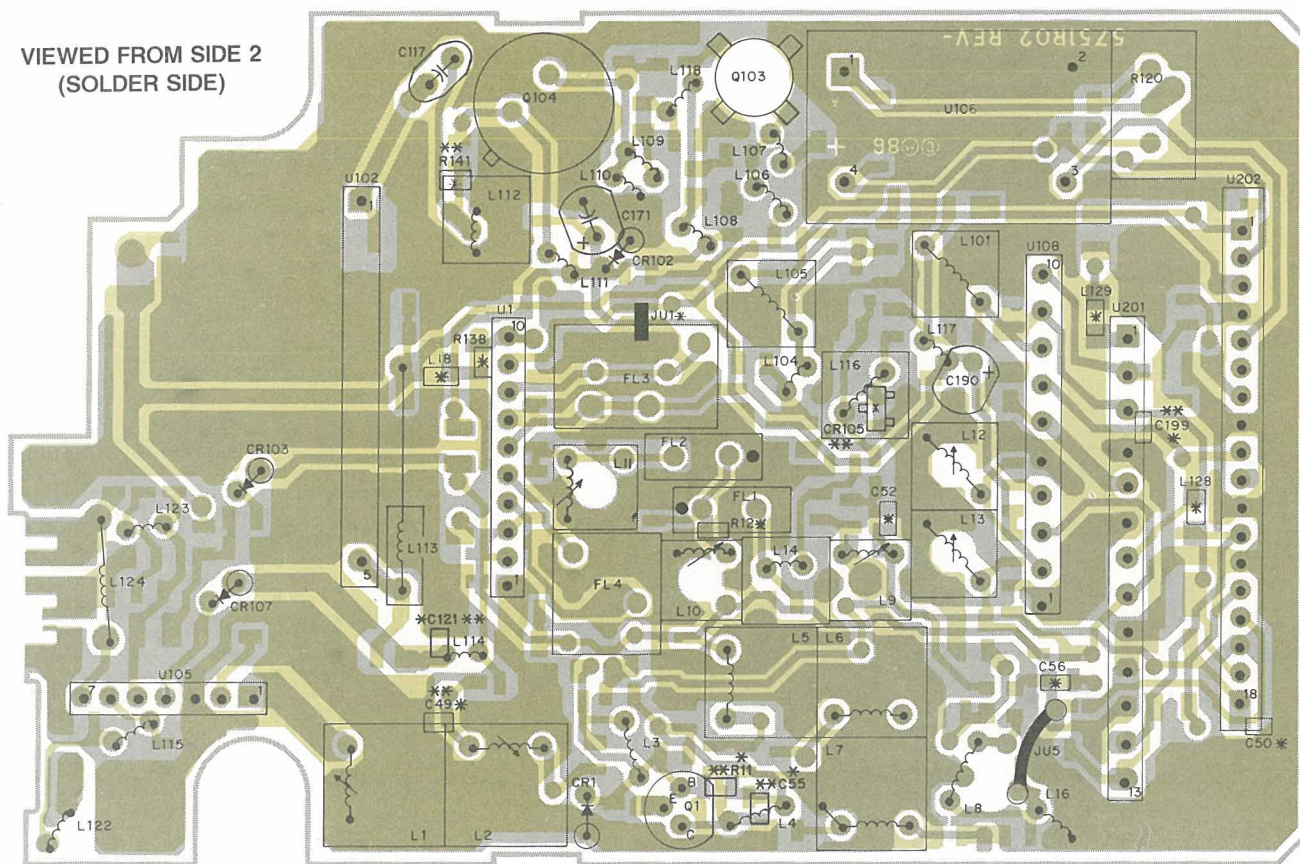
XX-REFER TO ELECTRICAL PARTS LIST FOR USAGE

VIEWED FROM SIDE 1
(COMPONENT SIDE)



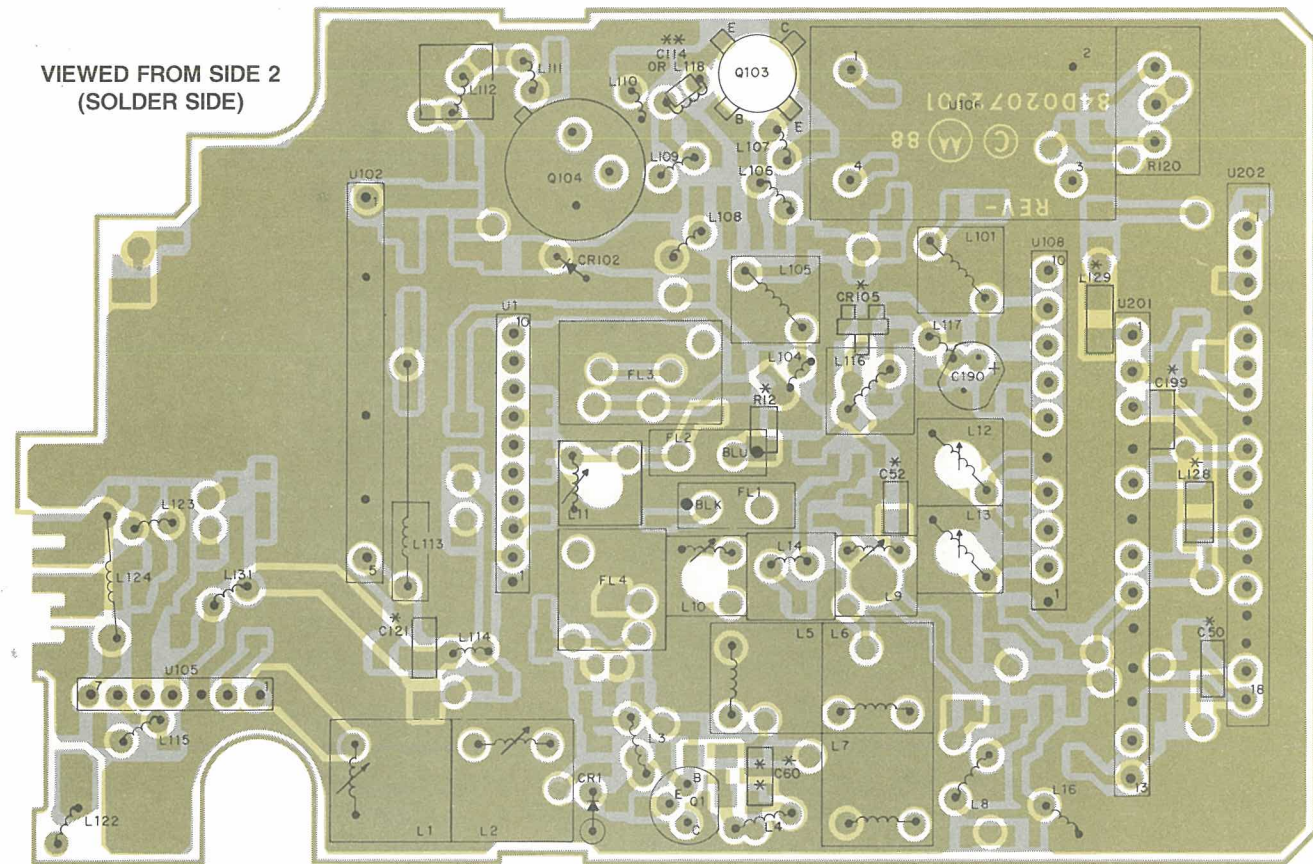
** REFER TO ELECTRICAL PARTS LIST FOR USAGE

VIEWED FROM SIDE 2
(SOLDER SIDE)



* MOUNTED ON SOLDER SIDE
**REFER TO ELECTRICAL PARTS LIST FOR USAGE

VIEWED FROM SIDE 2
(SOLDER SIDE)



* BACK OF THE BOARD
** REFER TO ELECTRICAL PARTS LIST FOR USAGE

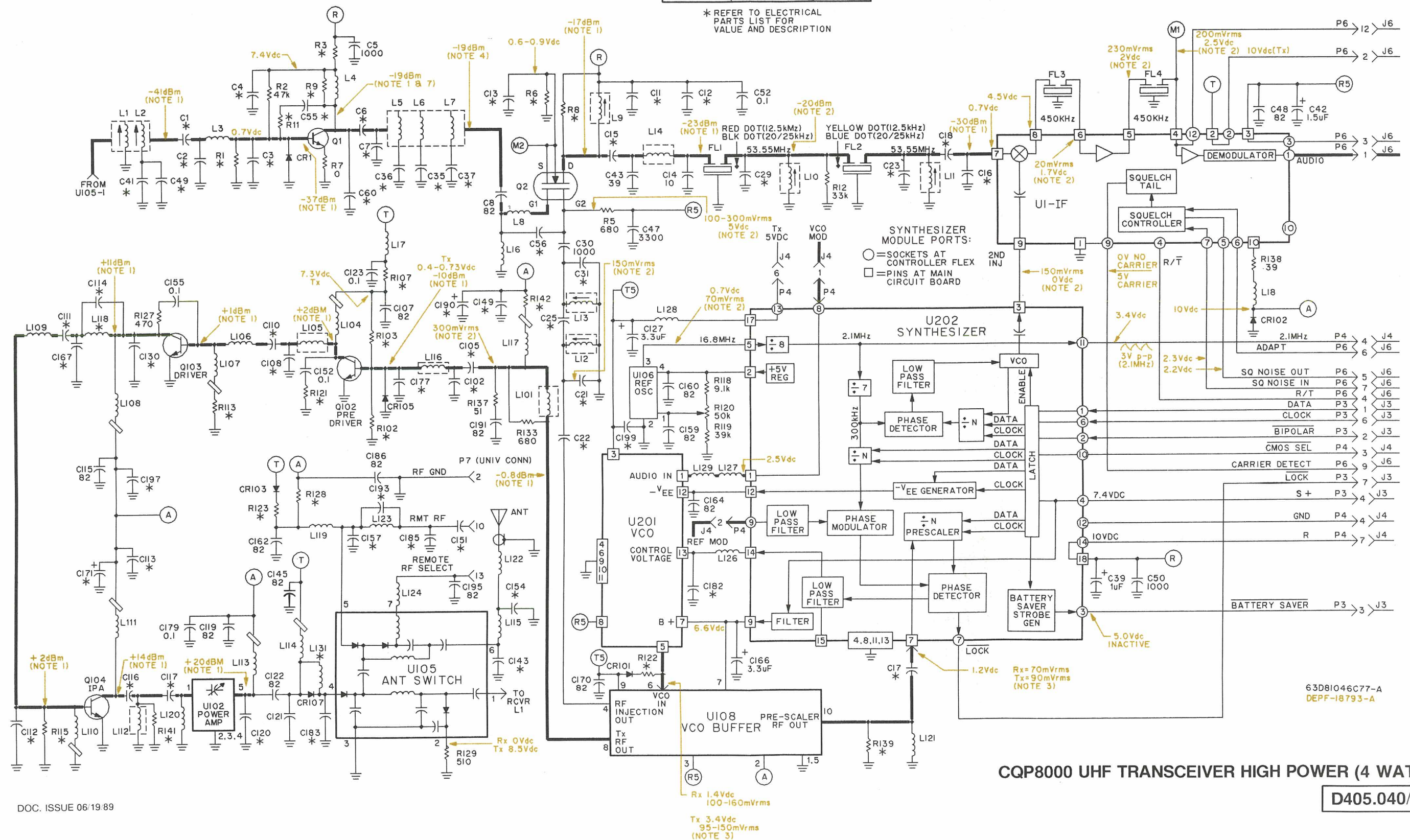
QCP8000 UHF TRANSCEIVER HIGH POWER (4 WATT) COMPONENT LAYOUT

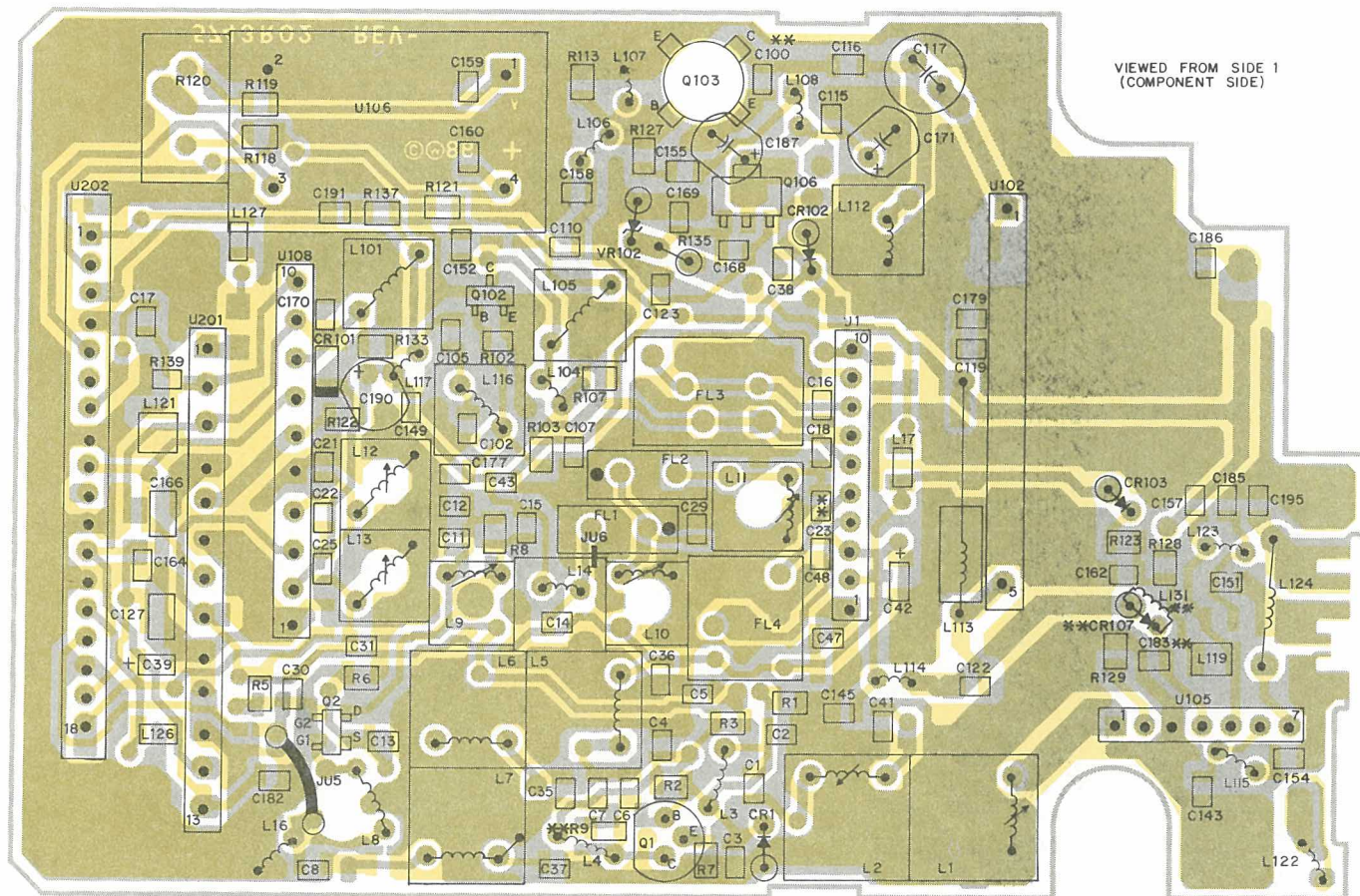
D405.041/3

ITEM REVISIONS CHART

ITEM NO.	FREQ.	CHANNEL SPACING
NUE6981B	403-433MHz	12.5kHz
NUE6982B	438-470MHz	12.5kHz
NUE7111B	403-433MHz	20/25kHz
NUE7112B	438-470MHz	20/25kHz
NUE7143A	470-500MHz	20/25kHz
NUE7144A	488-520MHz	20/25kHz
NUE7153A	470-500MHz	12.5kHz
NUE7154A	488-520MHz	12.5kHz

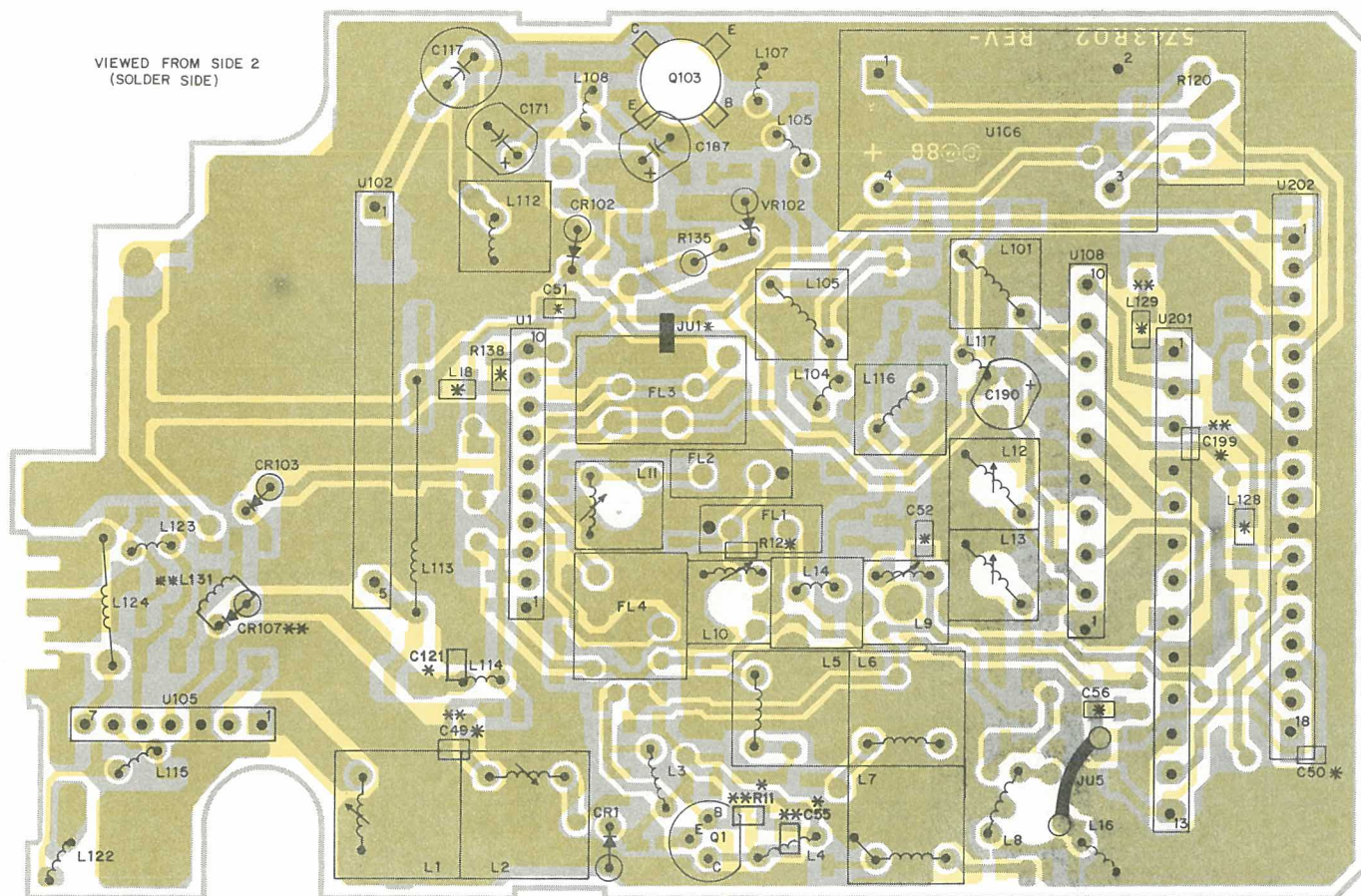
* REFER TO ELECTRICAL PARTS LIST FOR VALUE AND DESCRIPTION





**REFER TO ELECTRICAL PARTS LIST FOR USAGE

L1 CEPF-18518-0
L2 CEPF-18519-0
OL CEPF-18757-A



* MOUNTED ON SOLDER SIDE
** REFER TO ELECTRICAL PARTS LIST FOR USAGE

L1 CEPF-18521-0
L2 CEPF-18522-0
OL CEPF-18758-A

CQP8000 UHF TRANSCEIVER LOW POWER (2 WATT) COMPONENT LAYOUT

D405.038/3

PARTS LIST FOR CQP8000 UHF 2 WATT & 4 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		NUE6971B 403-433 MHz, 1&2W, 12.5kHz	(A)	C012	2113740A25	CAP 1500 pF ±5%; 50V J,L	1
		NUE6972B 438-470 MHz, 1&2W, 12.5kHz	(B)	C013	2113741A45	CAP .01μF;25V A,B,C,D,E F,G,H	1
		NUE6981B 403-433 MHz, 4W, 12.5kHz	(C)	C013	2113741A43	CAP 8200 pF ±5%; 50V I,K	1
		NUE6982B 438-470 MHz, 4W, 12.5kHz	(D)	C013	2160521G37	CAP .01μF J,L	1
		NUE7153A 470-500 MHz, 4W, 12.5kHz	(K)	C014	2113740A29	CAP 10 pF ±5%; 50V	1
		NUE7154A 488-520 MHz, 4W, 12.5kHz	(L)	C015	2113740A32	CAP 13 pF ±5%; 50V A,C,F,G,H	1
		NUE7101B 403-433 MHz, 1&2W, 20/25kHz	(E)	C015	2113740A35	CAP 18 pF ±5%; 50V B,D,E,L	1
		NUE7102C 438-470 MHz, 1&2W, 20/25kHz	(F)	C015	2113740A28	CAP 9.1 pF ±5%; 50V I,K	1
		NUE7111B 403-433 MHz, 4W, 20/25kHz	(G)	C015	2113740A29	CAP 10 pF ±5%; 50V J	1
		NUE7112B 438-470 MHz, 4W, 20/25kHz	(H)	C016	2113740A38	CAP 24 pF ±5%; 50V A,B,C,D,E G,K,L	1
		NUE7143A 470-500 MHz, 4W, 20/25kHz	(I)	C016	2113740A27	CAP 8.2 ±0.25pF F,H,I,J	1
		NUE7144A 488-520 MHz, 4W, 20/25kHz	(J)	C017	2113740A43	CAP 39 pF ±5%; 50V A,C,E,G (ONLY)	1
				C017	2113740A40	CAP 30 pF ±5%; 50V B,D,F,H (ONLY)	1
				C017	2113740A32	CAP 13 pF ±5%; 50V J,L (ONLY)	1
				C018	2113740A40	CAP 30 pF ±5%; 50V A,B,C,D,E,G	1
				C018	2113740A36	CAP 20 pF ±5%; 50V F,H,I,J,K,L	1
				C021	2113740A32	CAP 13 pF ±5%; 50V A	1
				C021	2113740A31	CAP 12 pF ±5%; 50V B,D,F,H	1
				C021	2113740A28	CAP 9.1 ±0.25 pF C,E,G	1
				C021	2113740A27	CAP 8.2 ±0.25 pF I,K	1
				C021	2113740A30	CAP 11 pF ±5%; 50V J,L	1
				C022	2113740A10	CAP 2.0 ±0.25 pF A,C,E,G	1
				C022	2113740A03	CAP 1.0 ±0.25 pF B,D,F,H	1
				C022	2113740A05	CAP 1.2 ±0.25 pF I,K	1
				C022	2113740A15	CAP 3.3 ±0.25 pF J,L	1
				C023	2113740A17	CAP 3.9 ±0.25 pF A,C,E,F,G,I,J (ONLY)	1
				C025	2113740A14	CAP 3.0 ±0.25 pF A,C,E,G,J,L	1
				C025	2113740A09	CAP 1.8 ±0.25 pF B,D,F,H,I,K	1
				C029	2113740A24	CAP 6.8 ±0.25%; 50V A,B,C,D,E,F,G,H,K,L	1
				C029	2113740A16	CAP 3.6 ±0.25 pF I,J	1
				C030	2113741A21	CAP 1000; 25V	1
				C031	2113740A19	CAP 4.7 ±0.25 pF A,C,E,G	1
				C031	2113740A28	CAP 9.1 ±0.25 pF B,D,F,H	1
				C031	2113740A15	CAP 3.3 ±0.25 pF I,K	1
				C031	2113740A16	CAP 3.6 ±0.25 pF J,L	1
				C035	2113740A25	CAP 7.5 ±0.25 pF A,C,E,G	1
				C035	2113740A40	CAP 30 pF ±5%; 50V B,D,F,H	1
				C035	2113740A28	CAP 9.1 ±0.25 pF I,K	1
				C035	2113740A33	CAP 15 pF ±5%; 50V J,L	1
				C036	0660076M01	CAP Chip Resistor; 0Ω A,B,C,D,E,F,G,H (ONLY)	1
				C037	0660076M01	CAP Chip Resistor; 0Ω A,B,C,D,E,F,G,H (ONLY)	1
				C038	2113741A21	CAP 1000; 25V A,B,E,F (ONLY)	1
				C039	2360562A13	CAP 1μF ±20%; 16V	1
				C041	0660076M01	CAP Chip Resistor; 0Ω A,B,C,D,E,F,G,H	1
				C041	2113740A53	CAP 82 pF ±5%; 50V I,J,K,L	1
				C042	2360562A16	CAP 1.5μF ±20%; 10V	1
				C043	2113740A43	CAP 39 pF ±5%; 50V	1
				C047	2113741A33	CAP 3300 pF ±5%; 50V	1
				C048	2113740A53	CAP 82 pF ±5%; 50V	1
C001	2113740A33	CAP 15 pF ±5%; 50V A,C,E,G	1				
C001	2113740A23	CAP 6.2 ±0.25pF B,D,F,H	1				
C001	2113740A39	CAP 27 pF ±5%; 50V I,K	1				
C001	2113740A40	CAP 30 pF ±5%; 50V J,L	1				
C002	2113740A15	CAP 3.3 pF ±0.25pF A,C,E,G	1				
C002	2113740A13	CAP 2.7 ±0.25pF B,D,F,G	1				
C002	2113740A27	CAP 8.2 ±0.25pF I,K	1				
C002	2113740A21	CAP 5.6 ±0.25pF J,L	1				
C003	2113740A21	CAP 5.6 ±0.25pF A,C,E,G (ONLY)	1				
C003	2113740A28	CAP 9.1 ±0.25pF B,D,F,H (ONLY)	1				
C004	2113740A53	CAP 82 ±5%; 50V A,B,C,D,E F,G,H,I,K	1				
C004	2113740A43	CAP 39 ±5%; 50V J,L	1				
C005	2113741A21	CAP 1000; 25V	1				
C006	2113740A16	CAP 3.6 ±0.25pF A,C	1				
C006	2113740A17	CAP 3.9 ±0.25pF B,D	1				
C006	2113740A30	CAP 11 pF ±5%; 50V E,G	1				
C006	2113740A18	CAP 4.3 ±0.25pF F,H	1				
C006	2113740A10	CAP 2.0 ±0.25pF I,K	1				
C006	2113740A14	CAP 3.0 ±0.25pF J,L	1				
C007	2113740A17	CAP 3.9 ±0.25pF A,C (ONLY)	1				
C007	2113740A23	CAP 6.2 ±0.25pF B,D (ONLY)	1				
C007	2113740A27	CAP 8.2 ±0.25pF E,G (ONLY)	1				
C007	2113740A12	CAP 2.4 ±0.25pF F,H (ONLY)	1				
C007	2113740A03	CAP 1.0 ±0.25pF I,K (ONLY)	1				
C008	2113740A53	CAP 82 pF ±5%; 50V	1				
C011	2113741A33	CAP 3300; 25V A,B,C,D,E F,G,H,I,K	1				
C011	2113740A25	CAP 1500 pF ±5%; 50V J,L	1				
C012	2113741A33	CAP 3300; 25V A,B,C,D,E F,G,H,I,K	1				

PARTS LIST FOR CQP8000 UHF 2 WATT & 4 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
C049	2113740A38	CAP 24 pF ±5%; 50V B,D,F,H (ONLY)	1	C121	2113740A10	CAP 2.0 ±0.25pF A,C,E,G (ONLY)	1
C050	2113741A21	CAP 1000; 25V	1	C121	2113740A23	CAP 2.2 ±0.25pF B,F (ONLY)	1
C051	2113741A21	CAP 1000; 25V A,B,E,F (ONLY)	1	C121	2113740B17	CAP 4.7 ±0.25pF I,K	1
C052	2160521A37	CAP 0.1μF + 80-20%;25V	1	C121	2113740A21	CAP 5.6 ±0.25pF J,L	1
C055	2113740A53	CAP 82 pF ±5%; 50V E,F,G,H (ONLY)	1	C122	2113740A53	CAP 82pF ±5%; 50V	1
C055	2113740A13	CAP 2.7 ±0.25pF B,C,D (ONLY)	1	C123	2113740A53	CAP 82pF ±5%; 50V A,B,E,F	1
C056	2113740A07	CAP 1.5 ±0.25pF A,C,E,G,I,K	1	C123	2160521G37	CAP 0.1uF +80-20%; 25V C,D,G,H,I,J,K,L	1
C056	2113740A05	CAP 1.2 ±0.25pF B,D,F,H	1	C127	2360562A24	CAP 3.3uF ±20; 16V	1
C056	2113740A03	CAP 1.0 ±0.25pF J,L	1	C130	2113740A03	CAP 1.0 ±0.25pF D,H (ONLY)	1
C060	2113740B07	CAP 1.8 ±0.25pF I,K (ONLY)	1	C130	2113740A16	CAP 3.6 ±0.25pF I,K (ONLY)	1
C100	2113740A09	CAP 1.8 ±0.25pF B,F (ONLY)	1	C143	2113740A17	CAP 3.9 ±0.25pF A,C,E,G	1
C102	2113740A33	CAP 15 pF ±5%; 50V A,E	1	C143	2113740A24	CAP 6.8 ±0.25pF B,F,I,K	1
C102	2113740A35	CAP 18 pF ±5%; 50V B,F	1	C143	2113740A15	CAP 3.3 ±0.25pF D,H,J,L	1
C102	2113740A36	CAP 20 pF ±5%; 50V C,G	1	C145	2113740A53	CAP 82pF ±5%; 50V	1
C102	2113740A38	CAP 24 pF ±5%; 50V D,H	1	C149	2160521G37	CAP 0.1uF +80-20%; 25V A,B,E,F,I,K	1
C102	2113740A19	CAP 4.7 ±0.25pF I,K	1	C149	2113740A53	CAP 82pF ±5%; 50V C,D,G,H,J,L	1
C102	2113740A27	CAP 8.2 ±0.25pF J,L	1	C151	2113740A53	CAP 82pF ±5%; 50V A,B,C,D,E,F,G,H,I,K	1
C105	2113740A53	CAP 82 pF ±5%; 50V A,B,E,F,I,J,K,L	1	C151	2113740A42	CAP 36pF ±5%; 50V J,L	1
C105	2113740A38	CAP 24 pF ±5%; 50V C,G	1	C152	2160521G37	CAP 0.1uF +80-20%; 25V	1
C105	2113740A41	CAP 33 pF ±5%; 50V D,H	1	C154	2113740A24	CAP 6.8 ±0.25pF A,C,E,G (ONLY)	1
C107	2113740A53	CAP 82pF ±5%; 50V	1	C154	2113740A03	CAP 1.0 ±0.25pF; 25V B,D,F,H (ONLY)	1
C108	2113740A28	CAP 9.1 ±0.25pF C,G (ONLY)	1	C155	2160521G37	CAP 0.1uF +80-20%; 25V	1
C108	2113740A31	CAP 12pF ±5%; 50V D,H (ONLY)	1	C157	2113740A20	CAP 5.1 ±0.25pF A,E	1
C108	2113740A33	CAP 15pF ±5%; 50V I,K	1	C157	2113740A21	CAP 5.6 ±0.25pF B,F	1
C108	2113740A31	CAP 12pF ±5%; 50V J,L	1	C157	2113740A23	CAP 6.2 ±0.25pF C,G	1
C110	2113740A18	CAP 4.3pF ±5%; 50V A,E	1	C157	2113740A10	CAP 2.0 ±0.25pF D,H	1
C110	2113740A42	CAP 36pF ±5%; 50V B,D,F,H	1	C157	2113740A03	CAP 1.0 ±0.25pF I,J,K,L	1
C110	2113740A53	CAP 82pF ±5%; 50V C,G	1	C158	2113740A17	CAP 3.9 ±0.25pF A,E (ONLY)	1
C110	2113740A39	CAP 27pF ±5%; 50V I,K	1	C158	2113740A29	CAP 10pF ±5%; 50V B,F (ONLY)	1
C110	2113740A48	CAP 51pF ±5%; 50V J,L	1	C159	2113740A53	CAP 82pF ±5%; 50V	1
C111	2113740A53	CAP 82pF ±5%; 50V C,G (ONLY)	1	C160	2113740A53	CAP 82pF ±5%; 50V	1
C111	2113740A31	CAP 12pF ±5%; 50V D,H (ONLY)	1	C162	2113740A53	CAP 82pF ±5%; 50V	1
C111	2113740A24	CAP 6.8 ±0.25pF I,K	1	C164	2113740A53	CAP 82pF ±5%; 50V	1
C111	2113740A53	CAP 82pF ±5%; 50V J,L	1	C166	2360562A24	CAP 3.3μF ±20%; 16V	1
C112	2113740A38	CAP 24pF ±5%; 50V C,D,G,H (ONLY)	1	C167	2113740A17	CAP 3.9 ±0.25pF C,G (ONLY)	1
C112	2113740A36	CAP 20pF ±5%; 50V I,K	1	C167	2113740A03	CAP 1.0 ±0.25pF D,H (ONLY)	1
C112	2113740A31	CAP 12pF ±5%; 50V J,L	1	C167	2113740A29	CAP 10pF ±5%; 50V I,K	1
C113	2113740A53	CAP 82pF ±5%; 50V C,D,G,H (ONLY)	1	C167	2113740A12	CAP 2.4 ±0.25pF J,L	1
C114	2105454G02	CAP 11pF ±5%; 50V J,L (ONLY)	1	C168	2113740A53	CAP 82pF ±5%; 50V A,B,E,F (ONLY)	1
C115	2113740A53	CAP 82pF ±5%; 50V	1	C169	2160521G37	CAP 0.1μF +80-20%; 25V A,E (ONLY)	1
C116	2113740A29	CAP 10pF ±5%; 50V A,E	1	C169	2113740A53	CAP 82pF ±5%; 50V B,F	1
C116	2113740A42	CAP 36pF ±5%; 50V B,F	1	C170	2113740A53	CAP 82pF ±5%; 50V	1
C116	2113740A36	CAP 20pF ±5%; 50V C,G	1	C171	2305499G13	CAP 1μF ±20%; 25V A,B,E,F	1
C116	2113740A34	CAP 16pF ±5%; 50V D,H	1	C171	2305499G20	CAP 10μF ±20%; 20V C,D,G,H	1
C116	2113740A30	CAP 11pF ±5%; 50V I,K	1	C171	2360562A24	CAP 3.3μF I,J,K,L	1
C116	2113740A17	CAP 3.9 ±0.25pF J,L	1	C177	2113740A20	CAP 5.1 ±0.25pF A,E	1
C117	2105454G38	CAP 33pF ±5%; 50V A,C,E,G	1	C177	2113740A23	CAP 6.2 ±0.25pF B,F	1
C117	2105454G18	CAP 22pF ±5%; 50V B,D,F,H	1	C177	2113740A27	CAP 8.2 ±0.25pF C,G	1
C117	2113740A53	CAP 82pF ±5%; 50V I,J,K,L	1	C177	2113740A19	CAP 4.7 ±0.25pF D,H	1
C119	2113740A53	CAP 82pF ±5%; 50V	1	C177	2113740A03	CAP 1.0 ±0.25pF I,K	1
C120	2113740A10	CAP 2.0 ±0.25pF D,H (ONLY)	1	C177	2113740A12	CAP 2.4 ±0.25pF J,L	1
C120	2113740A15	CAP 3.3 ±0.25pF I,K (ONLY)	1				

PARTS LIST FOR CQP8000 UHF 2 WATT & 4 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
C179	2160521G37	CAP 0.1 μ F +80-20%; 25V	1	L001	0105957M23	ASSY, Preselector; 2-pole	1
C182	2113741A37	CAP 4700 \pm 10%; 25V	1			B,D,F,H	
		A,B,C,D,E,F,G,H,I,K		L001	0102702J62	ASSY, Preselector; 2-pole	1
C182	2113741A21	CAP 1000pF \pm 5%; 50V J,L	1			I,K	
C183	2113740A05	CAP 1.2 \pm 0.25pF B,F (ONLY)	1	L001	0102702J63	ASSY, Preselector; 2-pole	1
C183	2113740A13	CAP 2.7 \pm 0.25pF C,G (ONLY)	1			J,L	
C183	2113740A15	CAP 3.3 \pm 0.25pF D,H (ONLY)	1	L002	0105951P30	ASSY, Preselector; 2-pole	1
C183	2113740A04	CAP 1.1 \pm 0.25pF I,K (ONLY)	1			A,C,E,G	
C185	2113740A20	CAP 5.1 \pm 0.25pF A,E	1	L002	0105957M23	ASSY, Preselector; 2-pole	1
C185	2113740A12	CAP 2.4 \pm 0.25pF B,F	1			B,D,F,H	
C185	2113740A19	CAP 4.7 \pm 0.25pF C,G	1	L002	0102702J62	ASSY, Preselector; 2-pole	1
C185	2113740A15	CAP 3.3 \pm 0.25pF D,H	1			I,K	
C185	2113740A03	CAP 1.0 \pm 0.25pF I,K	1	L002	0102702J63	ASSY, Preselector; 2-pole	1
C185	2113740A07	CAP 1.5 \pm 0.25pF J,L	1			J,L	
C186	2113740A53	CAP 82pF \pm 5%; 50V	1	L003	2405559P09	1 1/2 turns A,C,E,G	1
C187	2305499G19	CAP 0.1 μ F \pm 20%; 35V A,B,E,F (ONLY)	1	L003	2484238H02	1 1/2 turns B,D,F,H	1
				L003	2405027E38	3 1/2 turns I,J,K,L	1
C190	2305458G12	33 μ F 16V A,B,C,D	1	L004	2405559P03	1 1/2 turns A,C,E,G	1
C190	2305499G13	1 μ F \pm 20%; 25V E,F,G,H,I,J,K,L	1	L004	2484238H02	1 1/2 turns B,D,F,H	1
C191	2113740A53	CAP 82pF \pm 5%; 50V	1	L004	2405027E38	3 1/2 turns I,J,K,L	1
C193	2113740A20	CAP 5.1 \pm 0.25pF C,G (ONLY)	1	L005	2405732J22	11 3/4 turns A,C,E,G	1
C195	2113740A53	CAP 82pF \pm 5%; 50V	1	L005	2484238H02	10 3/4 turns B,D,F,H	1
C197	2113740A15	CAP 1000pF \pm 5%; 50V C,D,G,H (ONLY)	1	L005	2405732J08	10 turns I,J,K,L	1
				L006	2405732J10	12 turns A,C,E,G	1
C198	2113740A40	CAP 30pF \pm 5%; 50V H (ONLY)	1	L006	2405732J01	11 turns B,D,F,H	1
C199	2113740A44	CAP 43pF \pm 5%; 50V A,B,E,F (ONLY)	1	L006	2405732J01	10 1/2 turns I,K	1
				L006	2405732J06	10 1/4 turns J,L	1
C199	2113740A53	CAP 82pF \pm 5%; 50V D,H,I,J,K,L (ONLY)	1	L007	2405732J22	11 3/4 turns A,C,E,G	1
				L007	2405732J01	11 turns B,D,F,H	1
CR01	4883654H08	Dio Silicon	1	L007	2405732J06	10 1/4 turns I,K	1
CR101	4805494Q04	Dio Silicon	1	L007	2405732J08	10 turns I,J,K,L	1
CR102	4805490G02	Dio Silicon	1	L008	2405559P22	4 1/2 turns A,C,E,G	1
CR103	4883654H01	Dio Silicon A,E	1	L008	2405559P13	5 1/2 turns B,D	1
CR103	4883654H08	Dio Silicon B,C,D,F,G,H	1	L008	2405835C16	F,H	1
CR103	4805129M24	Dio Silicon I,J,K,L,G,H	1	L008	2405027E19	I,J,K,L	1
CR105	4805119G14	Dio Silicon C,D,G,H (ONLY)	1	L009	2405063H24	13 turns	1
				L010	2405063H13	0.9 μ H Choke, tunable	1
CR107	4880010E05	Dio Silicon B,C,D,F,G,H (ONLY)	1	L011	2405063H05	0.4 μ H Choke, tunable	1
				L012	2405523P36	2 1/2 turns, with core A,C,E,G	1
F001	6505214E02	Fuse Axial, 5-Amp.	1	L012	2405523P35	1 1/2 turns, with core	1
FL01	4805245J19	Filter Crystal, 53.55 MHz A,B,C,D,K,L	1			B,D,F,H,I,J,K,L	
FL01	4805245J20	Filter Crystal, 53.55 MHz E,F,G,H,I,J	1	L013	2405523P36	2 1/2 turns, with core A,C,E,G	1
				L013	2405523P35	1 1/2 turns, with core	1
FL02	4805245J19	Filter Crystal, 53.55 MHz A,B,C,D,K,L	1			B,D,F,H,I,J,K,L	
FL02	4805245J20	Filter Crystal, 53.55 MHz E,F,G,H,I,J	1	L014	2505129Q02	1.2 μ H Choke, tunable	1
				L016	2405027E19	RF Choke A,B,C,D,E,G	1
FL03	9105725Q03	Filter Ceramic, 450 KHz A,B,C,D,K,L	1	L016	2405559P14	3.5 turns F,H	1
FL03	9105725Q02	Filter Ceramic, 450 KHz E,F,G,H,I,J	1	L016	2405559P18	3 1/2 turns I,K	1
				L016	2405027E38	3 1/2 turns J,L	1
FL04	9105726Q03	Filter Ceramic, 450 KHz A,B,C,D,K,L	1	L017	2462575A01	0.39 μ H Choke	1
FL04	9105726Q01	Filter Ceramic, 450 KHz E,F,G,H,I,J	1	L018	2462575A01	0.39 μ H Choke	1
				L101	2405523P07	2 1/2 turns A,B,D,E,F,H	1
				L101	2405523P08	3 1/2 turns C,G	1
				L101	2405523P06	1 1/2 turns I,J,K,L	1
				L104	0105951N35	Assy,.085 μ H Choke, with bead and sleeving	1
L001	0105951P30	ASSY, Preselector; 2-pole A,C,E,G	1	L105	2405523P08	3 1/2 turns A,B,C,D,E,F,G,H	1

PARTS LIST FOR CQP8000 UHF 2 WATT & 4 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
L105	2405523P07	3 1/2 turns I,J,K,L	1	L129	2462575A01	0.39 μ H Choke	1
L106	2405559P19	4 1/2 turns A,E	1	L131	2405559P18	3 1/2 turns A,E (ONLY)	1
L106	2405027E38	3 1/2 turns B,C,D,F,G,H,I,K	1	L131	2405027E38	3 1/2 turns I,K	1
L106	2405027E21	2 1/2 turns J,L	1	L131	2405027E21	2 1/2 turns J,L	1
L107	0105950L78	Assy, 1.2 μ H Choke, A,C,D,E,G,H with bead and sleeving I,J,K,L	1	LS01	5005155Q03	Transducer	1
L107	0105951N35	Assy, .085 μ H Choke B,F with bead and sleeving	1	MK01	0105956M62	MIC FLEX ASSY	1
L108	0105951N35	Assy, .085 μ H Choke A,C,D,E,G,H with bead and sleeving I,J,K,L	1	P001	2805572P01	CONNECTOR, FLEX TOP 13 PIN	1
L108	0105951N34	Assy, 0.29 μ H Choke B,F	1	P002	2805572P01	CONNECTOR, FLEX TOP 13 PIN	1
L109	2405027E38	3 1/2 turns C,D,G,H,I,K (ONLY)	1	P003	2805144Q01	CONNECTOR SYNTHESIZER 7 PION	1
L109	2405027E21	2 1/2 turns J,L (ONLY)	1	P004	2805144Q01	CONNECTOR SYNTHESIZER 7 PION	1
L110	0105951N34	Assy, 0.29 μ H Choke C,D,G,H,I,K with bead and sleeving (ONLY)	1	P005	2805250Q01	CONNECTOR FRONT COVER	1
L110	0105950L78	Assy, 0.29 μ H Choke I,K with bead and sleeving (ONLY)	1	P006	2805247Q01	CONNECTOR I-F	1
L111	0105951N35	Assy, .085 μ H Choke C,D,G,H with bead and sleeving	1	P007	-----	Not field repairable, order Top Control Panel Assy 0105951N41	1
L112	2405523P08	3 1/2 turns A,E	1	Q001	4880182D39	TSTR NPN	1
L112	2405027E38	3 1/2 turns B,C,D,F,G,H	1	Q002	4805452G13	TSTR MOSFET Type M52G13	1
L112	2405027E21	2 1/2 turns I,J,K,L	1	Q102	4805218M84	TSTR NPN SOT	1
L113	0105951N19	Assy, 0.2 μ H Choke A,B,E,F with bead and sleeving	1	Q103	4805474G48	TSTR NPN Type MRF581 A,B,E,F	1
L113	0105952N08	Assy, 0.15 μ H Choke C,D,G,H with bead and sleeving	1	Q103	4805474G38	TSTR NPN Type MRF559 C,D,G,H	1
L113	0102702J40	Assy, .085 μ H Choke I,J,K,L with bead and sleeving	1	Q104	4800869887	TSTR NPN Type M9887 C,D,G,H (ONLY)	1
L114	0105951N34	Assy, 0.29 μ H Choke with bead and sleeving	1	Q106	4805128M09	TSTR NPN Type BCX54-16 SOT A,B,E,F (ONLY)	1
L115	2405559P19	4 1/2 turns A,B,C,D,E,F,G,H,I,K	1	R001	0660076A71	RES 8.2k A,C,E,G,I,J,K,L	1
L115	2405027E38	3 1/2 turns J,L	1	R001	0660076A69	RES 6.8k B,D,F,H	1
L116	2484238H02	1 1/2 turns A,B,C,D,E,F,G,H	1	R002	0660076A89	RES 47k	1
L116	2405559P09	1 1/2 turns I,K	1	R003	0660076A59	RES 2.7k A,C,E,G,I,J,K,L	1
L116	2405027E38	3 1/2 turns J,L	1	R003	0660076A57	RES 2.2k 1/8W B,D,F,H	1
L117	0102704J81	Assy, 0.29 μ H Choke A,B,C,D with bead and sleeving	1	R005	0660076A45	RES 680 Ω \pm 5%; 1/10W	1
L117	0105951N34	Assy, 0.29 μ H Choke E,F,G,H,I with bead and sleeving J,K,L	1	R006	0660076A35	RES 270 Ω \pm 5%; 1/10W A,C,E,G	1
L118	2405027E28	3 1/2 turns C,D,G,H (ONLY)	1	R006	0660076A39	RES 390 Ω \pm 5%; 1/10W B,D,F,H	1
L119	2405452C08	275 μ H Chip	1	R006	0660076A34	RES 240 Ω \pm 5%; 1/10W J,L	1
L120	2405452C08	275 μ H Chip C,G (ONLY)	1	R007	0660076M01	Chip Resistor; 0 Ω	1
L121	2405452C06	21 nH Chip	1	R008	0660076A54	RES 1.6k 1/8W A,B,C,D,E,F,G,H	1
L122	2405559P18	3 1/2 turns air wound A,B,C,E,F,G	1	R008	0660076A71	RES 8.2k I,K	1
L122	2405027E21	2 1/2 turns D,H,I,K	1	R008	0660076A56	RES 2k J,L	1
L122	2405559P14	3 1/2 turns J,L	1	R009	0660076A56	RES 2k A,C,E,G (ONLY)	1
L123	2405027E38	3 1/2 turns A,B,C,E,F,G,I,K	1	R009	0660076A49	RES 1k I,K	1
L123	2405559P18	3 1/2 turns D,H,J,L	1	R009	0660076A57	RES 2.2k; 1/8W B,D (ONLY)	1
L124	2482723H28	0.29 μ H Choke	1	R011	0660076A41	RES 470 Ω \pm 5%; 1/10W E,G (ONLY)	1
L126	2462575A01	0.39 μ H Choke	1	R011	0660076A36	RES 300; 1/8W F,H (ONLY)	1
L127	2462575A01	0.39 μ H Choke	1	R012	0660076A85	RES 33k	1
L128	2462575A01	0.39 μ H Choke	1	R102	0660076A46	RES 750 A,B,E,F (ONLY)	1
L129	0105957P25	Assy, 0.29 μ H Choke A,B,C,D,F,G with bead and sleeving H (ONLY)	1	R103	0660076A65	RES 4.7k A,E	1
				R103	0660076A64	RES 4.3k B,F	1
				R103	0660076A77	RES 15k ; 1/8W C,D,G,H	1
				R103	0660076A73	RES 10k I,K	1
				R103	0660076A59	RES 2.7k J,L	1
				R104	0660076A42	RES 510 Ω \pm 5%; 1/10W J,L (ONLY)	1
				R107	0660076A17	RES 47 Ω \pm 5%; 1/10W A,B,E,F	1
				R107	0660076A29	RES 150 Ω \pm 5%; 1/10W C,D,G,H,I,K	1
				R107	0660076A31	RES 180 Ω \pm 5%; 1/10W J,L	1
				R113	0660076A22	RES 75 Ω \pm 5%; 1/10W A,E	1
				R113	0660076A25	RES 100 Ω \pm 5%; 1/10W B,F	1
				R113	0660076M01	Chip Resistor; 0 Ω C,D,G,H,I,K	1
				R113	0660076A18	RES 51 Ω \pm 5%; 1/10W J,L	1

PARTS LIST FOR CQP8000 UHF 2 WATT & 4 WATT TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
R115	0660076A22	RES 75Ω ±5%; 1/10W C,G (ONLY)	1	U108	5102001J05	Buffer A,C,E,G	1
R115	0660076A25	RES 100Ω ±5%; 1/10W D,H,J,L (ONLY)	1	U108	5102001J02	Buffer B,D,F,H	1
R115	0660076A21	RES 68Ω ±5%; 1/10W I,K (ONLY)	1	U108	5105822P90	Buffer I,K	1
R118	0660076A72	RES 9.1k	1	U108	5105822P91	Buffer J,L	1
R119	0660076A87	RES 39k	1	U201	5105549S04	VCO A,C,E,G	1
R120	1805559S02	RES Pot 50k	1	U201	5105549S02	VCO F,H	1
R121	0660076A49	RES 1k A,E	1	U201	5105822P57	VCO I,K	1
R121	0660076A42	RES 510Ω ±5%; 1/10W B,F	1	U201	5105549S58	VCO J,L	1
R121	0660076A41	RES 470Ω ±5%; 1/10W C,D,G,H,I,J,K,L	1	U202	5105822P84	Synthesizer A,C,E,G	1
R122	0660076A79	RES 18k A,E,G	1	U202	5105822P56	Synthesizer B,D	1
R122	0660076A67	RES 5.6k B,F	1	U202	5105822P75	Synthesizer F,H,I,J,K,L	1
R122	0660076A63	RES 3.9k C,D,H	1	VR102	4805189E05	DIO Zener 7.5V A,B,E,F (ONLY)	1
R122	0660076A64	RES 4.3Ω ±5%; 1/10W I,J,K,L	1	VR301	4883461E32	DIO Zener	1
R123	0660076A48	RES 910Ω ±5%; 1/10W A,C,E,G,I,J,K,L	1			NON REFERENCED ITEMS	
R123	0660076A49	RES 1k B,D,F,H	1	0200007007		NUT Hex 8-32x1/4"x3/32" (for Q104 4W Models)	1
R127	0660076A41	RES 470Ω ±5%; 1/10W	1	0300136771		SCREW Phillips 2-56x3/16" (for Q104 heatsink 4W Models)	1
R128	0660076A52	RES 1.3k A,C,E,G,I,J,K,L	1	0300136771		SCREW Phillips 2-56x3/16" (for Q104 heatsink 4W Models)	1
R128	0660076A51	RES 1.2k B,D,F,H	1	0705196A04		BOOT for FL1, FL2	1
R129	0660076A42	RES 510Ω ±5%; 1/10W	1	1400861196		INSULATOR for Q103	1
R133	0660076A45	RES 680Ω ±5%; 1/10W	1	7505695R01		PAD for Q106	1
R135	0660076C45	RES 680; 1/8W A,B,E,F (ONLY)	1	2605494R01		SHIELD I-F Module	1
R137	0660076A18	RES 51Ω ±5%; 1/10W	1	0105955G27		ASSY Preselector Tuning Slug	1
R138	0660076A15	RES 39Ω ±5%; 1/10W	1	0102700J33		ASSY 3-Pole preselector can (438-470 MHz Models)	1
R139	0660076A51	RES 1.2k A,C,E,G (ONLY)	1	0102704J66		ASSY preselector can (403-433 MHz Models)	1
R139	0660076A49	RES 1k B,D,F,H (ONLY)	1	0102702J68		ASSY preselector can (470-500 MHz Models)	1
R140	1805100Q03	Pot 25K (inkl. S1)	1	0102700J39		ASSY preselector can (488-520 MHz Models)	1
R141	0660076A39	RES 390Ω ±5%; 1/10W D,H (ONLY)	1	0605524P01		Can for L14, L101, L112, L116	1
R141	0660076L18	RES 5.1Ω ±5%; 1/10W I,J,K,L (ONLY)	1	0605524P03		Can for L105, L111 thru L115 L119, L120	1
R142	0660076A18	RES 51Ω ±5%; 1/10W A,B,D,I,J,K,L (ONLY)	1	7505695R01		PAD for U106	1
S001	-----	SWITCH On/off part of R140	1	7505295b07		PAD for FL1, FL2	1
S002	4005265Q01	SWITCH 2-& 8-channel radios	1				
S002	4005265Q02	SWITCH 16-channel radios	1				
S003	4005101Q01	SWITCH Toggle SPDT	1				
S301	3905834K04	SWITCH Snap Dome Monitor	1				
S302	3905834K04	SWITCH Snap Dome PTT	1				
S303	3905834K04	SWITCH Snap Dome Monitor	1				
U001	5102001J09	CIRCUIT I-F A,B,C,D,K,L	1				
U001	5102001J08	CIRCUIT I-F E,F,G,H,I,J	1				
U102	5105729E79	Power Amplifier A,E	1				
U102	5105729E80	Power Amplifier B,F	1				
U102	5105729E81	Power Amplifier C,G	1				
U102	5105729E82	Power Amplifier D,H	1				
U102	5105822P68	Power Amplifier I,K	1				
U102	5105822P69	Power Amplifier J,L	1				
U105	5105822P85	Antenna Switch A,E	1				
U105	5105822P63	Antenna Switch B,F	1				
U105	5105729E75	Antenna Switch C,G	1				
U105	5102001J19	Antenna Switch D,H	1				
U105	5105729E77	Antenna Switch I,K	1				
U105	5105729E78	Antenna Switch J,L	1				
U106	5105729E72	Reference Oscillator A,B,C,D,K,L	1				
U106	5105729E52	Reference Oscillator E,F,G,H,I,J	1				

PARTS LIST FOR CQP8000 UHF DOWNBAND TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		Rx: 440-449 MHz, Tx: 425-432 MHz					
		MAX CHANNEL SEPARATION: Rx: 8 MHz, Tx: 7 MHz					
	EUE6979A	MOTHERBOARD					
	EUE6989A	DOWNBAND, 2W, 12.5 kHz					
		DOWNBAND, 4W, 12.5 kHz					
C001	2113740A23	6.2pF	1	C116	2113740A36	20pF (ONLY B)	1
C002	2113740A13	2.7pF	1	C117	2105454G38	33pF	1
C003	2113740A28	9.1pF	1	C119	2113740A53	82pF	1
C004	2113740A53	82pF	1	C121	2113740A10	2.0pF	1
C005	2113741A21	1000pF	1	C122	2113740A53	82pF	1
C006	2113740A17	3.9pF	1	C123	2113740A53	82pF (ONLY A)	1
C007	2113740A23	6.2pF	1	C127	2360562A24	3.3μF +80-20%	1
C008	2113740A53	82pF	1	C143	2360562A17	3.9pF	1
C011	2113741A33	3300pF	1	C145	2113740A53	82pF	1
C012	2113740A53	82pF	1	C149	2160521G37	0.1μF +80-20% (ONLY A)	1
C013	2113741A45	0.01μF	1	C149	2113740A53	82pF (ONLY B)	1
C014	2113740A29	10pF	1	C151	2113740A53	82pF	1
C015	2113740A35	18pF	1	C152	2160521G37	0.1μF +80-20%	1
C016	2113740A38	24pF	1	C154	2113740A24	6.8pF	1
C017	2113740A40	30pF	1	C155	2160521G37	0.1μF +80-20%	1
C018	2113740A40	30pF	1	C157	2113740A20	5.1pF (ONLY A)	1
C021	2113740A31	12pF	1	C157	2113740A23	6.2p (ONLY B)	1
C022	2113740A03	1.0pF	1	C158	2360562A17	3.9pF	1
C025	2113740A09	1.8pF	1	C159	2113740A53	82pF	1
C029	2113740A24	6.8pF	1	C160	2113740A53	82pF	1
C030	2113741A21	1000pF	1	C162	2113740A53	82pF	1
C031	2113740A28	9.1pF	1	C164	2113740A53	82pF	1
C035	2113740A40	30pF	1	C166	2360562A24	3.3μF 16V	1
C036	0660076M01	0 ohm	1	C167	2113740A17	3.9pF (ONLY B)	1
C037	0660076M01	0 ohm	1	C168	2113740A53	82pF (ONLY A)	1
C038	2113741A21	1000pF (ONLY A)	1	C169	2160521G37	0.1μF +80-20% (ONLY A)	1
C039	2360562A13	1.0μF; 16V	1	C170	2113740A53	82pF	1
C041	0660076M01	0 ohm	1	C171	2305499G13	1μF ±20% 20V (ONLY A)	1
C042	2360562A16	1.5μF; 10V	1	C171	2305499G20	10μF ±20% 20V (ONLY B)	1
C043	2113740A43	39pF	1	C177	2113740A20	5.1pF (ONLY A)	1
C047	2113741A33	3300pF	1	C177	2113740A27	8.2pF (ONLY B)	1
C048	2113740A53	82pF	1	C179	2160521G37	0.1μF +80-20%	1
C049	2113740A38	24pF	1	C182	2113741A37	4700pF	1
C050	2113741A21	1000pF	1	C183	0102700J45	6.8pF (ONLY A)	1
C051	2113741A21	1000pF (ONLY A)	1	C183	2113741A13	2.7pF (ONLY B)	1
C052	2160521G37	0.1μF +80-20%	1	C185	2113740A20	5.1pF (ONLY A)	1
C056	2113740A05	1.2pF	1	C185	2114740A19	4.7pF (ONLY B)	1
C102	2113740A33	15pF (ONLY A)	1	C186	2113740A53	82pF	1
C102	2113740A36	20pF (ONLY B)	1	C187	2305499G19	0.1μF ±20% 35V (ONLY A)	1
C105	2113740A53	82pF (ONLY A)	1	C190	2305499G13	1μF ±20% 20V (ONLY A)	1
C105	2113740A38	24pF (ONLY B)	1	C190	2305458G12	33μF 16V (ONLY B)	1
C107	2113740A53	82pF	1	C191	2113740A53	82pF	1
C108	2113740A28	9.1pF (ONLY B)	1	C193	2113740A20	5.1pF (ONLY B)	1
C110	2113740A18	4.3pF (ONLY A)	1	C195	2113740A53	82pF	1
C110	2113740A53	82pF (ONLY B)	1	C197	2113741A21	1000pF (ONLY B)	1
C111	2113740A53	82pF (ONLY B)	1	C199	2113740A44	43pF (ONLY A)	1
C113	2113740A53	82pF (ONLY B)	1				
C115	2113740A53	82pF	1	CR			
				001	4883654H08	SILICON	1
				101	4805494Q04	SILICON	1
				102	4805490G02	SILICON	1
				103	4883654H01	SILICON (ONLY A)	1
				103	4883654H08	SILICON (ONLY B)	1
				107	4880010E05	RF PIN (ONLY B)	1
				FL01	4805245J19	CRYSTAL 53.55 MHz	1
				FL02	4805245J19	CRYSTAL 53.55 MHz	1
				FL03	9105725Q03	CERAMIC 450 kHz	1
				FL04	9105726Q03	CERAMIC 450 kHz	1
				L001	0105957M23	ASSY Presselector; 2-pole	1

PARTS LIST FOR CQP8000 UHF DOWNBAND TRANSCEIVER

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
L002	0105957M23	ASSY Preselector; 2-pole	1	R006	0660076A39	390 ohm	1
L003	2484238H02	1.5 turns	1	R007	0660076M01	0 ohm	1
L004	2484238H02	1.5 turns	1	R008	0660076A54	1.6 Kohm	1
L005	2405732J21	10.75 turns	1	R009	0660076A57	2.2 Kohm	1
L006	2405732J01	11 turns	1	R012	0660076A85	33 Kohm	1
L007	2405732J01	11 turns	1	R102	0660076A46	750 ohm (ONLY A)	1
L008	2405559P13	5.5 turns	1	R103	0660076A65	4.7 Kohm (ONLY A)	1
L009	2405063H24	13 turns	1	R103	0660076A77	15 Kohm (ONLY B)	1
L010	2405063H13	0.9μH tunable	1	R107	0660076A17	47 ohm (ONLY A)	1
L011	2405063H05	0.4μH tunable	1	R107	0660076A29	150 ohm (ONLY B)	1
L012	2405523P35	1.5 turns with core	1	R113	0660076A22	75 ohm (ONLY A)	1
L013	2405523P35	1.5 turns with core	1	R113	0660076M01	0 ohm (ONLY B)	1
L014	2505129Q02	1.2μH tunable	1	R115	0660076A22	75 ohm (ONLY B)	1
L016	2405027E19	RF Choke	1	R118	0660076A72	9.1 Kohm	1
L017	2462575A01	0.39μH	1	R119	0660076A87	39 Kohm	1
L018	2462575A01	0.39μH	1	R120	1805559S02	Pot 50 Kohm	1
L101	2405559P07	2.5 turns (ONLY A)	1	R121	0660076A49	1.0 Kohm (ONLY A)	1
L101	2405523P08	3.5 turns (ONLY B)	1	R121	0660076A41	470 ohm (ONLY B)	1
L104	0105951N35	85nH + bead	1	R122	0660076A67	5.6 Kohm	1
L105	2405523P08	3.5 turns	1	R123	0660076A48	910 ohm	1
L106	2405559P19	4.5 turns (ONLY A)	1	R127	0660076A41	470 ohm	1
L106	2405027E38	3.5 turns (ONLY B)	1	R128	0660076A52	1.3 Kohm	1
L107	0105950L78	1.2μH + bead	1	R129	0660076A42	510 ohm	1
L108	0105951N35	85nH + bead	1	R133	0660076A45	680 ohm (ONLY A)	1
L109	2405027E38	3.5 turns (ONLY B)	1	R133	0660076A43	560 ohm (ONLY B)	1
L110	0105951N34	0.29μH (ONLY B)	1	R135	0660075C45	680 ohm (ONLY A)	1
L111	0105951N35	85nH (ONLY B)	1	R137	0660076A18	51 ohm	1
L112	2405523P08	3.5 turns (ONLY A)	1	R138	0660076A15	39 ohm	1
L112	2405027E38	3.5 turns (ONLY B)	1	R139	0660076A49	1.0 Kohm	1
L113	0105955N19	0.2μH + bead (ONLY A)	1	R142	0660076A18	51 ohm (ONLY B)	1
L113	0105952N08	1.5μH + bead (ONLY B)	1	U001	5102001J09	IF	1
L114	0105951N34	0.29μH + bead	1	U102	5105729E79	PA (ONLY A)	1
L115	2405559P19	4.5 turns	1	U102	5105729E81	PA (ONLY B)	1
L116	2484238H02	1.5 turns	1	U105	5105822P85	Antenna Switch (ONLY A)	1
L117	0105951N34	0.29μH + bead (ONLY A)	1	U105	5105729E75	Antenna Switch (ONLY B)	1
L117	0102704E81	0.29μH (ONLY B)	1	U106	5105729E72	Reference Oscillator	1
L118	2405027E38	3.5 turns (ONLY B)	1	U108	5102001J02	Buffer	1
L119	2405452C08	275μH	1	U201	5102001J18	VCO	1
L120	2405452C08	275μH (ONLY B)	1	U202	5105822P84	Synthesizer	1
L121	2405452C06	21nH	1	VR102	4805189E05	Zener diode 7.5V (ONLY A)	1
L122	2405559P18	3.5 turns	1				
L123	2405027E38	3.5 turns	1		NTN5374B	Controller Flex	
L124	2482723H28	0.29μH	1				
L126	2462575A01	0.39μH	1				
L127	2462575A01	0.39μH	1				
L128	2462575A01	0.39μH	1				
L129	0105957P25	0.29μH + bead	1				
L131	2405559P18	3.5 turns (ONLY A)	1				
Q001	4880182D39	NPN	1				
Q002	4805452G13	MOSFET BF990	1				
Q102	4805128M84	NPN SOT	1				
Q103	4805474G48	NPN MRF837 (ONLY A)	1				
Q103	4805474G38	NPN MRF559 (ONLY B)	1				
Q104	4800869887	NPN (ONLY B)	1				
Q106	4805128M09	NPN BCX54-16 SOT (ONLY A)	1				
R001	0660076A69	6.8 Kohm	1				
R002	0660076A89	47 Kohm	1				
R003	0660076A57	2.2 Kohm	1				
R005	0660076A45	680 ohm	1				

CONTROLLER FLEX

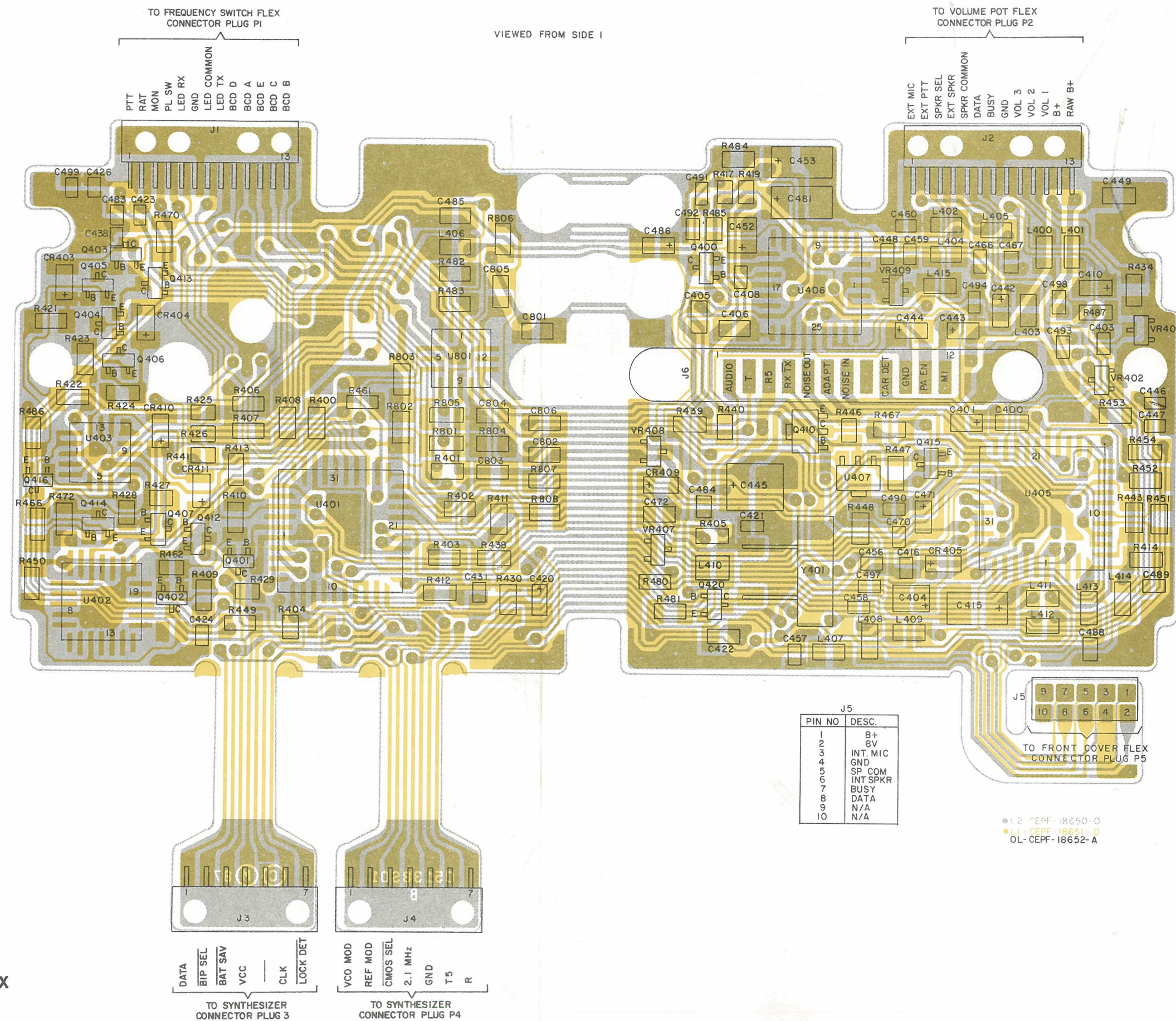
Component Layouts

Electrical Diagrams

Parts List

Volume Pot. & PTT/B +
& Frequency Switch Flex

- a) DTMF Front Cover
- b) Multicall Front Cover



CQP8XXX CONTROLLER FLEX
COMPONENT LAYOUT

D405.023/2



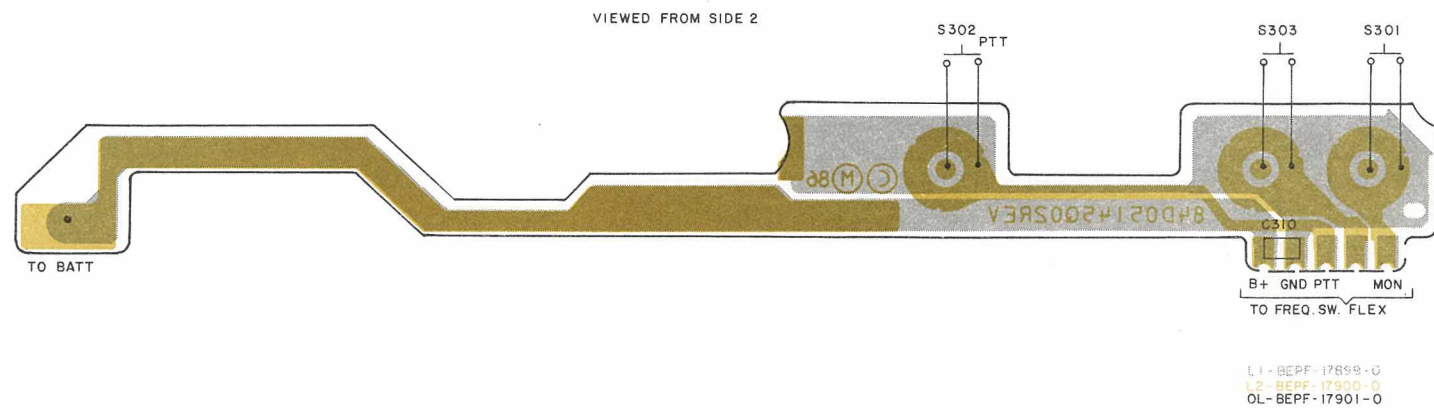
PARTS LIST FOR NTN5374B CONTROLLER FLEX

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		CAPACITOR, Fixed: pF $\pm 5\%$ 50V unless stated		C493	2160521G37	CAP 0.1uF +80 -20% 25V	1
C302	2113740A53	CAP 82	1	C494	2160521G37	CAP 0.1uF +80 -20% 25V	1
C301	2113740A53	CAP 82	1	C497	2113741A53	CAP 0.22uF	1
C303	2113740A53	CAP 82	1	C498	2113741A37	CAP 4700	1
C304	2113740A49	CAP 56	1	C499	2113741A45	CAP 0.1uF	1
C305	2113740A49	CAP 56	1	C490	2113741A45	CAP 0.1uF	1
C306	2113740A49	CAP 56	1	C801	2113741B33	CAP 3300	1
C307	2113740A53	CAP 82	1	C802	2111032B13	CAP 0.1uF +80-20% 50V	1
C308	2113740A53	CAP 82	1	C803	2160520P08	CAP 2000	1
C310	2113740A67	CAP 330	1	C804	2113740B61	CAP 330 $\pm 30\%$	1
C400	2113741B33	CAP 3300	1	C805	2113741B45	CAP 1000	1
C401	2360562A07	CAP 0.47uF 20% 25V	1	C806	2111032B13	CAP 0.1uF +80-20% 50V	1
C403	2160521G37	CAP 0.1uF +80 -20% 25V	1	CR			
C404	2360562A28	CAP 4.7uF 20% 10V	1	301	4805729G24	DIODE LED BICOLOR	
C405	2111032B13	CAP 0.1uF +80 -20% 50V	1	403	4805494Q04	DIODE SILICON	1
C406	2111032B13	CAP 0.1uF +80 -20% 50V	1			DIODE SILICON	1
C408	2113741A37	CAP 4700	1	404	4805494Q04	DIODE SILICON	1
C410	2111032B13	CAP 0.1uF +80 -20% 50V	1	405	4805494Q04	DIODE SILICON	1
C415	2360562A43	CAP 10uF 20% 16V	1	409	4805494Q04	DIODE SILICON	1
C416	2160521G37	CAP 0.1uF +80 -20% 25V	1	410	4805494Q04	DIODE SILICON	1
C420	2360562A13	CAP 1uF 20% 16V	1	411	4805494Q04	DIODE SILICON	1
C421	2113740A29	CAP 10 $\pm 30\%$	1	J1	0905573P02	JACK CONN CTR FLEX TOP 13-PIN	1
C422	2113740B29	CAP 15 $\pm 30\%$	1	J2	0905573P02	JACK CONN CTR FLEX TOP 13-PIN	1
C423	2113740A55	CAP 100 $\pm 30\%$	1	J3	0905577P01	JACK SYNT CTR FLEX TOP 7-PIN	1
C424	2160521G37	CAP 0.1uF +80 -20% 25V	1	J4	0905577P01	JACK SYNT CTR FLEX TOP 7-PIN	1
C426	2113740A55	CAP 100 $\pm 30\%$	1	J5	0905504R01	JACK CONNECTOR 10-PIN	1
C431	2160521G37	CAP 0.1uF +80 -20% 25V	1	J6	0105959M27	JACK HEADER ASSEMBLY 13-PIN	1
C438	2113740A67	CAP 330 ± 30	1	L400	2462575A01	COIL 0.39uH CHOKE	1
C442	2360562A13	CAP 1uF 20% 16V	1	L401	2462575A01	COIL 0.39uH CHOKE	1
C443	2360562A13	CAP 1uF 20% 16V	1	L402	2462575A01	COIL 0.39uH CHOKE	1
C444	2360562A13	CAP 1uF 20% 16V	1	L403	2462575A01	COIL 0.39uH CHOKE	1
C445	2360562A35	CAP 10uF 20% 25V	1	L404	2462575A01	COIL 0.39uH CHOKE	1
C446	2113741A39	CAP 5600	1	L405	2462575A01	COIL 0.39uH CHOKE	1
C447	2113741A31	CAP 2700	1	L406	2462575A01	COIL 0.39uH CHOKE	1
C448	2113741A45	CAP .01uF	1	L407	2462575A01	COIL 0.39uH CHOKE	1
C449	2111032B13	CAP 0.1uF +80 -20% 50V	1	L408	2462575A01	COIL 0.39uH CHOKE	1
C452	2360562A28	CAP 4.7uF 20% 10V	1	L409	2462575A01	COIL 0.39uH CHOKE	1
C453	2360562A43	CAP 10uF 20% 16V	1	L410	2460590A02	COIL 150uH CHOKE	1
C456	2113740A59	CAP 150 $\pm 30\%$	1	L411	2462575A01	COIL 0.39uH CHOKE	1
C457	2113740A59	CAP 150 $\pm 30\%$	1	L412	2462575A01	COIL 0.39uH CHOKE	1
C458	2113740A59	CAP 150 $\pm 30\%$	1	L413	2462575A01	COIL 0.39uH CHOKE	1
C459	2113740A59	CAP 150 $\pm 30\%$	1	L414	2462575A01	COIL 0.39uH CHOKE	1
C460	2113740A59	CAP 150 $\pm 30\%$	1	L415	2462575A01	COIL 0.39uH CHOKE	1
C466	2113740A53	CAP 82 $\pm 30\%$	1	Q400	4805128M94	TSTR PNP	1
C467	2113740A53	CAP 82 $\pm 30\%$	1	Q401	4805128M12	TSTR NPN	1
C470	2113741A45	CAP 0.1uF	1	Q402	4805128M94	TSTR PNP	1
C471	2360562A13	CAP 1uF 20% 16V	1	Q403	4805128M94	TSTR PNP	1
C472	2113740B47	CAP 82 $\pm 30\%$	1	Q404	4805128M94	TSTR PNP	1
C481	2360562A43	CAP 10uF 20% 16VDC	1	Q405	4805128M12	TSTR NPN	1
C483	2113741A21	CAP 1000	1	Q406	4805128M12	TSTR NPN	1
C484	2113741A21	CAP 1000	1	Q407	4805128M94	TSTR PNP	1
C485	2113740B47	CAP 82 $\pm 30\%$	1	Q410	4805128M10	TSTR PNP	1
C486	2360562A13	CAP 1uF 20% 16V	1	Q412	4805128M94	TSTR PNP	1
C488	2160521G37	CAP 0.1uF +80 -20% 25V	1	Q413	4805128M12	TSTR NPN	1
C489	2160521G37	CAP 0.1uF +80 -20% 25V	1	Q414	4805128M94	TSTR PNP	1
C490	2113741A45	CAP 0.1uF	1	Q415	4805128M12	TSTR NPN	1
C491	2113741A53	CAP 0.22uF	1	Q416	4805128M12	TSTR NPN	1
C492	2113741A53	CAP 0.22uF	1	Q420	4805128M12	TSTR NPN	1

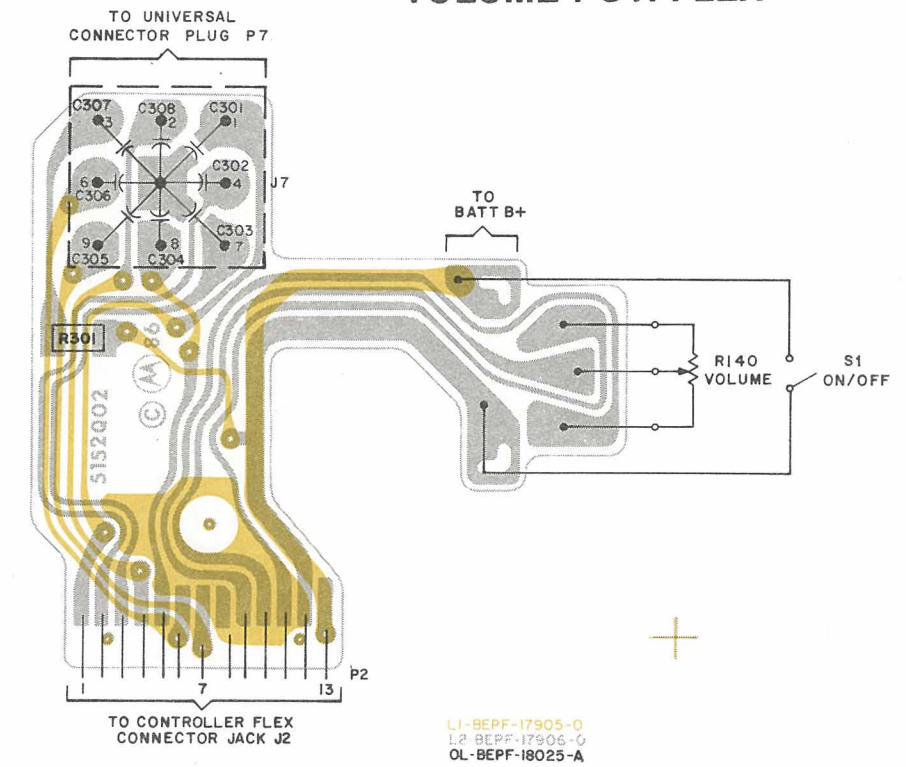
PARTS LIST FOR NTN5374B CONTROLLER FLEX

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		RESISTOR, Fixed Ω $\pm 5\%$ 1/8W unless stated					
R301	0660076A43	RES 560	1	R801	0611024J73	RES 750K $\pm 1\%$	1
R400	0611077B23	RES 100K	1	R802	0611024J73	RES 750K $\pm 1\%$	1
R401	0611077A98	RES 10K	1	R803	0611024J14	RES 182K $\pm 1\%$	1
R402	0611077A98	RES 10K	1	R804	0611077B25	RES 120K	1
R403	0611077A92	RES 5.6K	1	R805	0611077B11	RES 33K	1
R404	0660076A73	RES 10K	1	R806	0611077A96	RES 8.2K	1
R405	0660076K49	RES 10 MEG	1	R807	0611077A96	RES 8.2K	1
R406	0611077B23	RES 100K	1	R808	0611077B47	RES 1 MEG	1
R407	0611077B23	RES 100K	1	U401	0105958P12	CIRCUIT MODULE MICROCOMPUTER	1
R408	0611077B23	RES 100K	1	U402	0105958N07	CIRCUIT MODULE EEPROM	1
R409	0611077A72	RES 820	1	U403	0105957N87	CIRCUIT MODULE HEX GATE	1
R410	0611077A84	RES 2.7K	1	U405	0105951Q59	CIRCUIT MODULE AUDIO FILTER	1
R411	0611077A98	RES 10K	1	U406	0105958P03	CIRCUIT MODULE AUDIO PA	1
R412	0611077B23	RES 100K	1	U407	5160880B01	CIRCUIT MODULE 5V REGLT. CMOS	1
R413	0611077B23	RES 100K	1	U801	0105957N83	CIRCUIT MODULE QUAD OP-AMP	1
R414	0611077B16	RES 51K	1	VR			
R417	0660076A56	RES 2K	1	401	4880140L09	DIODE ZENER 6.2V	1
R419	0660076A56	RES 2K	1	402	4880140L09	DIODE ZENER 6.2V	1
R421	0611077A66	RES 470	1	407	4880140L09	DIODE ZENER 6.2V	1
R422	0611077A76	RES 1.2K	1	408	4880140L09	DIODE ZENER 6.2V	1
R423	0611077B09	RES 27K	1	409	4880140L09	DIODE ZENER 6.2V	1
R424	0611077A78	RES 1.5K	1	Y401	4805664G33	CRYSTAL 3.6864 MHZ	1
R425	0660076F01	RES 100K $\pm 1\%$	1				
R426	0660076E84	RES 30K $\pm 1\%$	1				
R427	0660076A94	RES 75K	1				
R428	0660076B05	RES 150K	1				
R429	0660076B01	RES 100K	1				
R430	0611077A98	RES 10K	1				
R434	0611077A66	RES 470	1				
R438	0611077B23	RES 100K	1				
R439	0611077A98	RES 10K	1				
R440	0660076A73	RES 10K	1				
R441	0660076B25	RES 1 MEG	1				
R443	0611077B23	RES 100K	1				
R446	0660076A25	RES 100	1				
R447	0611024J08	RES 158K $\pm 1\%$	1				
R448	0611024H84	RES 90.9K $\pm 1\%$	1				
R449	0611077A26	RES 10	1				
R450	0611077A98	RES 10K	1				
R451	0611077B15	RES 47K	1				
R452	0611077A79	RES 1.6K	1				
R453	0611077A74	RES 1K	1				
R454	0611077A74	RES 1K	1				
R461	0611077B23	RES 100K	1				
R462	0660076A73	RES 10K	1				
R466	0611077A98	RES 10K	1				
R467	0611077A84	RES 2.7K	1				
R470	0611077A50	RES 100	1				
R472	0611077A50	RES 100	1				
R480	0611077B23	RES 100K	1				
R482	0611024J09	RES 162K $\pm 1\%$	1				
R482	0611077A98	RES 10K	1				
R483	0611024H88	RES 100K $\pm 1\%$	1				
R484	0611024H09	RES 15K $\pm 1\%$	1				
R485	0660076E90	RES 51K $\pm 1\%$	1				
R486	0611077A82	RES 2.2K	1				
R487	0611077A82	RES 2.2K	1				

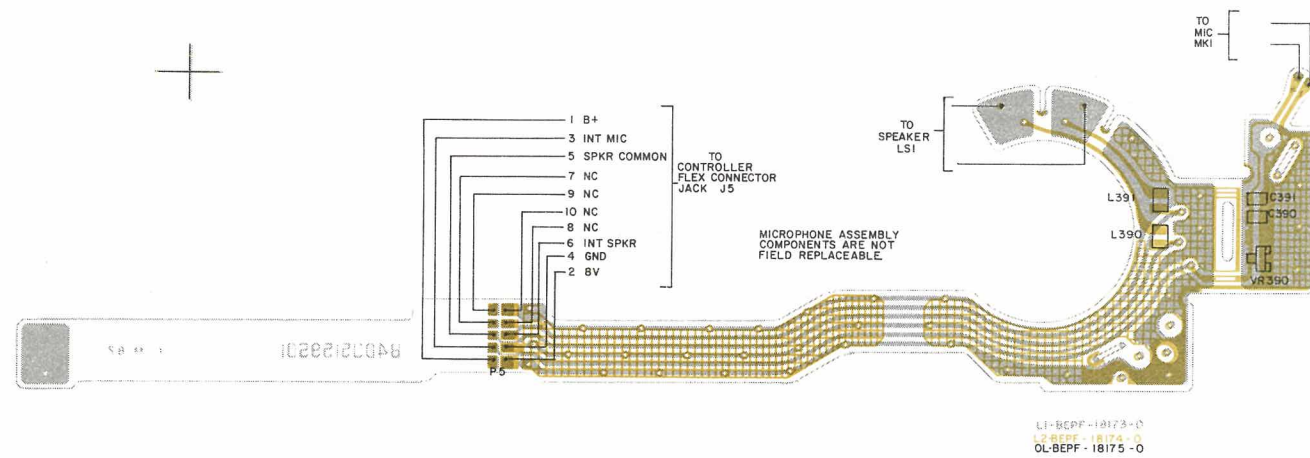
PTT/B + FLEX



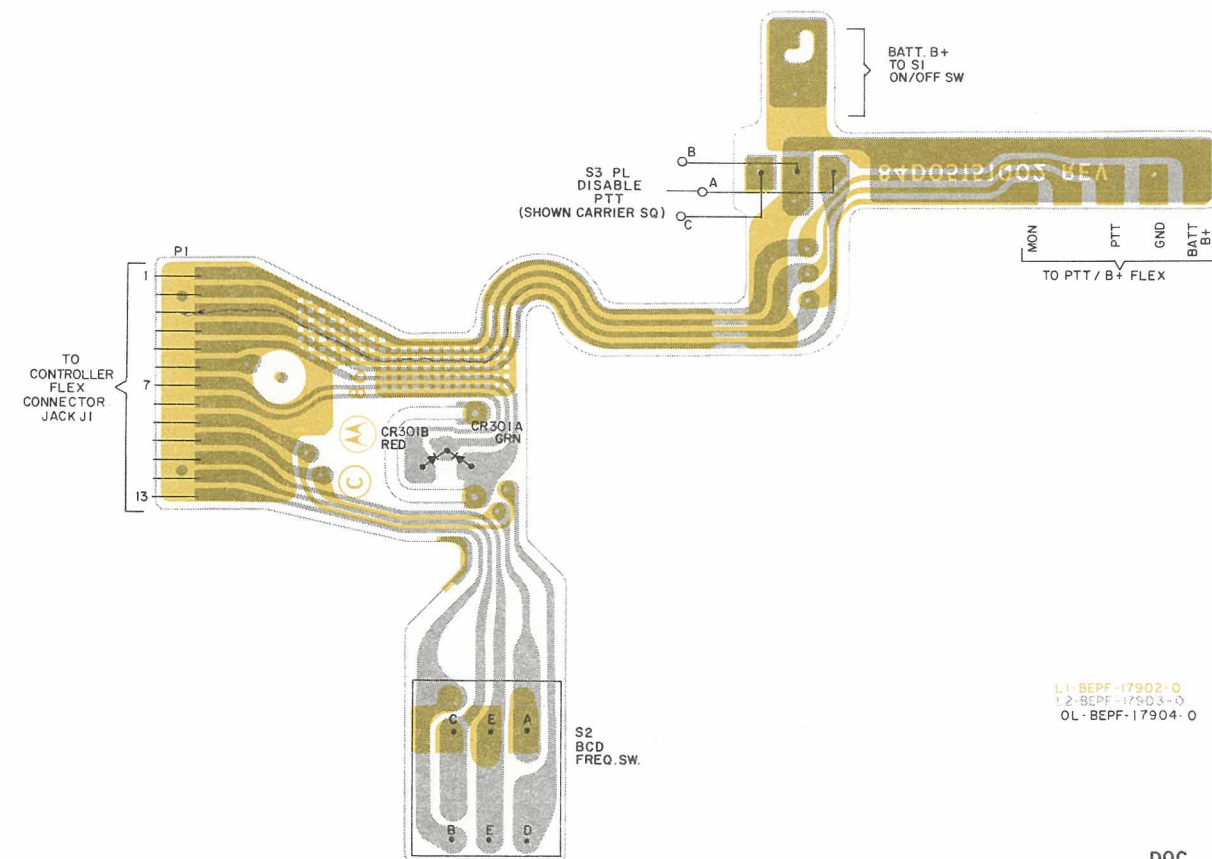
VOLUME POT. FLEX



MICROPHONE FLEX ASSEMBLY MK1



FREQUENCY SWITCH FLEX



CQP8XXX PTT/B + FLEX, VOLUME POT. FLEX,
FREQUENCY SWITCH FLEX, MICROPHONE FLEX
COMPONENT LAYOUT

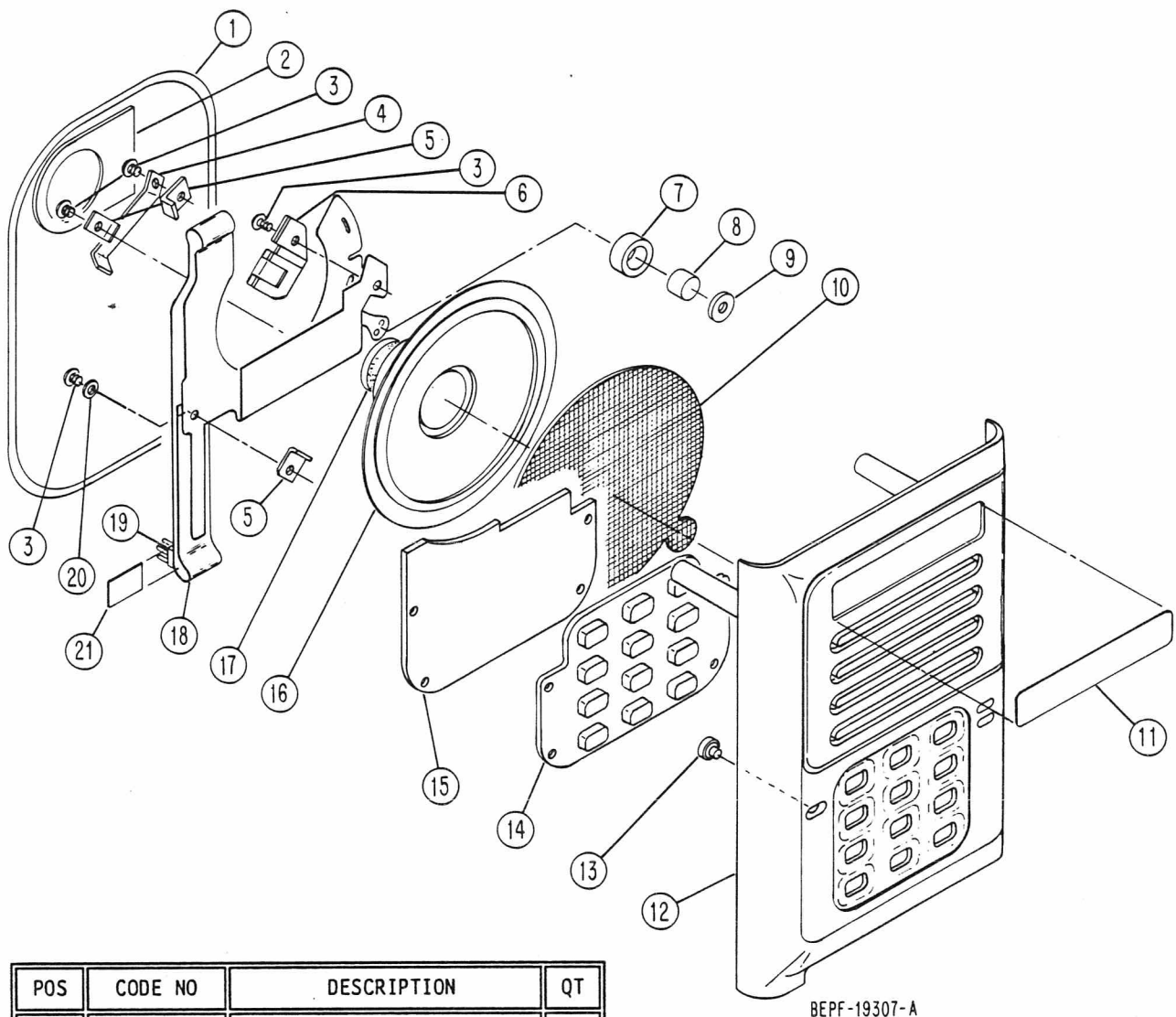
D405.043/3

DTMF FRONT COVER

Exploded View & Mechanical Parts List

Parts List

Circuit Board & Flex Assembly



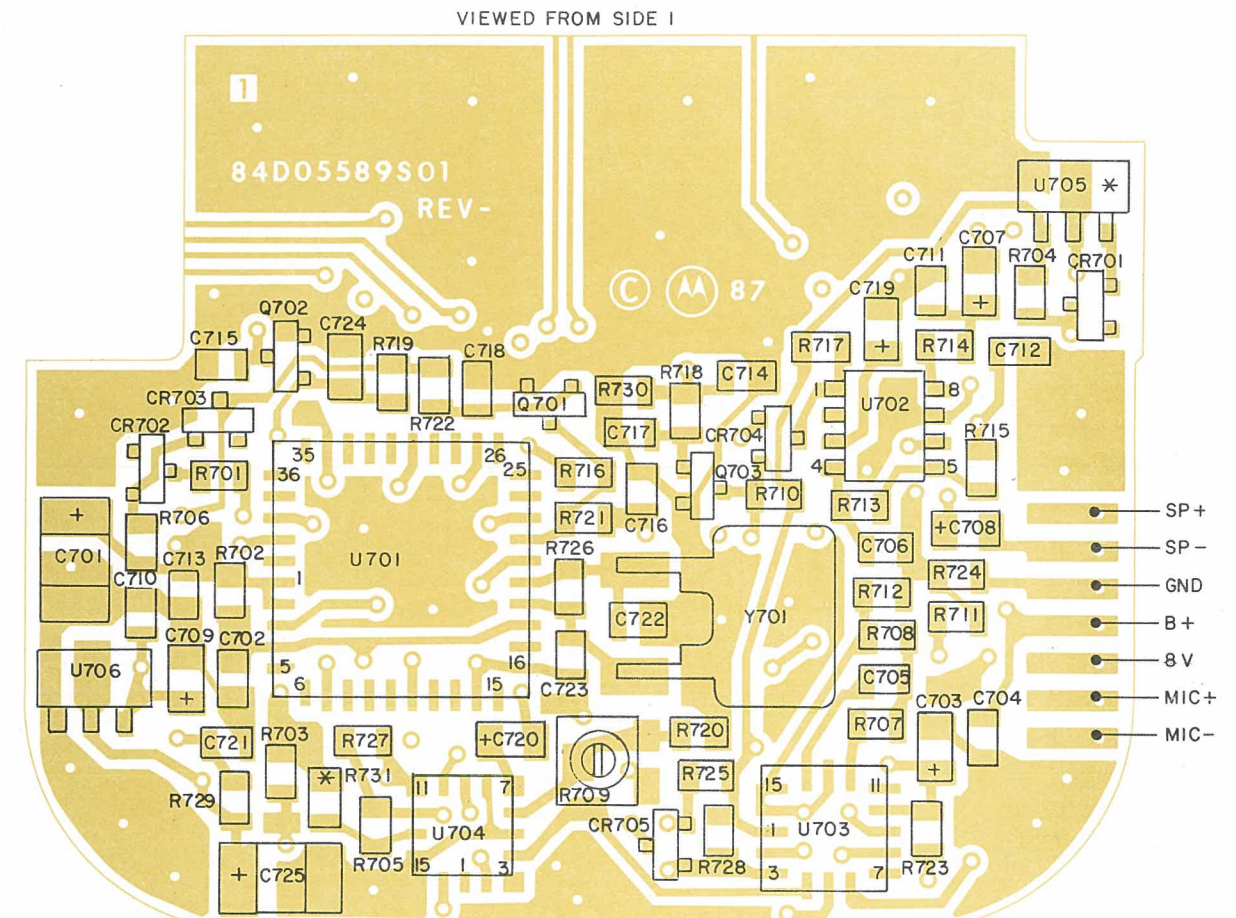
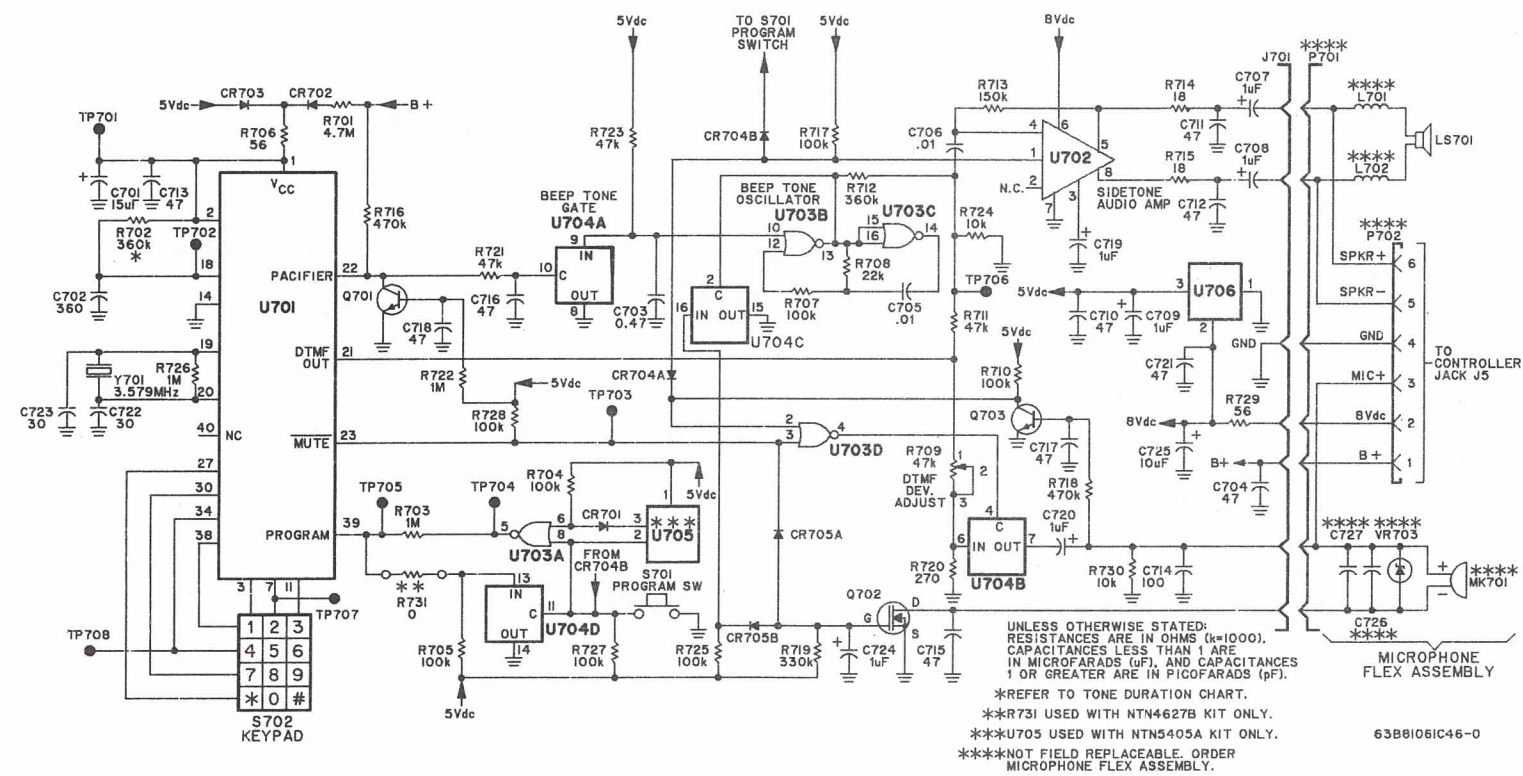
POS	CODE NO	DESCRIPTION	QT
1	3205141Q01	O-RING, FRONT COVER	1
2	1405299Q01	INSULATOR, SPEAKER	1
3	0300139444	SCREW, #2-56x5/32"	
4	3905178S01	CONTACT, FRONT COVER	1
5	4205166S01	CLAMP, SPEAKER	1
6	4205167S01	RETAINER, MICROPHONE	2
7	1405299L01	BOOT, MICROPHONE	1
8	-----	MIC, PART OF ITEM 18	1
9	7505564S01	PAD, MICROPHONE	1
10	3505152J01	FELT, SPEAKER	1
10	1105776R01	ADHESIVE, SPEAKER FELT, PART OF ITEM 10	1
11	3305260Q06	NAMEPLATE	1
12	-----	* FRONT COVER	1
13	-----	* SWITCH, ACTUATOR	1
14	-----	* SWITCH, KEYPAD	1
15	-----	* CIRCUIT BOARD	1
16	See note	SPEAKER	1
17	7505501R02	PAD, SPEAKER	1
18	See note	FLEX, MIC (MK701) INLC. ITEMS 7, 8, 16 & 19	1
19	2805433R02	PLUG, PCB	1
20	0484345A06	WASHER, SEAL	1
21	7505501R04	PAD	1

NOTE: See Electrical Parts List for number and description

* Not field replaceable, order applicable DTMF Front Cover Kit

CQP8000 EXPLODED VIEW
DTMF FRONT COVER
NTN5040A STANDARD
NTN5395A ANI
NTN5596A CONTINUOUS TONE

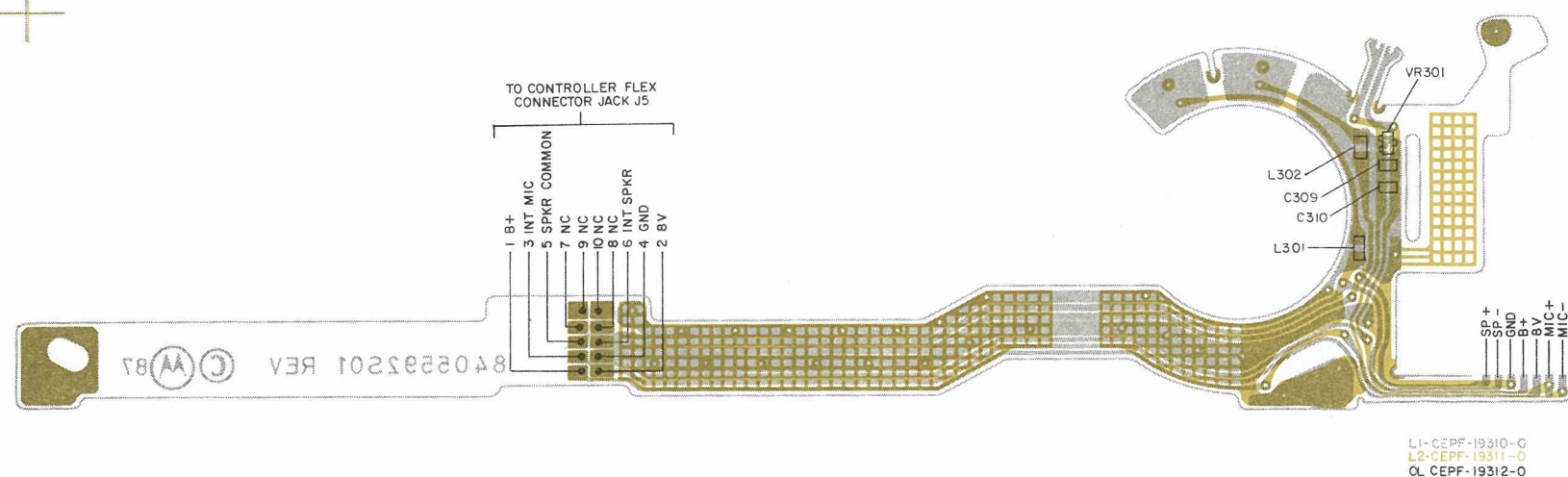
M405.706



NOTE * REFER TO TABLE BELOW

KIT NO	R731	U705
NTN5395A	NOT USED	USED
NTN5040A	USED	NOT USED

OL-BEPF-19314-0

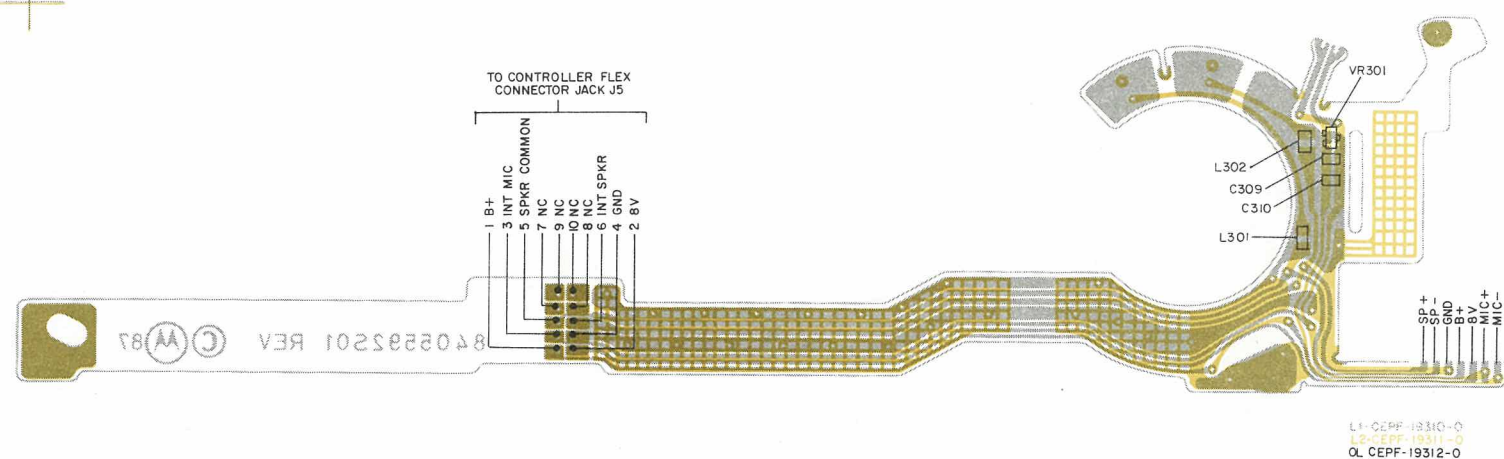
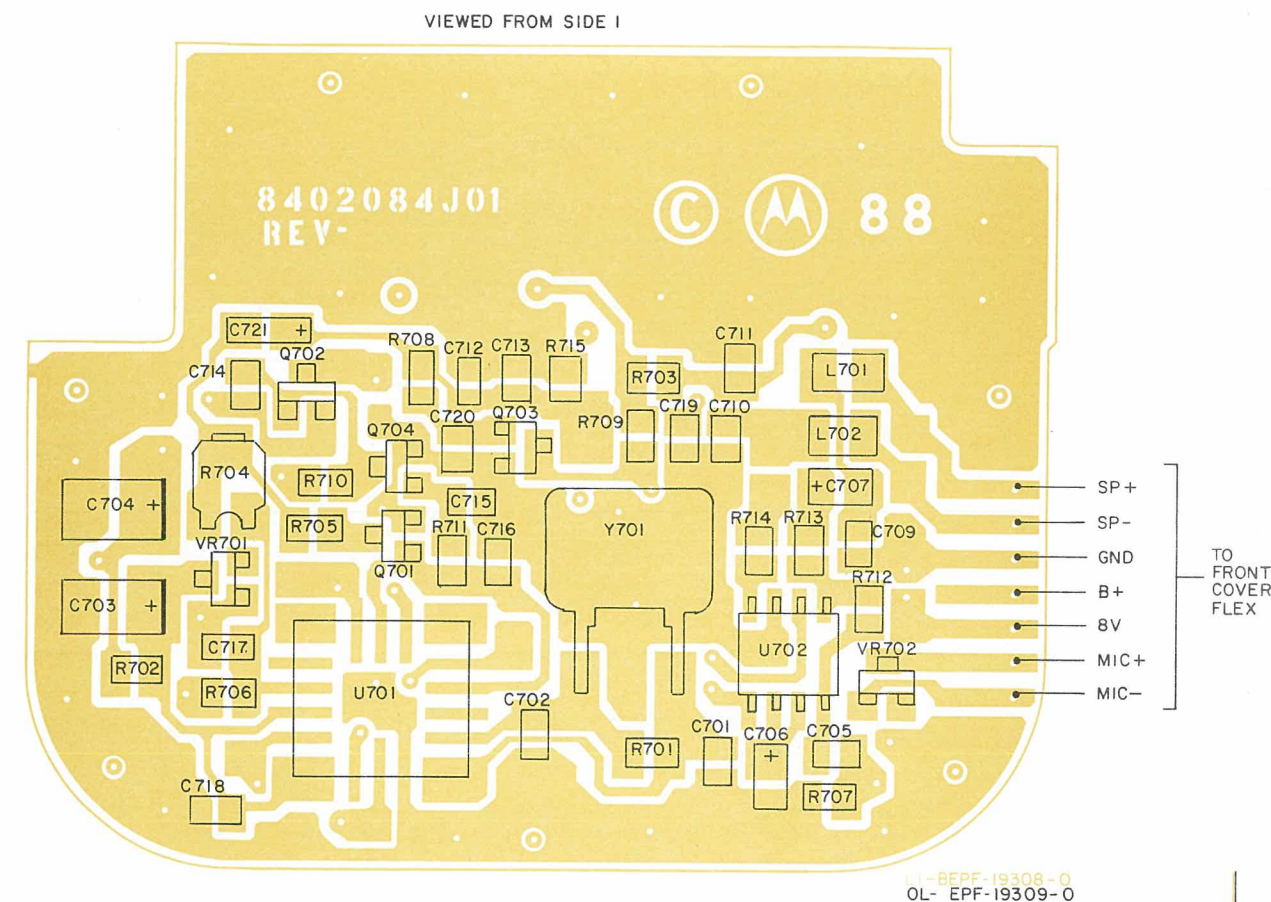
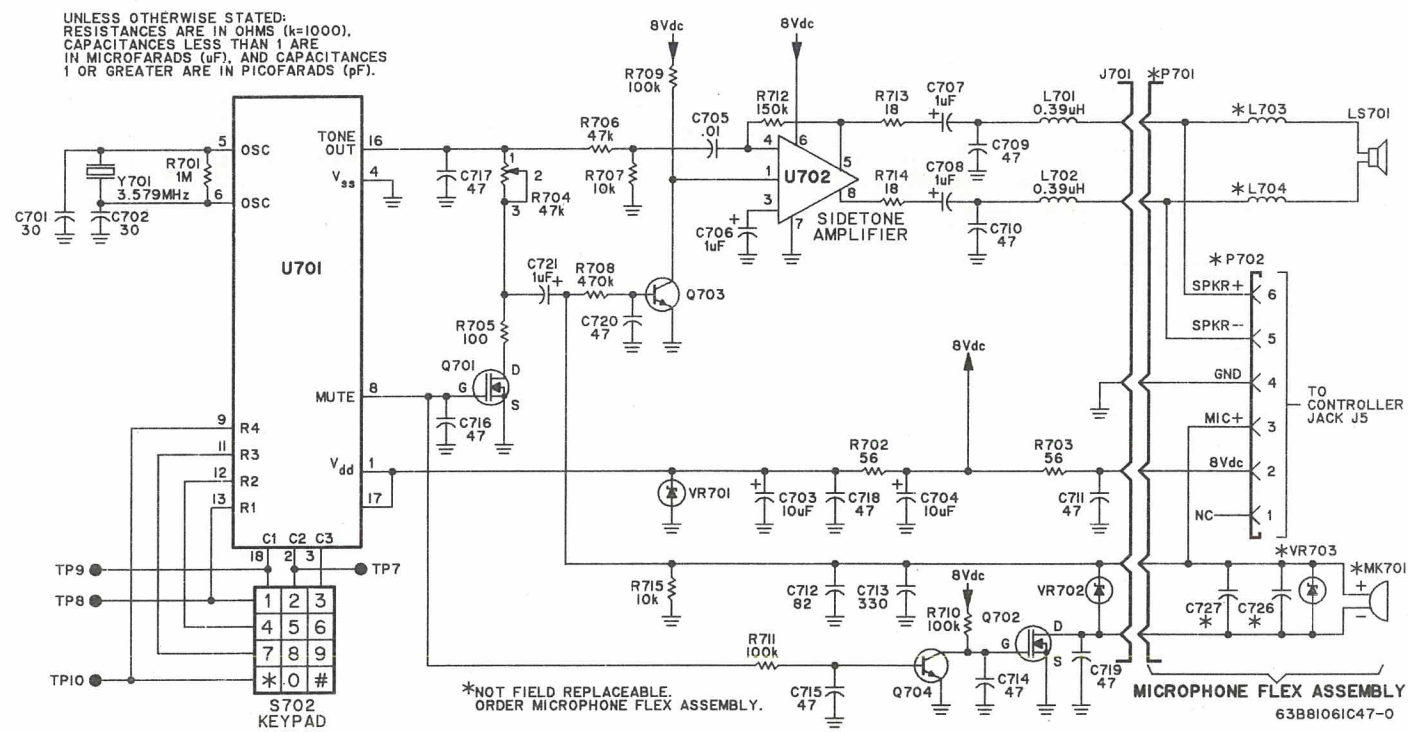


CQP8XXX CIRCUIT BOARD FOR DTMF
STANDARD AND ANI

D405.472

PARTS LIST FOR DTMF FRONT COVERS, NTN5040A: STANDARD, NTN5395A: ANI

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		CAPACITOR, Fixed uF $\pm 10\%$ 16V unless stated		R723	0660076A89	RES 47K	1
C701	2362998C24	CAP 15 10V	1	R724	0660076A73	RES 10K	1
C702	2113740A68	CAP 360pF $\pm 30\%$	1	R725	0660076B01	RES 100K	1
C703	2362998C05	CAP 0.47 35V	1	R726	0660076B25	RES 1 MEG	1
C704	2113740A46	CAP 47pF $\pm 30\%$	1	R727	0660076B01	RES 100K	1
C705	2113741A45	CAP .01 25V	1	R728	0660076B01	RES 100K	1
C706	2113741A45	CAP .01 25V	1	R729	0660076A19	RES 56	1
C707	2362998C09	CAP 1	1	R730	0660076A73	RES 10K	1
C708	2362998C09	CAP 1	1	R731	0660076M01	RES 0 (NTN5040A ONLY)	1
C709	2362998C09	CAP 1	1	U701	5105226P87	CIRCUIT MODULE TONE GENERATOR	1
C710	2113740A46	CAP 47pF $\pm 30\%$	1	U702	5105469E51	CIRCUIT MODULE AUDIO AMPLIFIER	1
C711	2113740A46	CAP 47pF $\pm 30\%$	1	U703	5105226P60	CIRCUIT MODULE QUAD NOR GATE	1
C712	2113740A46	CAP 47pF $\pm 30\%$	1	U706	5160880B01	CIRCUIT MODULE 5-VOLT REGULATOR	1
C713	2113740A46	CAP 47pF $\pm 30\%$	1	Y701	4805719G04	CRYSTAL 3.579 MHz RESONATOR	1
C714	2113740A55	CAP 100pF $\pm 30\%$	1				
C715	2113740A46	CAP 47pF $\pm 30\%$	1				
C716	2113740A46	CAP 47pF $\pm 30\%$	1				
C717	2113740A46	CAP 47pF $\pm 30\%$	1				
C718	2113740A46	CAP 47pF $\pm 30\%$	1				
C719	2362998C09	CAP 1	1				
C720	2362998C09	CAP 1	1				
C721	2113740A46	CAP 47pF $\pm 30\%$	1				
C722	2113740A40	CAP 30pF $\pm 30\%$	1				
C723	2113740A40	CAP 30pF $\pm 30\%$	1				
C724	2362998C09	CAP 1	1				
C725	2311049J26	CAP 10 $\pm 20\%$	1				
CR70	4805129M24	DIODE SWITCHING	1				
CR70	4805129M24	DIODE SWITCHING	1				
CR70	4805129M24	DIODE SWITCHING	1				
CR70	4805129M24	DIODE SWITCHING	1				
CR70	4805129M24	DIODE SWITCHING	1				
Q701	4805128M11	TSTR SOT	1				
Q702	4805218N11	TSTR D-MOS	1				
Q703	4805128M11	TSTR SOT	1				
		RESISTOR, Fixed: $\pm 5\%$; 1/8W unless stated					
R701	0660076H41	RES 4.7 MEG $\pm 10\%$	1				
R702	0660076B14	RES 360K	1				
R703	0660076B25	RES 1 MEG	1				
R704	0660076B01	RES 100K	1				
R705	0660076B01	RES 100K	1				
R706	0660076A19	RES 56	1				
R707	0660076B01	RES 100K	1				
R708	0660076A81	RES 22K	1				
R709	1860502A17	RES POT 47K	1				
R710	0660076B01	RES 100K	1				
R711	0660076A89	RES 47K	1				
R712	0660076B14	RES 360K	1				
R713	0660076B05	RES 150K	1				
R714	0660076A07	RES 18	1				
R715	0660076A07	RES 18	1				
R716	0660076B17	RES 470K	1				
R717	0660076B01	RES 100K	1				
R718	0660076B17	RES 470K	1				
R719	0660076B13	RES 330K	1				
R720	0660076A35	RES 270	1				
R721	0660076A89	RES 47K	1				
R722	0660076B25	RES 1 MEG	1				



PARTS LIST FOR NTN5596A DTMF FRONT COVER (CONTINUOUS TONE)

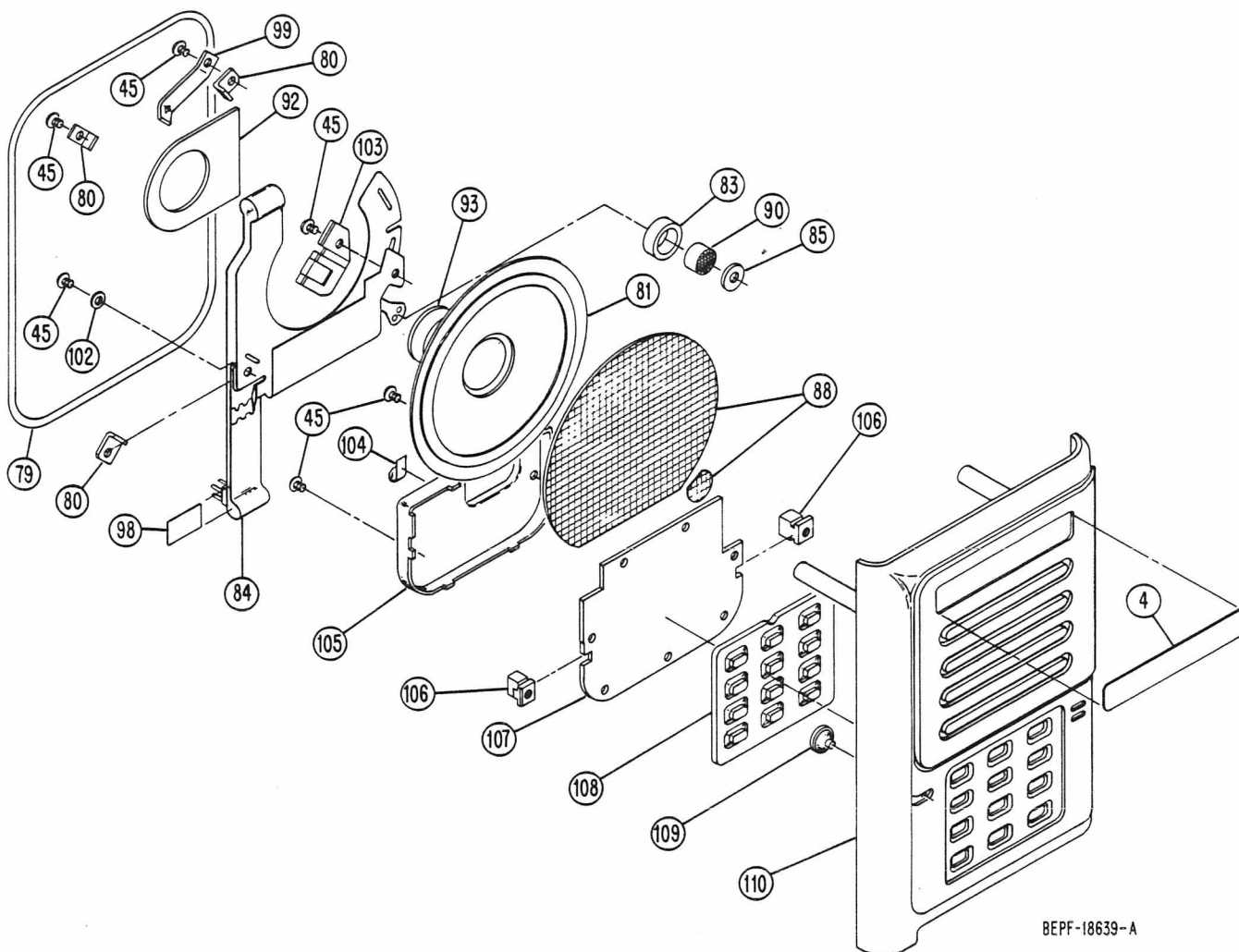
Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
		CAPACITOR, Fixed: pF $\pm 10\%$; 50V unless stated					
C701	2113740A40	CAP 30 $\pm 30\%$	1				
C702	2113740A40	CAP 30 $\pm 30\%$	1				
C703	2311049J26	CAP 10uF 20% 16V	1				
C704	2311049J26	CAP 10uF 20% 16V	1				
C705	2113741A45	CAP 0.1uF	1				
C706	2362998C09	CAP 1uF 10% 16V	1				
C707	2362998C09	CAP 1uF 10% 16V	1				
C708	2362998C09	CAP 1uF 10% 16V	1				
C709	2113740A46	CAP 47 $\pm 30\%$	1				
C710	2113740A46	CAP 47 $\pm 30\%$	1				
C711	2113740A46	CAP 47 $\pm 30\%$	1				
C712	2113740A53	CAP 82 $\pm 30\%$	1				
C713	2113740A67	CAP 330 $\pm 30\%$	1				
C714	2113740A46	CAP 47 $\pm 30\%$	1				
C715	2113740A46	CAP 47 $\pm 30\%$	1				
C716	2113740A46	CAP 47 $\pm 30\%$	1				
C717	2113740A46	CAP 47 $\pm 30\%$	1				
C718	2113740A46	CAP 47 $\pm 30\%$	1				
C719	2113740A46	CAP 47 $\pm 30\%$	1				
C720	2113740A46	CAP 47 $\pm 30\%$	1				
C721	2362998C09	CAP 1uF 10% 16V	1				
L701	2462575A01	COIL 0.39uH	1				
L702	2462575A01	COIL 0.39uH	1				
Q701	4805218N11	TSTR D-MOS FET	1				
Q702	4805218N11	TSTR D-MOS FET	1				
Q703	4805128M11	TSTR NPN	1				
Q704	4805128M11	TSTR NPN	1				
		RESISTOR, Fixed: $\Omega \pm 5\%$ 1/8W unless stated					
R701	0660076B25	RES CHIP 1 MEG	1				
R702	0660076A19	RES CHIP 56	1				
R703	0660076A19	RES CHIP 56	1				
R704	1860502A17	47K POT	1				
R705	0660076A25	RES CHIP 100	1				
R706	0660076A89	RES CHIP 47K	1				
R707	0660076A73	RES CHIP 10K	1				
R708	0660076B17	RES CHIP 470K	1				
R709	0660076B01	RES CHIP 100K	1				
R710	0660076B01	RES CHIP 100K	1				
R711	0660076B01	RES CHIP 100K	1				
R712	0660076B05	RES CHIP 150K	1				
R713	0660076A07	RES CHIP 18	1				
R714	0660076A07	RES CHIP 18	1				
R715	0660076A73	RES CHIP 10K	1				
U701	0105959M87	CIRCUIT MODULE TONE GENERATOR	1				
U702	5105469E51	CIRCUIT MODULE AUDIO AMPLIFIER	1				
VR							
701	4805129M49	DIODE ZENER	1				
702	4805129M42	DIODE 5.6V	1				
Y701	4805719G04	RESON CER 3.579 MHz	1				

MULTICALL FRONT COVER

Exploded View & Mechanical Parts List

Parts List

Circuit Board & Flex Assembly

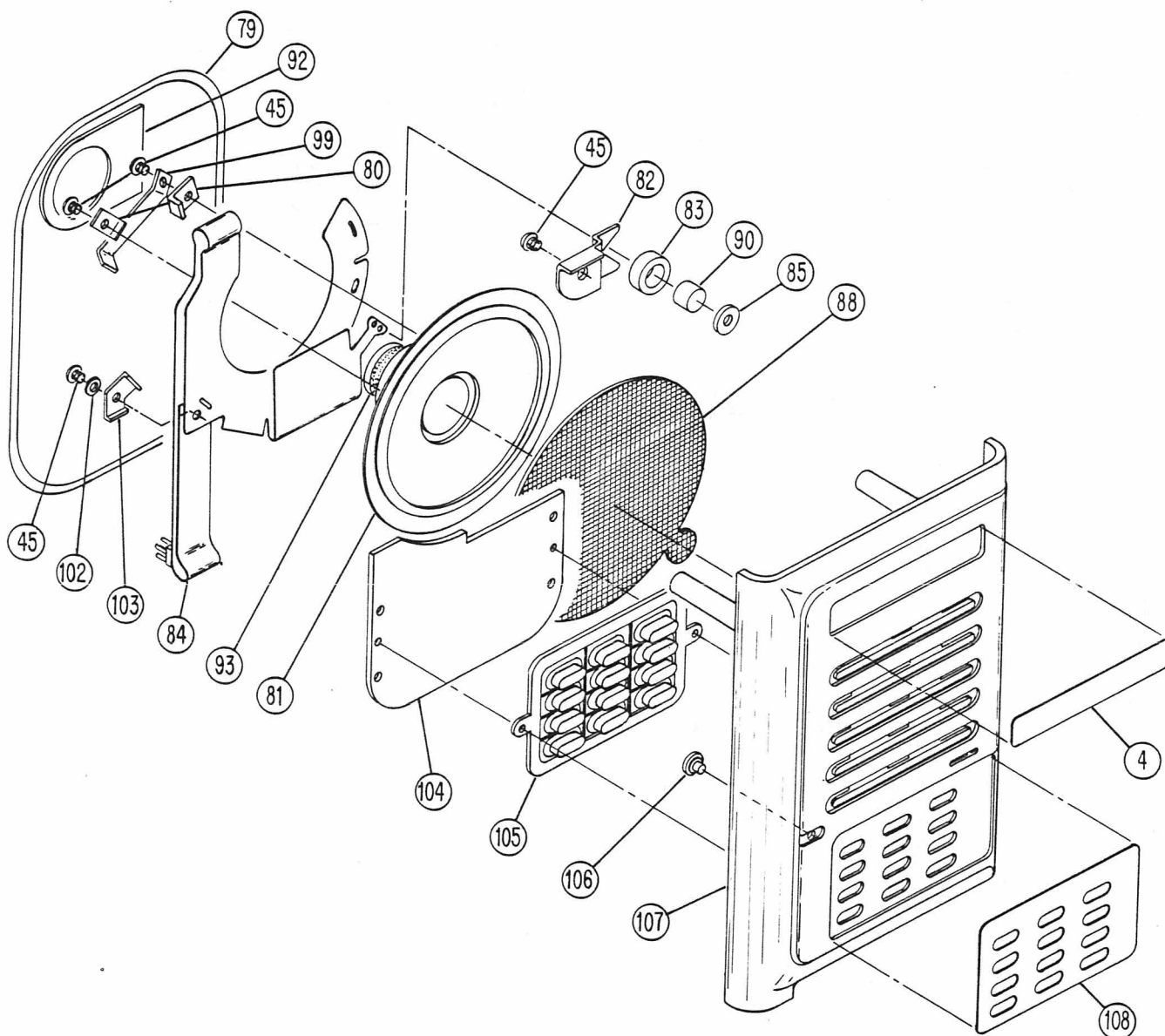


BEPF-18639-A

POS	CODE NO	DESCRIPTION	QT
Note: Motorola part number and description of Multicall Exploded View items (ITEM No.s 4 to 83,85,90,92,93,98,99, and 102) correspond to those of the standard radio Exploded View & Exploded View Parts List. The following items are unique to Multicall Front Cover			
84	0105956P58	ASSEMBLY, MULTICALL MIC	1
88	3505152J01	FELT, SPEAKER	1
103	4205167S01	RETAINER, MIC	1
104	3905509R02	CONTACT	1
105	2605164S01	SHIELD, CIRCUIT BOARD	1
106	-----	* INSERT, SHIELD	2
107	-----	* CIRCUIT BRD, MULTICALL	1
108	-----	* SWITCH, KEYPAD	1
109	-----	* SWITCH, ACTUATOR	1
110	-----	* COVER, FRONT	1

* Not field replaceable, order Multicall Front Cover Kit NTN4958A

CQP8000 MULTICALL FRONT COVER EXPLODED VIEW & PARTS LIST



BEPP-18570-0

**NTN4884 DTMF Front Cover
Exploded View Parts List**

TPLF-3589-O

ITEM NO.	MOTOROLA PART NO.	DESCRIPTION
Note: Motorola part number and description of DTMF Exploded View items (ITEM NO.s 4 to 83, 85, 88, 90, 93, and 99) correspond to those of the standard radio Exploded View and Exploded View Parts List. The following items are unique to DTMF Front Cover.		
84	0105956P38	ASSEMBLY, DTMF Microphone Flex
102	0484345A06	WASHER, Seal
103	0705456R01	BRACKET, Speaker
104	-----	* CIRCUIT BOARD, DTMF
105	-----	* SWITCH, Keypad
106	-----	* SWITCH, Actuator
107	-----	* COVER, Front
108	1305455R01	ESCUTCHEON, DTMF

* Not field replaceable, order DTMF Front Cover Kit NTN4884

**CQP8000 DTMF FRONT COVER
EXPLODED VIEW & PARTS LIST**

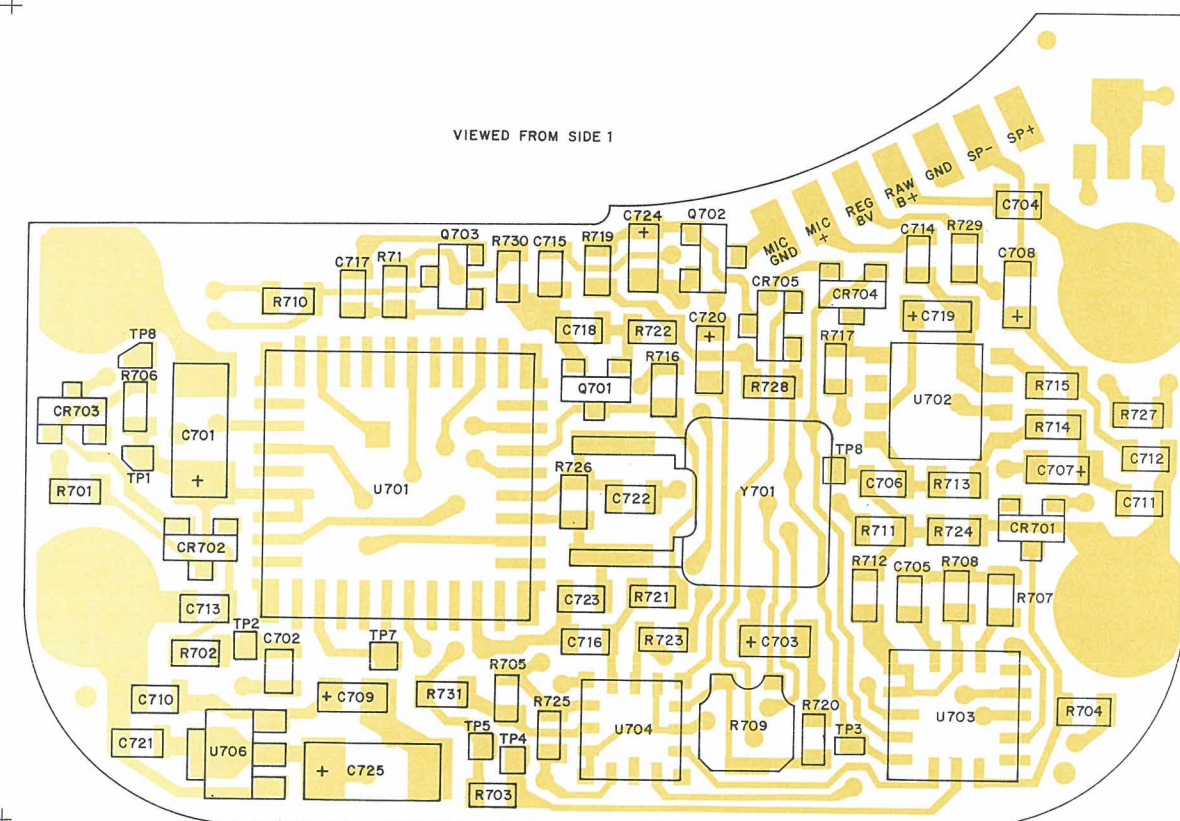
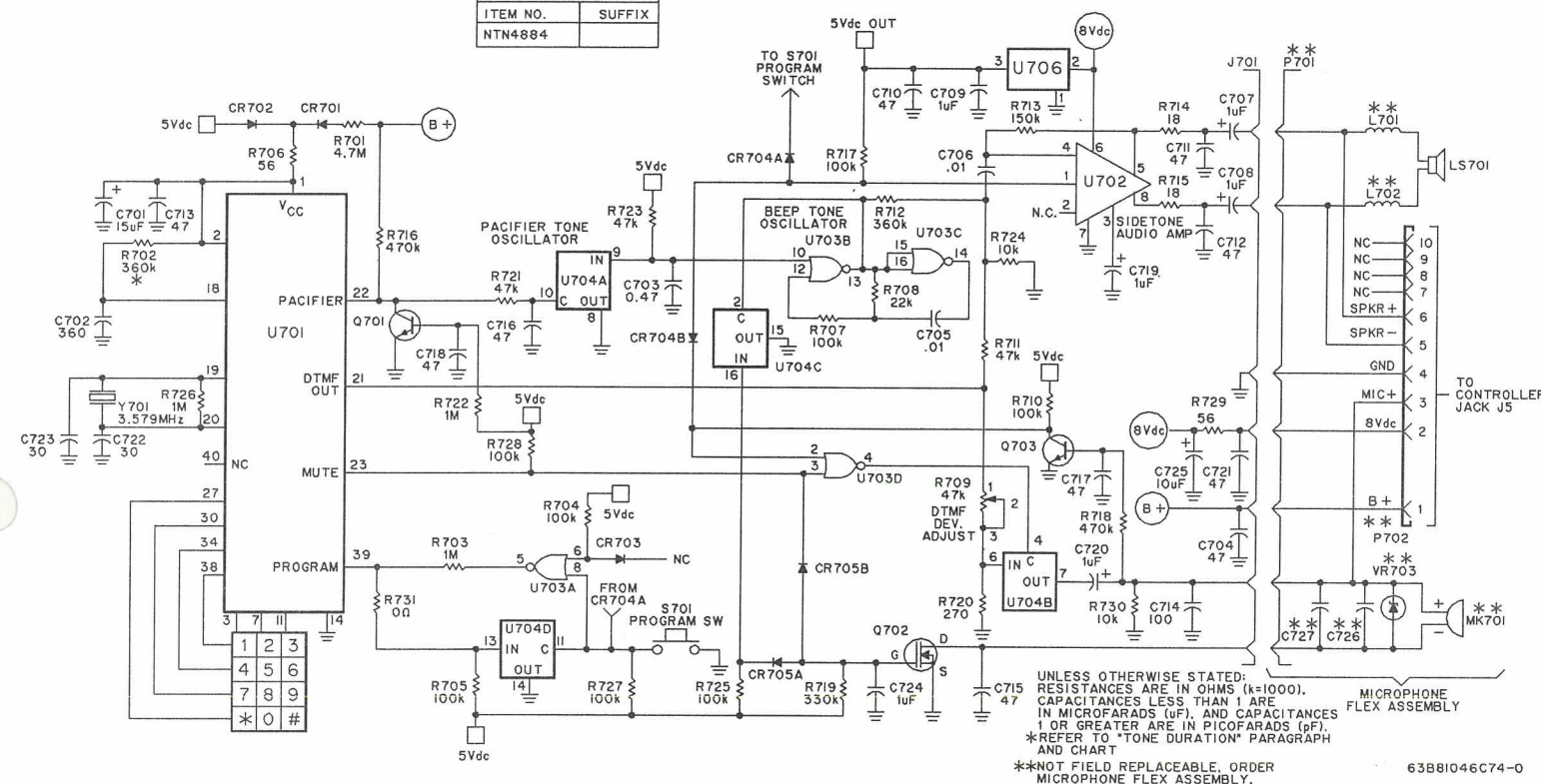
M405.484

DATE: 10/28/1988

Pos	Code No	Description	Qt
		CAPACITOR Fixed uF $\pm 10\%$ 16V unless stated	
C701	2362998C24	15 10V Tant	1
C702	2160520C14	360pF $\pm 2\%$ 25V	1
C703	2362998C05	0.47 35V	1
C704	2160520B17	47pF $\pm 5\%$ 50V	1
C705	2160520C25	.01 25V	1
C706	2160520C25	.01 25V	1
C707	2362998C09	1	1
C708	2362998C09	1	1
C709	2362998C09	1	1
C710	2160520B17	47pF $\pm 5\%$ 50V	1
C711	2160520B17	47pF $\pm 5\%$ 50V	1
C712	2160520B17	47pF $\pm 5\%$ 50V	1
C713	2160520B17	47pF $\pm 5\%$ 50V	1
C714	2160520C01	100pF $\pm 5\%$	1
C715	2160520B17	47pF $\pm 5\%$ 50V	1
C716	2160520B17	47pF $\pm 5\%$ 50V	1
C717	2160520B17	47pF $\pm 5\%$ 50V	1
C718	2160520B17	47pF $\pm 5\%$ 50V	1
C719	2362998C09	1	1
C720	2362998C09	1	1
C721	2160520B17	47pF $\pm 5\%$ 50V	1
C722	2160520B12	30pF $\pm 5\%$ 50V	1
C723	2160520B12	30pF $\pm 5\%$ 50V	1
C724	2362998C09	1	1
C725	2362998B73	10 $\pm 20\%$	1
C726	-----	Not field repairable, order mic flex assembly 0105956P38	
C727	-----	Not field repairable, order mic flex assembly 0105956P38	
CR701	4805129M24	Switching	1
CR702	4805129M24	Switching	1
CR703	4805129M24	Switching	1
CR704	4805129M24	Switching	1
CR705	4805129M24	Switching	1
L701	-----	COIL 0.39uH Choke not field repairable, Order mic flex assembly 0105956P38	
L702	-----	0.39uH Choke not field repairable, Order mic flex assembly 0105956P38	
LS701	5005155Q03	TRANSDUCER	1
MK701	-----	MICROPHONE Not field repairable, order mic flex assembly 0105956P38	
P701	-----	PLUG Contacts flex circuit plating Socket 10-Pin	
P702	-----	Contacts flex circuit plating Socket 10-Pin	
Q701	4805128M11	TRANSISTOR SOT	1
Q702	4805218N11	D-MOS	1
Q703	4805128M11	SOT	1
R701	0660076H41	RESISTOR Fixed ohm $\pm 5\%$ 1/10W unless stated	
R702	0660076B14	4.7 Meg	1
R703	0660076B25	360k	1
R704	0660076B01	1 Meg	1
R705	0660076B01	100k	1
R706	0660076B01	100k	1
R707	0660076A19	56 1/8W	1
R708	0660076B01	100k	1
R709	0660076A81	22k	1
R710	1860520A17	Pot 47k	1
R711	0660076B01	100k	1
R712	0660076A89	47k	1
R713	0660076B14	360k	1
R714	0660076B05	150k	1
R715	0660076A07	18	1
R716	0660076A07	18	1
R717	0660076B17	470k	1
R718	0660076B01	100k	1
R719	0660076B17	470k	1
R720	0660076B13	330k	1
R721	0660076A35	270	1
R722	0660076A89	47k	1
R723	0660076B25	1 Meg	1
R724	0660076A89	47k	1
R725	0660076A73	10k	1
R726	0660076B01	100k	1
	0660076B25	1 Meg	1

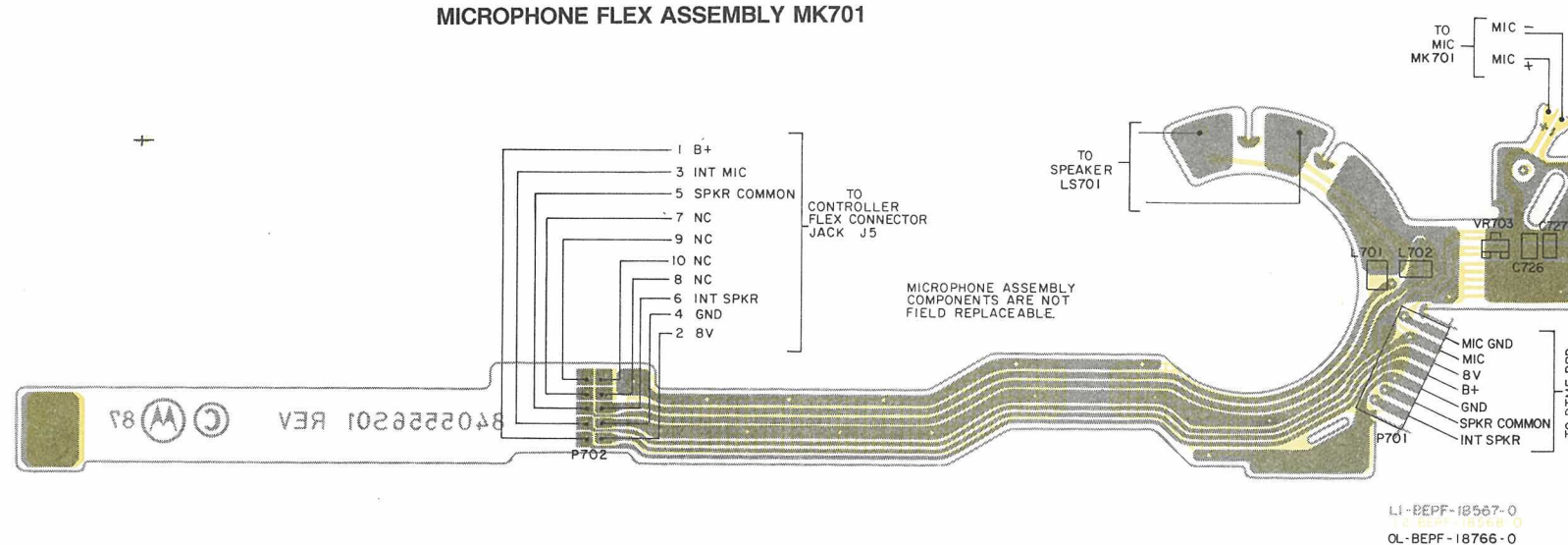
Pos	Code No	Description	Qt
R727	0660076B01	100k	
R728	0660076B01	100k	
R729	-----	Not field repairable, order mic flex assembly 0105956P38	
R730	0660076A73	10k	1
R731	0660076M01	0	1
S701	-----	SWITCH Program, Single-Pole (Not replaceable order DTMF Front Cover Kit)	
S702	-----	Keypad (Not replaceable, order DTMF Front Cover Kit)	
U701	0105953P31	CIRCUIT MODULE Tone Generator	1
U702	5105469E51	Audio Amplifier	1
U703	0105953P32	Quad NOR Gate	1
U704	0105953P33	Analog Switch	1
U706	5160880B01	5-Volt Regulator	1
VR703	-----	DIODE Zener 5.6V Not field repairable, order mic flex assembly 0105956P38	
Y701	4805719G04	CRYSTAL 3.579 MHz Resonator	1

ITEM REVISIONS CHART	
ITEM NO.	SUFFIX
NTN4884	

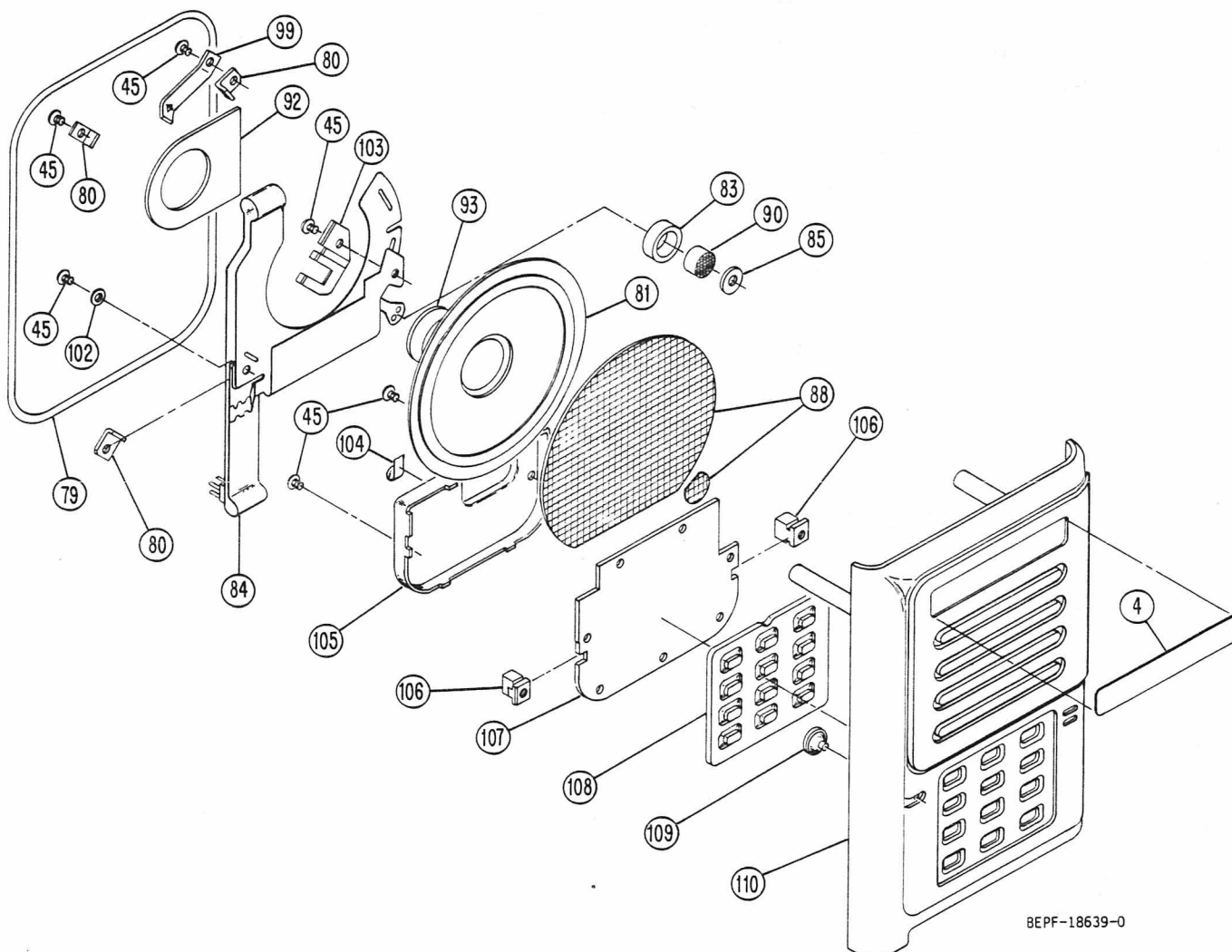


L1 CEPF-18767-0
OL CEPF-18791-0

MICROPHONE FLEX ASSEMBLY MK701



L1-BEPF-18567-0
OL-BEPF-18766-0



8EPF-18639-0

**NTN4958 Multicall Front Cover
Exploded View Parts List**

TPLF-3601-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
Note: Motorola part number and description of Multicall Exploded View items (ITEM NO.s 4 to 83, 85, 90, 92, 93, 99, and 102) correspond to those of the standard radio Exploded View and Exploded View Parts List. The following items are unique to Multicall Front Cover.		
84	0105956P58	ASSEMBLY, Multicall
88	3505152J01	Microphone Flex
103	4205167S01	FELT, Speaker
104	3905509R02	RETAINER, Microphone
105	2605164S01	CONTACT
106	.....	SHIELD, Circuit Board
107	.....	* INSERT, Shield (2 req'd)
108	.....	* CIRCUIT BOARD, Multicall
109	.....	* SWITCH, Keypad
110	.....	* SWITCH, Actuator
	.....	* COVER, Front

* Not field replaceable, order Multicall Front Cover Kit NTN4958

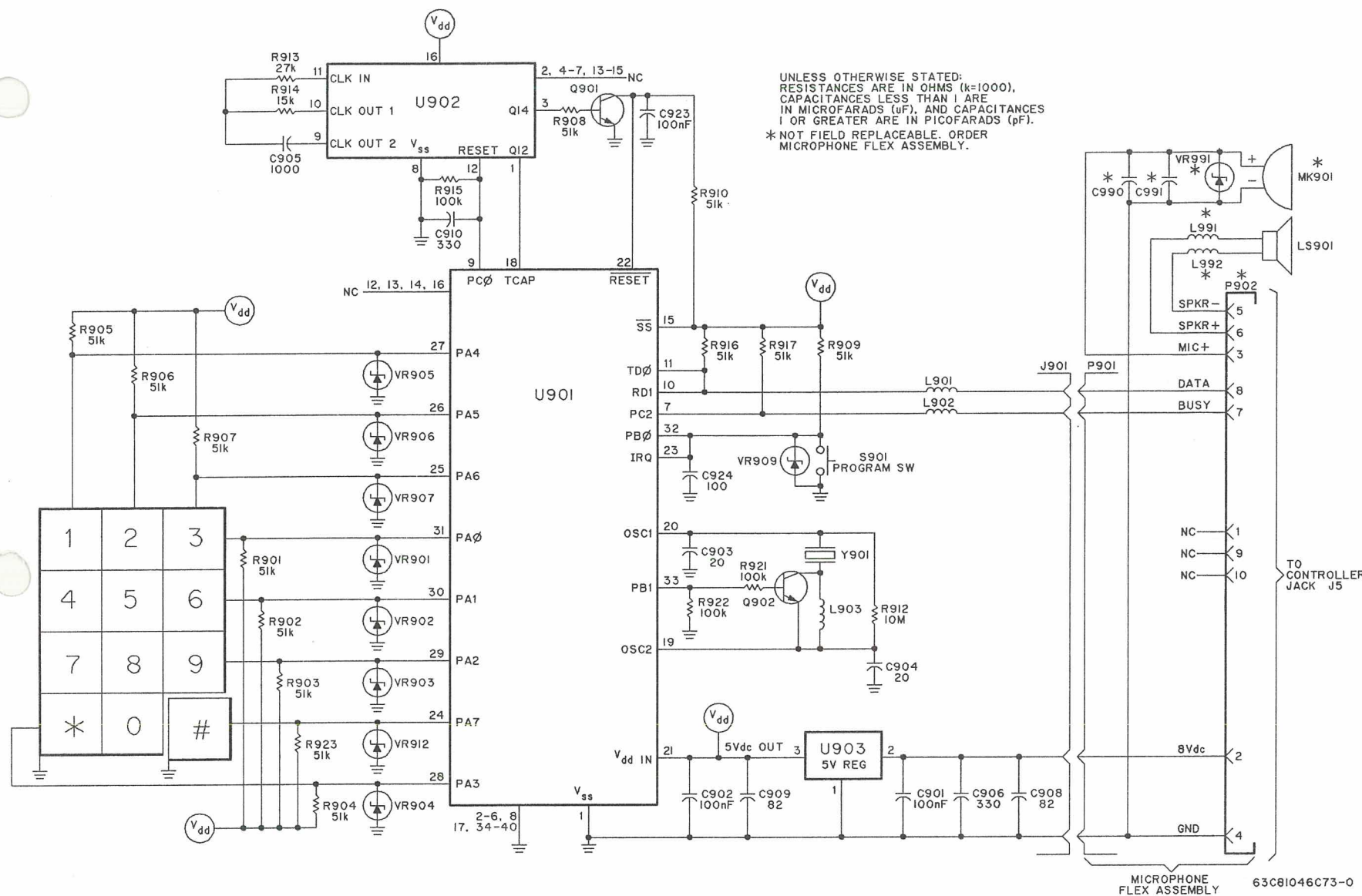
**CQP8000 MULTICALL FRONT COVER
EXPLODED VIEW & PARTS LIST**

M405.483/2

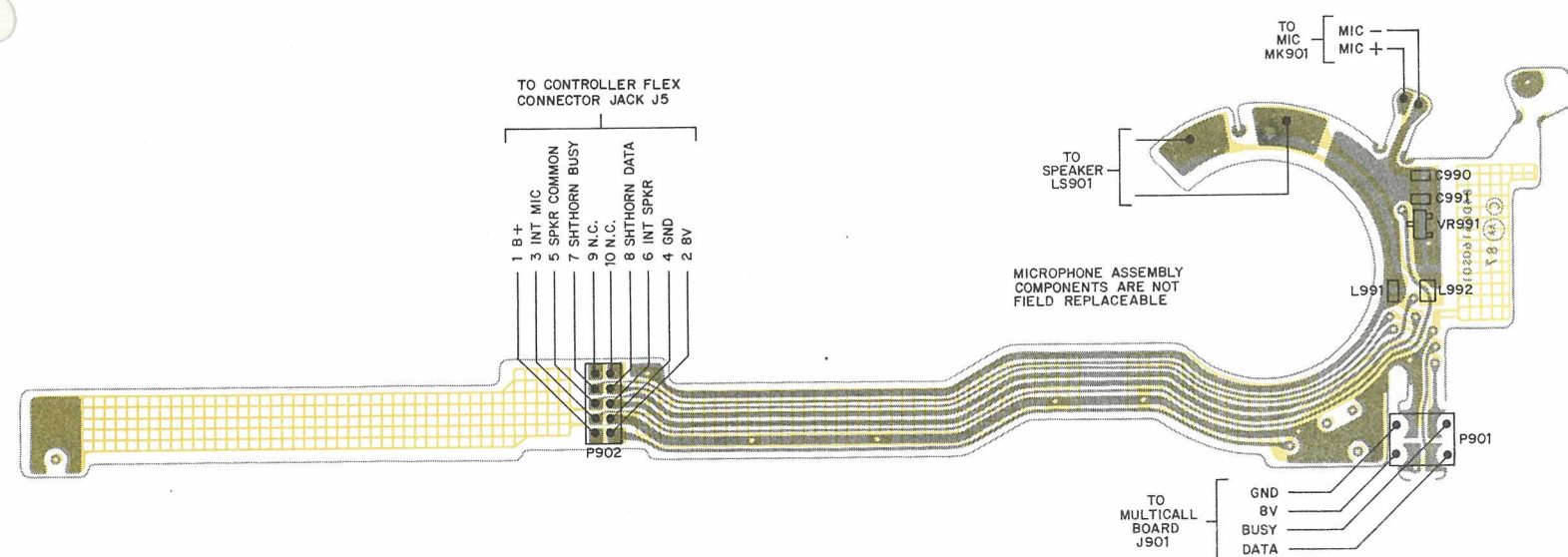
DATE: 10/28/1988

Pos	Code No	Description	Qt
		CAPACITOR Fixed pF $\pm 5\%$ 16V	
		unless stated	
C901	2160521G37	100nF +80 -20%	1
C902	2160521G37	100nF +80 -20%	1
C903	2160520808	20	1
C904	2160520808	20	1
C905	2160521A13	1000	1
C906	2160520C13	330	1
C908	2160520823	82	1
C909	2160520823	82	1
C910	2160520C13	330	1
C923	2160521G37	100nF +80 -20%	1
C924	2160521A13	1000	1
C991	-----	Not field replaceable order mic flex assembly 0105956P38	
C992	-----	Not field replaceable order mic. flex assembly 0105956P38	
		COIL	
L901	2462575A03	0.82uH Choke	1
L902	2462575A03	0.82uH Choke	1
L903	2460590A03	180uH Chip Inductor	1
L991	-----	Not field replaceable order mic flex assembly 0105956P38	
L992	-----	Not field replaceable order mic flex assembly 0105956P38	
LS901	5005155Q03	TRANSDUCER	1
		MICROPHONE	
MK901	-----	Not field replaceable order mic flex assembly 0105956P38	
		PLUG	
P901	-----	Contacts flex circuit plating Not field replaceable order mic flex assembly 0105956P38	
P902	-----	Socket 10-Pin Not field replaceable order mic flex assembly 0105956P38	
		TRANSISTOR	
Q901	4805128M12	SOT	1
Q902	4805128M12	SOT	1
		RESISTOR Fixed ohm $\pm 5\%$ 1/8W	
		unless stated	
R901	0660076A90	51k	1
R902	0660076A90	51k	1
R903	0660076A90	51k	1
R904	0660076A90	51k	1
R905	0660076A90	51k	1
R906	0660076A90	51k	1
R907	0660076A90	51k	1
R908	0660076A90	51k	1
R909	0660076A90	51k	1
R910	0660076A90	51k	1
R912	0660076H49	10 Meg $\pm 10\%$	1
R913	0660076A83	27k	1
R914	0660076A77	15k	1
R915	0660076B01	100k	1
R916	0660076A90	51k	1
R917	0660076A90	51k	1
R921	0660076B01	100k	1
R922	0660076B01	100k	1
R923	0660076A90	51k	1
		SWITCH	
S901	-----	Program, Single-Pole (Not replaceable order Multicall Front Cover Kit	
S902	-----	Keypad (Not replaceable order Multicall Front Cover Kit	
		CIRCUIT MODULE	
U901	0105805P23	Microcomputer	1
U902	5105461G42	14-bit Frequency Counter	1
U903	5160880B01	5-Volt Regulator	1
		DIODE	
VR901	4880140L09	Zener 6.2V	1
VR902	4880140L09	Zener 6.2V	1
VR903	4880140L09	Zener 6.2V	1
VR904	4880140L09	Zener 6.2V	1
VR905	4880140L09	Zener 6.2V	1
VR906	4880140L09	Zener 6.2V	1
VR907	4880140L09	Zener 6.2V	1
VR908	4880140L09	Zener 6.2V	1
VR912	4880140L09	Zener 6.2V	1
VR991	-----	Not field replaceable order mic flex assembly 0105956P38	
		CRYSTAL	
Y901	4805664G33	3.5864 MHz Resonator	1

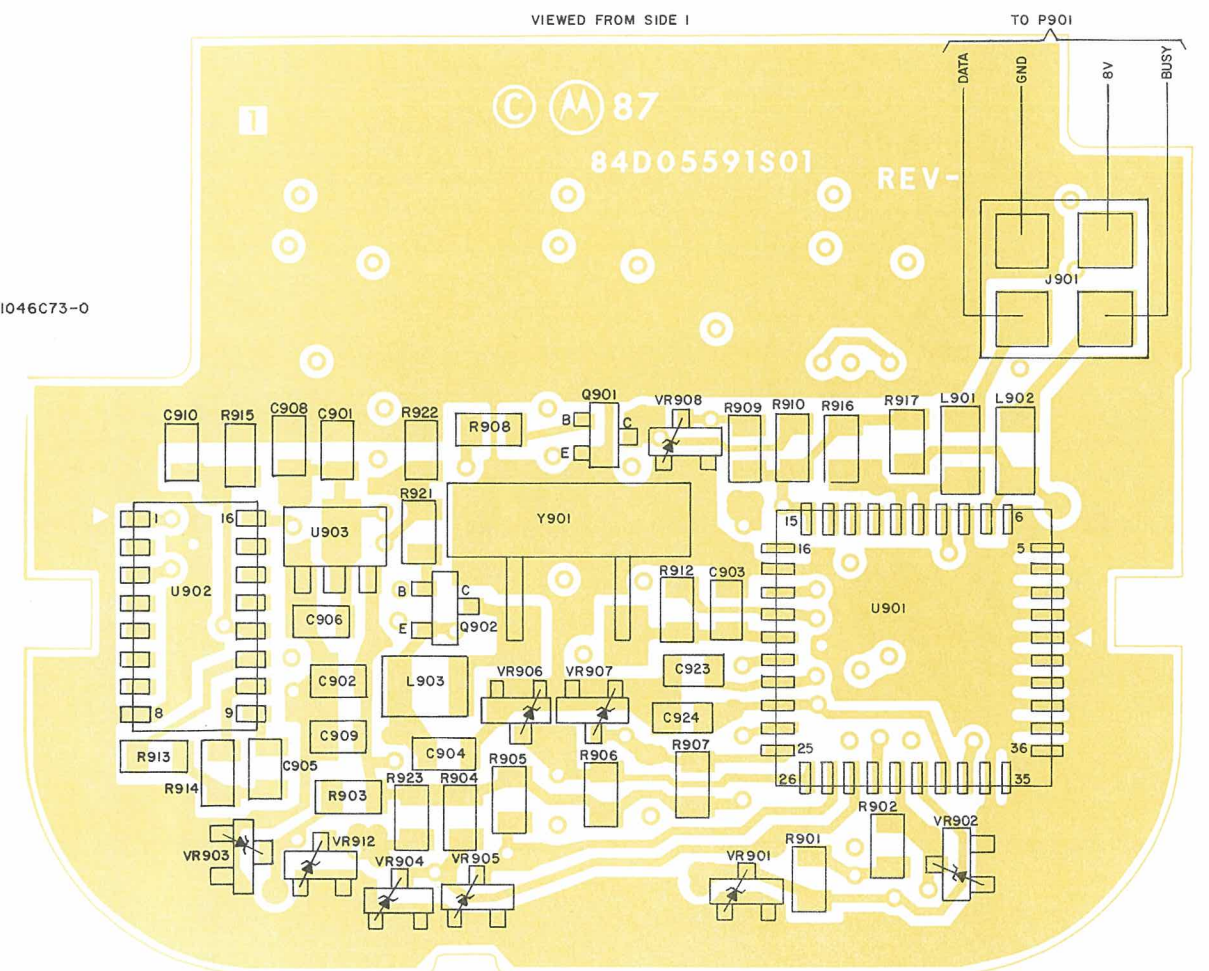
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MICROPHONE FLEX ASSEMBLY MK901



L1 BEPF-18636-0
OL BEPF-18638-0



L1-CEPF-18634-0
OL-CEPF-18635-0

CQP8000 MULTICALL CIRCUIT BOARD &
FLEX ASSEMBLY

D405.064

CQP8000

ACCESSORIES INDEX BY CODE

CODE	DESCRIPTION	CHAPT. 4 DETAILED	
		PAGE	CHAPT. (MM)
EAD6471	Heliflex antenna, 136 - 151 MHz.	1	
EAD6472	Heliflex antenna, 146 - 162 MHz.	1	
EAD6473	Heliflex antenna, 157 - 174 MHz.	1	
EAE6131	Helical antenna for public safety microphone, 403 - 433 MHz.	1	
EAE6132	Helical antenna for public safety microphone, 433 - 470 MHz.	1	
EAE6133	Helical antenna for public safety microphone, 470 - 512 MHz.	1	
EAE6431	Helical antenna, 400 - 433 MHz.	1	
EAE6432	Helical antenna, 433 - 470 MHz.	1	
EAE6434	Helical antenna, 470 - 512 MHz.	1	
EAE6440	Whip antenna, 403 - 512 MHz.	1	
ELN1050	220 V AC single-unit charger.	3	6
ELN1051	240 V AC single-unit charger.	3	6
ELN1052	220 V AC single-unit regular rate charger	3	7
ELN1053	240 V AC single-unit regular rate charger	3	7
ELN1060	220 V AC multi-unit charger.	3	8
ELN1061	240 V AC multi-unit charger.	3	8
EMN6101	Remote speaker microphone.	4	9
ETN4760	Standard size leather carrying case with belt loop.	6	
ETN4761	Large leather carrying case with belt loop.	6	
ETN6101	Public safety microphone with velcro back.	4	10
ETN6103	Public safety microphone with clip.	4	10
GLN6591	Shoulder strap in nylon attaching to the leather carrying cases.	7	
NLN7967	Wall mounting kit for multi-unit charger.	3	
NLN7968	Rack mounting kit for multi-unit charger.	3	

MOTOROLA HTX/STORNO CP1000, ACCESSORIES INDEX BY CODE

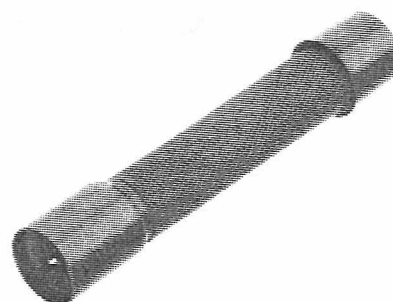
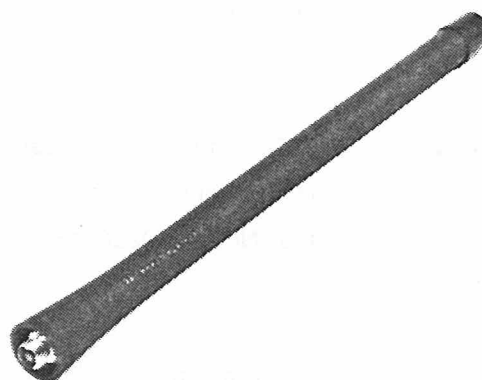
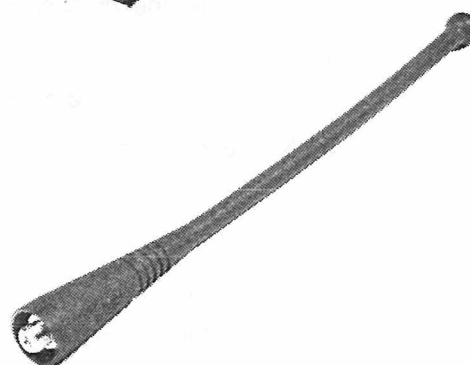
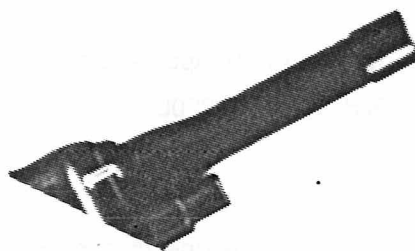
CODE	DESCRIPTION	CHAPT. 4 PAGE	DETAILED CHAPT. (MM)
NTN4560	Leather swivel carrying case, with medium capacity battery.	7	
NTN4655	Leather swivel carrying case, with medium/high capacity battery.	7	
NTN4814	Belt clip carry holder with nylon T-strap.	6	
NTN4823	500 mAh medium capacity FM approved battery.	2	5
NTN4825	1000 mAh high capacity FM approved battery.	2	5
NTN4870	1700 mAh Alkaline battery.	2	5
NTN4879	Nylon T-strap - Motorola brand.	7	
NTN4929	Lanyard in nylon which attaches to the back of the radio.	6	
NTN5043	Earphone 3.55 mm jack and volume control.	4	
NTN4046	500 mAh regular rate battery.	2	5
NTN5047	500 mAh rapid rate battery.	2	5
NTN5048	900 mAh regular rate battery.	2	5
NTN5049	900 mAh rapid rate battery.	2	5
NTN5075	Hirose adaptor.	5	
NTN5386	6.4 cm belt clip for attaching the radio to the belt.	6	
NTN5387	7.6 cm belt clip for attaching the radio to the belt.	6	
NTN5450	Leather swivel carrying case for multicall or DTMF-radios.	6	
ZMN6031	Earpiece and microphone with separate PTT.	5	
ZMN6032	Earpiece and microphone with attached PTT.	5	

CQP8000

ACCESSORIES OVERVIEW

ANTENNAS

- EAE6431 Helical antenna (UHF)
400 - 433 MHz
Part No.: 8505816K13
- EAE6432 Helical antenna (UHF)
433 - 470 MHz
Part No.: 8505816K14
- EAE6434 Helical antenna (UHF)
470 - 520 MHz
Part No.: 8505816K15
- EAE6440 Flexible whip antenna (UHF)
403 - 512 MHz.
Part No.: 8505247K15
- EAD6471 Heliflex antenna (VHF)
136 - 151 MHz.
Part No.: 8505816K10
- EAD6472 Heliflex antenna (VHF)
146 - 162 MHz.
Part No.: 8505816K11
- EAD6473 Heliflex antenna (VHF)
157 - 174 MHz.
Part No.: 8505816K12
- EAE6131 Antenna for Public Safety Microphone.
403 - 433 MHz.
Part No.: 8505355K03
- EAE6132 Antenna for Public Safety Microphone.
438 - 470 MHz.
Part No.: 8505355K04
- EAE6133 Antenna for Public Safety Microphone.
470 - 512 MHz.



CQP8000 ACCESSORIES OVERVIEW

BATTERIES

NTN4823 500 mAh FM Approved battery.
Used with standard size carrier case.
Part No.: 6060930L14

NTN4825 1000 mAh FM Approved battery.
Part No.: 6060930L15

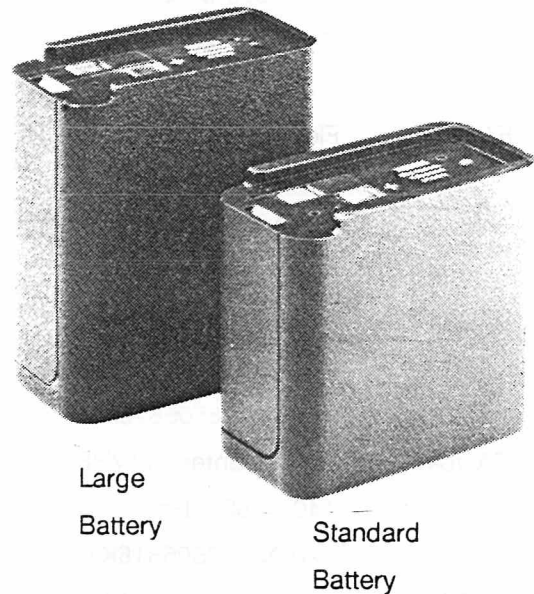
NTN4870 1700 mAh Alkaline Primary Rate
battery.
Used with standard size carrier case.
Part No.: 6060936E02

NTN5046 500 mAh Regular Rate battery.
Used with standard size carrier case.
Part No.: 6060930L17

NTN5047 500 mAh Rapid Rate battery.
Used with standard size carrier case.
Part No.: 6060930L18

NTN5048 900 mAh Regular Rate battery.
Used with large carrier case.
Part No.: 6060930L19

NTN5049 900 mAh Rapid Rate battery.
Used with large carrier case.
Part No.: 606093 + L20



CHARGERS

ELN1050 220 V Single Unit Rapid Rate Charger provided with a green and a red LED. For desk top use.

ELN1051 240 V Single Unit Rapid Rate Charger provided with a green and a red LED. For desk top use.

ELN1052 220 V Single Unit Regular Rate Charger provided with a red LED. For desk top use.

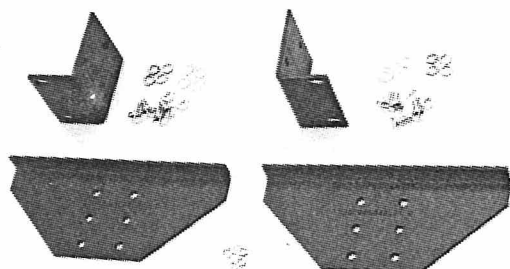
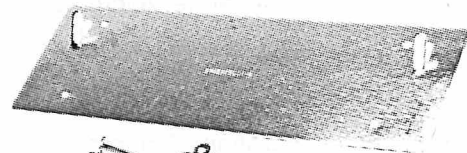
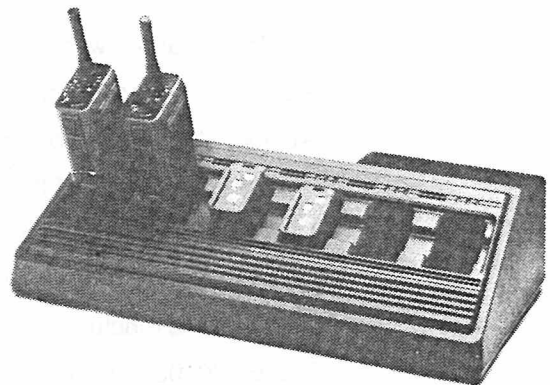
ELN1053 240 V Single Unit Regular Rate Charger provided with a red LED. For desk top use.

ELN1060 220 V Multi-Unit Charger comprising up till six outlets and provided with a red, a green and a yellow LED. For desk, wall, and rack mounting.

ELN1061 240 V Multi-Unit Charger comprising up till six outlets and provided with a red, a green and a yellow LED. For desk, wall, and rack mounting.

NLN7967 Wall Mounting Kit for multi-unit chargers ELN1060 and ELN1061.

NLN7968 Rack Mounting Kit for multi-unit chargers ELN1060 and ELN1061.

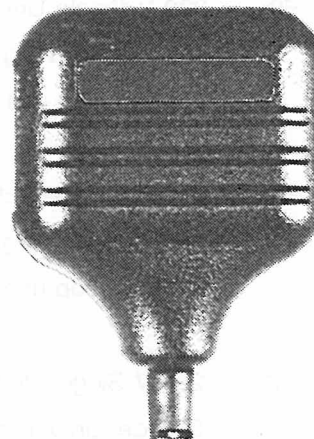


AUDIO ACCESSORIES

EMN6101 Remote Speaker Microphone including a speaker, a microphone and a push-to talk switch (PTT).

A coil cord with a special plug provides the connection to the universal connector of the radio.

The EMN6101 includes a clip.



ETN6101/ ETN6103 Public Safety Microphone for UHF radios only.

Includes a speaker, a microphone, a push-to-talk switch (PTT) and high/low volume switch.

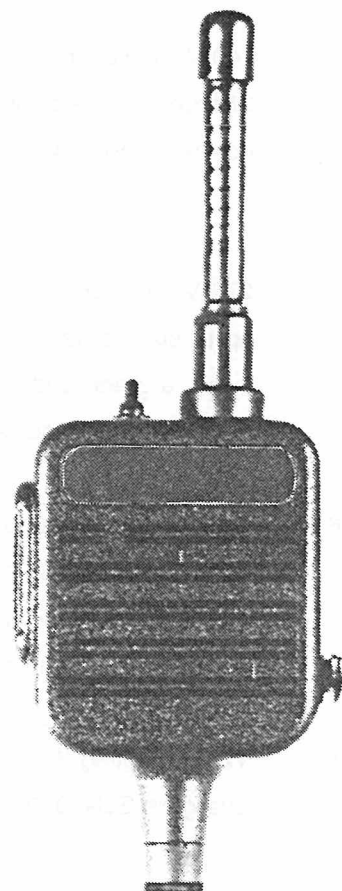
A coil cord with a special plug provides the connection to the universal connector of the radio.

The antenna should be ordered separately (See Antennas).

The ETN6101 includes a Velcro back.

The ETN6103 includes a Velcro back and a clip.

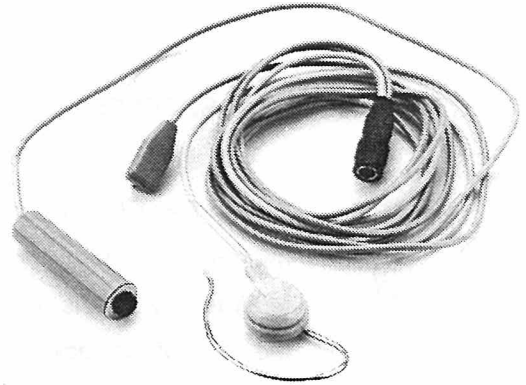
A separate Velcro patch pin attachment, NLN8410 can be ordered.



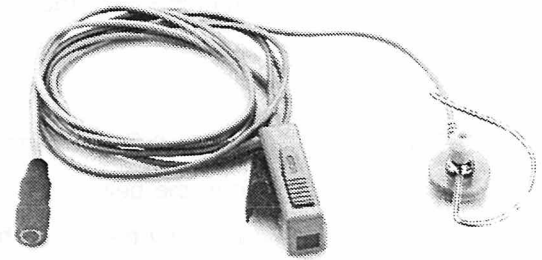
NTN5043 Earphone 3.5 mm. Jack and volume control.

CQP8000 ACCESSORIES OVERVIEW

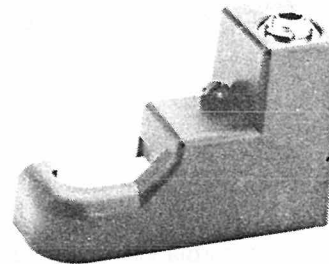
ZMN6031 Earpiece and microphone with separate PTT, including Earphone NTN5043, a miniature microphone, and a pocket PTT-button.



ZMN6032 Earpiece and microphone with attached PTT, including Earphone NTN5043 and a miniature microphone.



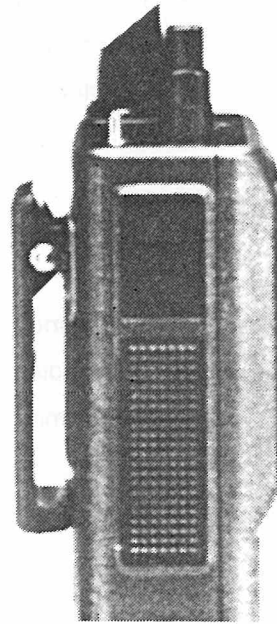
NTN5075 Hirose adaptor providing a six-pin jack to connect the radio to two-piece and three-piece audio accessories.



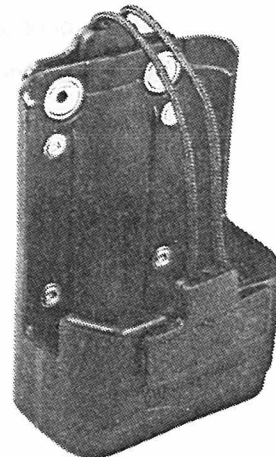
CARRYING ACCESSORIES

NTN5386 6.4 cm Belt Clip for attaching the radio to the belt.
49a Mounted by means of the two screws on the back of the radio housing and a slot moulded into the bottom of the radio.

NTN5387 7.6 cm Belt Clip for attaching the radio to the belt.
 Mounted by means of the two screws on the back of the radio housing and a slot moulded into the bottom of the radio.



NTN4814 Motorola Belt Clip Carry Holder with nylon T-strap.



NTN4929 Lanyard Wrist Strap in nylon which attaches to the back of the radio.
 Mounting procedure as for Belt clips NTN5386/87.

ETN4760 Standard size Leather Carrying Case with belt loop.
 Cannot be used for radios with multicall.

ETN4761 Large Leather Carrying Case with belt loop.
 Cannot be used for radios with multicall.



CQP8000 ACCESSORIES OVERVIEW

- GLN6591 Shoulder Strap in nylon attaching to the leather carrying cases.
- NTN4879 Motorola Nylon T-strap
- NTN4560/ Motorola Leather Swivel Carrying Case
NTN4655 with 6.4 cm swivel belt loop and nylon T-strap.
NTN4560: For use with medium capacity batteries.
NTN4655: For use with medium, high or alkaline batteries.
- NTN5450 Motorola Leather Swivel Carrying Case with 6.4 cm belt loop and nylon T-strap. For use with multical or DTMF front cover radios.

CQP8000

BATTERIES AND BATTERY CHARGING

The rechargeable nickel-cadmium batteries available for CQP8000 radio are listed in Table 1. Battery choice is governed by duty cycle, operating time, and maximum height and weight desired.

BATTERY CAPACITY	RAPID CHARGE TIME	TYPICAL HOURS OF OPERATION	
		2-WATT RADIOS	4- & 5-WATT RADIOS
500 mAh	1 HR	8 HRS	5 HRS
900 mAh	1 HR	**13 HRS	8 HRS

* Based on a duty cycle of 5% transmit, 5% receive, and 90% standby time.

** 14 hours on VHF radios.

CHARGERS AVAILABLE

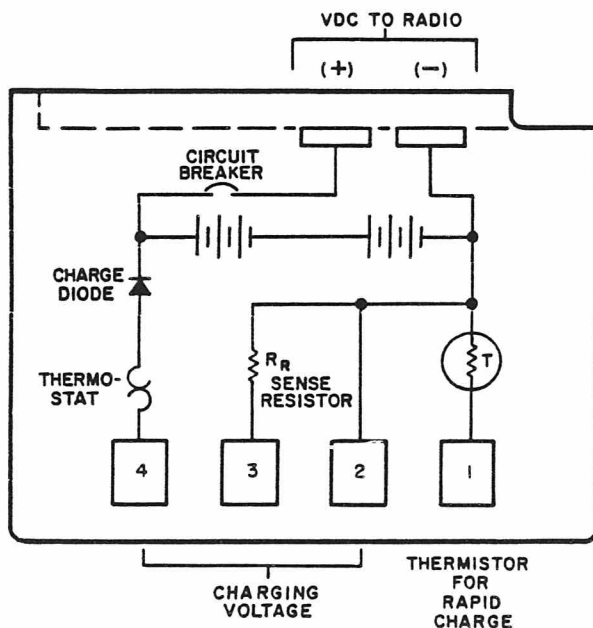
Available chargers include compact chargers, single-unit desk top chargers, and multiple-unit chargers that may be mounted on a wall or bench.

The multiple-unit chargers will charge up to six nickel-cadmium batteries at one time.

The chargers are available in slow charge and rapid charge models. The slow charge models will charge any of the batteries, with or without the radio attached, in 16 hours. The rapid charge models will charge any of the rapid-charge batteries in approximately one hour.

BATTERY CONSTRUCTION

The CQP8000 rapid-charge battery has four charger contacts, two of which receive the charging current. A third contact connects an internal resistor (R_R) to the charger, automatically setting the charging current output to match the capacity of the battery. The fourth contact connects an internal thermistor to the charger.



Typical Rapid-Charge Battery Construction, Rear View

CQP8000 BATTERIES AND BATTERY CHARGING

The thermistor senses battery temperature and automatically controls the charger output to permit maximum charger output without overheating the battery.

All rapid-charge batteries contain an internal current-limiting device (breaker) for protection. A diode in the battery prevents damage from an accidental short between the charging contacts.

CAUTION

Substained shorts across the radio contacts (+,-), excessive current, or excessive heat will destroy the internal thermal fuse, which is not replaceable.

BATTERY CHARACTERISTICS

Each nickel-cadmium battery consists of eight cells connected in series to provide a nominal 10 VDC output, which remains approximately constant under load until the battery approaches a discharged condition. At this time, a marked decrease in voltage occurs and the discharge condition (1.0 volt per cell) is reached abruptly.

A general characteristic of all rechargeable batteries in storage is self-discharge. If the battery is to be used after an unknown period of storage, it is recommended that it be charged at the full charging rate using an approved battery charger.

MAINTENANCE

The battery cells will never require additional electrolyte. The only maintenance required is recharging the battery and keeping the contacts clean.

Use only a Storno approved charger. The use of other chargers, unless approved, will void the battery warranty and may result in permanent damage to the battery.

STORAGE

The battery may be stored at room temperature in any state of charge without damage. As previously stated, however, the battery is subject to self-discharge and should be recharged after extended storage.

DETERMINING BATTERY CAPACITY

Battery capacity is determined by measuring the time that a fully-charged battery requires to discharge to eight volts through a specified load, as described in the following procedure.

NOTE

This procedure requires using a 20-ohm, 1%, 10-Watt load resistor to discharge medium capacity batteries, and an 11-ohm, 1%, 15-Watt load resistor to discharge high capacity batteries.

CQP8000 BATTERIES AND BATTERY CHARGING

1. Obtain a Radio Housing Adapter (part number 1580368B62) from your nearest Service Center.
2. Connect the appropriate 20-ohm or 11-ohm load resistor (see note above) between the gold (+) terminal and a solder lug (-) screw and nut of the housing adapter.
3. Connect a voltmeter across the load resistor and slide a fully charged battery onto the housing adapter.
4. Monitor the voltmeter as the battery discharges through the load resistor, until the voltage is eight volts. This will erase the memory effect.
5. Disconnect battery from the housing adapter (resistor load) when the cell pack reaches 8.0 volts.

CAUTION

Discharging the battery down to 4.0 volts can cause permanent cell pack damage.

6. Recharge the battery to a complete charge. This will require a 1-hour rapid charge followed by a 16-hour standard charge.
7. Re-attach the battery to the housing adapter (resistor load) and measure the elapsed time until the cell pack reaches 8.0 volts. Disconnect the battery.
8. A good battery will require 48 minutes or longer to discharge, indicating greater than 80% of rated capacity. A weak battery will drop below 8.0 volts in less than 48 minutes.

ELN1050/ELN1051

SINGLE-UNIT RAPID-CHARGE BATTERY CHARGER

INTRODUCTION

The ELN1050 (220 VAC), and the ELN1051 (240 VAC) Single-Unit Rapid-Charge Battery Chargers are accessory items for charging rechargeable nickel-cadmium batteries.

SPECIFICATIONS

INPUT POWER	220 VAC, 240 VAC; 50 Hz
SIZE	193 x 128 x 78.5 mm
WEIGHT	1.1 kg
RAPID CHARGE RATE	Approximately 1 hour
OPERATING TEMPERATURE RANGE	0°C to 50°C
RAPID-CHARGE TEMPERATURE WINDOW	8°C to 41°C

DESCRIPTION

These single-unit rapid chargers are current sensing, voltage sensing, current regulating devices which provide two different charger rates; a one-hour rate and a 16-hour rate. A rapid-charge nickel-cadmium battery is charged initially at a one-hour charge rate, after which the charging rate is automatically reduced to the 16-hour rate. A standard-charge nickel-battery is charged only at the 16-hour rate. Either of the batteries (rapid or standard) can be left in the charger indefinitely without any resultant harm.

The ELN1050 charger operates from a 220 VAC, 50 Hz power source, and the ELN1051 operates from a 240 VAC, 50 Hz power source. Two light-emitting diode (LED) indicators display charging conditions and battery fault indications, such as open or shorted battery cells.

OPERATION

Normal battery operation is eight hours of use followed by approximately one hour of rapid charge. Place the charger in operation as follows:

1. Visually check the battery and charger charging contacts for dirt, grease or other material which may prevent good conduct, and clean if necessary.
2. Connect the charger to the appropriate AC power source. Both LED's will light momentarily.
3. Insert the battery, with or without radio, into the charger pocket. When the battery contacts mate with the charger's charging contacts, charging begins. If the battery is within the proper temperature range (+ 8 to + 41°C), the red (CHARGING) LED will light to indicate that the battery is rapid-charging.

NOTE

To ensure proper charging, make certain that the battery is pushed fully into the charger pocket.

4. Allow sufficient time for the battery to fully charge (approximately one hour). When rapid-charging is complete, trickle-charging begins. The red (CHARGING) LED will turn off and the green (charge COMPLETE) LED will turn on.

At this time, the battery has reached approximately 90% full charge and can be used. If the battery is left in the charger, it will reach 100% full charge after approximately two hours of trickle-charging. The battery can be removed from the charger and used or remain in the charger indefinitely.

If a battery which is outside the + 8 to + 41°C temperature range is inserted into the charger, it will be trickle-charged. The green LED will light if the battery temperature is above 41°C, or the red LED will light if the battery temperature is below 8°C. Once the battery moves inside the temperature window, the charger automatically switches to the rapid-charge rate and charging continues as described in the steps above.

CIRCUIT DESCRIPTION

(Refer to the schematic diagram)

GENERAL

Operating voltage (B +) is developed from a stepdown transformer (T1), with a fused primary, driving a conventional full-wave bridge rectifier (CR1-CR4). The B + (approximately 30 VDC) output is applied to a number of transistor stages and to a precision 12-volt regulator circuit (U4). The regulated 12 VDC (A) is applied to various transistor stages and to most of the logic circuits. A reduced B + voltage (approximately 27 VDC) is applied to the VCC input at U1 pin 4.

Charging current for the battery is provided by a constant-current source. The charging current is controlled by a current regulator with negative feedback. The current regulator is comprised of transistor circuits (Q1-Q6), a differential amplifier (U1C), and a single-input amplifier (U1D).

Under normal charging conditions, transistors Q2 and Q6 are turned on, R10 is effectively shorted (rapid charge condition). For a momentary increase in charging current, the voltage across R14 will increase. The input to U1C pin 10 increases, which produces an increased output at U1C pin 8. The higher potential at U1C pin 8 is fed through CR8, R21 and R22 to U1D pin 13. This higher input at pin 13 reduces the output at U1D pin 14, which is passed through R15, CR7 and VR2 to reduce the drive of Q3, then Q1. The reduced drive of Q1 results in a reduction of charging current, returning back to normal.

Diodes CR5, CR6, transistor Q4 and resistor R73 provide for a constant current input of transistor Q2, ensuring Q2 to be turned on, independent of battery terminal voltage and charge rate. Together with Q5, this constant current source can be switched off for trickle-charging, by switching off Q5, consequently Q4 and Q2. With Q2 turned off, resistor R10 is added in the charging path.

Rapid-charge charging current for a high-capacity rapid-charge battery is approximately 800 mA. Trickle-charge current for the same battery is approximately 72 mA. The following chart lists the three different capacity batteries and the battery's respective RC, rapid charging current, and trickle charging current.

BATTERY CAPACITY	RC	CHARGING CURRENT	
		RAPID	TRICKLE
Medium	5.6 K	500 mA	50 mA
High	3.3 K	800 mA	72 mA

MAXIMUM CURRENT LIMITER

The maximum current limiter is a protective circuit for the charger. If the charge rate exceeds a predetermined threshold, set by resistors R30 and R31, the output at U2A pin 1 goes high. This high turns on Q7, which turns off Q6. With Q6 turned off, the charging rate is no longer a function of RC, but a function of resistor R23. The charging current is limited to approximately 850 mA.

BATTERY SENSE DETECT

With no battery in the charger, the voltage at U1B pin 6 is approximately 9.6 V, which holds the output at U1B pin 7 low. When a battery is placed in the charger, via the conduction of transistor Q6, the voltage at U1B pin 6 drops to approximately 2.2 V (during normal charging) or lower (if either the dynamic voltage clamp circuit or the open cell detect circuit is activated). The voltage drop at pin 6 of U1B, results in a high output at U1B pin 7, which turns on transistor Q8 and the red CHARGING LED, CR18.

TEMPERATURE WINDOW AND BISTABLE MULTIVIBRATOR

Comparators U2C and U2D sense the RT line and set the cold and hot sides of the temperature window respectively. The cold side temperature is 8 degrees C. The hot side temperature is 41 degrees C. In a normal rapid-charge condition, a voltage level which represents the battery's temperature is felt at U2C pin 10 and U2D pin 9. As the battery charges and the battery's temperature rises, the voltage at U2D pin 9 decreases. At 41 degrees C, the low level input at U2D pin 9 reaches a point that triggers the output at U2D pin 14 to go low. The low output of U2D is applied through CR12, CR13 and R13 to the base of Q5 and the following sequence occurs.

Transistor Q5 turns off, Q4 turns off, Q2 turns off, resistor R10 is placed in the charging circuit, and the battery trickle charges. The low output at U2D is also applied through coupling capacitor C15 to U3A pin 7, which triggers the output of U3A at pin 1 to switch from high to low. This low output at U3A pin 1 is applied to the LED display circuit via Q8, turning off the red (CHARGING) LED, and via Q10/Q9, turning on the green (charge COMPLETE) LED. When the battery's temperature cools down below 41 degrees C, the outputs of U2D and U3A are latched low via a feedback through diode CR14. This feedback latching prevents a fully charged battery from being rapid-charged again.

When a battery outside the cold temperature window is placed in the charger, the battery sense detect circuit, via U1B, turns on the red (CHARGING) LED. The temperature window circuit, via an increased voltage level at U2C pin 10, triggers a low from U2C pin 13 to initiate trickle charging. The output of U2C is isolated from the output of U2D by diode CR13. Thus, the green LED remains off and the red LED remains on. When the battery's temperature rises and enters the temperature window, the output at U2C goes high, Q5, Q4 and Q2 turn on, and the battery begins rapid charging.

OSCILLATOR

The oscillator circuit turns the green and red LEDs on and off (flashing) to indicate that a problem (shorted or open cells or shorted contacts) is detected with the battery or battery contacts. Whenever the potential at the cathode is lower than the anode of diode CR26 (a low from U2B pin 2 or a low from U3D pin 14), the oscillator becomes activated. The oscillator output at U3B pin 2 flips back and forth (high to low), and is sent to the LED display circuit. On the low cycle, both transistors (Q8 and Q9) are turned off and both LEDs are turned off. On the high cycle, both transistors are turned on and both LEDs are turned on. If a problem occurs during the charge complete cycle, only the green LED will flash.

BATTERY OPEN CIRCUIT (O/C) DETECT

During normal charging conditions (good battery) or when a battery is not in the charger, the voltage at the cathode of CR16 is somewhat higher than the anode voltage. The output of U2B at pin 2 is high. When an open-circuited battery is detected (RC present but no charging current), the low impedance path of RC (compared to R53) causes the voltage at the anode to drop to a very low level. This low-level input (2.2 V to 1.2 V) at U2B pin 5 flips the output (U2B pin 2) high to low. The U2B low is passed to the LED display circuit, turning on the green LED (CR21). The U2B low is also passed to the oscillator circuit, which triggers both LEDs to flash.

SHORTED CELLS AND SHORT CIRCUIT DETECT

This circuit detects shorted battery cells and shorted contacts by monitoring the battery's terminal voltage (BATT B +). Low battery voltage at U3D pin 8 triggers the comparator (for rapid-charge battery or standard-charge battery) to produce a low output at U3D pin 14. A low from the comparator keys the oscillator to flash the LEDs and to trickle-charge the battery.

DYNAMIC VOLTAGE CLAMP

During normal charging conditions, a low voltage level at U1A pin 2 holds the output at U1A pin 1 high. As the battery voltage (BATT B +) increases, the input voltage level at U1A pin 2 increases. If the BATT B + voltage increases to a predetermined threshold level (approximately 15.5 volts), the higher potential at U1A pin 2 triggers the output at U1A pin 1 low. This low output from U1A pin 1 overrides the output at U1D pin 14, and reduces the base drive current of transistor Q3, hence that of Q1. This negative feedback action to reduce the charging current results in maintaining a constant battery terminal voltage (15.5 volts). This circuit prevents overvoltage conditions that could damage the radio's electronics if the radio is attached to the battery when charging.

MAINTENANCE

FUSE

The fuse (F1) in the primary circuit of transformer T1 is the only user serviceable part in the charger. If necessary, replace this fuse with one of the same size and rating as marked, or refer to the electrical parts list for the proper electrical specifications. After replacing the fuse, if the charger still fails to operate properly, contact a local Service Shop for repairs.

RADIO CONTACTS

If the red CHARGING LED does not turn on when a battery is inserted into the pocket, check the contacts of the radio for dirt, grease, or foreign material. Clean the contacts if necessary.

DC VOLTAGE MEASUREMENTS CHARTS

In the following charts,

- Measurements were taken with a FLUKE 8010A Digital Multimeter at 25°C room temperature
- All voltages readings are DC and referenced to charger ground
- DC voltages designated with an "m" will vary with the temperature of the battery

			Q1	Q2	Q3	Q4	Q5	Q6					
BATTERY AND CONDITION	B+ BATT	CHARG CURR. mA	E	B	C	B	E	B	B	B	B	C	E
NO BATTERY	10.76	-	28.2	28.2	1.9	1.89	10.76	0.00	1.92	0.08	9.28	9.69	9.25
RAPID CHARGE 500 mAh	12.85	563.5	22.3	21.6	15.79	14.87	14.07	0.62	14.80	0.70	2.70	2.18	2.10
COMPLETE CHARGE 500 mAh	12.84	51.14	26.8	26.2	15.55	3.99	12.94	0.60	15.55	0.17	2.70	2.18	2.10
RAPID CHARGE 900 mAh	12.86	805.5	20.8	20.00	16.40	15.44	14.62	0.63	15.39	0.71	0.05	2.18	0.05
COMPLETE CHARGE 900 mAh	12.83	72.51	26.5	25.8	16.09	9.03	12.99	0.60	16.09	0.17	0.05	2.18	0.00

	Q7	Q8	Q9	Q10	VR1			
BATTERY AND CONDITION	B	C	B	C	B	B	C	
NO BATTERY	0.06	26.8	0.03	26.6	0.00	11.73	0.53	11.84
RAPID CHARGE 500 mAh	0.06	0.09	0.71	20.7	0.00	11.74	0.02	11.85
COMPLETE CHARGE 500 mAh	0.07	25.4	0.15	0.08	0.71	0.60	1.25	11.85
RAPID CHARGE 900 mAh	0.65	0.10	0.71	19.10	0.00	11.74	0.02	11.86
COMPLETE CHARGE 900 mAh	0.63	25.1	0.15	0.08	0.72	0.60	1.25	11.85

DC VOLTAGE MEASUREMENTS CHARTS

U1													
BATTERY AND CONDITION	8+	1	2	3	4	5	6	8	9	10	12	13	14
NO BATTERY	26.8	25.5	5.66	7.61	6.97	9.64	0.61	0.00	10.60	9.23	2.17	9.68	0.00
RAPID CHARGE 500 mAh	21.5	20.2	6.67	7.61	6.97	2.18	20.1	8.56	12.09	12.36	2.17	2.18	7.30
COMPLETE CHARGE 500 mAh	25.9	24.6	6.65	7.61	6.98	2.18	24.5	8.69	12.07	12.23	2.17	2.18	6.88
RAPID CHARGE 900 mAh	19.10	17.79	6.69	7.61	6.98	2.18	17.71	12.12	12.57	12.75	2.17	2.18	7.49
COMPLETE CHARGE 900 mAh	24.8	23.6	6.65	7.61	6.98	2.18	23.5	12.13	12.51	12.67	2.17	2.18	7.01

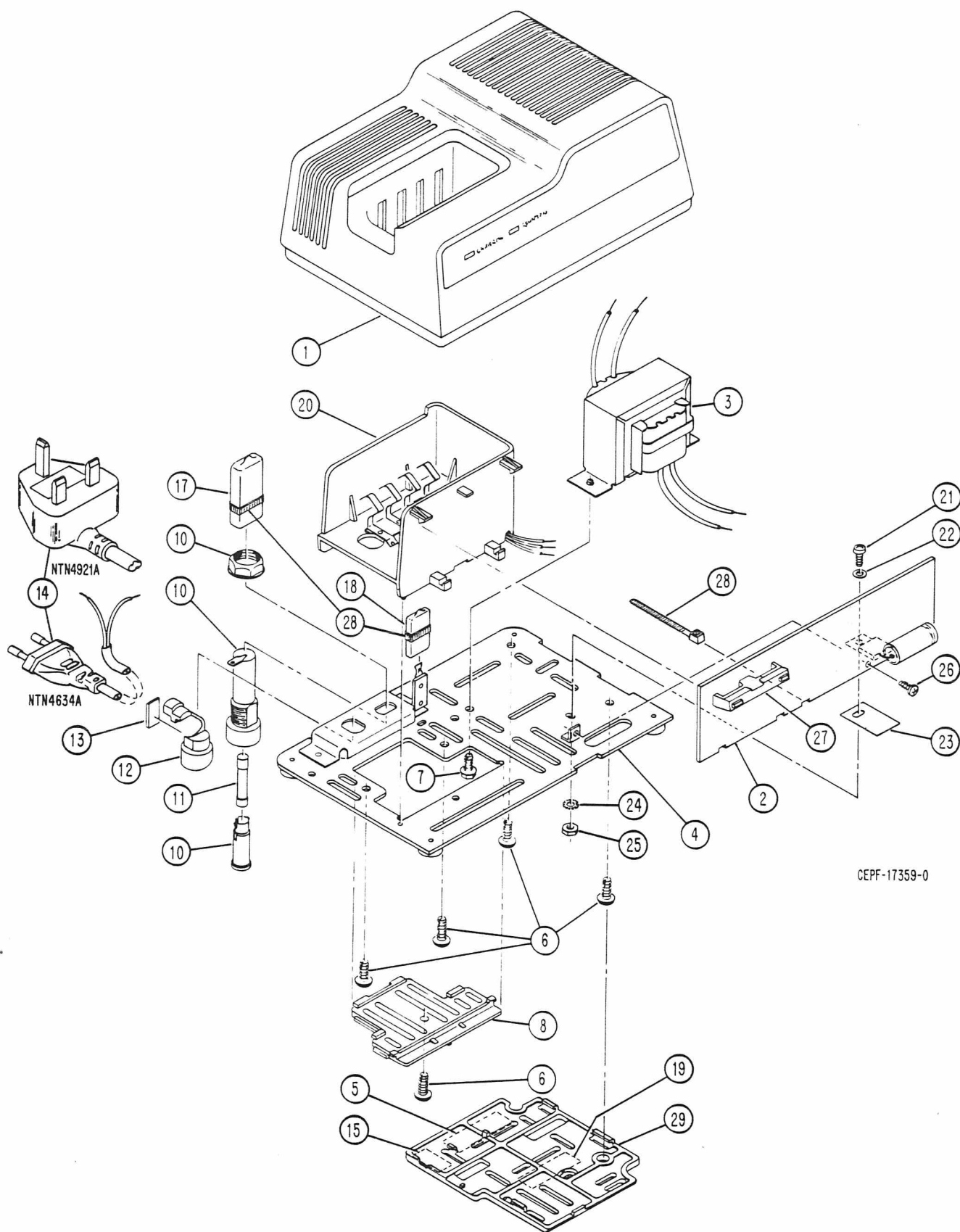
U2												
BATTERY AND CONDITION	1	2	4	5	6	7	8	9	10*	11	13	14
NO BATTERY	0.06	11.52	2.14	3.93	6.88	0.00	2.91	11.83	11.83	7.32	0.08	11.83
RAPID CHARGE 500 mAh	0.06	11.54	2.14	3.93	6.88	4.34	2.96	6.89	6.89	7.44	11.80	11.79
COMPLETE CHARGE 500 mAh	0.07	11.48	2.14	3.93	6.89	4.41	2.92	0.62	0.62	7.33	0.75	0.11
RAPID CHARGE 900 mAh	11.19	11.55	2.14	3.93	6.89	8.40	2.95	6.90	6.90	7.44	11.80	11.79
COMPLETE CHARGE 900 mAh	11.19	11.48	2.14	3.93	6.89	8.40	2.92	0.62	0.62	7.33	0.75	0.11

U3												
BATTERY AND CONDITION	1	2	4	5	6	7	8	9	10	11	13	14
NO BATTERY	11.83	11.73	9.61	11.49	1.11	11.80	1.10	5.66	0	5.67	11.77	11.77
RAPID CHARGE 500 mAh	11.84	11.74	9.63	11.79	7.63	11.81	2.18	6.67	0	6.67	11.79	11.79
COMPLETE CHARGE 500 mAh	0.06	11.74	9.63	11.79	7.64	2.23	2.18	6.65	0	6.65	11.79	11.79
RAPID CHARGE 900 mAh	11.85	11.74	9.63	11.79	7.64	11.82	2.18	6.69	0	6.69	11.79	11.79
COMPLETE CHARGE 900 mAh	0.06	11.74	9.63	11.79	7.63	2.23	2.18	6.65	0	6.65	11.79	11.79

DATE: 8/17/1988

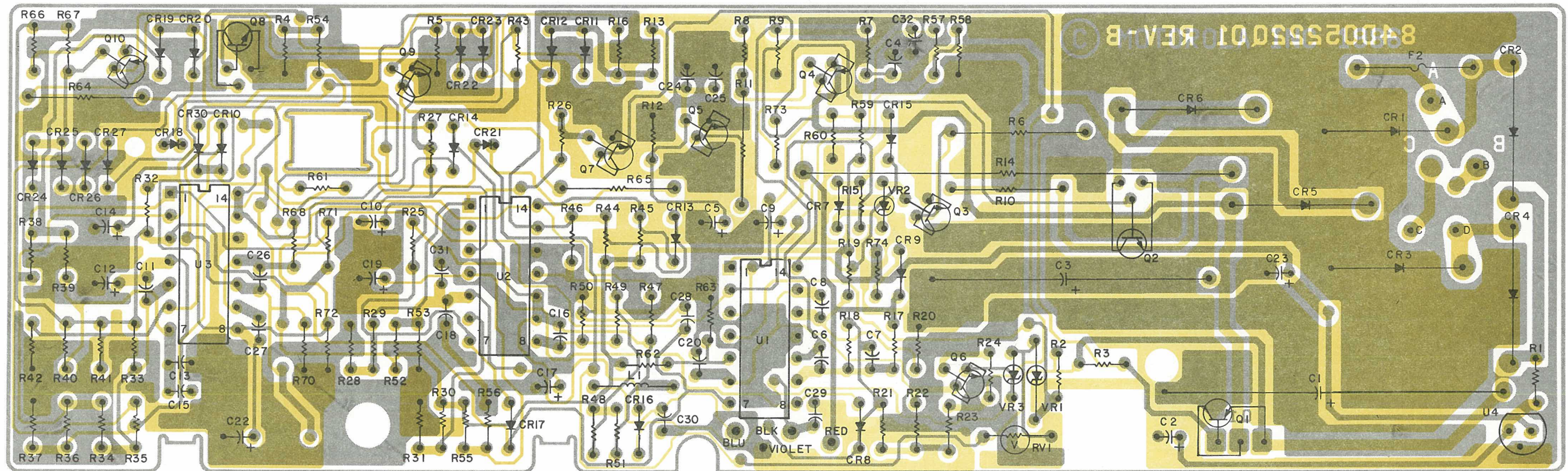
Pos	Code No	Description	Qt
1	0105957M08	ASSEMBLY TOP HOUSING INCLUDES	1
18	SEE NOTE	HOUSING ESCUTCHEON THERMAL PARTITION	1
2	0105950N68	AND FASTENER CLIP	1
2	0105957M06	ASSEMBLY CIRCUIT BOARD	1
3	SEE NOTE	TRANSFORMER (T1)	1
4	0105957M14	ASSEMBLY BASE PLATE	1
		INCLUDES BRACKETS SINGLE LUG	
5	4210217A26	TERMINAL STRIP BASE PLATE AND 4	1
6	SEE NOTE	RUBBER BUMPERS	1
7	0105950P81	ASSEMBLY BASE PLATE	1
8	0105950N70	INCLUDES BRACKETS SINGLE LUG	1
		TERMINAL STRIP BASE PLATE AND 4	
		RUBBER BUMPERS	
5	5405228Q01	LABEL CAUTION	1
6	0300138574	SCREW PHILLIPS Hd 8-32x3/8"	5
7	0300131632	SCREW TAPPING SLOTTED 8-32x3/8"	2
8	1305130Q01	GRILLE BASE	1
10	0905724C02	RECEPTACLE FUSE HOLDER	1
11	SEE NOTE	FUSE (F1)	1
12	4205723C01	RETAINER CABLE	1
13	4305233D01	SPACER	1
14	SEE NOTE	ASSEMBLY CABLE (P1,W1)	1
15	5405229Q03	LABEL FUSE	1
17	3805637M02	CAP GUARD FUSE HOLDER	1
18	3805637M01	CAP GUARD TERMINAL	1
19	5405230Q01	LABEL INFO	1
	5405230Q05	LABEL INFO	1
20	0105957M07	ASSEMBLY PARTITION INCLUDES TERMAL	1
		PARTITION CHARGING CONTACTS	
		FASTENER CLIP AND CAPACITORS C33,C34	
21	0300120938	SCREW PHILLIPS Hd 4-40x5/16"	1
22		BUSHING NYLON (PART OF Q1 SEE NOTE)	1
23		INSULATOR MICA (PART OF Q1 SEE NOTE)	1
24	0400007667	LOCKWASHER #4 EXTERNAL TOOTH	1
25	0200120486	NUT HEX 4-40x1/4x3/32"	1
26	0300120619	SCREW PHILLIPS Hd 4-40x5/16"	1
27	0705567P01	HOLDER LED	1
28	4210217A26	TIE WRAP	1
29	1305412R01	GRILL THERMAL	1
		NOTE:	
		REFER TO ELECTRICAL PARTS LIST	
		FOR PART NUMBER AND DESCRIPTION	

Pos	Code No	Description	Qt



CEPF-17359-0

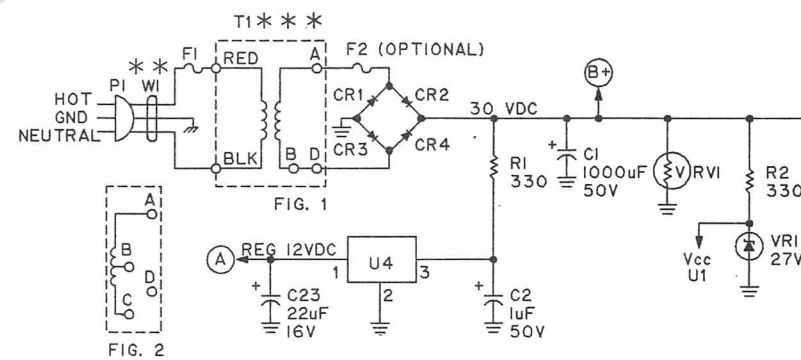
VIEWED FROM SIDE 1



SI-CEPF-17312-0
S2-CEPF-17313-0
OL-CEPF-17314-B

CQP8000
SINGLE UNIT CHARGER (RAPID) ELN1050
COMPONENT LAYOUT

D405.031/2

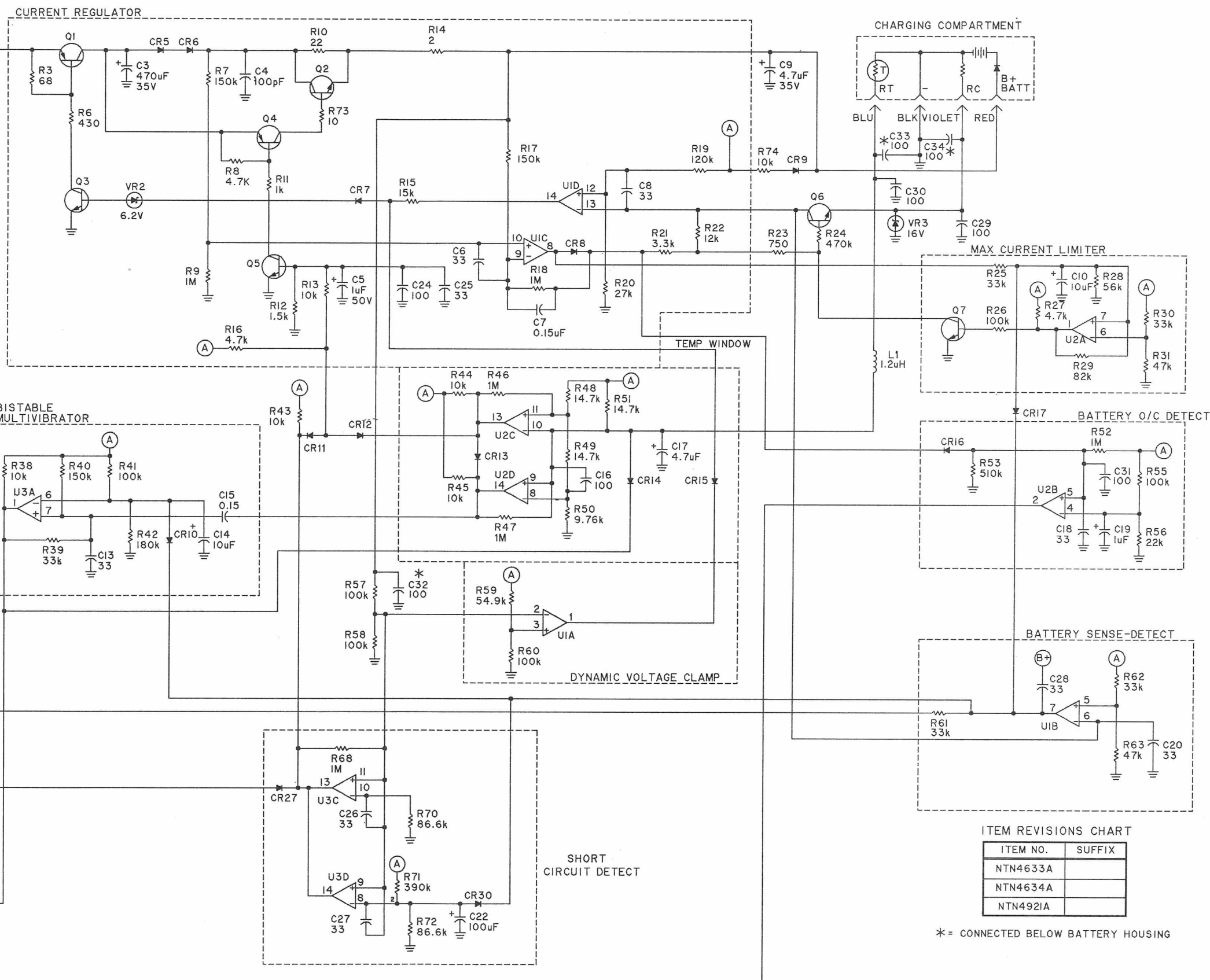


*** TRANSFORMER (T1) WIRE COLORS

VAC	PRIMARY	SECONDARY	CONN. POINTS	FIG.
117	RED BLK	WHT ORG	B TO D	1
220	RED BLK	BRN ORG	C TO D	2
240	RED BLK	BRN WHT	B TO D	2

** AC LINE CORD (WI) WIRING

CHARGER NO	VAC	HOT	NEUTRAL	GROUND
NTN4633A	117	SMOOTH	RIBBED	GRN
NTN4634A	220	BRN	BLU	---
NTN4921A	240	BRN	BLU	GRN-YEL



ITEM REVISIONS CHART

ITEM NO.	SUFFIX
NTN4633A	
NTN4634A	
NTN4921A	

* = CONNECTED BELOW BATTERY HOUSING

CQP8000
SINGLE UNIT CHARGER (RAPID) ELN1050

D405.030/2

PARTS LIST FOR SINGLE UNIT CHARGER (RAPID) FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	ELN1050	220 V AC		CR23	4805746G13	DIO SILICON	1
	ELN1051	240 V AC		CR25	4805746G13	DIO SILICON	1
				CR26	4805746G13	DIO SILICON	1
C1	2360563A01	CAP 1000 μ F \pm 5% 50V	1	CR27	4805746G13	DIO SILICON	1
C2	2360561M09	CAP 1 μ F \pm 5% 50V	1	CR30	4805746G13	DIO SILICON	1
C3	2360561N02	CAP 470 μ F 35V	1	F1	6505384M02	FUSE 1/4AMP 250V	
C4	2105455G12	CAP 100pF \pm 5% 63V	1	F2	6505214E07	FUSE 3AMP (OPTIONAL)	1
C5	2360561M09	CAP 1 μ F \pm 5% 50V	1	L1	2482723H01	CHOKE RF 1.2 μ H	1
C6	2105455G09	CAP 33pF \pm 5% 63V	1	P1	-----	PLUG AC CONNECTOR PART OF	1
C7	2184008H03	CAP 0.15 μ F +80-20%	1			CORD ASSEMBLY W1	1
C8	2105455G09	CAP 33pF \pm 5% 63V	1	Q1	4805708G09	TSTR PNP	
C9	2360561M15	CAP 4.7 μ F 35V	1	Q2	4805474G43	TSTR NPN	1
C10	2360561M19	CAP 10 μ F 35V	1	Q3	4805474G42	TSTR NPN	1
C11	2105455G12	CAP 100pF \pm 5% 63V	1	Q4	4805474G41	TSTR PNP	1
C12	2360561M19	CAP 10 μ F 35V	1	Q5	4805474G42	TSTR NPN	1
C13	2105455G09	CAP 33pF \pm 5% 63V	1	Q6	4805474G42	TSTR NPN	1
C14	2360561M19	CAP 10 μ F 35V	1	Q7	4805474G42	TSTR NPN	1
C15	2184008H03	CAP 0.15 μ F +80-20%	1	Q8	4805474G42	TSTR NPN	1
C16	2105455G12	CAP 100pF \pm 5% 63V	1	Q9	4805474G42	TSTR NPN	1
C17	2360561M15	CAP 4.7 μ F 35V	1	Q10	4805474G41	TSTR PNP	1
C18	2105455G09	CAP 33pF \pm 5% 63V	1	R1	0660075A37	RES 330 \pm 5% 1/8W	1
C19	2360561M09	CAP 1 μ F \pm 5% 50V	1	R2	0660075A37	RES 330 \pm 5% 1/8W	1
C20	2105455G09	CAP 33pF \pm 5% 63V	1	R3	0660075A21	RES 68 \pm 5% 1/8W	1
C22	2360561M44	CAP 100 μ F 16V	1	R4	0660075A61	RES 3.3k	1
C23	2360561M23	CAP 22 μ F 16V	1	R5	0660075A89	RES 47k	1
C24	2105455G12	CAP 100pF \pm 5% 63V	1	R6	1760471A01	RES 430 2W	1
C25	2105455G09	CAP 33pF \pm 5% 63V	1	R7	0660075M77	RES 150k \pm 2% 1/4W	1
C26	2105455G09	CAP 33pF \pm 5% 63V	1	R8	0660075A65	RES 4.7k	1
C27	2105455G09	CAP 33pF \pm 5% 63V	1	R9	0660075M95	RES 1M \pm 2% 1/4W	1
C28	2105455G09	CAP 33pF \pm 5% 63V	1	R10	0660075N01	RES 22 \pm 2% 1/2W	1
C29	2105455G12	CAP 100pF \pm 5% 63V	1	R11	0606075L49	RES 1k 3/4W	1
C30	2105455G12	CAP 100pF \pm 5% 63V	1	R12	0660075A53	RES 1.5k	1
C31	2105455G12	CAP 100pF \pm 5% 63V	1	R13	0660075A73	RES 10k	1
C32	2105455G12	CAP 100pF \pm 5% 63V	1	R14	1805226Q01	RES 2 7W WIRE WOUND	1
C33	2105455G12	CAP 100pF \pm 5% 63V	1	R15	0660075A77	RES 15k	1
C34	2105455G12	CAP 100pF \pm 5% 63V	1	R16	0660075A65	RES 4.7k	1
CR1	4805746G16	DIO SILICON	1	R17	0660075M77	RES 150k \pm 2% 1/4W	1
CR2	4805746G16	DIO SILICON	1	R18	0660075M95	RES 1M \pm 2% 1/4W	1
CR3	4805746G16	DIO SILICON	1	R19	0660075M75	RES 120k \pm 2% 1/4W	1
CR4	4805746G16	DIO SILICON	1	R20	0660075M59	RES 27k \pm 2% 1/4W	1
CR5	4805746G16	DIO SILICON	1	R21	0660075M37	RES 3.3k \pm 2% 1/4W	1
CR6	4805746G16	DIO SILICON	1	R22	0660075M51	RES 12k \pm 2% 1/4W	1
CR7	4805746G13	DIO SILICON	1	R23	0660075M22	RES 750 \pm 2% 1/4W	1
CR8	4805746G13	DIO SILICON	1	R24	0660075B14	RES 470k	1
CR9	4805746G13	DIO SILICON	1	R25	0660075A85	RES 33k	1
CR10	4805746G13	DIO SILICON	1	R26	0660075A97	RES 100k	1
CR11	4805746G13	DIO SILICON	1	R27	0660075A65	RES 4.7k	1
CR12	4805746G13	DIO SILICON	1	R28	0660075A91	RES 56k	1
CR13	4805746G13	DIO SILICON	1	R29	0660075A95	RES 82k	1
CR14	4805746G13	DIO SILICON	1	R30	0660075A85	RES 33k	1
CR15	4805746G13	DIO SILICON	1	R31	0660075A89	RES 47k	1
CR16	4805746G13	DIO SILICON	1	R32	0660075A73	RES 10k	1
CR17	4805746G13	DIO SILICON	1	R33	0660075A67	RES 5.6k	1
CR18	4805729G08	DIO LED RED	1	R34	0660075A67	RES 5.6k	1
CR19	4805746G13	DIO SILICON	1	R35	0660075A49	RES 1k	1
CR20	4805746G13	DIO SILICON	1	R36	0660075A97	RES 100k	1
CR21	4805729G09	DIO LED GREEN	1	R37	0660075B14	RES 470k	1

PARTS LIST FOR SINGLE UNIT CHARGER (RAPID) FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
R38	0660075A73	RES 10k	1				
R39	0660075A85	RES 33k	1				
R40	0660075B02	RES 150k	1				
R41	0660075A97	RES 100k	1				
R42	0660075B04	RES 180k	1				
R43	0660075A73	RES 10k	1				
R44	0660075A73	RES 10k	1				
R45	0660075A73	RES 10k	1				
R46	0660075B22	RES 1M	1				
R47	0660075B22	RES 1M	1				
R48	1760470A21	RES 14.7k $\pm 1\%$ 0.2W	1				
R49	1760470A21	RES 14.7k $\pm 1\%$ 0.2W	1				
R50	17604770A04	RES 9.76k $\pm 1\%$ 0.2W	1				
R51	1760470A21	RES 14.7k $\pm 1\%$ 0.2W	1				
R52	0660075B22	RES 1M	1				
R53	0660075B15	RES 510k	1				
R54	0660075A73	RES 10k	1				
R55	0660075A97	RES 100k	1				
R56	0660075A81	RES 22k	1				
R57	1760470A97	RES 100k $\pm 1\%$ 0.2W	1				
R58	1760470A97	RES 100k $\pm 1\%$ 0.2W	1				
R59	1760470A72	RES 54.9k $\pm 1\%$ 0.2W	1				
R60	1760470A97	RES 100k $\pm 1\%$ 0.2W	1				
R61	0660075A85	RES 33k	1				
R62	0660075A85	RES 33k	1				
R63	0660075A89	RES 47k	1				
R64	0660075L53	RES 1.5k 3/4W	1				
R65	0660075L53	RES 1.5k 3/4W	1				
R66	0660075A81	RES 22k	1				
R67	0660075A97	RES 100k	1				
R68	0660075B22	RES 1M	1				
R70	1760470A91	RES 86.6k $\pm 1\%$ 0.2W	1				
R71	0660075B12	RES 390k	1				
R72	1760470A91	RES 86.6 $\pm 1\%$ 0.2W	1				
R73	0660075A01	RES 10 5% 1/8W	1				
R74	0660075A73	RES 10k	1				
RV1	0605220M01	VARISTOR 35V	1				
T1	2505491R01	TSFR POWER	1				
U1	5184320A80	CIRCUIT MODULE QUAD OPERATIONAL AMPLIFIER	1				
U2	5184320A51	CIRCUIT MODULE QUAD COMPARATOR	1				
U3	5184320A51	CIRCUIT MODULE QUAD COMPARATOR	1				
U4	5105469E49	CIRCUIT MODULE VOLTAGE REGULATOR 12V	1				
VR1	4883461E12	DIO ZENER 27V	1				
VR2	4805249R04	DIO ZENER 6.2V	1				
VR3	4805249R14	DIO ZENER 16V	1				
W1	3005526R01	CABLE 2-CONDUCTOR INCLUDES AC CORD AND PLUG (P1) (220V AC)	1				
W1	0105950P79	CABLE 3-CONDUCTOR INCLUDES AC CORD AND PLUG(P1)AND CRIMP LUG (240V AC)	1				

ELN1052/ELN1053

SINGLE-UNIT STANDARD-CHARGE BATTERY CHARGER

INTRODUCTION

The Single-Unit Standard-Charge Battery Chargers are accessory items for charging rechargeable nickel-cadmium batteries. The chargers are approved for use with the following standard-charge and rapid-charge batteries:

- NTN4823 - 500 mAh, FM, Standard Charge
- NTN5046 - 500 mAh, Standard Charge
- NTN5047 - 500 mAh, Rapid Charge
- NTN5048 - 900 mAh, Rapid Charge
- NTN5049 - 900 mAh, Standard Charge

SPECIFICATIONS

INPUT POWER	220 VAC, 240 VAC; 50 Hz
SIZE	193 x 127,6 x 77.5 mm
WEIGHT	751.25 g
CHARGE RATE	Approximately 16 hours
OPERATING TEMPERATURE RANGE	0°C to 50°C

DESCRIPTION

These single-unit standard chargers are current sensing, voltage sensing, current regulating devices which provide a 16-hour charge rate. The batteries can be left in the charger indefinitely without any resultant harm.

The ELN1052 charger operates from a 220 VAC, 50 Hz power source and the ELN1053 charger operates from a 240 VAC, 50 Hz power source.

A red light-emitting diode (LED) indicates a charging condition when a battery is inserted into the charger.

OPERATION

Normal battery operation is eight hours of use followed by approximately 16 hours of charge. Place the charger in operation as follows:

1. Visually check the battery and charger charging contacts for dirt, grease or other material which may prevent good conduct, and clean if necessary.

2. Connect the charger's AC plug to the appropriate AC power source.
3. Insert the battery, with or without radio, into the charger pocket. When the battery contacts mate with the charger's charging contacts, charging begins and the red LED indicator will light.

NOTE

To ensure proper charging, make certain that the battery is pushed fully into the charger pocket.

4. Allow sufficient time for the battery to fully charge (approximately 16 hours). After this time the battery will reach 100% full charge. The battery can be removed from the charger or remain in the charger indefinitely.

CIRCUIT DESCRIPTION

(Refer to the schematic diagram)

GENERAL

Operating voltage (B +) is developed from a stepdown transformer (T1), with a fused primary, driving a conventional full-wave bridge rectifier (CR6-CR9) in the chargers. The B + (approximately 30 VDC - no load, to 20 VDC - full load) is applied to transistor Q1 and resistor R1.

Initially, when the charger is plugged in (without a battery inserted), Q1 conducts and Q4 turns on, which provides a turn-on voltage for Q3. The conduction of Q3 effectively shorts out resistor R8, and a quiescent drive current is established for Q1, by components R1, VR1 and R9. Transistors Q3 and Q4 are components of the charger's short-circuit protection circuitry and are active during both the quiescent and charging states.

When a battery is placed in the charger pocket a current path is established through the battery. This allows current to flow through diode CR2 and the base-emitter junction of transistor Q5, which turns on Q5 and diode CR5 (the red LED). Charging current for the battery is provided by the current regulator circuitry consisting of transistors Q1 and Q2. Base current for Q1 is controlled by transistor Q2, resistors R2, R7 and R9, and the internal battery resistor RC. The value of RC determines the charge rate for a particular battery capacity. RC is electrically placed across the base-emitter junction of Q2. Its value, combined with the resistance of R7 and R9, determines the amount of conduction of Q2, which limits the amount of base drive for Q1, thus regulating the charge current. The following chart lists the two different capacity batteries and their respective RC and trickle charge currents.

BATTERY CAPACITY	RC	CHARGING CURRENT
Medium	5.6 K	50 mA
High	3.3 K	80 mA

OVER-VOLTAGE PROTECTION

Battery over-voltage protection is achieved by Zener diode VR1 during the charging mode. If the voltage between the base of Q1 and the battery ground terminal approaches 16 volts, VR1 conducts. This conduction removes the base drive from Q1, thus maintaining a safe battery voltage of approximately 14.5 volts. Also, if Q1 should fail (e.g. collector to emitter short), the diode combination of CR3 and VR1 will hold the battery terminal voltage to a safe level.

SHORT-CIRCUIT PROTECTION

Transistor Q4 and resistors R3, R4 and R5, together with transistor Q3 and resistor R8 help to protect the charger if the charging contacts are shorted. During normal operation, transistor Q4 is biased "on" to ensure that transistor Q3 is always saturated, thus bypassing resistor R8. However, if B+ is shorted to ground (e.g. charging contacts are shorted together), Q4 is cut off, which removes the base drive of transistor Q3. Consequently, R8 (a high resistance component), is placed in the charging path, which limits the current to a value of less than 1 mA.

MAINTENANCE

FUSES

The fuse (F1) in the primary circuit of transformer (T1) is the only user serviceable part in the charger. If necessary, replace this fuse with one of the same size and rating as marked, or refer to the electrical parts list for the proper electrical specifications. After replacing the fuse, if the charger still fails to operate properly, contact a local Service Shop for repairs.

RADIO CONTACTS

If the red LED does not turn on when a battery is inserted into the pocket, check the contacts of the radio for dirt, grease, or foreign material. Clean the contacts if necessary.

DC VOLTAGE MEASUREMENTS CHARTS

In the following charts,

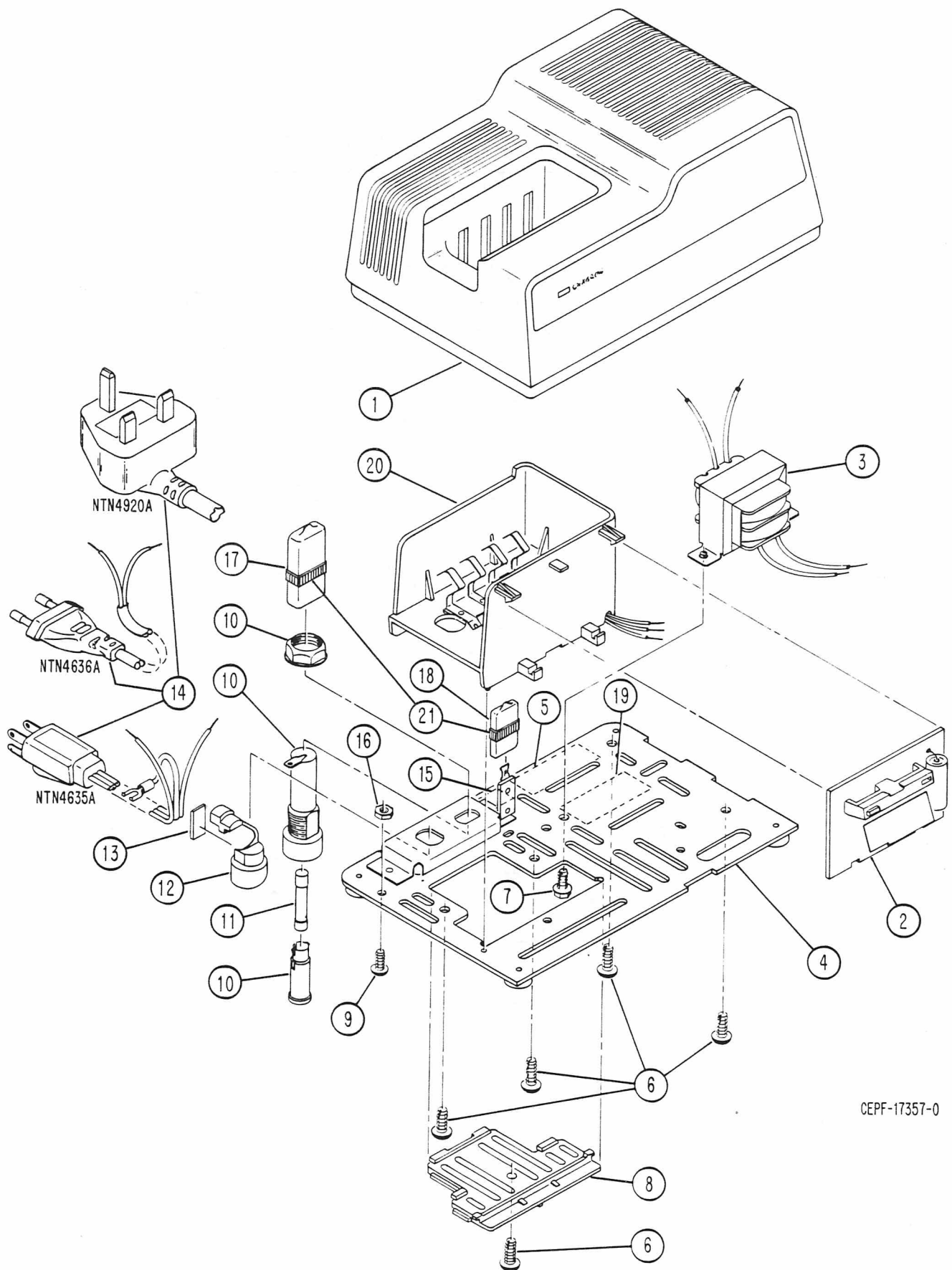
- Measurements were taken with a FLUKE 8010A digital multimeter at 25°C room temperature
- All voltages readings are DC and referenced to charger ground
- The DC voltages are typical readings and will vary with conditions of the battery

DC VOLTAGE MEASUREMENTS CHART

		Q1			Q2			Q3			Q4			Q5			CR5
BATTERY TYPE	CHARGE CURRENT mA	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	12
NO BATTERY	0	15.1	16.2	29.1	.01	.02	15.4	0	0.79	.01	9.6	8.9	0.79	15.1	14.7	0	0
500 mAh	50	15.5	16.6	25.0	2.2	2.7	12.9	0	0.84	.08	10.9	10.2	0.84	15.5	14.8	15.4	2.0
900 mAh	80	16.7	17.7	23.6	3.6	4.1	15.3	0	0.86	0.12	12.1	11.4	0.86	16.7	15.9	16.6	2.03

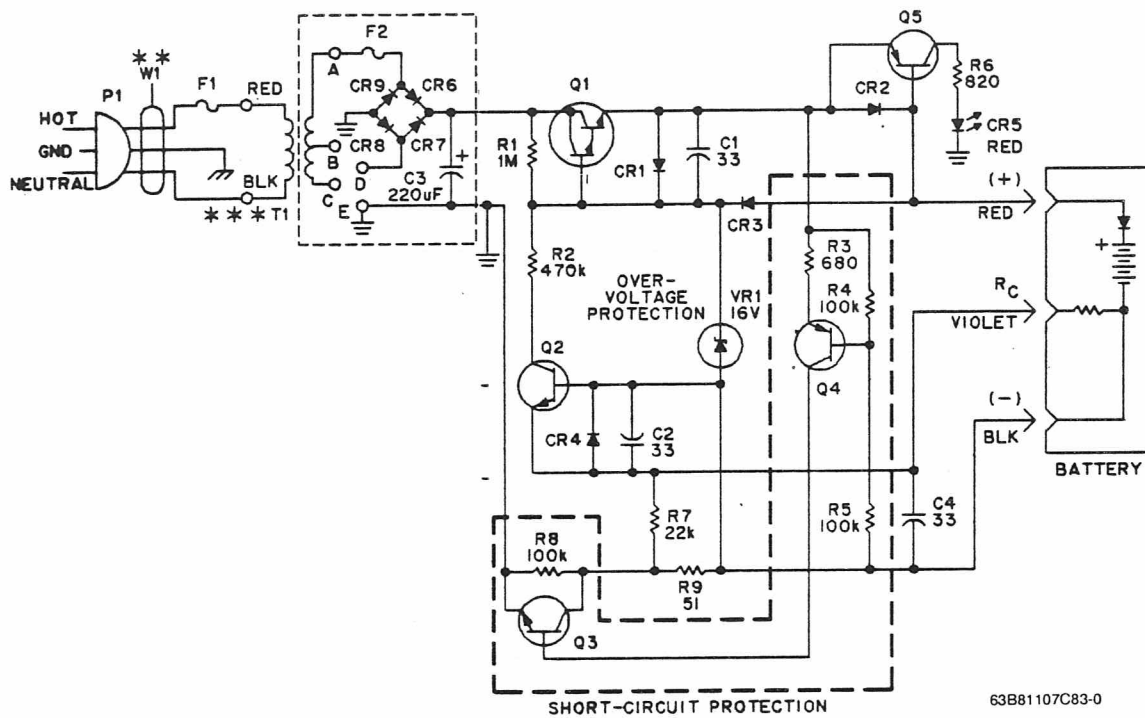
DATE: 8/17/1988

Pos	Code No	Description	Qt
1	0105957M11	ASSEMBLY TOP HOUSING INCLUDES HOUSING ESCUTCHEON THERMAL PARTITION AND FASTENER CLIP	1 1 1
2	0105950P75	ASSEMBLY PC BOARD	1
	0105957M09	ASSEMBLY PC BOARD	1
3	SEE NOTE	TRANSFORMER (T1)	1
4	0105957M20	ASSEMBLY BASE PLATE INCLUDES BRACKETS SINGLE LUG TERMINAL STRIP BASE PLATE AND 4 RUBBER BUMPERS	1 1 1
	0105957M18	ASSEMBLY BASE PLATE INCLUDES BRACKETS SINGLE LUG TERMINAL STRIP BASE PLATE AND 4 RUBBER BUMPERS	1 1 1
	0105950P78	ASSEMBLY BASE PLATE INCLUDES BRACKETS SINGLE LUG TERMINAL STRIP BASE PLATE AND 4 RUBBER BUMPERS	1 1 5
5	5405228Q01	LABEL CAUTION	1
6	0300138574	SCREW PHILLIPS Hd 8-32x3/8"	5
7	0300131632	SCREW TAPPING 8-32x3/8"	2
8	1305130Q01	GRILLE BASE	1
9	0300138035	SCREW PHILLIPS Hd 6-32x3/8"	1
10	0905724C02	RECEPTACLE FUSE HOLDER	1
	0905490R01	RECEPTACLE FUSE HOLDER	1
11	SEE NOTE	FUSE (F1)	1
12	4205723C01	RETAINER CABLE	1
13	4305233D01	SPACER	1
14	SEE NOTE	ASSEMBLY CABLE (P1,W1)	1
15	5405229Q02	LABEL FUSE	1
	5405229Q04	LABEL FUSE	1
16	0200007005	NUT HEX 6-32x1/4" 3/32"	1
17	3805637M02	CAP GUARD FUSE HOLDER	1
18	3805637M01	CAP GUARD TERMINAL	1
19	5405230Q02	LABEL INFO	1
	5405230Q04	LABEL INFO	1
	5405230Q06	LABEL INFO	1
20	0105957M10	ASSEMBLY PARTITION INCLUDES THERMAL PARTITION CHARGING CONTACTS AND FASTENER CLIP	1 1 1
21	4210217A26	TIE WRAP	1
29	1305412R01	GRILL THERMAL	1
		NOTE: REFER TO ELECTRICAL PARTS LIST FOR PART NUMBER AND DESCRIPTION	

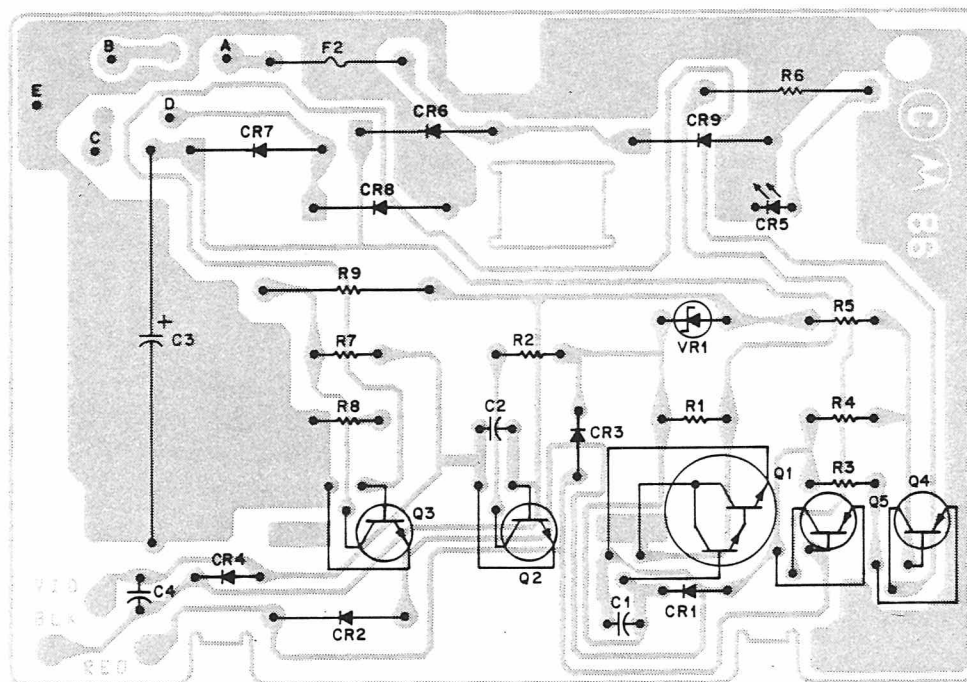


CEPF-17357-0

CQP8000
EXPLODED VIEW
SINGLE UNIT STANDARD CHARGER ELN1052
M405.479/2



** AC LINE CORD (W1) WIRING					*** TRANSFORMER (T1) WIRE COLORS			
CHARGER NO	VAC	HOT	NEUTRAL	GROUND	VAC	PRIMARY	SECONDARY	CONN. POINTS
ELN1052	220	BRN	BLU	— —	220	RED-BLK	BRN-ORG	C TO D
ELN1053	240	BRN	BLU	GRN - YEL	240	RED-BLK	BRN-WHT	B TO D



OL-BEPF-17548-0

CQP8000
SINGLE UNIT CHARGER ELN1052/53

D405.027/2

DATE: 8/17/1988

Pos	Code No	Description	Qt	Pos	Code No	Description	Qt
C1	2105499G01	CAP 33pF ±5% 63V	1				
C2	2105499G01	CAP 33pF ±5% 63V	1				
C3	2360561N01	CAP 220µF ±5% 50V	1				
C4	2105499G01	CAP 33pF ±5% 63V	1				
CR1	4805746G13	DIO SILICON	1				
CR2	4805746G10	DIO SILICON	1				
CR3	4805746G13	DIO SILICON	1				
CR4	4805746G13	DIO SILICON	1				
CR5	4805729G08	DIO LED RED	1				
CR6	4805746G10	DIO SILICON	1				
CR7	4805746G10	DIO SILICON	1				
CR8	4805746G10	DIO SILICON	1				
CR9	4805746G10	DIO SILICON	1				
F1	6500480555	FUSE 0.2AMP 125V (ELN1052)	1				
	6505384M01	FUSE 1/8AMP 250V (ELN1052, ELN1053)	1				
F2	6505214E06	FUSE 1AMP OPTIONAL FUSE	1				
P1	-----	PLUG AC CONNECTOR PART OF CORD ASSEMBLY W1					
Q1	4805474G40	TSTR NPN DARLINGTON	1				
Q2	4805474G42	TSTR NPN	1				
Q3	4805474G42	TSTR NPN	1				
Q4	4805474G41	TSTR PNP	1				
Q5	4805474G41	TSTR PNP	1				
R1	0660075B22	RES 1 M	1				
R2	0660075B14	RES 470k	1				
R3	066075A45	RES 680 ±5% 1/8W	1				
R4	0660075A97	RES 100k	1				
R5	0660075A97	RES 100k	1				
R6	0660075L47	RES 820 3/4W	1				
R7	0660075L47	RES 22k ±2%	1				
R8	0660075A97	RES 100k	1				
R9	0660075L18	RES 51 3/4W	1				
T1	2505491R02	TRANSFORMER POWER	1				
VR1	4805249R14	DIO ZENER 16V	1				
W1	3005526R01	INCLUDES AC CORD AND PLUG (P1) (ELN1052)	1				
W1	0105950P79	INCLUDES AC CORD PLUG (P1) AND RED CRIMP LUG (ELN1053)	1				

ELN1060/ELN1061

MULTI-UNIT RAPID-CHARGE BATTERY CHARGERS

IMPORTANT SAFETY INSTRUCTIONS

- This manual contains important safety and operating instructions.
- Before using battery charger, read all instructions and cautionary markings on (1) battery charger, (2) battery, and (3) radio using battery.
- **WARNING** - to reduce risk of injury, charge only the nickel-cadmium type rechargeable batteries listed. Other types of batteries may burst, causing personal injury and damage.
- Do not expose charger to rain or snow.
- Use of an attachment not recommended or sold by Storno may result in a risk of fire; electric shock, or injury to persons.
- To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
- Make sure cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:
 - That pins on plug of extension cord are same number; size, and shape as those on plug on charger;
 - That extension cord is properly wired and in good electrical conditions;
 - The cord size is 18AWG for lengths up to 100 ft., and 16AWG for lengths up to 150 ft.
- Do not operate charger with damaged cord or plug - replace them immediately.
- Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- Do not disassemble charger; take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

INTRODUCTION

WARNING

Do not discard batteries in fire; they may explode

The Multi-Unit Rapid-Charge Battery Chargers are accessory items for "Handie-Talkie" Portable Radios using rechargeable nickel-cadmium batteries with the following capacities:

SPECIFICATIONS

INPUT POWER	220 VAC, 240 VAC; 50 Hz
SIZE	450 x 310 x 140 mm
WEIGHT	4 kg
RAPID CHARGE TIME	Approximately 1 hour
OPERATING TEMPERATURE RANGE	0°C to 50°C
RAPID-CHARGE TEMPERATURE WINDOW	10°C to -40°C

DESCRIPTION

The multi-unit rapid chargers are constant-current devices which can charge up to six nickel-cadmium batteries simultaneously. Each charging pocket provides two different charge rates: a one-hour rate and a 16-hour rate. A rapid-charge nickel-cadmium battery is charged initially at a one-hour charge rate, after which the charging rate is automatically reduced to the 16-hour rate; a standard-charge battery charges only at the 16-hour rate. The battery may be left in the battery charger indefinitely without any resultant harm.

A line voltage selector switch at the bottom of the charger selects which power source voltage will be used.

The appropriate AC power cord is provided with the charger.

OPERATION

After a period of use, a battery normally requires approximately one hour of rapid charging. The radio may be left on while attached to a battery being recharged. Place the charger in operation as follows:

1. Connect the AC cord to the battery charger.
2. Plug the AC line cord into the proper AC receptacle. The battery charger performs a self test: pocket 1's three LEDs are simultaneously turned on, then off, followed, in numerical order, by the LEDs of pockets 2 through 6.

NOTE

Make certain that the AC power cord's plug is completely inserted into the charger socket and a good electrical connection is made.

IMPORTANT NOTE

DO NOT press the PTT switch on the radio while the radio is in a charger pocket.

3. Insert the battery, with or without the radio attached, into a vacant charger pocket and seat it firmly to ensure that proper contact has been made. The pocket's three LEDs turn on and off, then the red **Charging** LED turns on to indicate that the battery is being rapid-charged.

NOTE

If the yellow **Stand-By** LED lights instead of the red LED, the battery is either too hot or too cold to be rapid-charged. Refer to "Circuit Description" for details.

If both the red **Charging** LED and the yellow **Stand-by** LED light at the same time, the battery is being trickle-charged. Refer to "Circuit Description" for details.

4. Allow approximately one hour for batteries to charge.

NOTE

When a rapid-charge battery reaches full charge, the red **Charging** LED turns off and the green **Complete** LED turns on.

IN CASE OF TROUBLE

Before requesting service, refer to the following table for possible remedies.

NOTE	
Use only STORNO nickel-cadmium (NI-CD) batteries with this charger.	

CONDITION	REMEDY
Red Charging LED does not light when battery is inserted in pocket	<ul style="list-style-type: none"> ● Check battery and charger contacts for dirt, grease, or foreign material. Wipe with a soft cloth.
Red Charging LED flashes	<ul style="list-style-type: none"> ● Try reseating battery. ● Check battery contacts for dirt, grease, or foreign material. Wipe with soft cloth. ● Try another battery. If problem goes away, the problem is with the first battery.
Yellow Stand-By LED lights	<ul style="list-style-type: none"> ● Battery is either too hot or too cold to be rapid charged.
No LEDs light	<ul style="list-style-type: none"> ● Make sure charger is plugged in. ● Check to see if charger has a fuse. ● Check to see if fuse is blown.

CIRCUIT DESCRIPTION

POWER SUPPLY

The position of the line voltage selector switch on the bottom of the power supply determines the input source voltage.

Operating B+ is developed within the power supply and fed to the main circuit board via plug P1. The power supply's output voltage (B+) is determined by the position of a jumper on the side of the power supply. On the main circuit board, B+ is distributed to LED boards 1 and 2, to charging circuit transistors Q5, Q7, Q9, Q11, Q13, and Q15, to ICs U18 and U23, and to 5-volt regulator U13. The 5-volt regulator provides regulated +5 VDC to the microcomputer (U15) and all other ICs.

MICROCOMPUTER AND DISPLAY CIRCUITS

All of the timing, monitoring, and sensing of the circuit is performed by the microcomputer (U15). Upon power up, with no battery inserted, the microcomputer performs a self-check of its erasable programmable read-only memory (EPROM), random-access memory (RAM), and internal timer.

ELN1060/ELN1061 MULTI-UNIT RAPID CHARGE BATTERY CHARGERS

Next, the microcomputer tests the display circuitry by turning all three LEDs for each pocket on and off in numerical order, starting with pocket 1. To control the display the microcomputer sends pocket display data via the PA0 through PA5, and PA7 lines (U15, pins 33 through 38, and 40) to HEX D flip-flop ICs U4 through U6 as follows:

POCKET	DATA LINES	IC	PINS IN	PINS OUT	LEDs
1	PA0 - 2,7	U4	1,3,4,6	2,5,7	1-3
2	PA3 - 5,7	U4	1,11,13,14	10,12,15	4-6
3	PA0 - 2,7	U5	1,3,4,6	2,5,7	7-9
4	PA3 - 5,7	U5	1,11,13,14	10,12,15	10-12
5	PA0 - 2,7	U6	1,3,4,6	2,5,7	13-15
6	PA3 - 5,7	U6	1,11,13,14	10,12,15	16-18

At the same time, the microcomputer selects the pocket displays to be changed by sending positive-going clock pulses via the PB5 through PB7 lines (U15, pins 30 through 32) to the clock inputs (pin 9) of ICs U4 through U6. These ICs multiplex and latch the display data from the microcomputer, and send control signals to the appropriate LEDs via lamp drivers in ICs U1 through U3. A logic high output from one of the flip-flops will turn an LED on; a logic low will turn the LED off.

If the microcomputer fails its self-check, all LEDs will light simultaneously and will remain lit until the charger is reset by removing AC power. If the self-check is completed without any problems being encountered, the microcomputer turns all LEDs off; the LEDs will remain off until a battery is inserted into one of the pockets.

MONITORING AND SENSING CIRCUITS

Before any batteries can be charged, the microcomputer (U15) must first determine the charger type by checking the value of B+. This is accomplished by applying B+ across voltage divider network R142 and R143, and feeding the network's output to the pin 4 input of multiplexer U22. The microcomputer selects this input by sending its binary address, via control lines PB0 through PB2, to pins 9 through 11 of U22. U22 outputs this voltage, via the PD2 line (U22, pin 3), to the AN2 input (pin 22) of U15. This voltage (see Tables 3 and 4) is then used by the microcomputer to set up its internal charging parameters.

Following charging parameter setup, the microcomputer monitors the PB0 through PD3 lines (U15, pins 21 through 24) from multiplexers U21 through U24 to monitor battery type, temperature, voltage, and current. Using these four multiplexers, the PD0 through PD3 lines are able to report the battery parameters of all six pockets.

The microcomputer searches for the presence of a battery in any of the pockets by continually monitoring their battery type and temperature values, cycling through the pockets in ascending order. The microcomputer selects the pocket to be sensed by sending the desired pocket's binary address (0 through 5), via control lines PB0 through PB2, to pins 9 through 11 of all four multiplexers.

ELN1060/ELN1061 MULTI-UNIT RAPID CHARGE BATTERY CHARGERS

When the presence of a battery in a pocket is indicated by a valid capacity resistor (RC) value (see Table 1), and a thermistor (RT) value between 10°C (3.33 VDC on the RT contact) and 40°C (1.87 VDC on the RT contact) is detected, the pocket's charge cycle will begin.

RC VALUE	BATTERY TYPE
3.3 K ohm	NTN5048, NTN5049, NTN4825
5.6 K ohm	NTN4823, NTN5046, NTN5047

Table 1. Normal RC Values

If the RC value is not valid, the red **Charging** LED will flash. If the thermistor is neither shorted nor open but its value is not within the rapid-charging window, the yellow **Stand-by** LED will light and no charging will occur. When the battery temperature is within the prescribed window, the yellow LED will turn off and the red LED will light, and the normal charging cycle will begin. If the thermistor is shorted, the red LED will flash; if the thermistor is open, the battery will first be pre-charged as described under "Charging Circuits", then it will be trickle-charged, and both red and yellow LEDs will light.

CHARGING CIRCUITS

Following the power-up, microcomputer self check, battery installation, and normal battery RC, RT, and voltage checks, rapid charging begins. There are several different rapid-charge rates as determined by the battery RC (see Table 2).

BATTERY TYPE	CHARGE RATE (mA)	
	RAPID	TRICKLE
NTN5046	--	50
NTN5048	--	90
NTN4823, NTN5047	600	50
NTN4825, NTN5049	840	90

Table 2. Charge Rates

The microcomputer first precharges the battery at 600 mA for 30 seconds. The microcomputer selects the pocket to be charged by sending that pocket's address, via the PB0 through PB2 lines, to triple "AND" gates U17A through U17C. At the same time, a high pulse is sent over the PC7 line to U17 to enable the gates. The resulting address is fed over the A1 through A3 lines to binary-to-octal decoder U16. U16 then sends a clock pulse, via one of the Q1 through Q6 lines, to the HEX D flip-flop IC (U7 through U12) for the desired pocket.

Charging current is set and latched by sending a six-bit word from U15, pins 9 through 14, via the PC0 through PC5 lines, to pins 3, 4, 6, 11, 13, and 14 of HEX D flip-flop ICs U7 through U12, and setting the PA7 line (U15, pin 40) high. The six-bit word is determined by the value of the battery's RC. At the flip-flop IC of the selected pocket, the clock pulse (Q1 through Q6) from U16 latches the six-bit word; the flip-flop IC's six output lines (Q0 through Q5) select a resistive network which determines the charge rate. If the charge current is not within specified limits (see Table 2), the microcomputer will stop charging current to the pocket, and will indicate a pocket fault condition by lighting all three of the pocket's LEDs.

ELN1060/ELN1061 MULTI-UNIT RAPID CHARGE BATTERY CHARGERS

At the end of the 30-second precharge, the battery voltage is read. If the voltage reading falls between 9 VDC and 15 VDC the charger switches to the rapid-charge mode. If the voltage is outside of this range, the charger signals a battery problem by flashing the red **Charging** LED.

Every three minutes, the microcomputer stops the charging current and checks the temperature of the battery. As the battery reaches full charge in the rapid-charge mode, the battery temperature rises. When the battery temperature reaches 45°C, or the rate of increase within the three minutes exceeds 1.6°C (80 mV), the charger switches to the trickle-charge mode, turning off the red **Charging** LED, and turning on the green **Complete** LED.

RESET CIRCUIT

Integrated circuit U14 is a "watchdog" timer. At least once every second, a positive signal from U15, pin 28 (PB3 line), is received at U14, pin 2. This signal keeps Q1 from resetting the microcomputer. If a problem occurs in the microcomputer, such as the microcomputer's internal timer ceasing to function correctly, the microcomputer stops sending the signal at U15, pin 28. As a result, the following sequence occurs: U14, pin 3, goes low, turning off Q2. This turns on Q1, which resets the microcomputer. When the microcomputer is reset, Q3 is turned on, pulling U14, pin 2, low, and resetting the U14 timer. Resetting the timer causes U14, pin 3, to go high, which turns on Q2, turns off Q1, and pulls the microcomputer out of reset via U15, pin 2.

SHUTDOWN CIRCUIT

The charger also contains a shutdown circuit which the microcomputer controls via the PA6 line (U15, pin 39). During normal operation, a logic high appears at pin 39 which keeps Q17 turned on. If the microcomputer senses current flow when current should not be flowing, it outputs a logic low on pin 39, turning off Q17, and pulling pin 1 of P1 high. This triggers an SCR within the power supply which ceases to send power to the main circuit board. AC power must be removed from the power supply to reset the unit.

MAINTENANCE

FUSE

If the charger does not operate, check the fuse, and replace if necessary. If the replaced fuse "blows", check for shorts in the power supply output, charger circuits, and 5-volt regulator U13.

CONTACTS

If the red **Charging** LED does not turn on with a radio or battery inserted into the pocket, check the contacts of the battery or charger for dirt, grease, or other foreign materials. Clean the contacts with a soft cloth, if necessary.

CAUTION

The following maintenance procedures should only be performed by qualified service personnel:

ELN1060/ELN1061 MULTI-UNIT RAPID CHARGE BATTERY CHARGERS

VOLTAGE MEASUREMENTS

The following DC voltage measurements tables list typical voltage levels that should be present with varying chargers, batteries, and operating conditions. Measurements shown are for pocket 1.

BATTERY AND CONDI- TIONS	PIN	B+	U22	Q7		Q8		U8						U18		
			4	B	C*	B	E	2	5	7	10	12	15	1	3	9
NO BATTERY		16.0	4.7	16.0	10.9	0	0	0	0	0	0	0	0	0	0	0
NTN5047/4823 RAPID CHARGE		16.0	4.7	15.3	12.4	2.2	1.5	5.0	0	0	5.0	5.0	0	1.70	.36	.36
NTN5047/4823 COMPLETE		16.0	4.7	15.3	12.0	0.9	0.2	5.0	5.0	0	0	0	0	0.16	.04	.04
NTN5049/4825 RAPID CHARGE		16.0	4.7	15.3	12.5	3.2	2.5	5.0	0	0	0	0	5.0	2.40	.51	.51
NTN5049/4825 COMPLETE		16.0	4.7	15.3	12.0	1.0	0.3	5.0	0	5.0	0	0	0	0.27	.06	.06
NTN5046 STANDARD		16.0	4.7	15.3	12.0	0.9	0.2	5.0	5.0	0	0	0	0	0.16	.04	.04
NTN5048 STANDARD		16.0	4.7	15.3	12.0	1.0	0.3	5.0	0	5.0	0	0	0	0.27	.06	.06

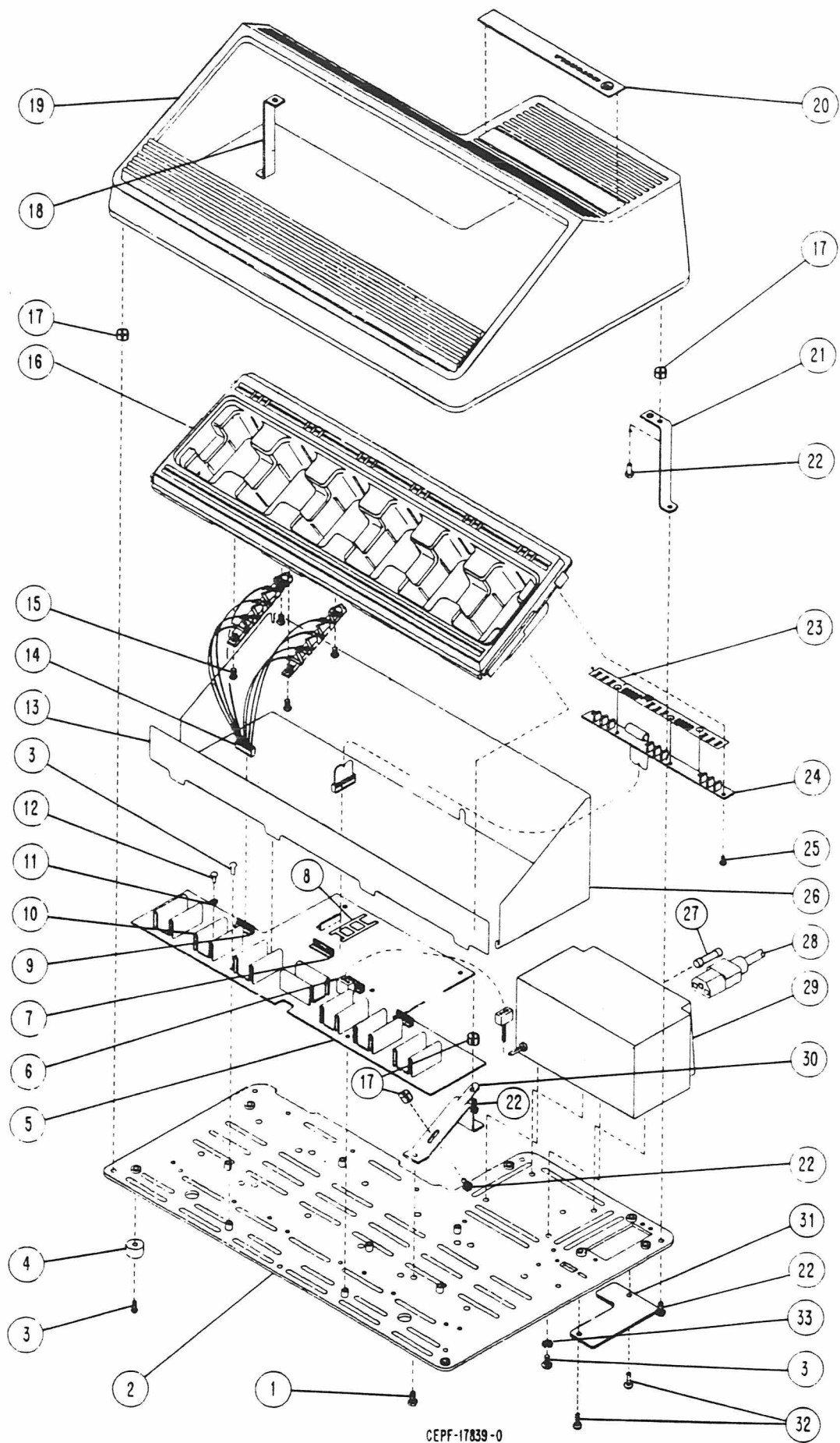
BATTERY AND CONDI- TIONS	PIN	U15						P1	U1			CHARGING CURRENT (mA)
		2	21	22*	23	24**	29	1	16	15	14	
NO BATTERY		5.0	0	3.1	4.9	4.9	4.8	0	14.7	14.7	14.7	0
NTN5047/4823 RAPID CHARGE		5.0	1.70	3.6	0.8	2.7	4.8	0	14.7	0.7	14.7	600
NTN5047/4823 COMPLETE		5.0	0.16	3.4	0.5	0.5	4.8	0	14.7	14.7	0.7	50
NTN5049/4825 RAPID CHARGE		5.0	2.40	3.6	0.8	2.8	4.8	0	14.7	0.7	14.7	840
NTN5049/4825 COMPLETE		5.0	0.27	3.4	0.4	0.5	4.8	0	14.7	14.7	0.7	90
NTN5046 STANDARD		5.0	0.16	3.4	0.5	4.9	4.8	0	0.7	0.7	14.7	50
NTN5048 STANDARD		5.0	0.27	3.4	0.4	4.9	4.8	0	0.7	0.7	14.7	90

NOTES:

1. All voltages referenced to charger ground.
2. Voltages designated * will vary with the voltage of the battery, battery voltage for this table is 12 VDC.
3. Voltages designated ** will vary with the temperature of the battery, for this table, rapid-charge RT = 10 K ohm and charge complete RT = 1 K ohm.

MECHANICAL PARTS LIST FOR MULTI-UNIT BATTERY CHARGER CQP8000

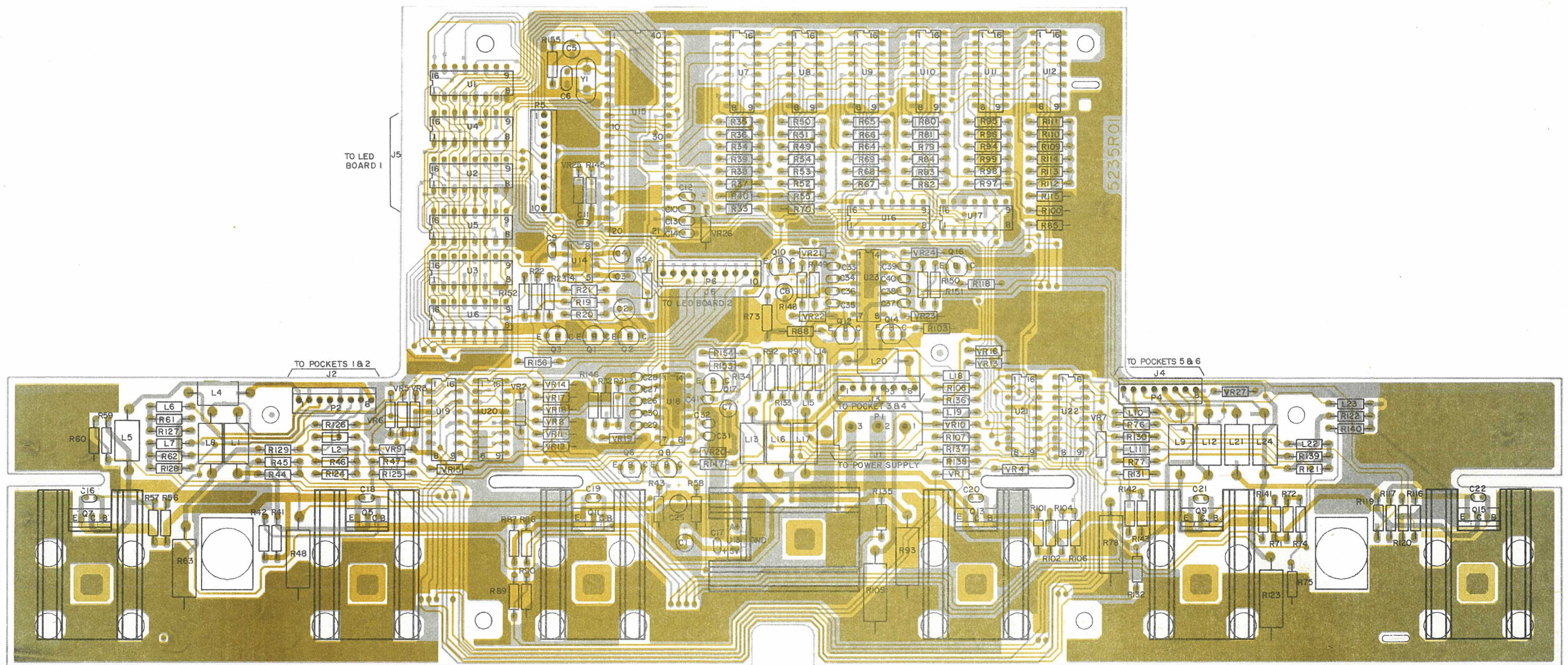
Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	ELN1060	220V AC					
	ELN1061	240V AC					
1	0300129890	SCREW MACHINE 10-32 x .375"	4				
2	0105952P82	ASSEMBLY BASE PLATE	1				
3	0300121057	SCREW MASHINE 6-32 x .375"	16				
4	7505413D01	BUMPER RUBBER	5				
5	SEE NOTE	ASSEMBLY MAIN PCB (INCLUDES ITEMS 6,7,8,9,10,11,12)	1				
6	SEE NOTE	CONNECTOR 3-POSITION (P1) (PART OF ITEM 5)	1				
7	SEE NOTE	CONNECTOR 10-POSITION (P5,P6) (PART OF ITEM 5)	2				
8	SEE NOTE	SOCKET IC (PART OF ITEM 5)	1				
9	SEE NOTE	CONNECTOR 8-POSITION (P2,P3,P4)(PART OF ITEM 5)	3				
10	2605239R01	HEAT SINK 5-WATT (PART OF ITEM 5)	7				
11	0410057A13	WASHER SHOULDER PLASTIC (PART OF ITEM 5)	7				
12	0300002951	SCREW MASHINE 4-40 x .250" (PART OF ITEM 5)	7				
13	2605541L02	SHIELD THERMAL	1				
14	SEE NOTE	ASSEMBLY CABLE (INCLUDES J2,J3,J4,J7,J8,J9,J10,J11)	3				
15	0300139982	SCREW MACHINE 2-56 x 5/32"	12				
16	1505411R01	HOUSING POCKET (SEE D405.226)	1				
17	4205722C02	CLIP FASTENER	10				
18	0705466Q01	BRACKET CHARGER HOUSING	1				
19	1505277L02	HOUSING MULIT-UNIT CHARGER	1				
20	3305543L06	NAMEPLATE CHARGER	1				
21	0705193L01	BRACKET COVER TIN-PLATED	2				
22	0300131632	SCREW TAPPING 8-32 x .375"	13				
23	2605407S01	SHIELD STATIC	2				
24	SEE NOTE	PRINTED CIRCUIT BOARD LED	2				
25	0300135922	SCREW TAPPING 4-24 x .25"	6				
26	2605238R01	SHIELD THERMAL	1				
27	SEE NOTE	FUSE POWER SUPPLY	1				
28	SEE NOTE	CORD AC POWER (220V AC)	1				
29	SEE NOTE	POWER SUPPLY SWITCH MODE 120-WATT	1				
30	0705169L01	BRACKET POCKET	2				
31	6405636L03	COVER SWITCH	1				
32	0300002941	SCREW MACHINE 6-32 x .25"	2				
33	0400007666	WASHER EXTERNAL TOOTH #6	4				
		NOTE: REFER TO ELECTRICAL PARTS LIST FOR PART NUMBER AND DISCRIPTION					



**MULTI-UNIT BATTERY CHARGERS ELN1060/1061
EXPLODED VIEW**

M405.543

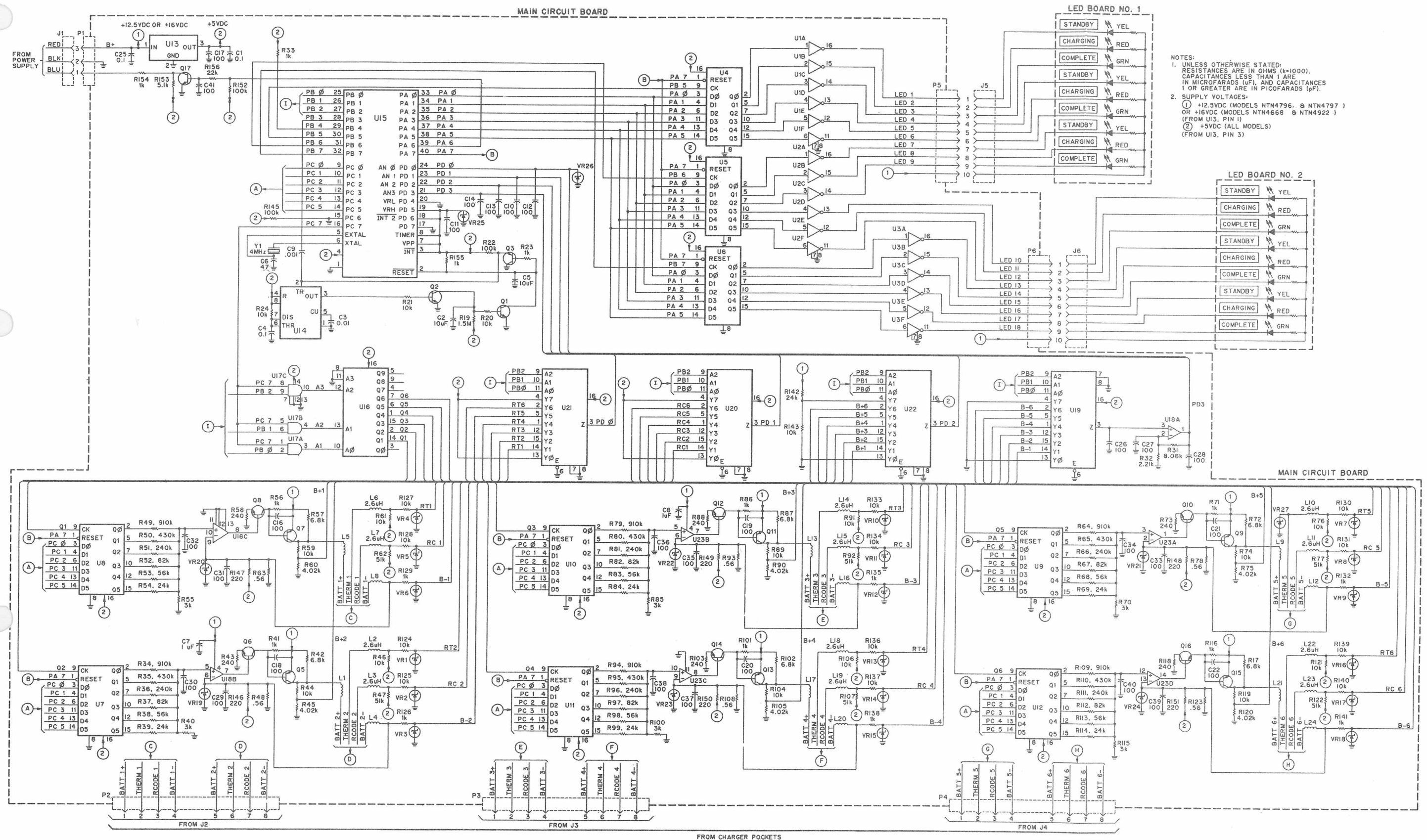
VIEWED FROM COMPONENT SIDE



● SS-DEPF-17826-0
● CS-DEPF-17827-0
● OL-DEPF-17828-0

MAINBOARD FOR MULTI-UNIT BATTERY CHARGERS COMPONENT LAYOUT

D404.814/3



MAINBOARD FOR MULTI-UNIT BATTERY CHARGERS

PARTS LIST FOR MULTI-UNIT BATTERY CHARGER FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	ELN1060	220 V AC		L17	2483977B02	COIL CHOKE	1
	ELN1061	240 V AC		L18	2482723H39	COIL 2.6uH	1
				L19	2482723H39	COIL 2.6uH	1
				L20	2483977B02	COIL CHOKE	1
				L21	2483977B02	COIL CHOKE	1
C1	2383441B20	CAP 0.1 μ F \pm 20% 35V	1	L22	2482723H39	COIL 2.6uH	1
C2	2305499G16	CAP 10 μ F 16V	1	L23	2482723H39	COIL 2.6uH	1
C3	2105457G14	CAP .01+30-80%	1	L24	2483977B02	COIL CHOKE	1
C4	2383441B20	CAP 0.1 \pm 20% 35V	1	P1	0905367R01	PLUG CONNECTOR 3-POSITION	1
C5	2305499G16	CAP 10 μ F 16V	1	P2	2805350R03	PLUG CONNECTOR 8-POSITION	1
C6	2105529B11	CAP 47pF \pm 5% N150	1	P3	2805350R03	PLUG CONNECTOR 8-POSITION	1
C7	2383441B15	CAP 1 μ F \pm 20% 35V	1	P4	2805350R03	PLUG CONNECTOR 8-POSITION	1
C8	2383441B15	CAP 1 μ F \pm 20% 35V	1	P5	2805350R04	PLUG CONNECTOR 10-POSITION	1
C9	2105457G09	CAP 1000pF	1	P6	2805350R04	PLUG CONNECTOR 10-POSITION	1
C10	2105455G12	CAP 100pF N750	1	P7	2805350R01	PLUG CONNECTOR HEADER	1
C11	2105455G12	CAP 100pF N750	1			RIGHT-ANGLE 4-POSTION	
C12	2105455G12	CAP 100pF N750	1	P8	2805350R01	PLUG CONNECTOR HEADER	1
C13	2105455G12	CAP 100pF N750	1			RIGHT-ANGLE 4-POSTION	
C14	2105455G12	CAP 100pF N750	1	P9	2805350R01	PLUG CONNECTOR HEADER	1
C16	2105455G12	CAP 100pF N750	1			RIGHT-ANGLE 4-POSTION	
C17	2105455G12	CAP 100pF N750	1	P10	2805350R01	PLUG CONNECTOR HEADER	1
C18	2105455G12	CAP 100pF N750	1			RIGHT-ANGLE 4-POSTION	
C19	2105455G12	CAP 100pF N750	1	P11	2805350R01	PLUG CONNECTOR HEADER	1
C20	2105455G12	CAP 100pF N750	1			RIGHT-ANGLE 4-POSTION	
C21	2105455G12	CAP 100pF N750	1	Q1	4800869642	TSTR NPN TYPE M9642	1
C22	2105455G12	CAP 100pF N750	1	Q2	4800869642	TSTR NPN TYPE M9642	1
C25	2383441B20	CAP 0.1 μ F \pm 20% 35V	1	Q3	4800869643	TSTR PNP TYPE M9643	1
C26	2105455G12	CAP 100pF N750	1	Q5	4800869807	TSTR PNP TYPE M9807	1
C27	2105455G12	CAP 100pF N750	1	Q6	4800869642	TSTR NPN TYPE M9642	1
C28	2105455G12	CAP 100pF N750	1	Q7	4800869807	TSTR PNP TYPE M9807	1
C29	2105455G12	CAP 100pF N750	1	Q8	4800869642	TSTR NPN TYPE M9642	1
C30	2105455G12	CAP 100pF N750	1	Q9	4800869807	TSTR PNP TYPE M9807	1
C31	2105455G12	CAP 100pF N750	1	Q10	4800869642	TSTR NPN TYPE M9642	1
C32	2105455G12	CAP 100pF N750	1	Q11	4800869807	TSTR PNP TYPE M9807	1
C33	2105455G12	CAP 100pF N750	1	Q12	4800869642	TSTR NPN TYPE M9642	1
C34	2105455G12	CAP 100pF N750	1	Q13	4800869807	TSTR PNP TYPE M9807	1
C35	2105455G12	CAP 100pF N750	1	Q14	4800869642	TSTR NPN TYPE M9642	1
C36	2105455G12	CAP 100pF N750	1	Q15	4800869807	TSTR PNP TYPE M9807	1
C37	2105455G12	CAP 100pF N750	1	Q16	4800869642	TSTR NPN TYPE M9642	1
C38	2105455G12	CAP 100pF N750	1	Q17	4800869642	TSTR NPN TYPE M9642	1
C39	2105455G12	CAP 100pF N750	1	R19	0610164K38	RES 1.5M	1
C40	2105455G12	CAP 100pF N750	1	R20	0611009C73	RES 10k	1
C41	2105455G12	CAP 100pF N750	1	R21	0611009C73	RES 10k	1
L1	2483977B02	COIL RF CHOKE	1	R22	0611009C97	RES 100k	1
L2	2482723H39	COIL 2.6uH	1	R23	0611009C49	RES 1k	1
L3	2482723H39	COIL 2.6uH	1	R24	0611009C73	RES 10k	1
L4	2483977B02	COIL CHOKE	1	R31	0610621C82	RES 8.06k \pm 1%	1
L5	2483977B02	COIL CHOKE	1	R32	0610621C28	RES 2.21k \pm 1%	1
L6	2482723H39	COIL 2.6uH	1	R33	0611009C49	RES 1k	1
L7	2482723H39	COIL 2.6uH	1	R34	0611009D21	RES 910k	1
L8	2483977B02	COIL CHOKE	1	R35	0611009D13	RES 430k	1
L9	2483977B02	COIL CHOKE	1	R36	0611009D07	RES 240k	1
L10	2482723H39	COIL 2.6uH	1	R37	0611009C95	RES 82k	1
L11	2482723H39	COIL 2.6uH	1	R38	0611009C91	RES 56k	1
L12	2483977B02	COIL CHOKE	1	R39	0611009C82	RES 24k	1
L13	2483977B02	COIL CHOKE	1	R40	0611009C60	RES 3k	1
L14	2482723H39	COIL 2.6uH	1	R41	0611009C69	RES 6.8k	1
L15	2482723H39	COIL 2.6uH	1	R42	0611009C49	RES 1k	1
L16	2483977B02	COIL CHOKE	1	R43	0611009C34	RES 240 \pm 5% 1/4W	1

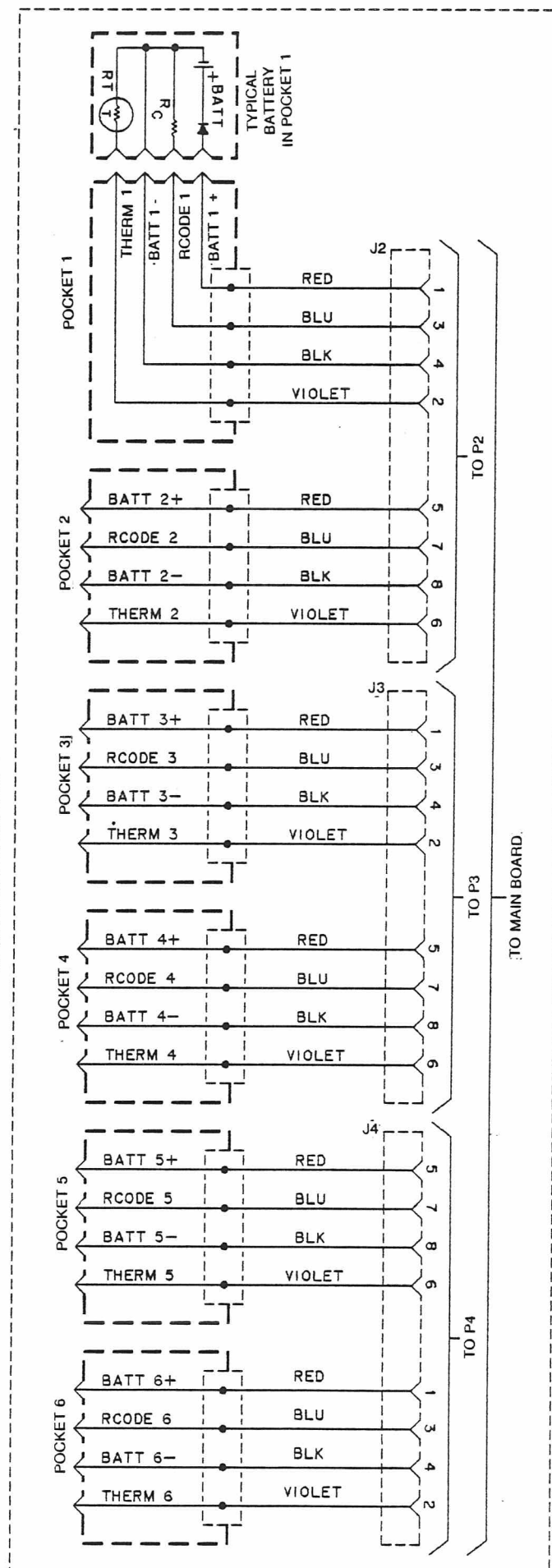
PARTS LIST FOR MULTI-UNIT BATTERY CHARGER FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
R44	0610621C91	RES 10k $\pm 1\%$	1	R103	0611009C34	RES 240 $\pm 5\%$ 1/4W	1
R45	0610621C53	RES 4.02k $\pm 1\%$	1	R104	0610621C91	RES 10k $\pm 1\%$	1
R46	0610621C91	RES 10k $\pm 1\%$	1	R105	0610621C53	RES 4.02k $\pm 1\%$	1
R47	0611009C90	RES 51k	1	R106	0610621C91	RES 10k $\pm 1\%$	1
R48	1782036G18	RES .56 2W	1	R107	0611009C90	RES 51k	1
R49	0611009D21	RES 910k	1	R108	1782036G18	RES .56 2W	1
R50	0611009D13	RES 430k	1	R109	0611009D21	RES 910k	1
R51	0611009D07	RES 240k	1	R110	0611009D13	RES 430k	1
R52	0611009C95	RES 82k	1	R111	0611009D07	RES 240k	1
R53	0611009C91	RES 56k	1	R112	0611009C95	RES 82k	1
R54	0611009C82	RES 24k	1	R113	0611009C91	RES 56k	1
R55	0611009C60	RES 3k	1	R114	0611009C82	RES 24k	1
R56	0611009C49	RES 1k	1	R115	0611009C60	RES 3k	1
R57	0611009C69	RES 6.8k	1	R116	0611009C49	RES 1k	1
R58	0611009C34	RES 240 $\pm 5\%$ 1/4W	1	R117	0611009C69	RES 6.8k	1
R59	0610621C91	RES 10k $\pm 1\%$	1	R118	0611009C34	RES 240 $\pm 5\%$ 1/4W	1
R60	0610621C53	RES 4.02k $\pm 1\%$	1	R119	0610621C91	RES 10k $\pm 1\%$	1
R61	0610621C91	RES 10k $\pm 1\%$	1	R120	0610621C53	RES 4.02k $\pm 1\%$	1
R62	0611009C90	RES 51k	1	R121	0610621C91	RES 10k $\pm 1\%$	1
R63	1782036G18	RES .56 2W	1	R122	0611009C90	RES 51k	1
R64	0611009D21	RES 910k	1	R123	1782036G18	RES .56 2W	1
R65	0611009D13	RES 430k	1	R124	0611009C73	RES 10k	1
R66	0611009D07	RES 240k	1	R125	0611009C73	RES 10k	1
R67	0611009C95	RES 82k	1	R126	0611009C49	RES 1k	1
R68	0611009C91	RES 56k	1	R127	0611009C73	RES 10k	1
R69	0611009C82	RES 24k	1	R128	0611009C73	RES 10k	1
R70	0611009C60	RES 3k	1	R129	0611009C49	RES 1k	1
R71	0611009C49	RES 1k	1	R130	0611009C73	RES 10k	1
R72	0611009C69	RES 6.8k	1	R131	0611009C73	RES 10k	1
R73	0611009C34	RES 240 $\pm 5\%$ 1/4W	1	R132	0611009C49	RES 1k	1
R74	0610621C91	RES 10k $\pm 1\%$	1	R133	0611009C73	RES 10k	1
R75	0610621C53	RES 4.02k $\pm 1\%$	1	R134	0611009C73	RES 10k	1
R76	0610621C91	RES 10k $\pm 1\%$	1	R135	0611009C49	RES 1k	1
R77	0611009C90	RES 51k	1	R136	0611009C73	RES 10k	1
R78	1782036G18	RES .56 2W	1	R137	0611009C73	RES 10k	1
R79	0611009D21	RES 910k	1	R138	0611009C49	RES 1k	1
R80	0611009D13	RES 430k	1	R139	0611009C73	RES 10k	1
R81	0611009D07	RES 240k	1	R140	0611009C73	RES 10k	1
R82	0611009C95	RES 82k	1	R141	0611009C49	RES 1k	1
R83	0611009C91	RES 56k	1	R142	0611009C82	RES 24k	1
R84	0611009C82	RES 24k	1	R143	0611009C73	RES 10k	1
R85	0611009C60	RES 3k	1	R145	0611009C97	RES 100k	1
R86	0611009C49	RES 1k	1	R146	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R87	0611009C69	RES 6.8k	1	R147	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R88	0611009C34	RES 240 $\pm 5\%$ 1/4W	1	R148	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R89	0610621C91	RES 10k $\pm 1\%$	1	R149	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R90	0610621C53	RES 4.02k $\pm 1\%$	1	R150	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R91	0610621C91	RES 10k $\pm 1\%$	1	R151	0611009C33	RES 220 $\pm 5\%$ 1/4W	1
R92	0611009C90	RES 51k	1	R152	0611009C97	RES 100k	1
R93	1782036G18	RES .56 2W	1	R153	0611009C66	RES N5.1k	1
R94	0611009D21	RES 910k	1	R154	0611009C49	RES 1k	1
R95	0611009D13	RES 430k	1	R155	0611009C73	RES 10k	1
R96	0611009D07	RES 240k	1	R156	0611009C81	RES 22k	1
R97	0611009C95	RES 82k	1	U1	5183629M93	IC PERIPHERAL DRIVER ARRAY MC1413	1
R98	0611009C91	RES 56k	1	U2	5183629M93	IC PERIPHERAL DRIVER ARRAY MC1413	1
R99	0611009C82	RES 24k	1	U3	5183629M93	IC PERIPHERAL DRIVER ARRAY MC1413	1
R100	0611009C60	RES 3k	1				
R101	0611009C49	RES 1k	1				
R102	0611009C69	RES 6.8k	1				

PARTS LIST FOR MULTI-UNIT BATTERY CHARGER FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
U4	5184887K70	IC HEX D FLIP-FLOP MC14174	1			NON REFERENCED ITEMS	
U5	5184887K70	IC HEX D FLIP-FLOP MC14174	1		0905035J12	SOCKET IC	
U6	5184887K70	IC HEX D FLIP-FLOP MC14174	1		X 2505237R01	POWER SUPPLY SWITCH MODE	
U7	5184887K70	IC HEX D FLIP-FLOP MC14174	1		1052-	120 WATT (INC.J1)	
U8	5184887K70	IC HEX D FLIP-FLOP MC14174	1		3060665A05	CORD POWER 220VAC	
U9	5184887K70	IC HEX D FLIP-FLOP MC14174	1		6505700Q09	FUSE 3 Amp 250V	
U10	5184887K70	IC HEX D FLIP-FLOP MC14174	1		0105952P81	ASSEMBLY MAIN PCB	
U11	5184887K70	IC HEX D FLIP-FLOP MC14174	1		8405366R01	PRINTED CIRCUIT BOARD, LED (INCL.J5,J6)	
U12	5184887K70	IC HEX D FLIP-FLOP MC14174	1		0105955N09	ASSEMBLY CONTACT (INCL.J2,J3,J4)	
U13	5184320A47	IC 5V REGULATOR MC7805	1				
U14	5184320A35	IC TIMING NE555	1				
U15	0105956P09	IC MICROCOMPUTER MC68705R3	1				
U16	5105461G32	IC BINARY-T0-OCTAL DECODER MC14028	1				
U17	5184887K75	IC QUAD 2-INPUT AND GATE MC14081	1				
U18	5184561L75	IC QUAD LOW-POWER OP Amp MC34074	1				
U19	5105461G33	IC 8-CHANN. ANALOG MUX/DEMUX MC14051	1				
U20	5105461G33	IC 8-CHANN. ANALOG MUX/DEMUX MC14051	1				
U21	5105461G33	IC 8-CHANN. ANALOG MUX/DEMUX MC14051	1				
U22	5105461G33	IC 8-CHANN. ANALOG MUX/DEMUX MC14051	1				
U23	5184561L75	IC QUAD LOW-POWER OP Amp MC34074	1				
VR1	4811034G13	DIO ZENER 6.2V	1				
VR2	4811034G13	DIO ZENER 6.2V	1				
VR3	4811034G13	DIO ZENER 6.2V	1				
VR4	4811034G13	DIO ZENER 6.2V	1				
VR5	4811034G13	DIO ZENER 6.2V	1				
VR6	4811034G13	DIO ZENER 6.2V	1				
VR7	4811034G13	DIO ZENER 6.2V	1				
VR8	4811034G13	DIO ZENER 6.2V	1				
VR9	4811034G13	DIO ZENER 6.2V	1				
VR10	4811034G13	DIO ZENER 6.2V	1				
VR11	4811034G13	DIO ZENER 6.2V	1				
VR12	4811034G13	DIO ZENER 6.2V	1				
VR13	4811034G13	DIO ZENER 6.2V	1				
VR14	4811034G13	DIO ZENER 6.2V	1				
VR15	4811034G13	DIO ZENER 6.2V	1				
VR16	4811034G13	DIO ZENER 6.2V	1				
VR17	4811034G13	DIO ZENER 6.2V	1				
VR18	4811034G13	DIO ZENER 6.2V	1				
VR19	4811034G13	DIO ZENER 6.2V	1				
VR20	4811034G13	DIO ZENER 6.2V	1				
VR21	4811034G13	DIO ZENER 6.2V	1				
VR22	4811034G13	DIO ZENER 6.2V	1				
VR23	4811034G13	DIO ZENER 6.2V	1				
VR24	4811034G13	DIO ZENER 6.2V	1				
VR25	4811034G13	DIO ZENER 6.2V	1				
VR26	4811034G13	DIO ZENER 6.2V	1				
VR27	4811034G13	DIO ZENER 6.2V	1				
Y1	4805664G25	CRYSTAL 4MHz	1				

MODEL NTN4668 AND NTN4922 CHARGER POCKETS



EMN6101

REMOTE SPEAKER MICROPHONE

DESCRIPTION

The Model EMN6101 Remote Speaker Microphone includes a speaker, a microphone, a push-to-talk (PTT) switch and associated circuitry. A cable, terminated with a special plug, is provided for attaching to the universal connector on the portable radio.

When the remote speaker microphone is attached to the radio, the speaker in the radio is disabled, and receiver audio is connected to the accessory speaker. Similarly, the accessory microphone is connected to the transmitter, and the accessory PTT switch can now control the PTT function in the radio. The radio microphone and PTT switch are still operational, but you can listen to the radio only through the accessory speaker.

NOTE

Observe safety information in the radio operating instructions.

OPERATION

1. Attach the microphone's accessory connector to the universal connector on top of the radio.
2. Firmly tighten the captive screw of the accessory connector into the threaded hole (middle of universal connector). The maximum recommended torque is 4 in. lbs.
3. While listening to the accessory speaker, turn the radio on and operate it as explained in the operating instructions supplied with the radio.
4. The microphone will perform best if it is worn as shown in Figure 1.



Figure 1

HANDLING PRECAUTIONS

To avoid damage to circuits, observe the following handling, shipping and servicing precautions.

1. Prior to and while servicing a remote speaker microphone, particularly after moving within the service area, momentarily place both hands on a bare metal, earthgrounded surface. This will discharge any static charge which may have accumulated on the person doing the service.

NOTE

Wearing a conductive wrist strap will minimize static buildup during servicing

WARNING

When wearing a conductive wrist strap, be careful near high-voltage sources. The good ground provided by the wrist strap will also increase the danger of lethal shock from accidentally touching high-voltage sources.

2. Whenever possible, avoid touching any electrically conductive part of the unit with your hands.
3. When servicing a unit, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) because they contribute to static buildup.
4. All electrically powered test equipment should be grounded. Apply the ground lead from the test equipment to the unit before connecting the test probe. Similarly, disconnect the test probe prior to removing the ground lead.
5. If the microphone cartridge is removed from the unit, place it on a conductive surface, such as a sheet of aluminum foil which is connected to ground through 100 Kohm of resistance.

WARNING

If the aluminum foil is connected directly to ground, be cautious of possible electrical shock from contacting the foil at the same time as other electrical circuits.

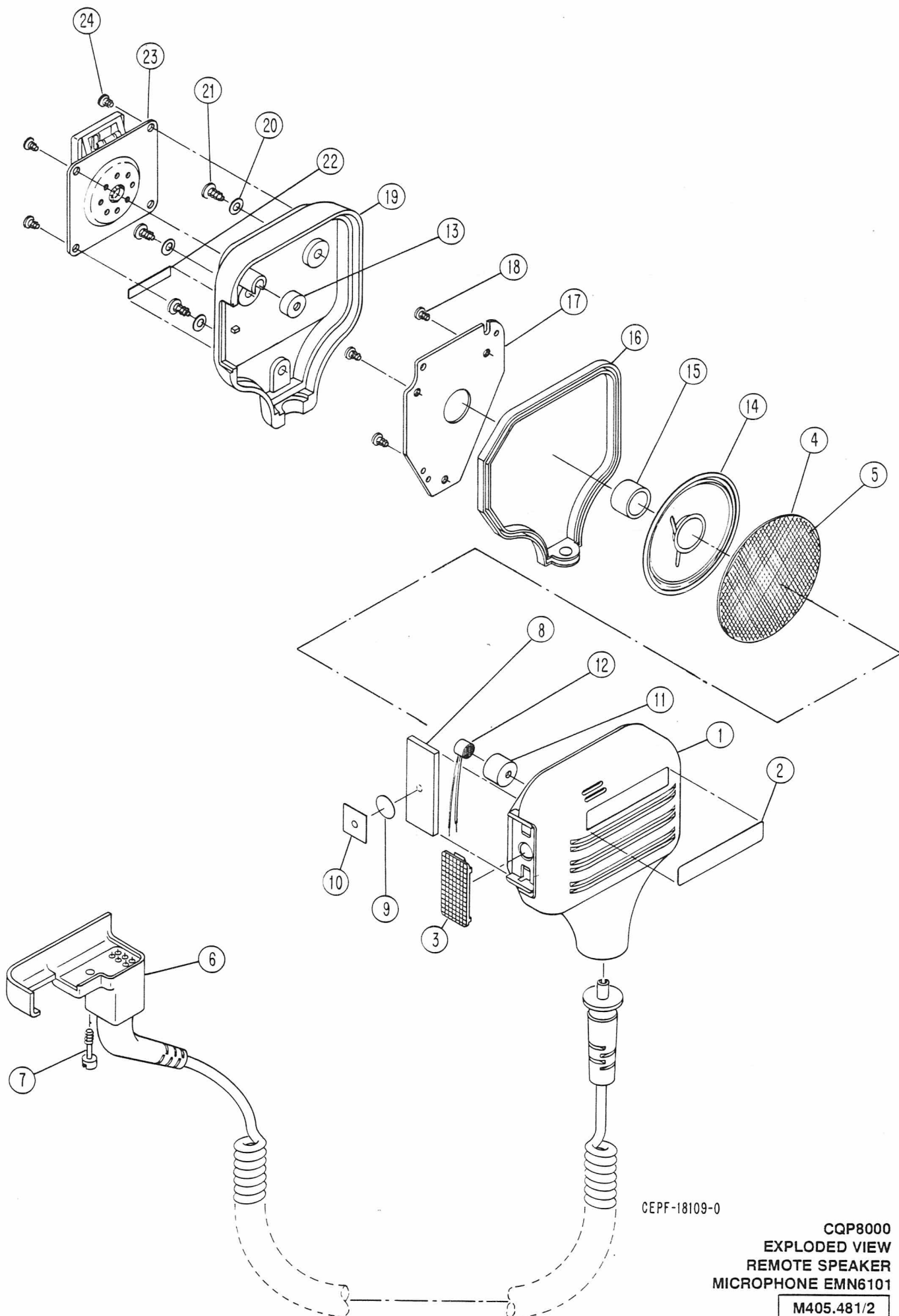
6. When soldering, be sure the soldering iron is grounded.
7. Prior to replacing circuit components or touching the microphone cartridge, be sure to discharge any static buildup. Since voltage differences can exist across the human body, it is recommended that only one hand be used if it is necessary to touch the microphone cartridge and associated wiring.
8. Replacement microphone cartridges should be kept in conductive packaging until they are placed in the unit.

MAINTENANCE

Refer to the schematic diagram, the exploded view, and the part lists. Every part in the microphone is identified and illustrated for assistance in removal and replacement. If necessary, the external surfaces of the remote speaker microphone may be cleaned with a 0.5% solution of mild dishwashing detergent in water (one teaspoon of detergent in 4 litres of water).

MECHANICAL PARTS LIST FOR REMOTE SPEAKER MICROPHONE EMN6101 FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
1	0105954P70	ASSEMBLY FRONT HOUSING INCLUDES	1				
		ITEMS 1,2,3,4,5					
2	3305259Q01	NAMEPLATE	1				
3	4505182Q01	LEVER PTT	1				
4	3505152J01	GRILLE CLOTH	1				
5	1105461R01	ADHESIVE	1				
6	0105954P73	ASSEMBLY CABLE AND CONNECTOR	1				
	NK64/6B	INCLUDES ITEMS 6 AND 7					
7	0305425R01	SCREW CAPTIVE	1				
8	0105953N46	ASSEMBLY PC BOARD INCLUDES	1				
		ELECTRICAL COMPONENTS					
9	SEE NOTE	SWITCH SNAP DOME CONTACT (S1)	1				
10	3205231Q01	SEAL DOME	1				
11	1405219Q01	BOOT MICROPHONE	1				
12	SEE NOTE	ASSEMBLY MICROPHONE (MK1)	1				
		INCLUDES ITEMS 11 AND 12					
13	1405299L01	SUPPORT MICROPHONE	1				
14	SEE NOTE	SPEAKER (LS1)	1				
15	7505283Q01	PAD SPEAKER	1				
16	3205690R01	GASKET	1				
17	6405689R01	PLATE HOUSING MOUNTING	1				
18	0300139982	SCREW PHILLIPS Hd 2-56x5/32"	3				
19	1505172Q01	HOUSING BACK	1				
20	0484345A06	WASHER SEAL	3				
21	0305137Q02	SCREW PHILLIPS Hd	3				
22	5405253Q01	LABEL KIT NUMBER	1				
23	0105959N54	ASSEMBLY BELT CLIP INCLUDES	1				
		ITEMS 23 AND 24					
24	0300139982	SCREW PHILLIPS Hd 2-56x5/32"	4				
		NOTE:					
		REFER TO ELECTRICAL PARTS LIST					
		FOR PART NUMBER AND DESCRIPTION					

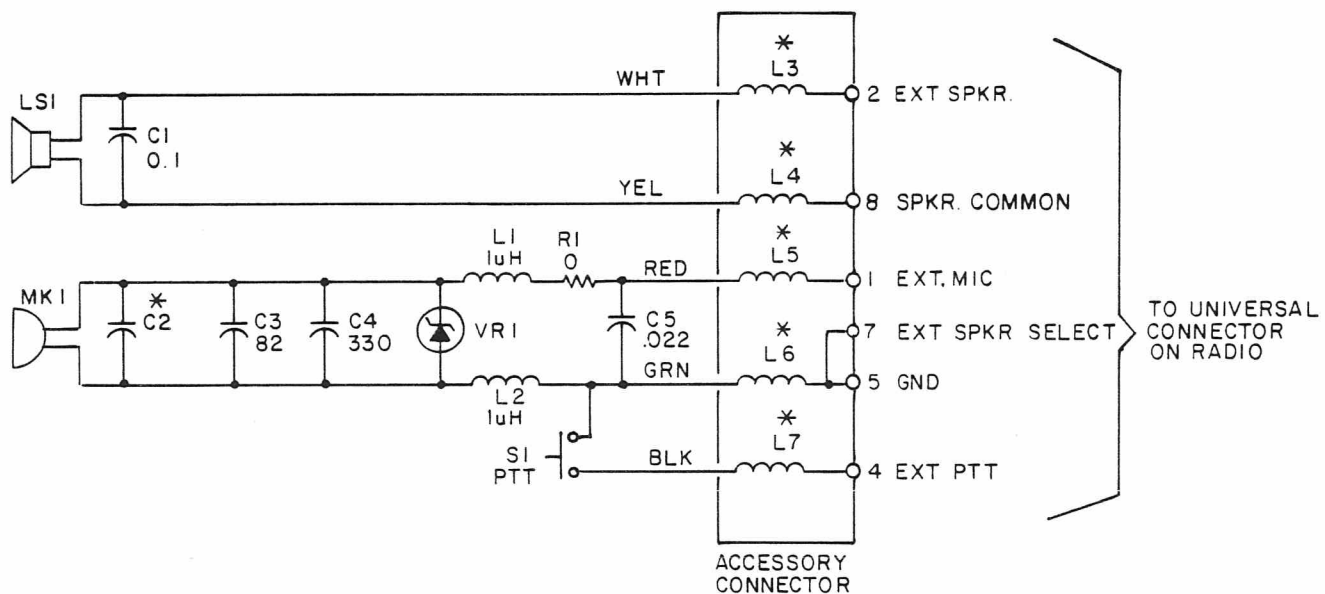


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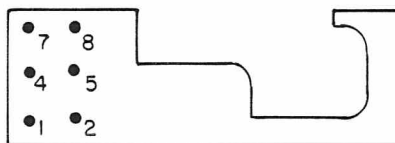
CQP8000
EXPLODED VIEW
REMOTE SPEAKER
MICROPHONE EMN6101
M405.481/2

PARTS LIST FOR REMOTE SPEAKER MICROPHONE EMN6101 FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
C1	2160521D37	CAP 0.1 μ F	1				
C2	-----	NOT FIELD REPAIRABLE ORDER MICROPHONE ASSEMBLY (MK1)					
C3	2160520B23	CAP 82pF \pm 5%	1				
C4	2160520C13	CAP 330pF \pm 5%	1				
C5	2160521A29	CAP .022 μ F	1				
L1	2462575A04	COIL RF CHOKE 1 μ H	1				
L2	2462575A04	COIL RF CHOKE 1 μ H	1				
L3	SEE NOTE	NOT FIELD REPAIRABLE					
L4	SEE NOTE	NOT FIELD REPAIRABLE					
L5	SEE NOTE	NOT FIELD REPAIRABLE					
L6	SEE NOTE	NOT FIELD REPAIRABLE					
L7	SEE NOTE	NOT FIELD REPAIRABLE					
LS1	5005910P04	SPEAKER 1 3/4"	1				
MK1	0105953N48	ASSEMBLY MICROPHONE ELECTRET INCLUDES CAPACITOR C2	1				
R1	0660076M01	RES 0	1				
S1	3905834K04	SWITCH DOME PTT	1				
VR1	4880140L14	DIO ZENER 9.1V	1				
		NOTE: NOT FIELD REPAIRABLE ORDER CABLE AND CONNECTOR ASSEMBLY (MPL405.481 ITEM 6)					



* REFER TO ELECTRICAL PARTS LIST
FOR INFORMATION.



ACCESSORY CONNECTOR
BOTTOM VIEW

63A8110 8C09-0

CQP8000
REMOTE SPEAKER MICROPHONE EMN6101

D405.035/2

ETN6101/ETN6103

PUBLIC SAFETY MICROPHONE

DESCRIPTION

The Model ETN6101/ETN6103 Public Safety Microphone (PSM) includes a speaker, a microphone, a push-to-talk (PTT) switch, a high/low volume switch, an earphone jack, and associated circuitry. The public safety microphone also includes a cable and connector assembly, terminated with a special plug, for attaching to the universal connector on the portable radio. In order for the PSM to operate properly, a removable antenna, designed for the desired frequency band, must be ordered separately and installed on the PSM.

The PSM has a choice of fasteners; The ETN6101 has a velchro pad fastener, while the ETN6103 has a belt clip fastener.

When the PSM's accessory connector is connected to the radio's universal connector, the speaker and antenna in the radio are disabled, and the speaker and antenna in the PSM are enabled. The radio's PTT switch and internal microphone still operate normally. If the PSM's PTT switch is used to activate the radio's transmitter, the PSM's microphone must also be used; if the radio's PTT switch is used, the radio's microphone must be used as well. In either case, the radio can be listened to only through the remote speaker.

A high/low volume switch, S2, allows the user to monitor the audio at a low volume level, then to immediately switch to a high volume level without resetting the volume control on the radio. This feature is especially useful when the radio is worn on the belt and the speaker microphone is on the lapel or shoulder, as shown in Figure 1.

NOTE

Observe safety information in the radio operating instructions.

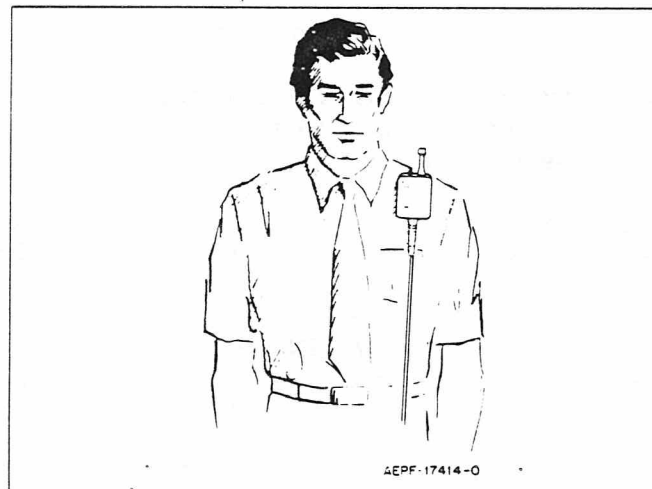


Figure 1

OPERATION

1. Attach the microphone's accessory connector to the universal connector on top of the radio.
2. Firmly tighten the captive screw of the accessory connector into the threaded hole (middle of universal connector). The maximum recommended torque is 4 in. lbs.
3. Turn the radio on and operate it as explained in the operating instructions supplied with the radio. Listen to the radio through the PSM's speaker.
4. Set the "high-low" switch on the speaker microphone to the "low" position to monitor audio at a low volume; for a high volume level, set the switch to the "high" position.
5. The microphone will perform best if it is worn with the antenna above the shoulder as shown in Figure 1.

HANDLING PRECAUTIONS

To avoid damage to circuits, observe the following handling, shipping and servicing precautions.

1. Prior to and while servicing a public safety speaker microphone, particularly after moving within the service area, momentarily place both hands on a bare metal, earth-grounded surface. This will discharge any static charge which your body may have accumulated.

CAUTION

Wearing a conductive wrist strap will minimize static buildup during servicing

WARNING

When wearing a conductive wrist strap, be careful near high-voltage sources. The good ground provided by the wrist strap will also increase the danger of lethal shock from accidentally touching high-voltage sources.

2. Whenever possible, avoid touching any electrically conductive part of the unit with your hands.
3. Because they contribute to static buildup, avoid carpeted areas, dry environments, and certain types of clothing (silk, nylon, etc.) when servicing a unit.
4. All electrically-powered test equipment should be grounded. Connect the ground lead from the test equipment to the unit before connecting the test probe. Similarly, disconnect the test probe prior to removing the ground lead.
5. If the microphone cartridge is removed from the unit, place it on a conductive surface, such as a sheet of aluminum foil, which is connected to ground through 100 Kohm of resistance.

WARNING

If the aluminium foil is connected directly to ground, be cautious of possible electrical shock from contacting the foil and other electrical circuits at the same time.

6. When soldering, be sure the soldering iron is grounded.
7. Prior to replacing circuit components or touching the microphone cartridge, be sure to discharge any static buildup. Since voltage differences can exist across the human body, it is recommended that only one hand be used if it is necessary to touch the microphone cartridge and associated wiring.
8. Replacement microphone cartridges should be kept in conductive packaging until they are placed in the unit.

MAINTENANCE

Refer to the schematic diagram, the exploded view, and the part lists. Every part in the speaker microphone is identified and illustrated for assistance in removal and replacement.

If disassembly of the public safety microphone is required, do not reassemble it without doing the following (numbers in parentheses refer to item numbers in the exploded view):

- o Remove the O-ring (22) from the cover assembly (16).
- o Inspect the seal areas around the housing (1) and the cover (16) for foreign material which might prevent the O-ring from sealing properly.
- o Inspect O-ring (22) and both cover screw O-rings (18). If any of these are split, cracked, or damaged in any way, discard and replace them.
- o If the main printed circuit board (14) is removed, remove the speaker spacer (27) and inspect the membrane of the seal pad (28) for tears or holes. If the membrane is damaged, remove it, being careful to remove all old adhesive, and replace it with a new seal pad.

NOTE

When replacing the seal pad (28), it is critical that the small seal pad opening be aligned with the microphone port in the housing.

- o Tighten all hardware loosened or removed during disassembly per the values listed in the Torque Specifications table. Use the recommended torque driver (Sturtevant PM-5 Rotatorq Tool or equivalent).

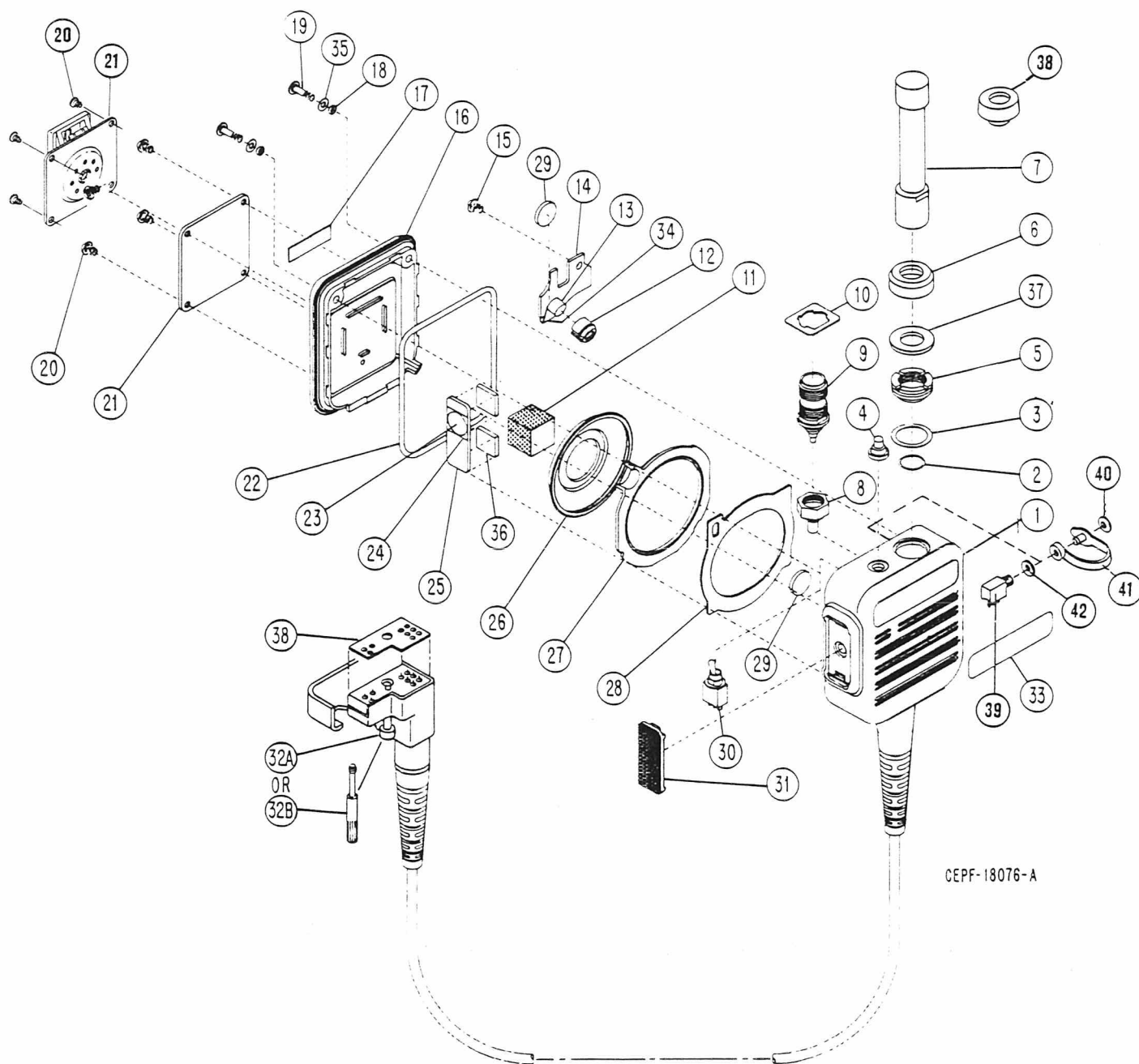
TORQUE SPECIFICATIONS

APPLICATION	TORQUE (IN.LBS.)	TORQUE (N-m)	TORQUE BIT NO.
Cover Screws	6	.68	6680321B78
PC Board Screw	4	.45	6680321B78
Velcro Pad Screws	4	.45	6680321B78
Toggle Switch Boot	3	.34	6680370B99
RF Connector Nut	20	2.27	6680371B01
Accessory Conn. Capt. Screw	4	.45	-----

If necessary, the external surfaces of the speaker microphone may be cleaned with a 0.5% solution of mild dishwashing detergent in water (one teaspoon of detergent in 4 litres of water).

MECHANICAL PARTS LIST FOR PUBLIC SAFETY MICROPHONE FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	ETN6101	WITH VELCRO BACK					
	ETN6103	WITH BELT CLIP					
1	0105957P44	ASSEMBLY HOUSING CABLE AND ACC.	1				
		CONN. INCL. ITEMS 28,29,31,32					
2	3205082E69	GASKET O-RING	1				
3	0405465C02	WASHER PLASTIC	1				
4	0205791P01	NUT TOGGLE SEAL	1				
5	0205326S01	NUT ANTENNA	1				
6	3205325S01	SEAL WASHER	1				
7	SEE NOTE	ANTENNA (MUST BE ORDERED SEP.)	1				
8	0205541C01	NUT SPECIAL	1				
9	SEE NOTE	CONNECTOR RF	1				
10	0405327S01	WASHER BEARING	1				
11	7582154D33	PAD SPEAKER	1				
12	1405490Q01	BOOT MICROPHONE	1				
13	SEE NOTE	MICROPHONE (MK1)	1				
14	SEE NOTE	PRINTED CIRCUIT BOARD MAIN	1				
15	0300139047	SCREW CUTTING	1				
16	0105955P12	ASSEMBLY COVER	1				
17	5405152S01	LABEL KIT NUMBER (ETN6101)	1				
17	5405152S01	LABLE KIT NUMBER (ETN6103)	1				
18	3205082E03	GASKET O-RING	2				
19	0382210E19	SCREW COVER CAPTIVE #4-40	2				
20	0300139939	SCREW PAD RETAINER (ETN6101)	4				
20	0300139982	SCREW PHILLIPS (ETN6103)	4				
21	7505385P01	PAD HOOK (ETN6101)	1				
21	0105957Q44	ASSEMBLY BELTCLIP (ETN6103)	1				
		INCL. ITEM 20					
22	3205082E63	GASKET O-RING	1				
23	SEE NOTE	DOME PTT (S1)	1				
24	3205264L06	SEAL PTT	1				
25	SEE NOTE	PRINTED CIRCUIT BOARD PTT	1				
26	SEE NOTE	SPEAKER (LS1)	1				
27	4305407R01	SPACER SPEAKER	1				
28	3205190R01	PAD SEAL	1				
29	7505136L03	PAD SILICON SPONGE	2				
30	SEE NOTE	SWITCH TOGGLE (S2)	1				
31	4505211R01	LEVER PTT	1				
32A	0305425R02	SCREW CAPTIVE	1				
32B	0305202T02	THUMSCREW	1				
33	3305269R01	LABEL NAMEPLATE	1				
34	SEE NOTE	PRINTED CIRCUIT FLEXIBLE	1				
35	0405465C01	WASHER PLASTIC	2				
36	1405424D04	INSULATOR	2				
37	0405910D01	WASHER INSULATOR	1				
38	3205782P01	SEAL RADIO ANTENNA BUSHING	1				
		INSULATOR					
39	0905101S02	JACK EARPHONE	1				
40	0205163Q03	NUT SPANNER	1				
41	3205557S01	SEAL EARPHONE JACK	1				
42	0405551S02	WASHER PLASTIC	1				
		NOTE:					
		REFER TO ELECTRICAL PARTS LIST					
		FOR PART NUMBER AND DESCRIPTION					



CEPF-18076-A

CQP8000
EXPLODED VIEW
PUBLIC SAFETY MICROPHONE

M405.480/4










PARTS LIST FOR PUBLIC SAFETY MICROPHONE FOR CQP8000

Pos	Code No.	Description	Qt	Pos	Code No.	Description	Qt
	ETN6101	WITH VELCRO BACK					
	ETN6103	WITH A CLIP					








C1	2160521D37	CAP 0.1 μ F	1				
C2	2184008H08	CAP .022 μ F	1				
C3	2160520B23	CAP 82pF \pm 5%	1				
C4	2160520C13	CAP 330pF \pm 5%	1				
L1	2462575A04	COIL RF CHOKE 1 μ H	1				
L2	2462575A04	COIL RF CHOKE 1 μ H	1				
L3	2405452C08	COIL CHOKE 0.275 μ H	1				
L4	2405452C08	COIL CHOKE 0.275 μ H	1				
L5	2405452C08	COIL CHOKE 0.275 μ H	1				
L6	2405452C08	COIL CHOKE 0.275 μ H	1				
L7	2405452C08	COIL CHOKE 0.275 μ H	1				
LS1	5005910P03	SPEAKER 1-3/4"	1				
MK1	5005227J02	MICROPHONE ELECTRET	1				
R1	0611024A34	RES 240 Ω \pm 5% 1/8W	1				
R2	0611024A34	RES 240 Ω \pm 5% 1/8W	1				
R3	0660075C47	RES 820 Ω \pm 5% 1/8W	1				
S1	3905834K05	SWITCH DOME PTT	1				
S2	4005680K04	SWITCH TOGGLE	1				
VR1	4880140L14	DIO ZENER 9.1V	1				
		NON REFERENCED ITEMS					
	EAE6131	ANTENNA HELICAL (403-433 MHz)					
	EAE6132	ANTENNA HELICAL (433-470 MHz)					
	EAE6133	ANTENNA HELICAL (470-512 MHz)					
	0905261B01	CONNECTOR RF					
	8405213S01	PRINTED CIRCUIT BOARD FLEXIBLE					
	8405296R01	PRINTED CIRCUIT BOARD PTT					
	0105954P68	PRINTED CIRCUIT BOARD MAIN ASSY					

GRAPHICAL SYMBOLS USED IN CIRCUIT DIAGRAMS






Resistors(R)

-  Resistor
-  Resistor with fixed tap
-  Variable resistor
-  Resistor with movable tap (Potentiometer).
-  Varistor (voltage-dependent resistor)
-  Temperature-dependent resistor with negative temperature coefficient
-  Light-emitting diode (photosensitive resistor)
-  Temperature dependent resistor with positive temperature-coefficient.
-  Resistor with preset adjustment



Capacitors(C)

-  Capacitor
-  Variable capacitor
-  Trimmer capacitor
-  Feedthrough capacitor
-  Electrolytic capacitor polarized
-  Polarized capacitor general
-  Electrolytic capacitor non-polarized













Coils(L)

-  RF coil, air core
-  Coupled RF coils, air core
-  RF coil with adjustable core
-  Coil with tap.
-  Helical-coil.





Transformers(T)

-  Transformer with iron core
-  Transformer with adjustable RF cores





Diodes(D)

-  Diode
-  Bridge rectifier
-  Series-connected stabilizer diodes within one case
-  Light-emitting diode
-  Zener diode (uni-directional)
-  Zener diode (bidirectional)
-  Tunnel diode
-  Backward diode
-  Varactor diode
-  Controlled rectifier, PNP (N-thyristor)
-  Controlled rectifier, NPN (P-thyristor)
-  Zener diode-programmable.


Transistors(Q)

-  Transistor, PNP
-  Transistor, NPN
-  Light-sensitive transistor PNP
-  Unipolar transistor with N-type base

Junction Field Effect Transistors (JFET)

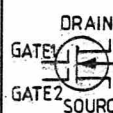
-  N-channel JFET
-  P-channel JFET
-  N-channel dual gate JFET
-  P-channel dual gate JFET

Insulated Gate Field Effect Transistors (IGFET or MOS)

-  N-channel IGFET (MOS)



P-channel IGFET (MOS)



N-channel dual gate IGFET (MOS)








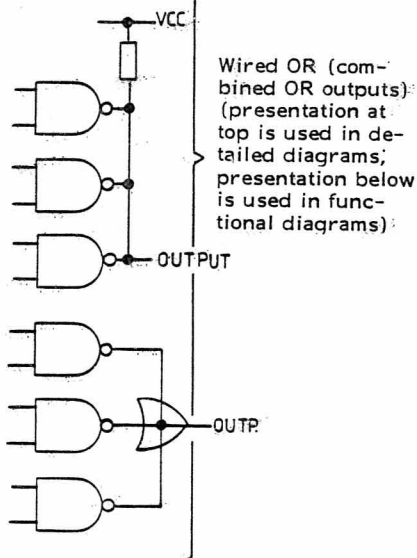
P-channel dual gate IGFET (MOS)

Integrated Circuits (U)

Several integrated circuits contained within one case are designated by one common number followed by an identifying letter (a, b, c, etc.). Thus, circuits U1A, U1B and U1C are contained within one case.

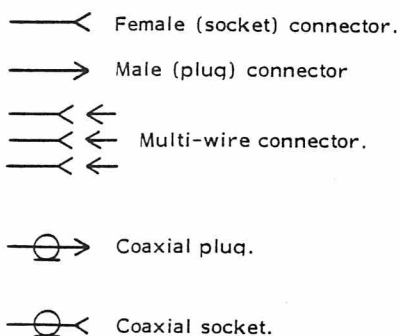
Gates

-  AND gate.
-  OR gate.
-  NAND gate.
-  NOR gate.
-  Exclusive OR gate.

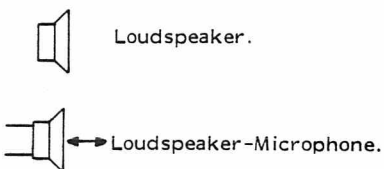


GRAPHICAL SYMBOLS USED IN CIRCUIT DIAGRAMS

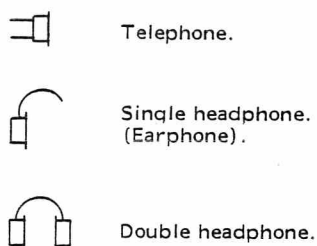
Connectors(J and P)



Loudspeakers(LS)



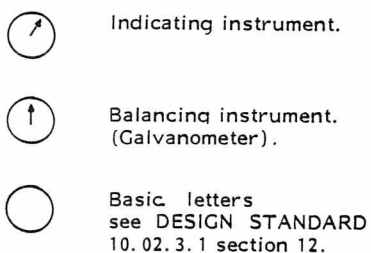
Telephones(TEL)



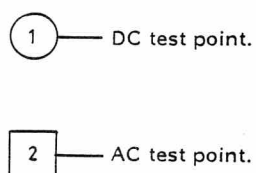
Microphones(M)



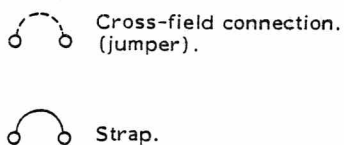
Meters etc.



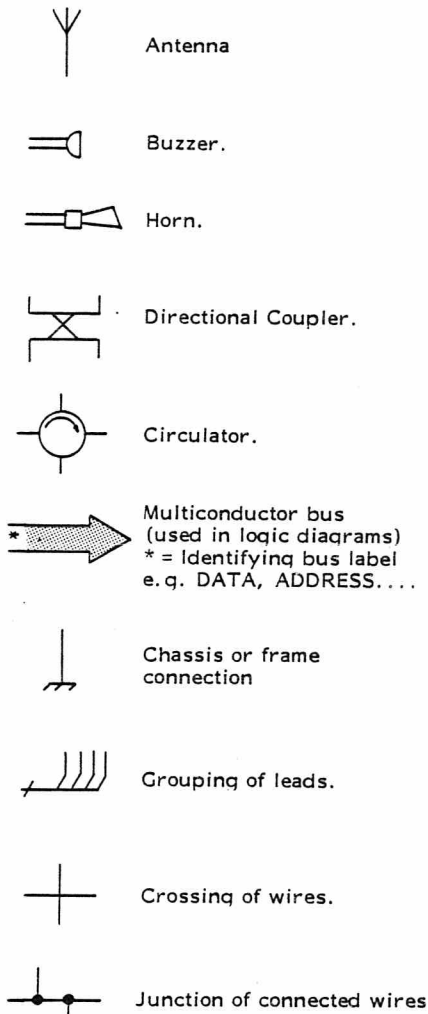
Test Points



Replaceable Connections(W)



Miscellaneous



**COLOUR CODE/
CODE DES COULEURS/
FARBKODE**

0	BK/BLK	BLACK	NOIR	SCHWARZ
1	BN/BRN	BROWN	MARRON	BRAUN
2	RD/RED	RED	ROUGE	ROT
3	OR/ORG	ORANGE	ORANGE	ORANGE
4	YW/YEL	YELLOW	JAUNE	GELB
5	GN/GRN	GREEN	VERT	GRÜN
6	BL/BLU	BLUE	BLEU	BLAU
7	VT/VIO	VIOLET	VIOLET	VIOLET
8	GY/GRY	GREY	GRIS	GRAU
9	WH/WHT	WHITE	BLANC	WEIß