



Service Manual

For

29 LTD

Model 29 LTD

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THEORY OF OPERATIONS

CB 29 LTD / CB 29 LTD WX

The COBRA models CB29 LTD and CB 29 LTD WX are the citizen band AM radio transceivers operated in the frequency range of 26,965 to 27.405 MHz (40 channels). For model CB 29 LTD WX, it can also receive the seven channels of 162 MHz weather signal.

1. CB Mode of Operation

1.1 CB Transmitter Section

When in transit mode, TR20 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop frequency synthesizer IC1 D2816C and IC TA7510P to produce the reference frequencies of 16.725 to 17.165 MHz. The fundamental frequency and the reference frequencies are then mixed up in IC3 TA7310P to produce the RF signal of 26.965 to 27.405 MHz. This signal, after magnified by the RF amplifiers TR16, TR15, and TR14, is fed to the antenna for transmitting.

In the meantime, the speech signal picked up by the microphone is amplified by TR17 and IC4 TA7222AP, and then applied to the collectors of TR15 and TR14 for RF amplitude modulation. Thus completes the speech signal modulation and transmitting.

1.2 CB Receiver Section

When in receive mode, TR30 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop frequency synthesizer IC1 D2816C and IC2 TA7310P to produce the first local oscillator frequencies 16.270 to 16.710 MHz.

In the meantime, the AM RF signal (26.725 to 27.405 MHz) picked up by the antenna is magnified by TR7 and fed to the first mixer FET1. This signal is then mixed with the first local oscillator frequencies 16.270 to 16.710 MHz. That produces the first IF frequency 10.695 MHz. The first IF signal, after passing through the ceramic filter, is fed to the second mixer FET2 for mixing with the second local oscillator frequency 10.24 MHz. That produces the second IF frequency 455 kHz. The second IF signal, after filtered by the ceramic filter and magnified by TR8, TR9, TR10, is demodulated by D4 for speech signal recovery. The recovered speech signal is then magnified by IC4 TA7222AP and fed to the speaker. Thus completes the speech signal receiving.

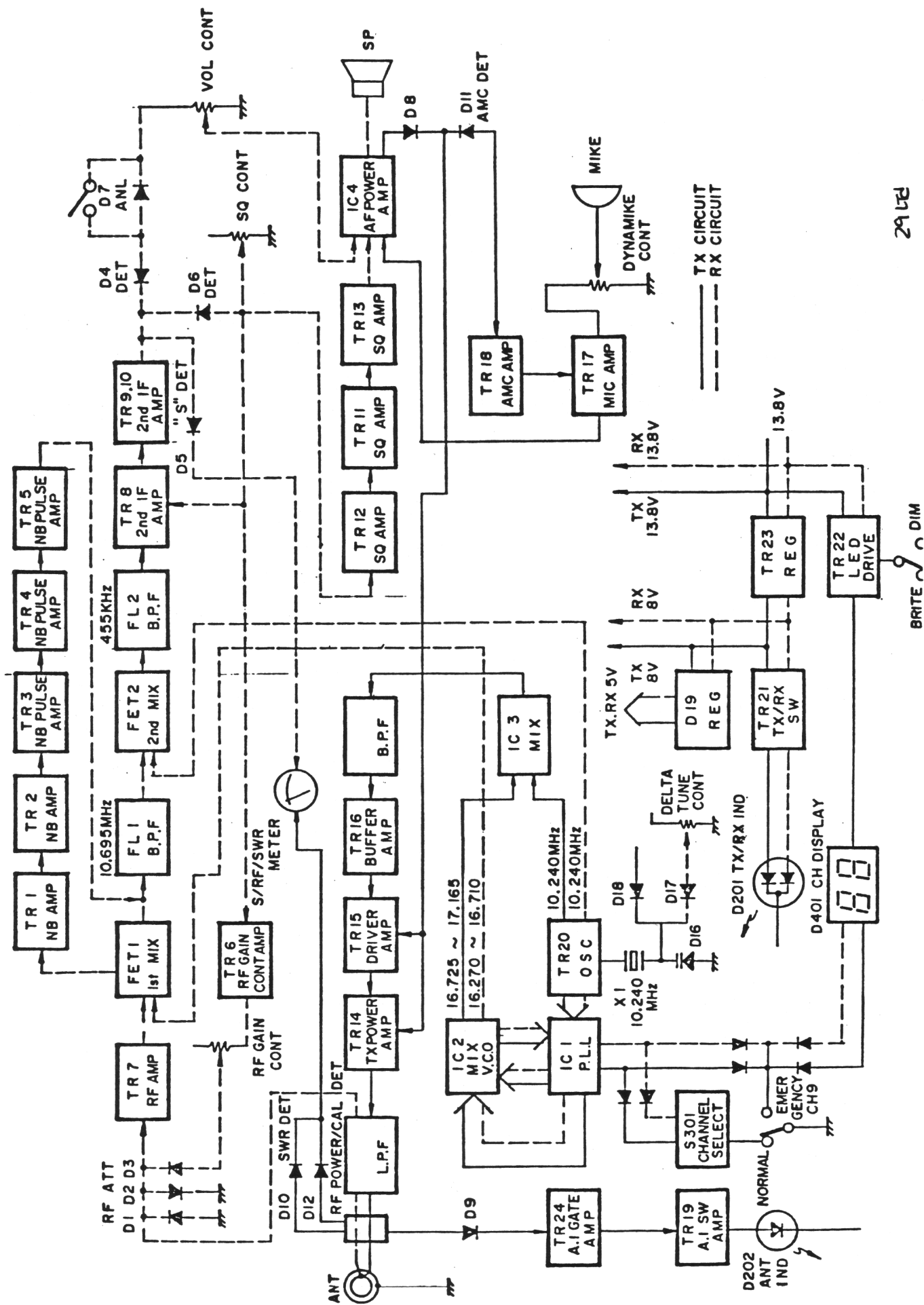
2. PA Mode of Operation

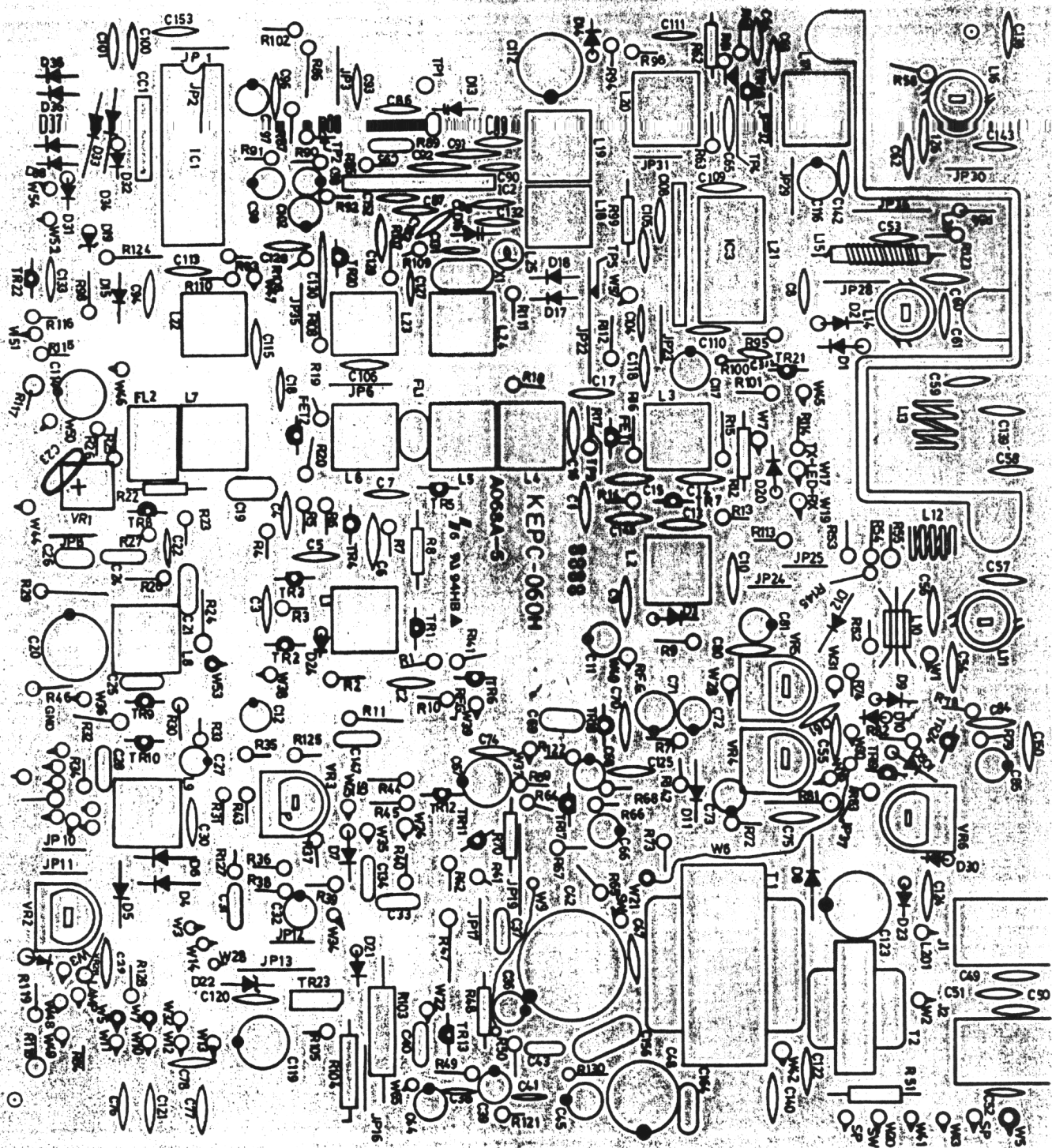
With the CB-PA switch set at PA position, the speech signal picked up by the microphone is fed to IC4 TA7222AP for magnification to a level of about 4 watts, and then via the PA terminal sent to the speaker for speech sound reproduction.

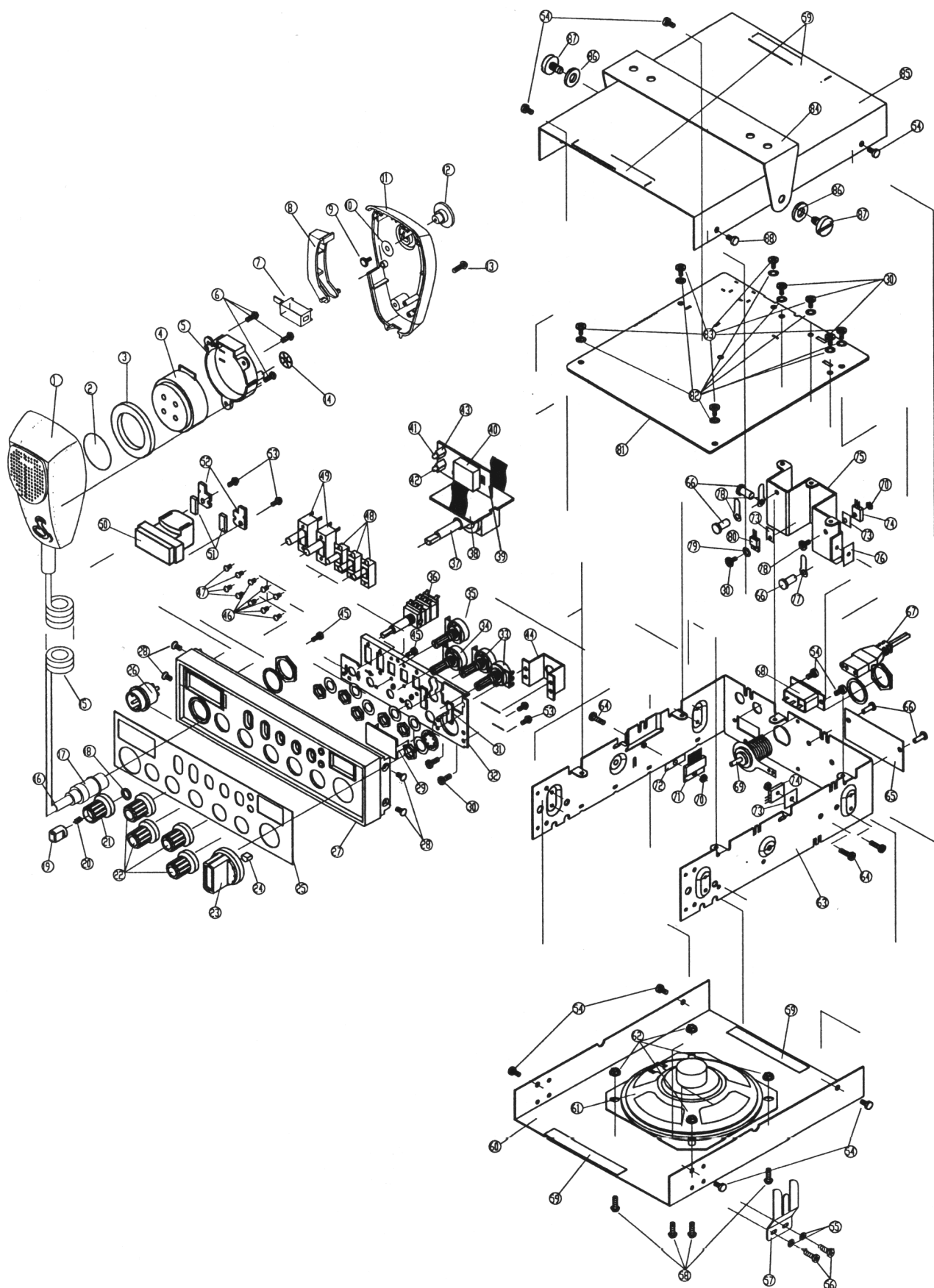
3. WX Mode of Operation (162 MHz Weather receiving) - for CB 29 LTD WX only

3.1 With the CB-WX switch set at WX position, the 162 MHz weather signal (frequency modulated) picked up by the antenna is magnified by Q601 and fed to the mixer Q606. In the meantime, Q602 and crystal oscillator generate a local oscillation frequency in the range of 162 Mhz, also fed to Q606 for mixing. That produces the IF frequency 455 kHz. The IF signal, after magnified by Q603, Q604, Q605, is frequency discriminated by D605, D606 for audio signal recovery. The recovered WX signal is then magnified by Q703, IC TA7222 and fed to the speaker for WX signal reproduction.

3.2 Before the weather messages broadcasted, there will be a 10-second alert tone (at 1050Hz) sending out from the weather station. When received the 1050 Hz alert tone signal, the tone decoder IC701 NJM567D sends out a control signal that turns on the power supply for the CB transceiver. It also turns on Q704 and sends the 1050 Hz signal to IC4 for amplification and to be produced at the speaker output for alerting.







MODEL: 29 LDM

DEC 01,2000

29LDM PART LIST

ITEM	P/N	DESCRIPTION	QTY
1	KEM-P7001A	FRONT CABINET	1
2	KEM-OT7001	FELT DIA. 28	1
3	KEM-OT0702	SPONGY 38 OD X26 ID X 5 THK.	1
4	KESP-016	MIC DYNAMIC	1
5	KEM-P7003A	MIC BRACKET	1
6	KEM-TS2608B1N	TAPPING SCREW B/HD T2.6X8	3
7	KESW-079	PUSH BUTTON SWITCH 4P2T	1
8	KEM-P7103E	PTT SWITCH KNOB	1
9	KEM-TS2606B1N	TAPPING SCREW B/HD T2.6X6	1
10	KEM-WP0952805N	M2.8 PLAIN WASHER 103J-1	1
11	KEM-P7002A	REAR CABINET	1
12	KEM-P7107B	HANGING KNOB	1
13	KEM-TS3010P1B	TAPPING SCREW P/HD T3X10	1
14	KEM-WI1003903X	SELF LOCKING WASHER DIA .4	1
15	KETC-036-5	CURL CORD 4 CORES 3.05M	1
16	KEM-OT9005	PVC SLEEVE-CURL CORD	0.03
17	KEJ-163	MIC	1
18	KEM-M8407A	LOCK SPRING	1
19	KEM-P8407	INNER KNOB	1
20	KEM-M8403	INSERT 1	1
21	KEM-P8406	OUTER KNOB	1
22	KEM-P8408A	VR KNOB	4
23	KEM-P0708B	BAND SELECT KNOB	1
24	KEM-M0610-01	INSERT-KNOB	1
25	KEM-M0713A	TRIM PLATE	1
26	KEJ-032-1	MIC SOCKET 4PIN PLT-164-R	1
27	KEM-P0712	FRONT PANEL	1
28	KEM-MS3006C2N	SCREW-MACHINE F/H M3X6MM	4
29	KEM-P0709	DISPLAY LENS	1
30	KEM-MS3006B2N	M3X6 B/HD SCREW	6
31	KEM-OT0709	FELT FOR BRACKET	2
32	KEM-M0714	FRONT PANEL BRACKET	1
33	KER-502P11	POT. 5KB RV160-10-20K-B53-3020	1
34	KER-102P11	POT. 1KB RV160-10-20K-B13-3020	1
35	KER-502P10	POT.5KA RV160-10-20K-A53-3020	1
36	KER-D503B503A-C	VR DUAL SHAFT 50KB0150KAI W/SW	1
37	KESW-048	CHANNEL SELECTOR GPS-0735 40CH	1
38	KEPC-257-A	PCB CH SW 46X55X1.6MM SS DS	1
39	KEPC-261-1	PCB LED 54X25X1.6MM SS DS	1
40	KED-LA402NDGC-1	DIODE LED 7SEGS 2 DIGITS A-402	1
41	KED--L64GR	DIODE LED LT0362025-D63 RED-GREEN	1

29LDM PART LIST

42	KED-LA402NDGC-1	DIODE LED 7SEGS 2 DIGITS A-402	1
43	KEM-OT0707	LED HOLDER 3 PIN	2
44	KEM-M0712A	SELECTOR BRACKET	1
45	KEM-TS2604B2Z	SCREW T2.6X4	3
46	KEM-MS2005B2N	SCREW-MACHINE B/HD DIA M2.0X5MM	6
47	KEM-MS2604P2N	M2.6X4 P/HD SCREW	4
48	KESW-028-2	SLIDE SW 2P2T SS2249BAT11	3
49	KESW-027-2	SLIDE SW 2P3T SS2324BAT11	2
50	KEOE-OT122	METER ANALOG H-319-8827	1
51	KEOE-OT0608	CLAMP CUSHION	2
52	KEM-M8408	METER CLAMP	2
53	KEM-TS2606P2Z	T2.6X6 SCREW	4
54	KEM-MS3006B2N	M3X6 B/HD SCREW	9
55	KEM-WI0643304N	INNER TOOTH LOCK DIA 3.0	2
56	KEM-TS3506P5N	TAPPING SCREW T3.5X6 P/HD	2
57	KEM-M9014	BRACKET-MIC BONY	1
58	KEM-MS3008B2N	SCREW-MACHINE M3X8	4
59	KEM-OT0706	FELT STRIP 75X10	4
60	KEM-M8405A	BOTTOM COVER	1
61	KESP-056	SPEAKER 8 OHM 5W	1
62	KEM-NF0553040Z	FLANGE NUT M3.0	4
63	KEM-M8406D	FRAME	1
64	KEM-MS3008P2PN	PLASTIC SCREW P/HD 3X8MM(NYLON)	3
65	KEM-M0707-04	NAME PLATE	1
66	KEM-OT9002	BLIND RIVET DIA 3.2X6	5
67	KEOE-OT026	DC CORD	1
68	KEJ-060	JACK DC POWER 2S-I0813 #01	1
69	KEJ-010	ANTENNA RECEPTACLE 89713-0013	1
70	KEM-MH0553022G	HEX NUT M3.0X5.0X2.2T(3504-1)	5
71	KEIC-TA7222AP	IC TA7222AP POWER AMP	1
72	KEOE-OT124	MICA SHEET FOR TA7222P	1
73	KEOE-OT125-1	MICA SHEET FOR 2SC1957Q03.0MM	2
74	KET-2SC1957Q	TRANSISTOR NPN 2SC1957-Q	2
75	KEM-M0708A	HEAT SINK	1
76	KEOE-OT127	MICA SHEET FOR HEST SINK INSULATION	1
77	KEM-AN3314003YB	M3.0 ANT TERMINAL(10014-6) NI BRASS	3
78	KEM-MS3008P2N	SCREW-MACHINE P/H M3X8 MM	1
79	KEOT-OT128	BUSHING FOR 2SC2075	1
80	KET-C2078E	TRANSISTOR NPN 2SC2078	1
81	KEPC-060-H	MAIN PCB 29LDM 94HB S.S	1
82	KEM-WI0643304N	INNER TOOTHED LOCK WASHER DIA. 3	8
83	KEM-TS3006B5Z	TAPTITE SCREW B/H S M3X6	5
84	KEM-M0701	MOUNTING PLATE	1
85	KEM-M8404A	TOP COVER	1
86	KEM-OT0704	RUBBER RING 15 ODX 7IDX2 THK.	2
87	KEM-M0702	MOUNTING PLATE SCREW	2
88	KEM-MS3004B2N	MACHINE SCREW B/H M3X4 MM	1

IC & TRANSISTOR PIN VOLTAGE TABLE

MODEL: CB 29 SERIES

The Level of Transistor's pin (Main pcb)

MODEL:29WNW

(UNIT:volt)

	TX			RX			REMARKS	
FET NO.	S	D	G	S	D	G		
FET1	3.6	8.4	0	0.2	0.2	0		
FET2	1	13.3	0	1	13.2	0		
TR. NO.	E	C	B	E	C	B		
TR1	0	9.2	0.7	0	9.2	0.4		
TR2	8.6	13.3	9.3	8	13.2	9.3		
TR3	0	7.3	0.6	0	7.3	0.6		
TR4	13.3	0	13.3	13.2	0	13.2		
TR5	0	0	0	0	0	0		
TR6	0	0.1	0.7	0	-0.2	0		
TR7	0.9	8.3	1.7	0	0.2	0		
TR8	0.8	7.4	1.5	0	7.8	0		
TR9	0	1.6	0.8	0	0.2	0		
TR10	1.1	13.2	1.8	0	13.2	0.2		
TR11	0	4.3	0.1	0	4.2	0.2	SQ. MAX	
TR11	-	-	-	0	0	0.7	SQ. MIN	
TR12	0	0.1	0.6	0	0.2	0	SQ. MAX	
TR12	-	-	-	0	0.2	0	SQ. MON	
TR13	0	0	0.6	0	0	0.6		
TR14	0	13	0	0	12.3	0.2		
TR15	0	12.8	0	0	12.3	0		
TR16	0	0	0.5	0.9	7.7	0.5		
TR17	1.5	7.7	1.6	0.9	4.8	1.5		
TR18	0	0	0.1	0	0	0.1		
TR19	13.7	0	13.7	13.4	0	13.4		
TR20	3.2	7.6	3.7	3.3	7.8	3.7		
TR21	7.8	0	8.5	7.8	7.1	7.7		
TR22	7.2	12.7	7.8	7.2	12.4	7.8		
TR23	7.8	12.8	8.4	7.8	11.4	8.4		
TR24	0.7	13.7	0	0.7	13.4	0.5		

ALIGNMENT PROCEDURE

MODEL: CB29LTD _____

REVISION: _____

DATE : _____

PREPARED BY: _____

CHECKED BY: _____

APPROVED BY: _____

CB29WNW ALIGNMENT INSTRUCTION

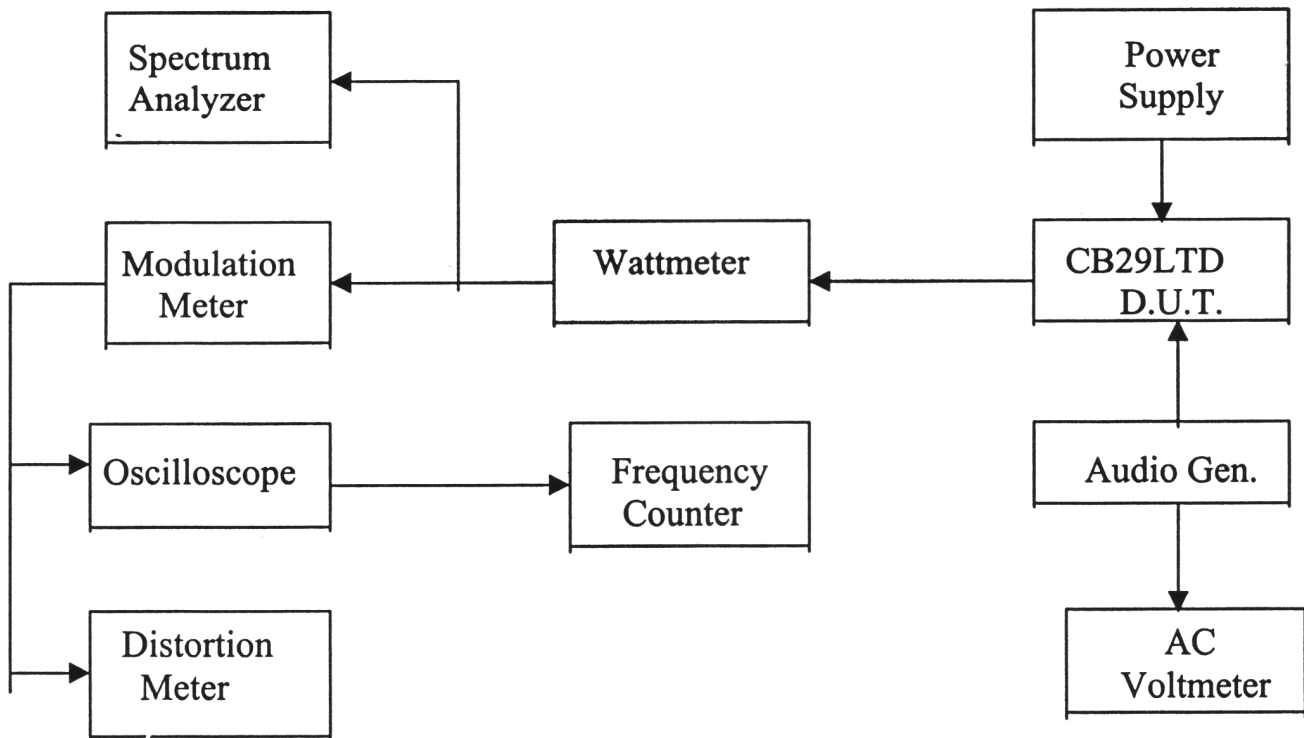
1.0 TEST CONDITION:

1.1. STANDARD DC POWER:	EXT.DC	13.8VDC
1.2. MEASUREMENT CHANNEL:	CB	CH19 (27.185MHz)
1.3. STANDARD AUDIO LOADING:	CB	8 Ω
1.4. ANTENNA IMPEDANCE:	CB	50 Ω
1.5. STANDARD REF. MODULATION:	CB	30% (AM)
1.6. STANDARD REF. AUDIO OUTPUT:	CB	0.5W
1.7. FREQUENCY TABLE:		

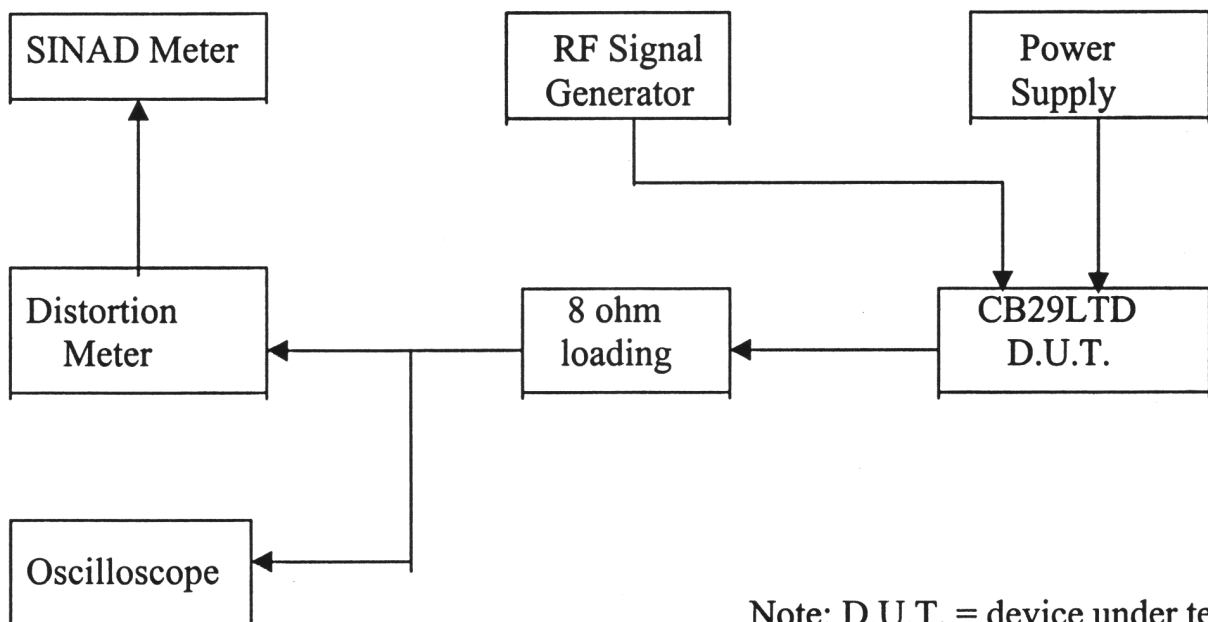
CH NO.	FREQ. (MHz)
1	26.965
2	26.975
3	26.985
4	27.005
5	27.015
6	27.025
7	27.035
8	27.055
9	27.065
10	27.075
11	27.085
12	27.105
13	27.115
14	27.125
15	27.135
16	27.155
17	27.165
18	27.175
19	27.185
20	27.205
21	27.215
22	27.225
23	27.255
24	27.235
25	27.245
26	27.265
27	27.275
28	27.285
29	27.295
30	27.305
31	27.315
32	27.325
33	27.335
34	27.345
35	27.355
36	27.365
37	27.375
38	27.385
39	27.395
40	27.405

1.8. TEST EQUIPMENT SETUP AS BELOW:

A. TX test equipment setup:



B. RX test equipment setup:



Note: D.U.T. = device under test

2.0 Alignment of P.L.L. portion.

2.1 Equipment required:

A: Oscilloscope (0 – 50MHz)

B: DC-voltage meter .

2.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. TX VCO voltage @ CH40	2. Connect the DC volt. Meter to the junction point of R59 and R60.	1. Adjust L15 to obtain approximately 3.5V $\pm 0.2V$ reading.
2. TP3 OUTPUT @ TX mode	1. Connect the oscilloscope to the junction point of R6 and JP14.	1. Adjust L16 for maximum output on the oscilloscope.

3.0 Alignment of CB receiver portion.

3.1 Equipment required:

A: Signal generator

B: AC voltmeter.

C: Oscilloscope.

D: Dummy load (8 ohm, 5 watts, resistive.)

E: DC power supply (13.8 v. 2Amp.)

3.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. AUDIO OUTPUT	1. Set channel 19. 2. Set the S.G. on 27.185MHz with 1KHz, 30% mod. and 1mV output level. 3. Set NB/OFF SW to OFF, Squelch to min. (CCW), PA-CB TO CB, ANL SW to CB/ANL, RF GAIN to max. Volume approximately Center.	1. Adjust L1,2,3,4,5,6 & 7 for maximum audio output & minimum distortion on the distortion meter.
2. RX Sensitivity	1. Same as above step 1 and 3. 2. Set the S.G. on 27.185MHz with 1KHz, 30% mod. RF output level 1.0uV.	1. Adjust L1,2,3,4,5,6 & 7 for more than 12dB t the Sinad meter. 2. Repeat as needed. 3. Set RF S.G. output level 0.4uV, the adj. VR2 to 2V on the AC voltmeter.
3. NB	1. Set NB/OFF SW to NB. 2. Set the level of S.G. to 1.0uV. 3. Noise generator to on. 4. Adjusted then revert item 1 setup.	1. Turn the volume to obtain 2V reading on AC voltmeter. 2. Adjust L19 for minimum reading on AC voltmeter.
4. Tight Squelch	1. Set Squelch volume to maximum (CW). 2. Set the level of S.G. to 1500uV. 3. Adjusted then revert item 1 setup.	1. Slowly turn VR4 to a position that the audio output waveform at the scope just appears from no output.
5. "S-9" and +30 meter indicator.	1. Set the level of S.G. to 100uV. 2. Adjusted then revert item 1 setup.	1. Adjust VR1 for "S-9" reading on analogue meter.

4.0 Alignment of Transmitter portion.**4.1 Equipment Required:**

A: VTVM (full scale: 1V DC with RF probe).

B: RF power meter.

C: Spectrum analyzers.

D: Frequency counter.

E: DC power supply.

F: 50 ohm load and attenuator.

G: Oscilloscope.

H: AF generator.

4.2 Alignment procedure:

TEST ITEM	TEST CONDITION & PROCEDURE	PURPOSE
1. TP4 output	1. Connect the oscilloscope to the TP4(R46 & 47). 2. Set TX mode , Channel 19.	1. Adjust L18, 17 for maximum output on the oscilloscope.
2. TX power	1. Set TX Channel 19.	1. Adjust L18,17,14 for maximum output on the RF power meter. 2. Turn L10 to obtain 4.0W on the RF meter reading.
3. TX carrier frequency	1. Set TX Channel 19.	1. Adjust VC1 to obtain 27.185MHz on the frequency counter.
4. Second harmonic	1. Set TX Channel 19.	1. Adjust L20 for a min. 2 nd harmonic (54MHz) output on the Spectrum anal.
5. "P4" indicator	1. Set TX Channel 19.	1. Adjust VR7 for "P4" display at the TX Signal meter of the analogue meter.
6. Modulation	1. Set TX Channel 19. 2. AF GEN. Output 30mV.	1. Adjust VR5 for 90% on the modulation Meter.

CB 29LDM(29LTD) BOM

Item	Description	Qty	LOCATION
CA-73N	MIC UNIT (ALL)	1	
CA-73NC	MIC CASING (ALL)	1	
CA-73NCXXX	MIC CASING COMMON	1	
KEJ-163	MIC PLUG 4 PIN FOR COBRA	1	A:KEJ-033
KEJ-033	MIC PLUG 4 PIN M24	0	
KEJW-SA26BK	STRAND WIRE UL1007 #26 BLACK	0.02	L=20mm
KEM-OT0702	SPONGY 38 OD x 26 ID x 5 THK	1	
KEM-OT7001	FELT DIA. 28	1	
KEM-OT9005	P.V.C. SLEEVE-CURL CORD	0.03	
KEM-P7001A	FRONT CABINET	1	E:548-G5128
KEM-P7001-01	FRONT CABINET W/O PRINTING	1	E:G5128
KEM-P7001A-Z	PRINTING FOR FRONT CABINET	1	E:G5128
KEM-P7002A	REAR CABINET	1	E:540
KEM-P7003A	MIC. BRACKET	1	E:540
KEM-P7103E	PTT SWITCH KNOB	1	E:572
KEM-P7107B	HANGING KNOB	1	E:566-G5189
KEM-TS2606B1N	TAPPING SCREW B/HD T2.6x6	1	
KEM-TS2608B1N	TAPPING SCREW B/HD T2.6x8	3	
KEM-TS3010P1B	TAPPING SCREW P/HD T3X10	1	
KEM-W11003903X	SELF LOCKING WASHER DIA.4	1	
KEM-WP0952805N	M2.8 PLAIN WASHER 103J-1	1	
KEOE-OT041	FIBRE SLEEVING DIA 1.5mm	0.01	
KEOE-OT042	FIBRE SLEEVING DIA 2MM	0.025	L=10mm,L=15mm
KESP-016	MIC DYNAMIC	1	
KESW-079	PUSH-BUTTON SWITCH 4P2T	1	
KETC-036-5	CURL CORD 4 CORES 3.05M	1	
29LDMB	MAIN UNIT (ALL)	1	
29LDMBC	MAIN CASING (ALL)	1	
29LDMBCXXX	MAIN CASING COMMON	1	
KEC-102FRZFT	CAP. CER. 50V F 2% 0.001UF	1	C204
KEJ-032-1	MIC SOCKET 4PIN PLT-164-R	1	J201
KEJW-SA24AE	STRAND WIRE UL1007 #24 ORANGE	0.205	W21 (L=205mm)
KEJW-SA24RD	STRAND WIRE UL1007 #24 RED	0.33	(L=100mm) - W50, W20 (L=230mm)
KEJW-TA24AE	TINNED WIRE UL1007 #24 ORANGE	0.76	L=70MM - W29,L=100MM - W46,W54,L=190MM - W48 L=300MM - W42 E:515,530,533
KEJW-TA24BK	TINNED WIRE UL1007 #24 BLACK	0.75	W23 (L=90mm), W27 (L=110mm), W26 (L=90mm) W55 (L=100mm), W51 (L=150mm), W56 (L=100mm) W33 (L=110mm).
KEJW-TA24BL	TINNED WIRE UL1007 #24 BLUE	0.99	W39 (L=220mm), W37 (L=230mm), W38 (L=110mm), W31 (L=300mm), W47 (L=130mm).
KEJW-TA24BN	TINNED WIRE UL1007 #24 BROWN	0.955	W34 (L=225mm), W52 (L=100mm), W14 (L=130mm), W49 (L=190mm), W43 (L=310mm).
KEJW-TA24GR	TINNED WIRE UL1007 #24 GREEN	0.64	W58 (L=110mm), W24 (L=190mm), W57 (L=340mm) E:533
KEJW-TA24RD	TINNED WIRE UL1007 #24 RED	0.465	W30 (L=300mm), W36 (L=80mm), W44 (L=85mm), E:533
KEJW-TA24WE	TINNED WIRE UL1007 #24 WHITE	0.93	W59 (L=100mm), W35 (L=230mm), W22 (L=170mm) W53 (L=130mm), W41 (L=300mm), E:533
KEJW-TA24YW	TINNED WIRE UL1007 #24 YELLOW	1.04	W32 (L=150mm), W64 (L=60mm), W40 (L=290mm), W25 (L=190mm), W45 (L=350mm).
KEM-MS2005B2N	SCREW-MACHINE B/HD DIA M2.0x5MM	6	
KEM-MS2604P2N	M2.6x4 P/HD SCREW	4	
KEM-MS3004B2N	MACHINE SCREW B/H M3X4MM	1	
KEM-MS3006B2N	M3x6 B/HD SCREW	9	
KEM-MS3006C2N	SCREW-MACHINE F/H M3X6MM	4	
KEM-MS3008B2N	M3x8 B/HD SCREW	4	
KEM-M0610-01	INSERT-KNOB	1	
KEM-M0712A	SELECTOR BRACKET	1	
KEM-M0713A	TRIM PLATE	1	E:511
KEM-M0714	FRONT PANEL BRACKET	1	
KEM-M8403	INSERT 1	1	
KEM-M8404A	TOP COVER	1	
KEM-M8405A	BOTTOM COVER	1	
KEM-M8407A	LOCK SPRING	1	
KEM-M8408	METER CLAMP	2	
KEM-NF0553040Z	FLANGE NUT M3.0	4	
KEM-OT0608	CLAMP CUSHION	2	
KEM-OT0706	FELT STRIP 75X10MM	4	
KEM-OT0709	FELT FOR BRACKET	2	
KEM-P0708B	BAND SELECT KNOB	1	
KEM-P0709	DISPLAY LENS	1	
KEM-P0712	FRONT PANEL	1	
KEM-P8406	OUTER KNOB	1	
KEM-P8407	INNER KNOB	1	
KEM-P8408A	VR KNOB	4	

CB 29LDM(29LTD) BOM

Item	Description	Qty	LOCATION
KEM-TS2604B2Z	SCREW T2.6X4	3	
KEM-TS2606P2Z	T2.6X6 SCREW	4	
KEOE-OT122	METER ANALOG H-319-8827	1	M201
KEOE-OT182	CABLE TIE TSL-102M 2.5X102MM	8	
KER-D503B503A-C	VR DUAL SHAFT 50KBO150KAI W/SW	1	VR202
KER-102JB8	RES. C-FILM 1/8W 5% S 1K	1	R314
KER-102P11	POT. 1KB RV160-10-20K-B13-3020	1	VR205
KER-203P07	POT. 20K RV160-10-20K-B24-3C20	1	VR204
KER-502P10	POT. 5KA RV160-10-20K-A53-3020	1	VR201
KER-502P11	POT. 5KB RV160-10-20K-B53-3020	1	VR206
KESP-056	SPEAKER 8 OHM SW	1	SP401
KESW-027-2	SLIDE SW 2P3T SS2324BAT11	2	S203,204
KESW-028-2	SLIDE SW 2P2T SS2249BAT11	3	S202,205,207
29LDMB1	MAIN PCB (ALL)	1	
29LDMB1XXX	MAIN PCB COMMON	1	
KCC-103FRKBM	CAP. CER. CHIP 50V B K% 0.01UF	1	C159
			E:535
KCC-104FRKBM	CAP. CER. CHIP 50V B K% 0.1uF	1	C302
KCD-1SV215	DIODE VARICAP 1SV215	1	D13
			E:501
KCD-214	DIODE VARACTOR 1SV214	1	D16
KEC-E105HRMU	CAP. ELECT. 50V M% 1UF	3	C32,73,85
KEC-E106ERMU	CAP. ELECT. 16V M% 10UF	2	C11,97
KEC-E107ERMU	CAP. ELECT. 16V M% 100UF	4	C20,67,114,119
KEC-E108FRMU	CAP. ELECT. 25V M% 1000UF	2	C42,123
KEC-E225HRMU	CAP. ELECT. 50V M% 2.2UF	2	C98,99
KEC-E227DRMU	CAP. ELECT. 10V M% 220UF	1	C71
KEC-E336ERMU	CAP. ELECT. 16V M% 33UF	1	C36
KEC-E474HRMU	CAP. ELECT. 50V M% 0.47UF	1	C102
KEC-E475FRMU	CAP. ELECT. 25V M% 4.7UF	3	C12,44,81
KEC-E476DRMU	CAP. ELECT. 10V M% 47UF	2	C45,66
KEC-E476ERMU	CAP. ELECT. 16V M% 47UF	2	C116,117
KEC-E477ERMU	CAP. ELECT. 16V M% 470UF	2	C48,112
KEC-MY102IRKA	CAP. MYLAR 100V K% 0.001UF	3	C25,31,43
KEC-MY103IRKA	CAP. MYLAR 100V K% 0.01UF	1	C69
KEC-MY104IRKA	CAP. MYLAR 100V K% 0.1UF	1	C68
KEC-MY222IRKA	CAP. MYLAR 100V 10% 0.0022UF	1	C40
KEC-MY223IRKA	CAP. MYLAR 100V K% 0.022UF	1	C95
KEC-MY224IRKA	CAP. MYLAR 100V K% 0.22UF	1	C156
KEC-MY333IRKA	CAP. MYLAR 100V K% 0.033UF	1	C37
KEC-MY393IRKA	CAP. MYLAR 100V K% 0.039UF	6	C21,23,24,26,28,147
KEC-MY473IRKA	CAP. MYLAR 100V K% 0.047UF	1	C19
KEC-MY682IRKA	CAP. MYLAR 100V K% 0.0068UF	2	C33,134
KEC-MY683IRKA	CAP. MYLAR 100V K% 0.068UF	1	C164
KEC-T106ERMU	CAP. TANT. 16V M% 10UF	1	C39
KEC-T106ERMU	CAP. TANT. 16V M% 10UF	1	C27
KEC-T335ERMU	CAP. TANT. 16V M% 3.3uF	1	C72
KEC-100FRDNPOT	CAP. CER. 50V CH D% 10PF	2	C127,128
KEC-100FRDSL	CAP. CER. 50V SL D% 10PF	1	C1
KEC-101FRJ220T	CAP. CER. 50V RH J% 100PF	1	C129
KEC-101FRKSLT	CAP. CER. 50V SL K% 100PF	1	C61
KEC-102FRKBT	CAP. CER. 50V B K% 0.001UF	1	C312
KEC-102FRZFT	CAP. CER. 50V F Z% 0.001UF	8	C38,41,49,50,51,52,76,170
KEC-103FRMY5TT	CAP. CER. 50V D M% 0.01UF	1	C139
KEC-103FRZFT	CAP. CER. 50V F Z% 0.01UF	49	C2,3,7,9,10,14,15,16,17,29,30,47,54,55,63,65,70, C75,77,78,80,84,88,93,100,101,105,108,109,110,111, C118,120,121,122,124,132,138,140,143,145,152,153, C161,135,141,201,202,310 E:535
KEC-103FRZFT4	CAP. CER. ARRAY 50V F Z 0.01UFx4	1	CC1
KEC-104FRZFT	CAP. CER. 50V F Z% 0.1UF	1	C133
KEC-109FRCSLT	CAP. CER. 50V SL C% 1PF	1	C22
KEC-150FRJ220T	CAP. CER. 50V RH J% 15PF	2	C8,90
KEC-150FRKSLT	CAP. CER. 50V SL K% 15PF	1	C104
KEC-201FRKSLT	CAP. CER. 50V SL K% 200PF	2	C4,5
KEC-220FRJ220T	CAP. CER. 50V RH J% 22PF	1	C126
KEC-221FRJ220T	CAP. CER. 50V RH J% 220PF	2	C91,130
KEC-221FRKSLT	CAP. CER. 50V SL K% 220PF	4	C13,58,62,163
KEC-271FRJ220T	CAP. CER. 50V RH J% 270PF	1	C59
KEC-330FRJ220T	CAP. CER. 50V RH J% 33PF	1	C166
KEC-331FRKSLT	CAP. CER. 50V SL K% 330PF	1	C86
KEC-390FRJSLT	CAP. CER. 50V SL J% 39PF	1	C106
KEC-393FRZFT	CAP. CER. 50V F Z% 0.039uF	6	C96,113,115,142,150,137
KEC-470FRJSLT	CAP. CER. 50V SL J% 47PF	1	C56
KEC-470FRJ750T	CAP. CER. 50V UJ J% 47PF	1	C89
KEC-471FRKSLT	CAP. CER. 50V SL K% 470PF	2	C74,125
KEC-472FRMY5TT	CAP. CER. 50V D M% 0.0047UF	2	C60,64

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Item	Description	Qty	LOCATION
KEC-609FRNCNPOT	CAP. CER. 50V CH C% 6PF	1	C131
KEC-680FRJSLT	CAP. CER. 50V SL J% 68PF	1	C87
KEC-680FRJ220T	CAP. CER. 50V RH J% 68PF	1	C53
KEC-681FRKSLT	CAP. CER. 50V SL K% 680PF	2	C6,18
KEC-809FRDSL	CAP. CER. 50V SL D% 8PF	1	C94
KEC-820FRJSLT	CAP. CER. 50V SL J% 82PF	1	C57
KEC-820FRJ220T	CAP. CER. 50V RH J% 82PF	1	C92
KECF-0003	CER. FILTER CFU455HT	1	FL2 E:541
KECF-0003-2	CER. FILTER LTU455HT	0	
KECF-0070	CRYSTAL FILTER 10.695MHZ 10G7.0A1	1	FL1
KED-Z5C2	DIODE ZENER HZ5C-2	1	D19
KED-Z9B1	DIODE ZENER HZ9B1	1	D22
KED-2-2AP261	DIODE GERMANIUM 2-2AP261	3	D5,6,24
KED-2-2AP261	DIODE GERMANIUM 2-2AP261	5	D9,10,12,316,501
KED-2AP34A	DIODE GERMANIUM 2AP34A	1	D4
KED-4003	DIODE 1N4003	2	D8,D23 E:538
KED-4004-A	DIODE 1N4004	0	
KED-4148-A	DIODE 1N4148 TOYO KUNI	19	D1,2,3,7,11,14,15,17,18,20,21,31,32,33,34,35,36 D37,38
KEI-105LH	IFT KM771NC 10MHZ	1	L1
KEI-106LH	IFT KM776A	1	L2
KEI-107LH	IFT KM774NC 30MHZ	1	L3
KEI-108LH	IFT KM772NC 11MHZ	1	L4
KEI-109LH	IFT KM807NC 11MHZ	1	L5
KEI-110LH	IFT KM808NC 11MHZ	1	L6
KEI-111LH	IFT 4A1052A 455KHZ	1	L7
KEI-112LH	IFT 4A1051N 455KHZ	1	L8
KEI-113LH	IFT 4A1164N 455KHZ	1	L9
KEI-114LH-1	IFT KM780NC 28MHZ	1	L17
KEI-115LH	IFT KM777NC 16.5MHZ	1	L18
KEI-116LH	IFT KM809N 2.5UH	1	L19
KEI-117LH	IFT KM779NC 30MHZ	1	L20
KEI-118LH	IFT KM810NC 16.8MHZ	1	L22
KEI-119LH	IFT KM811NC 11MHZ	1	L23
KEI-120LH	COIL KM812N 4.5UH	1	L24
KEI-123LH	IFT 2KM773N2C 27MHZ	1	L21
KEIC-TA7222AP	IC TA7222AP POWER AMP	1	IC4
KEIC-TA7310P	IC TA7310P PLL	2	IC2,3
KEIC-UPD2816C	IC D2816C PLL NPC	1	IC1
KEJ-010	ANTENNA RECEPTACLE 89713-0013	1	J202
KEJ-012	SPEAKER JACK JC-304B	2	J1,2
KEJ-060	JACK DC POWER 2S-10813 #01	1	J203
KEJW-TA24AE	TINNED WIRE UL1007 #24 ORANGE	0.15	W60 (L=150mm)
KEJW-TA24BK	TINNED WIRE UL1007 #24 BLACK	0.16	W2 (L=50mm), W65 (L=50mm), W9 (L=60mm)
KEJW-TA24BL	TINNED WIRE UL1007 #24 BLUE	0.348	W5(L=220MM),W11(L=128MM),E:
KEJW-TA24BN	TINNED WIRE UL1007 #24 BROWN	0.225	W7 (L=225mm)
KEJW-TA24RD	TINNED WIRE UL1007 #24 RED	0.543	W6(L=65MM),SP+(L=190MM),W61(L=160MM),W10(L=128MM) E:
KEJW-TA24WE	TINNED WIRE UL1007 #24 WHITE	0.378	W3(L=60MM),SP-(L=190MM),W13(L=128MM)
KEJW-TA24YW	TINNED WIRE UL1007 #24 YELLOW	0.528	W1 (L=40MM),W28(L=200MM),W62(L=160MM),W12(L=128MM) E:
KEJW-XXXBJW-23	WIRE BARE TINNED	1.51	JP1,2,3,6,8,10,11,12,13,16,17,19,22,23,24,25,28, JP29,31,32,35,36,37, L201 GND (L=10mm)
KEL-S047	COIL SPRING 0.8X6X7.5 HA-S026	2	L12,13
KEL-V178MA-1	COIL FIXED 0.17UH 20% MT280-1163-N	1	L16
KEL-V208PM	COIL VARIABLE 0.20UH 20% E0001	1	L11 E:543
KEL-V208AD	COIL VARIABLE 0.20UH 20%	0	
KEL-V308AD	COIL VARIABLE 0.3UH 20% ANDA	1	
KEL-V308CH	COIL VARIABLE 0.3UH 20% 044-041-9-001	0	
KEL-101MA-1	COIL FIXED 100UH 10%	1	L25
KEL-508CH-1	COIL FIXED 0.5UH 10% EN0096B	1	L15
KEL-508CL	COIL FIXED 0.5UH 10% CWR4-503328	0	
KEM-AN3314003YB	M3.0 ANT TERMINAL (10014-6) NI BRASS	3	
KEM-MS3006B2N	M3x6 B/HD SCREW	6	
KEM-MS3008P2N	SCREW-MACHINE P/H M3X8MM	1	
KEM-MS3008P2PN	PLASTIC SCREW P/H 3X8MM (NYLON)	3	
KEM-M0705A	FRAME	1	
KEM-M0708A	HEAT SINK	1	
KEM-NH0553022G	HEX NUT M3.0x0.5x2.2T (3504-1)	3	
KEM-OT9002	BLIND RIVET DIA 3.2x6	3	
KEM-P9001	SLEEVE-JACK (FORKEJ-012)	2	J1,2
KEM-TS3006B5Z	TAPTITE SCREW B/H S M3x6	5	

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Item	Description	Qty	LOCATION
KEM-WI0643304N	INNER TOOTHED LOCK WASHER DIA. 3 (404)	8	
KEOE-OT040	FIBRE SLEEVING DIA. 1 MM	0.039	D6 (L=15mm), L201 (L=10mm), C68x2 (L=7mm)
KEOE-OT118-1	FERRITE BEAD TS RH 3.5X5X1.3	2	L26,50
KEOE-OT121-1	FERRITE BEAD TG RHH 7X6 (1.5)	1	L201
KEOE-OT124	MICA SHEET FOR TA7222P	1	YY1
KEOE-OT125-1	MICA SHEET FOR 2SC1957Q03.0MM	3	YY2,3
KEOE-OT127	MICA SHEET FOR HEAT SINK INSULATION	1	YY4
KEOE-OT128	BUSHING FOR 2SC2075	1	YY5
KEOE-OT153-2	FERRITE BEAD T4FRH6X10X2.8	1	L10
KEOE-OT170	PVC TUBE DIA 1MM W/UL CSA	0.022	
KEOE-OT183	PVC TUBE DIA 2MM W/UL CSA	0.06	TR22 (L=20mm)x3
KEPC-060-H	PCB MAIN 29LDM 94HB S.5	1	E:547
KER-MX100EBB	RES. METAL-OXIDE 1W 5% S 10	1	R117
KER-MX150EBB	RES. METAL-OXIDE 1W 5% S 15	1	R104
KER-MX201FBB	RES. METAL-OXIDE 2W 5% S 200	1	R103
KER-MX399FBB	RES. METAL-OXIDE 2W 5% S 3.9 OHM	1	R51
KER-100CBB	RES. C-FILM 1/4W 5% S 10	1	R124
KER-101CBB	RES. C-FILM 1/4W 5% S 100	3	R22,29,86
KER-101CFB	RES. C-FILM 1/4W 5% F 100	4	R15,18,74,119
KER-102CFB	RES. C-FILM 1/4W 5% F 1K	4	R6,24,27,66
KER-102DBB	RES. C-FILM 1/2W 5% S 1K	1	R55
KER-102RH06J	RES. SEMI. RH0615C13J 1K	1	VR6
			E:536
KER-102KVSF637A	RES. SEMI. KVSF637A 1KOHM	0	
KER-102D8A	RES. SEMI. EVN-D8A-A03 1K	0	
KER-102D8Y	RES. SEMI. EVN-D8Y-A03-B13 1K	0	
KER-103CBB	RES. C-FILM 1/4W 5% S 10K	4	R11,47,88,
			VR5R
KER-103CFB	RES. C-FILM 1/4W 5% F 10K	9	R3,5,16,19,41,42,45,82,93
KER-103SR085	RES. SEMI-FIX SR085-2-10K	1	VR5
			E:548
KER-104CBB	RES. C-FILM 1/4W 5% S 100K	2	R8,48
KER-104KVSF637A	RES. SEMI. KVSF637A 100K	1	VR3
			E:537
KER-104D8A	RES. SEMI. EVN-D8A-A03 100K	0	
KER-104D8Y	RES. SEMI. EVN-D8Y-A03-B15 100K	0	
KER-104RH06J	RES. SEMI. RH0615C15J 100K	0	
KER-105CFB	RES. C-FILM 1/4W 5% F 1M	1	R1
KER-109CFB	RES. C-FILM 1/4W 5% F 1	2	R123,130
KER-122CBB	RES. C-FILM 1/4W 5% S 1.2K	1	R61
KER-123CBB	RES. C-FILM 1/4W 5% S 12K	1	R99
KER-123CFB	RES. C-FILM 1/4W 5% F 12K	1	R109
KER-150CFB	RES. C-FILM 1/4W 5% F 15	1	R146
KER-151CFB	RES. C-FILM 1/4W 5% F 150	1	R94
KER-152CFB	RES. C-FILM 1/4W 5% F 1.5K	1	R32
KER-154CFB	RES. C-FILM 1/4W 5% F 150K	1	R78
KER-181CBB	RES. C-FILM 1/4W 5% S 180	1	R85
KER-181CFB	RES. C-FILM 1/4W 5% F 180	1	R121
KER-182CFB	RES. C-FILM 1/4W 5% F 1.8K	3	R83,90,145
KER-183CFB	RES. C-FILM 1/4W 5% F 18K	1	R10
KER-220CFB	RES. C-FILM 1/4W 5% F 22	2	R56,60
KER-221CFB	RES. C-FILM 1/4W 5% F 220	1	R33
KER-222CBB	RES. C-FILM 1/4W 5% S 2.2K	1	R62
KER-222CFB	RES. C-FILM 1/4W 5% F 2.2K	10	R9,20,23,71,72,73,87,106,122,128
KER-223CBB	RES. C-FILM 1/4W 5% S 22K	2	R12,89
KER-223CFB	RES. C-FILM 1/4W 5% F 22K	5	R35,40,69,107,108
KER-223RH06J	RES. SEMI. RH0615CJ4J 22K	1	VR2
KER-223KVSF637A	RES. SEMI. KVSF637A 22KOHM	0	
KER-225CFB	RES. C-FILM 1/4W 5% F 2.2M	1	R4
KER-229CFB	RES. C-FILM 1/4W 5% F 2.2	1	R101
KER-272CFB	RES. C-FILM 1/4W 5% F 2.7K	4	R64,100,110,115
KER-273CFB	RES. C-FILM 1/4W 5% F 27K	1	R26
KER-330CFB	RES. C-FILM 1/4W 5% F 33	2	R67,96
KER-331CBB	RES. C-FILM 1/4W 5% S 330	1	R70
KER-331CFB	RES. C-FILM 1/4W 5% F 330	1	R52
KER-331D8A	RES. SEMI. EVN-D8A-A03 330R	1	VR1
			E:542
KER-331KVSF637A	RES. SEMI. KVSF637A 330OHM	0	
KER-331RH06J	RES. SEMI. RH0615CN2J 330	0	
KER-331D8Y	RES. SEMI. D8Y-331 330	0	
KER-332CBB	RES. C-FILM 1/4W 5% S 3.3K	1	R17
KER-332CFB	RES. C-FILM 1/4W 5% F 3.3K	1	R102
KER-333CFB	RES. C-FILM 1/4W 5% F 33K	1	R141
KER-390CFB	RES. C-FILM 1/4W 5% F 39	1	R63
KER-392CFB	RES. C-FILM 1/4W 5% F 3.9K	1	R125
KER-393CFB	RES. C-FILM 1/4W 5% F 39K	2	R43,44
KER-470CFB	RES. C-FILM 1/4W 5% F 47	1	R46

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Item	Description	Qty	LOCATION
KER-471CFB	RES. C-FILM 1/4W 5% F 470	2	R14,113
KER-472CFB	RES. C-FILM 1/4W 5% F 4.7K	1	R65
KER-473CFB	RES. C-FILM 1/4W 5% F 47K	2	R7,31
KER-511CFB	RES. C-FILM 1/4W 5% F 510	1	R54
KER-560CFB	RES. C-FILM 1/4W 5% F 56	3	R34,95,98
KER-561CFB	RES. C-FILM 1/4W 5% F 560	2	R25,53
KER-562CBB	RES. C-FILM 1/4W 5% S 5.6K	1	R140
KER-562CFB	RES. C-FILM 1/4W 5% F 5.6K	8	R2,13,30,68,91,112,116,142
KER-564CFB	RES. C-FILM 1/4W 5% F 560K	1	R127
KER-680DBB	RES. C-FILM 1/2W 5% S 68	1	R118
KER-681KVSF637A	RES. SEMI. KVSF637A 680	1	VR4
KER-682CBB	RES. C-FILM 1/4W 5% S 6.8K	1	VR2R
KER-682CFB	RES. C-FILM 1/4W 5% F 6.8K	3	R50,92,111
KER-683CFB	RES. C-FILM 1/4W 5% F 68K	2	R38,39
KER-821CFB	RES. C-FILM 1/4W 5% F 820	2	R105,114
KER-822CBB	RES. C-FILM 1/4W 5% S 8.2K	2	R81, D17
KER-823CFB	RES. C-FILM 1/4W 5% F 82K	3	R36,37,49
KER-824CFB	RES. C-FILM 1/4W 5% F 820K	1	R79
KER-829CFB	RES. C-FILM 1/4W 5% F 8.2	1	R58
KET-C2078E	TRANSISTOR NPN 2SC2078(E)	1	TR14
KET-C2078D	TRANSISTOR NPN 2SC2078(D)	0	
KET-KSA733C-G	TRANSISTOR PNP TR KSA733C-G	4	TR4,18,19,21
KET-KSD880Y	TRANSISTOR NPN KSD880Y	1	TR23
KET-2SC1674L	TRANSISTOR NPN 2SC1674L	1	TR7
KET-2SC1675L	TRANSISTOR NPN 2SC1675L	6	TR1,TR2,TR8,TR9,TR10,TR20 E:G5498
KET-2SC1675K	TRANSISTOR NPN 2SC1675K TO-92	0	
KET-2SC1957Q	TRANSISTOR NPN 2SC1957-Q	2	TR15,22
KET-2SC941TMO	TRANSISTOR NPN 2SC941TMO	1	TR16
KET-2SC945AQ	TRANSISTOR NPN 2SC945AQ	8	TR3,5,6,11,12,13,17,24
KET-2SK192ABL	FET 2SK192A-BL	1	FET1
KET-2SK192AY	FET 2SK192A-Y	1	FET2
KETR-010-1	TRANSFORMER MOD ETM512-96	1	T1
KETR-011-1	TRANSFORMER CHOKE ETM511-96	1	T2
KEX-0318	CRYSTAL 10.24DMHZ CL=30PF	1	X1
29LDMB2	LED PCB (ALL)	1	
29LDMB2XXX	LED PCB COMMON	1	
KED-LA4022-11E	DIODE LED 7 SEG 2 DIGITS LA4022-11 EWRW	1	D401 E:544
KED-LA402NDGC-1	DIODE LED 7SEGS 2 DIGITS A-402	0	
KED-LBDA402NDL9	DIODE LED 7 SEG 2 DIGITS BD-A402ND-LC9	0	
KED-L204R	DIODE LED EL204HD RED	1	D202 E:533
KED-L64GR	DIODE LED LT0362-25-D63 RED-GREEN	1	D201 E:533
KEJW-TA24AE	TINNED WIRE UL1007 #24 ORANGE	0.35	L=350MM - W16 E:533
KEJW-TA24GR	TINNED WIRE UL1007 #24 GREEN	0.38	L=380MM - W19 E:533
KEJW-TA24RD	TINNED WIRE UL1007 #24 RED	0.38	L=380MM - W17 E:533
KEJW-TA24WE	TINNED WIRE UL1007 #24 WHITE	0.3	L=150MM - W15,18 E:533
KEM-OT0707	LED HOLDER 3 PIN	2	E:534
KEOE-OT170	PVC TUBE DIA 1MM W/UL CSA	0.01	D201 E:533
KEOE-OT295-C	COVER FOR CB DUAL DIGIT DISPLAY	1	FOR D401 E:G5579
KEOE-OT295	A-402NDGC COVER	0	
KEOE-OT295-A	COVER 0.4" D/D CAP GREEN PANTAGE	0	
KEOE-OT295-B	COVER 0.4" D/D CAP GREEN PANTA	0	
KEPC-116-B	PCB 7SEG 1.6MM THK PHENOLIC	1	E:533
29LDMB3	CHANNEL SELECTOR UNIT	1	
29LDMB3XXX	CHANNEL SELECTOR COMMON	1	
KED-4148-A	DIODE IN4148 TOYO KUNI	14	D301,302,303,304,305,306,307,308,309,310,311,312 D313,314, A:KED-4148
KED-4148	DIODE 1N4148	0	
KEJW-FC002	FLAT CABLE 15 CORES 2.5MM PITCH 5-40-5MM	1	FC301
KEJW-FC003	FLAT CABLE 2.5MM PITCH 5-50-5MM 10 CORES	1	FC1
KEJW-XXXBJW-23	WIRE BARE TINNED	0.42	JP301,302,303,304,305,306,307 A:KEJW-XXXBJW-23
KEJW-XXXBJW-23	WIRE BARE TINNED	0	
KEPC-183-B	PCB CHANNEL SW 46X51X1.6MM S.S	1	
KER-221CBB	RES. C-FILM 1/4W 5% S 220	5	R302,303,304,305,306
KER-221CFB	RES. C-FILM 1/4W 5% F 220	1	R301 A:KER-221CFB

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Item	Description	Qty	LOCATION
KER-221CFB	RES. C-FILM 1/4W 5% F 220	0	
KER-331CBB	RES. C-FILM 1/4W 5% S 330	6	R307,308,309,310,313,314
KER-331CFB	RES. C-FILM 1/4W 5% F 330	2	R311,312
KESW-048	CHANNEL SELECTOR GPS-0735 40CH	1	SW301
29LDMP	PACKING UNIT	1	
29LDMPXXXX	PACKING COMMON	1	
KEM-M0701	MOUNTING PLATE	1	
KEM-M0702	MOUNTING PLATE SCREW	2	
KEM-M0707-06	NAME PLATE	1	E:532
KEM-M9014	BRACKET-MIC BODY	1	
KEM-OT0704	RUBBER RING 15 OD x 7 ID x 2 THK	2	
KEM-OT9002	BLIND RIVET DIA 3.2x6	2	
KEM-PB0906-10	POLYBAG 90X60X0.1MM	1	
KEM-PB2006-04	POLYBAG - D.C. CORD	1	
KEM-PB2818-04	CARD POLYBAG	1	
KEM-PB3209-10	POLYBAG 320X90X0.1MM	1	
KEM-PB6511-10A	POLYBAG 650X110X0.1MM	1	E:G5557
KEM-PK0626A	CARDBOARD FILLET	3	E:508
KEM-PK0632	95 RULE BOOKLET	1	
KEM-PK0633	FCC LABEL	1	
KEM-PK0712A	BUBBLE BAG - UNIT	1	
KEM-PK0726	CARDBOARD INSERT	1	
KEM-PK0731	FILLER BOARD	0.167	
KEM-PK0732	SHIPPING CARTON POLYBAG	0.167	
KEM-PK0737	GIFT BOX	1	
KEM-PK0738-01	USER'S MANUAL	1	E:549
KEM-PK0739-02	SHIPPING CARTON	0.167	E:540
KEM-PK0740X1073	BAR CODE SERIAL NO.LABEL	3	
KEM-PK8411	BLANK LABEL 60X20	1	
KEM-PK0741	UPC BAR CODE LABEL	0.33	
KEM-PK8412	BLANK LABEL 30X45	1	
KEM-PK2927C	CUSTOMER ASSISTANCE CARD	1	
KEM-PK7803	SPACER	1	
KEM-PK8405B	UNIT FITTING	1	E:508
KEM-PK8406	MIC FITTING	1	
KEM-PK8409	REGISTRATION CARD	1	
KEM-PK8609-15	BAR CODE CARTON LABEL	0.33	E:540
KEM-PK8610	BLANK LABEL 100X50(CLBG30JY10050)	1	E:540
KEM-PK8705	INSERT	1	
KEM-PK8706	INSERT ONE	1	
KEM-TS3506P5N	TAPTITE SCREW T3.5X6MM P/H	2	
KEM-TS5010P3N	TAPPING SCREW P/H DIA. 5x10	4	
KEM-WE1005306N	OUTER TOOTHED LOCK WASHER DIA. 5 (306)	4	
KEM-WI0643304N	INNER TOOTHED LOCK WASHER DIA. 3 (404)	2	
KEOE-OT026	DC CORD	1	
>>>> End of B.O.M.			



6500 W. Cortland St., Chicago, IL 60707
Technical Support Number 1-800-638-3680
Customer Service Number 1-773-889-3087



Service Manual

For

29 LTD ST
29 WX ST

Model 29 LTD ST / 29 WX ST

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THEORY OF OPERATIONS

CB29 LTD ST / CB 29 WX ST

The COBRA models CB29 LTD ST and CB 29 WX ST are the citizen band AM radio transceivers operated in the frequency range of 26,965 to 27.405 MHz (40 channels). For model CB 29 WX ST, it can also receive the seven channels of 162 MHz weather signal.

1. CB Mode of Operation

1.1 CB Transmitter Section

When in transit mode, TR20 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop frequency synthesizer IC1 D2816C and IC2 TA7310P to produce the reference frequencies of 16.725 to 17.165 MHz. The fundamental frequency and the reference frequencies are then mixed up in IC3 TA7310P to produce the RF signal of 26.965 to 27.405 MHz. This signal, after magnified by the RF amplifiers TR16, TR15, TR14, is fed to the antenna for transmitting.

In the meantime, the speech signal picked up by the microphone is amplified by TR17 and IC4 TA7222AP, and then applied to the collectors of TR15 and TR14 for RF amplitude modulation. Thus completes the speech signal modulation and transmitting.

A soundtracker switch controls the speech signal path of the microphone amplifier TR17. When the ST switch is set to ON, it cuts the TR17 output and directs it to a compander chip IC802 TA31101AP for speech signal dynamic range compressing. The output of IC802 is then fed to IC4 TA7222AP for the remaining processing. When the ST switch is set to off, the compander function is turned off.

1.2 CB Receiver Section

When in receive mode, TR20 and the crystal oscillator generate a fundamental frequency 10.24 MHz and send it to the Phase-Locked-Loop frequency synthesizer IC1 D2816C and IC2 TA7310P to produce the first local oscillator frequencies 16.270 to 16.710 MHz.

In the meantime, the AM RF signal (26.965 to 27.405 MHz) picked up by the antenna is magnified by TR7 and fed to the first mixer FET1. This signal is then mixed with the first local oscillator frequencies 16.270 to 16.710 MHz. That produces the first IF frequency 10.695 MHz. The first IF signal, after passing through the ceramic filter, is fed to the second mixer FET2 for mixing with the second local oscillator frequency 10.24 MHz. That produces the second IF frequency 455 kHz. The second IF signal, after filtered by the ceramic filter and magnified by TR8, TR9, TR10, is demodulated by D4 for speech signal recovery. The recovered speech signal is then magnified by IC4 TA7222AP and fed to the speaker. Thus completes the speech signal receiving.

A soundtracker switch controls the recovered speech signal path of the demodulation diode D4. When the ST switch is set to ON, it cuts the D4 output and directs it to a compander chip IC802 TA31101AP for speech signal dynamic range expanding. The output of IC802 is then fed to IC4 TA7222AP for the remaining processing. When the ST switch is set to OFF, the compander function is turned off.

2. PA Mode of Operation

With the CB-PA switch set at PA position, the speech signal picked up by the microphone is fed to IC4 TA7222AP for magnification to a level of about 4 watts, and then via the PA terminal sent to the speaker for speech sound reproduction.

A soundtracker switch controls the speech signal path of the microphone amplifier TR17. When the ST switch is set to ON, it cuts the TR17 output and directs it to a compander chip IC802 TA31101AP for speech signal dynamic range compressing. The output of IC802 is then fed to IC4 TA7222AP for the remaining processing. When the ST switch is set to OFF, the compander function is turned off.

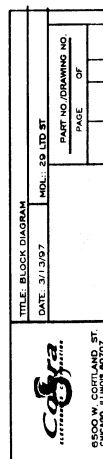
3. WX Mode of Operation (162 MHz Weather receiving) - for CB 29 WX ST only

3.1 With the CB-WX switch set at WX position, the 162 MHz weather signal (frequency modulated) picked up by the antenna is magnified by Q601 and fed to the mixer Q606. In the meantime, Q602 and crystal oscillator generate a local oscillation frequency in the range of 162 MHz, also fed to Q606 for mixing. That produces the IF frequency 455 kHz. The IF signal, after magnified by Q603, Q604, Q605, is frequency discriminated by D605, D606 for audio signal recovery. The recovered WX signal is then magnified by Q703, IC TA7222 and fed to the speaker for WX signal reproduction.

A soundtracker switch controls the recovered WX signal path of Q703. When the ST switch is set to ON, it cuts the Q703 output and directs it to a compander chip IC802 TA31101AP for speech signal dynamic range expanding. The output of IC802 is then fed to IC4 TA7222AP for the remaining processing. When the ST switch is set to OFF, the compander function is turned off.

3.2 Before the weather messages broadcasted, there will be a 10-second alert tone (at 1050Hz) sending out from the weather station. When received the 1050 Hz alert tone signal, the tone decoder IC701 NJM567D sends out a control signal that turns on the power supply for the CB transceiver. It also turns on Q704 and sends the 1050 Hz signal to IC4 for amplification and to be produced at the speaker output for alerting.

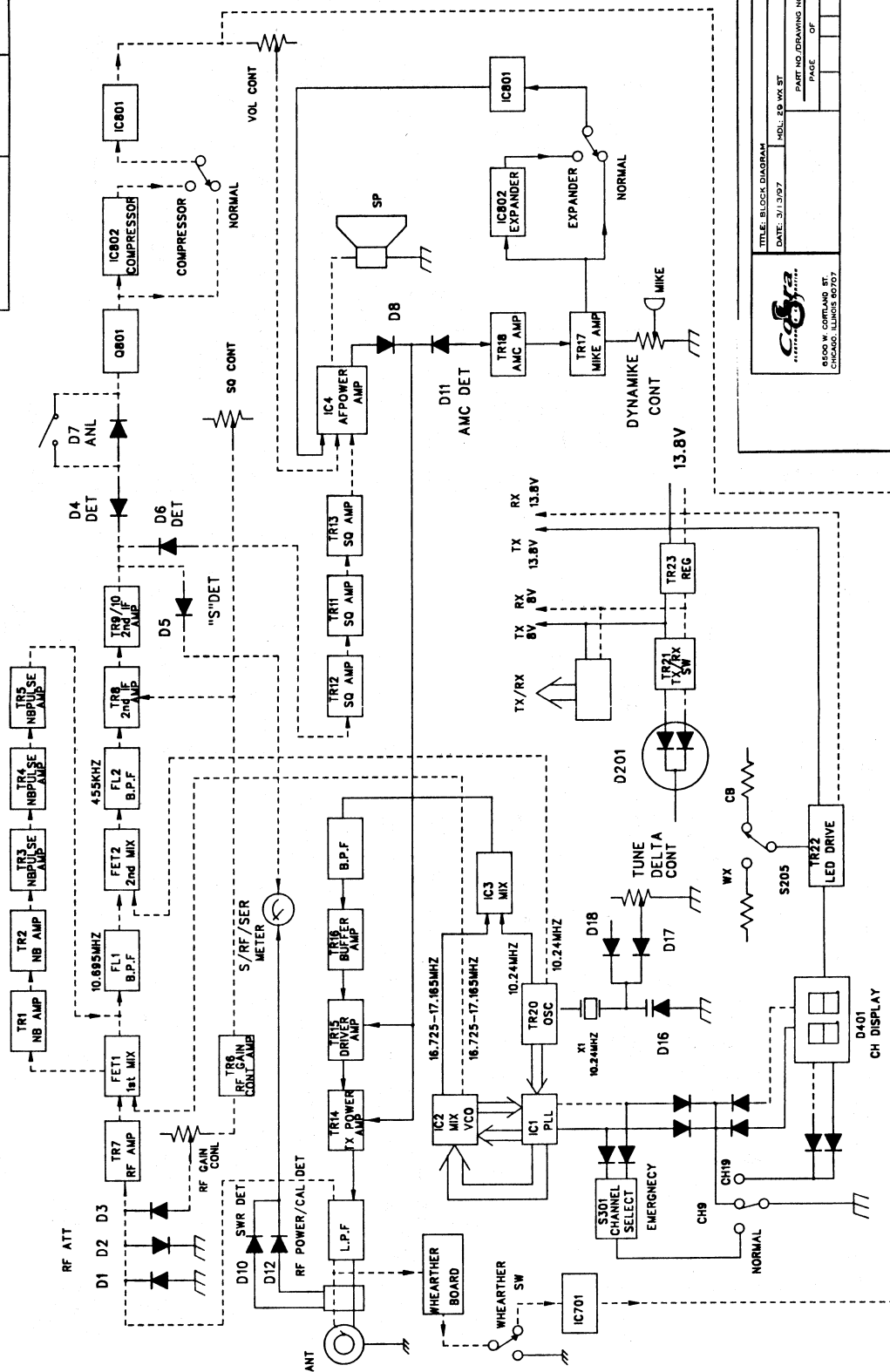
REVISION RECORD




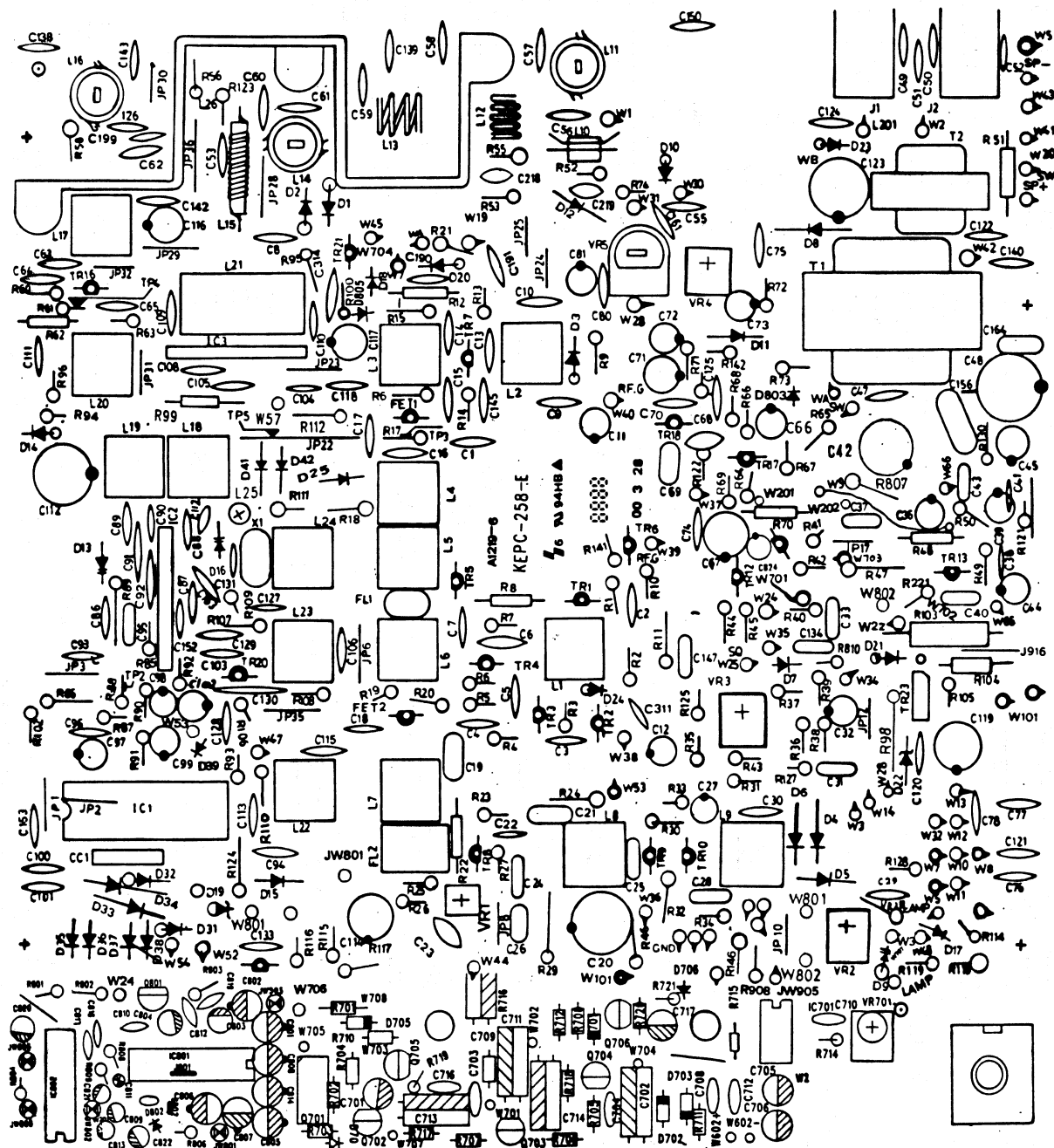
C29WST BLOCK DIAGRAM

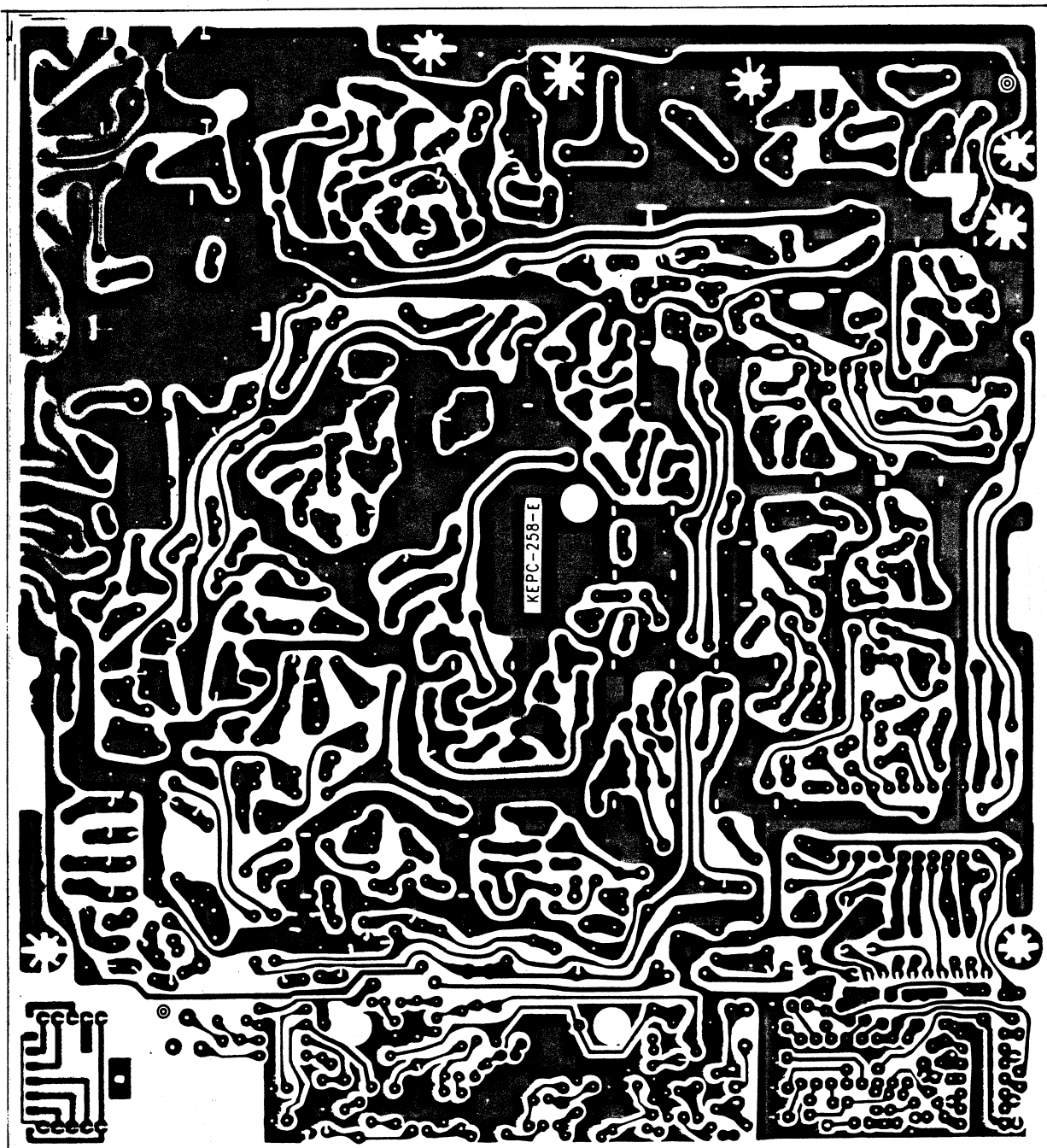
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UPDATE TO ECN	APPROVED:

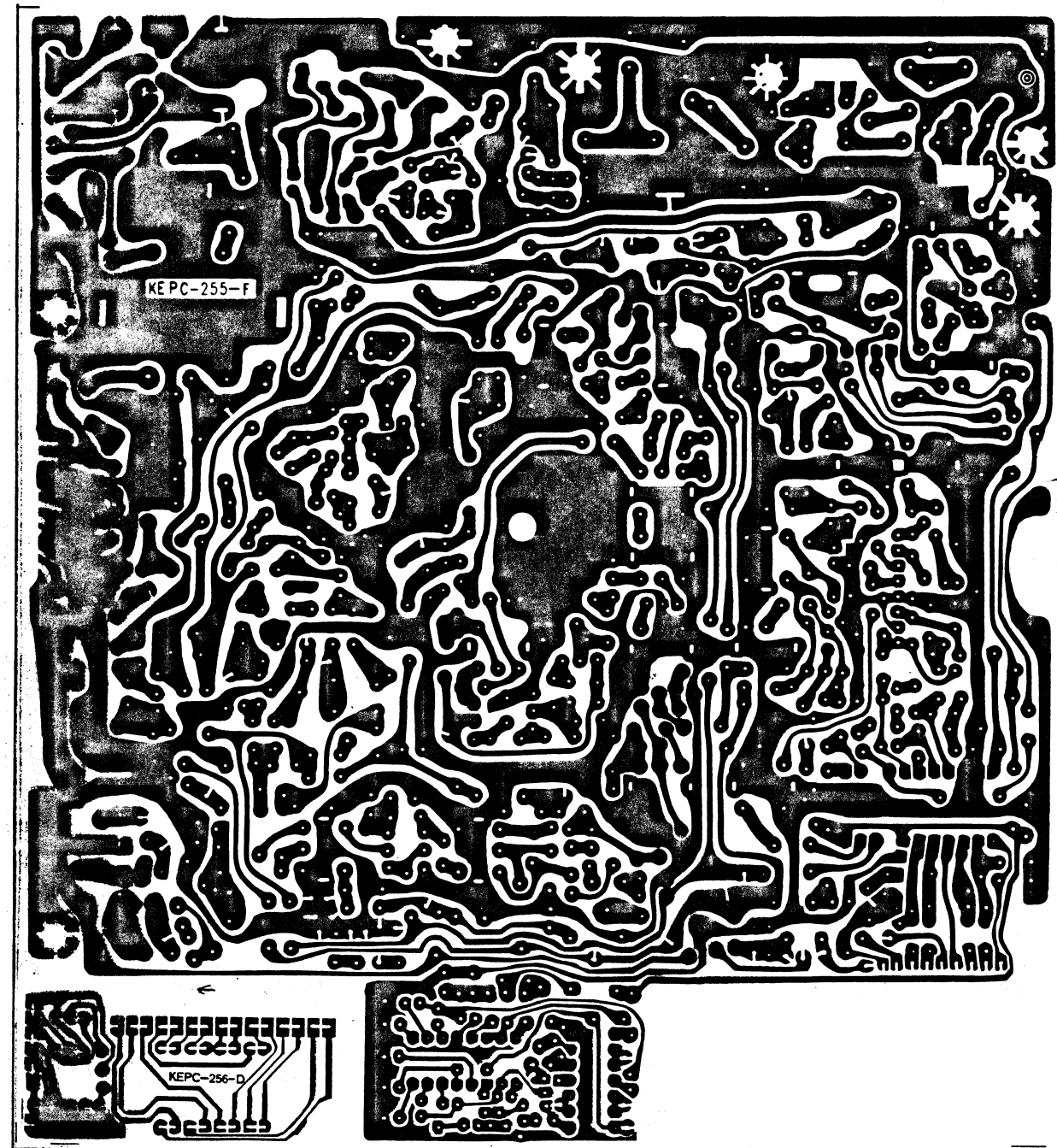
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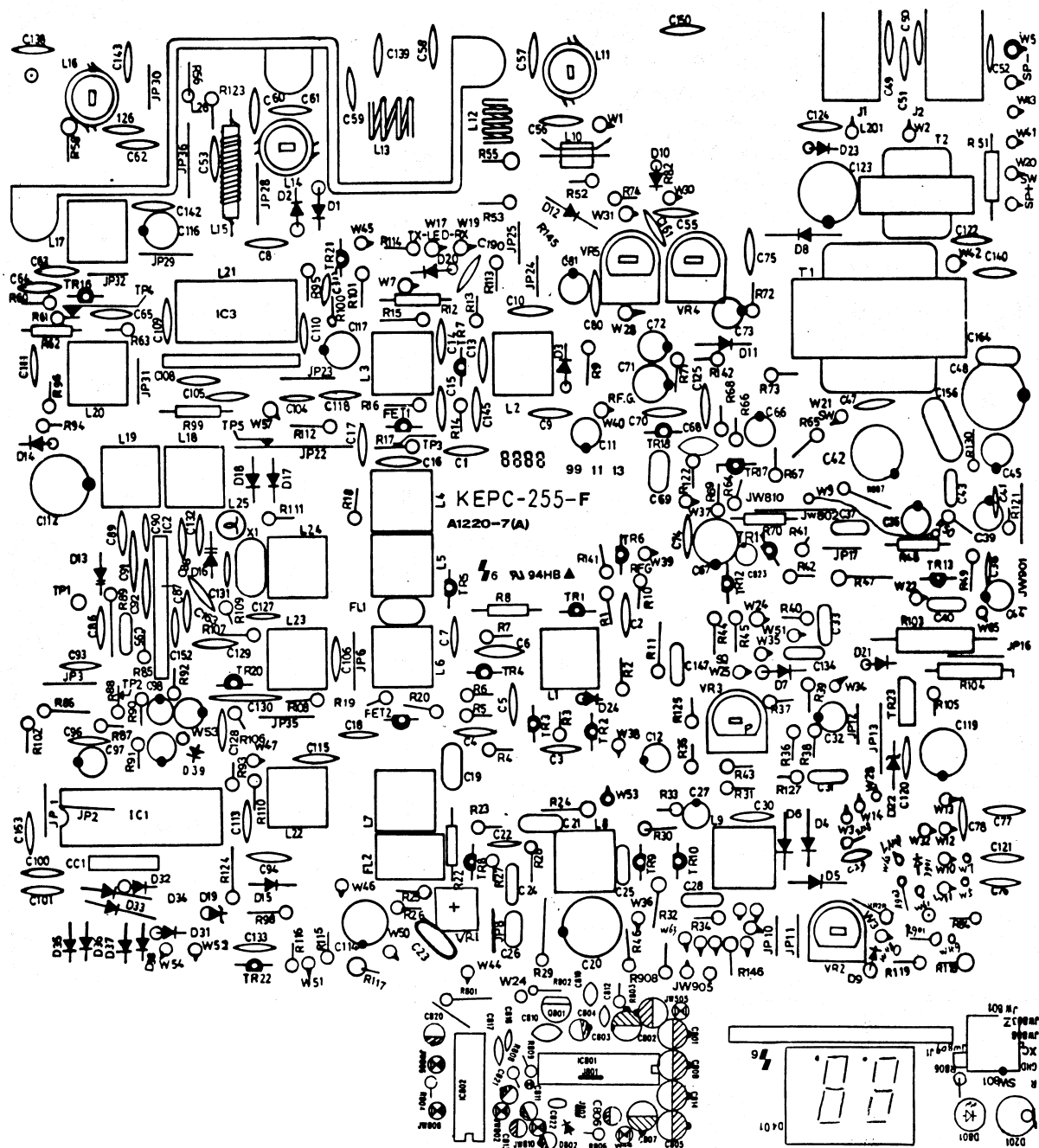


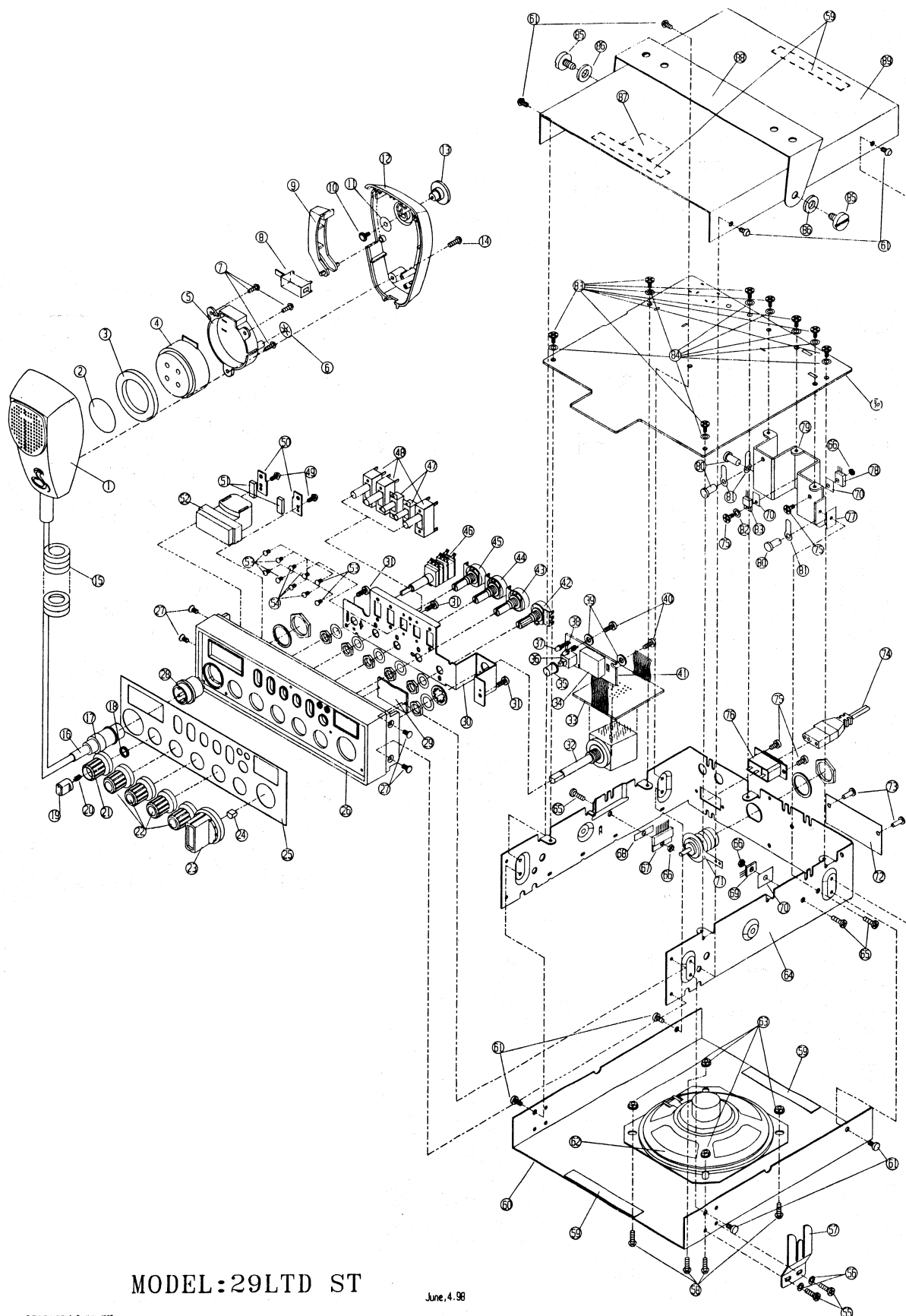
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	DATE: 3/13/97	HDL: 20 WA 5T
	PART NO./DRAWING NO.	PAGE OF











MODEL:29LTD ST

June, 4, 96

RECEIVED 10 JUN 1998

EXPLODED VIEW PART LIST MODEL: CB 29 LTD ST

REF. NO.	PART NO.	PART NAME	DESCRIPTION
1	KEM-P7001A	FRONT CABINET	ABS 94HB/Cr-PLATED
2	KEM-OT7001	FELT DIA. 28	FELT PAPER
3	KEM-OT0702	SPONGY 38 ODX26IDX5 THK	SPONGY
4	KESP-016	MIC. DYNAMIC	
5	KEM-P7003A	MIC. BRACKET	ABS 94HB
6	KEM-WI1003903X	SELF LOCKING WASHER DIA. 4	
7	KEM-TS2608B1N	TAPPING SCREW P/HD T2.6X8	NI-PLATED
8	KESW-079	PUSH-BUTTON SWITCH 4P2T	4P2T
9	KEM-P7103D	PTT SWITCH KNOB	ABS 94HB
10	KEM-TS2606B1N	TAPPING SCREW B/HD T2.6X6	NI-PLATED
11	KEM-WP0952805N	M2.8 PLAIN WASHER 103J-1	
12	KEM-P7002A	REAR CABINET	ABS 94HB
13	KEM-P7107B	HANGING KNOB	ABS 94HB
14	KEM-TS3010P1B	TAPPING SCREW B/HD T3X10	
15	KETC-036-1	CURL CORD 4 CORES	
16	KEM-OT9005	P.V.C. SLEEVE - CURL CORD	PVC
17	KEJ-163	MIC PLUG 4 PIN FOR COBRA	
18	KEM-M8407A	LOCK SPRING	
19	KEM-P8407	INNER KNOB	ABS 94HB/Cr-PLATED
20	KEM-M8403	INSERT 1	STAINLESS STEEL
21	KEM-P8406	OUTER KNOB	ABS 94HB/Cr-PLATED
22	KEM-P8408	VR KNOB	ABS 94HB/Cr-PLATED
23	KEM-P0708B	BAND SELECT KNOB	ABS 94HB/Cr-PLATED
24	KEM-M0610-01	INSERT KNOB	BRASS
25	KEM-M8402A	FRONT PANEL TRIM PLATE	AL. SHEET
26	KEM-P8401C	FRONT PANEL	ABS 94HB/Cr-PLATED
27	KEM-MS3006C2N	SCREW MACHINE F/H M3X6MM	NI-PLATED
28	KEJ-032-1	MIC SOCKET 4PIN PLT-164-R	
29	KEM-P9003B	FILTER DISPLAY	PMMA
30	KEM-M8401C	FRONT PANEL BRACKET	SPCC/ZINC-PLATED
31	KEM-TS2605B2N	TAPPING SCREW B/HD T2.6X5	NI-PLATED
32	KESW-048	CHANNEL SELECTOR GPS-0735 40CH	
33	KEPC-257	PCB CHANNEL SW 46X55X1.6MM S.S	46X55X1.6mm
34	KED-LA402NDGC-1	DIODE LED 7SEGS 2 DIGITS A-402	
	KEOE-OT295	A-402NDGC COVER	
35	KEM-P8405B	PUSH COVER	ABS 94HB/Cr-PLATED
36	KESW-064	PUSH BUTTON SWITCH 2C2P W/LOCK	
37	KED-L64GR	DIODE LED LT0362-25-D63 RED-GREEN	
38	KED-L204R	DIODE LED EL204HD RED	
39	KEM-WF0703308X	FIBRE WASHER 7.0ODX3.3IDX0.8THK	
40	KEM-TS2605B2N	TAPPING SCREW B/HD T2.6X5	NI-PLATED
41	KEPC-256	PCB 7SEGS 2DIGITS A-402	
42	KER-502P11	POT. 5KB RV160-10-20K-B53-3020	
43	KER-203P07	POT. 1KB RV160-10-20K-B24-3C20	
44	KER-102P11	POT. 1KB RV160-10-20K-B13-3020	
45	KER-502P10	POT. 5KA RV160-10-20K-A53-3020	
46	KER-D503B503A-C	VR DUAL SHAFT 50KBO / 50KAI W/SW	
47	KESW-028-2	SLIDE SW 2P2T SS2249BAT11	2P2T
48	KESW-027-2	SLIDE SW 2P3T SS2324BAT11	2P3T
49	KEM-TS2605B2N	TAPPING SCREW B/HD T2.6X5	NI-PLATED
50	KEM-M8408	METER CLAMP	SPCC/ZINC-PLATED

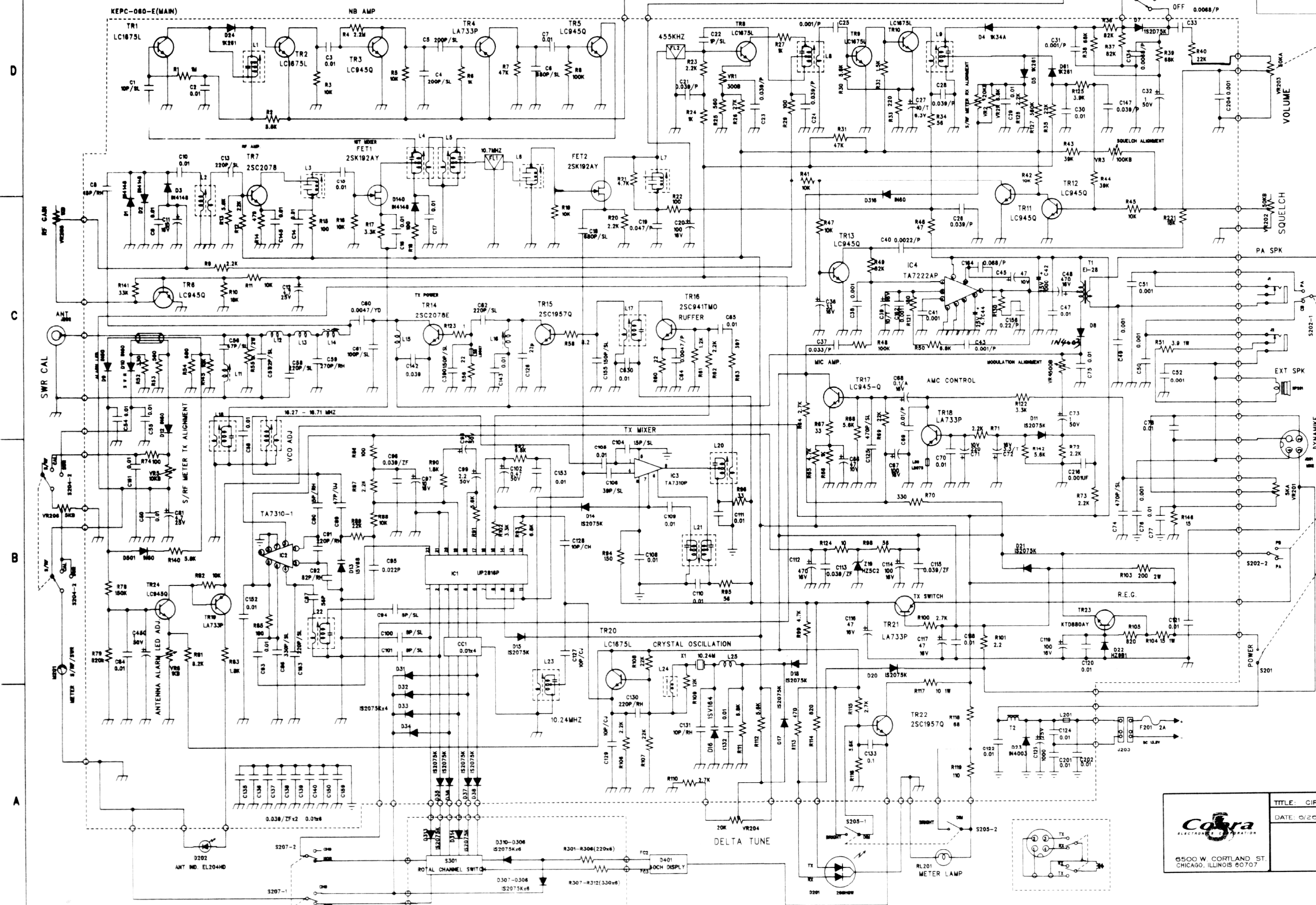
EXPLODED VIEW PART LIST MODEL: CB 29 LTD ST

[illegible]

CIRCUIT DIAGRAM FOR COBRA 29LTD

REVISION RECORD

UPDATE TO ECN NO.	APPROVED:	DATE:



- NOTES:
1. RESISTANCE VALUES ARE SHOWN IN OHMS UNLESS OTHERWISE NOTED. (K=10³ OHMS, M=10⁶ OHMS)
 2. RESISTOR WATTAGES ARE 1/8W UNLESS OTHERWISE SPECIFIED.
 3. CAPACITANCE VALUES ARE INDICATED IN MICROFARADS UNLESS OTHERWISE NOTED. (P=PICO-FARAD, N=NEO-FARAD)
 4. ALL CAPACITORS TEMPERATURE CHARACTERISTICS ARE YF UNLESS OTHERWISE NOTED.
 5. CAPACITANCE VALUE OF C131 IS FACTORY ADJUSTED FROM 8P TO 10P

TITLE: CIRCUIT DIAGRAM	
DATE: 6/26/97	MDL: 29 LTD CLASSIC
PART NO./DRAWING NO.	
PAGE 1 OF 1	

6500 W. CORTLAND ST.
CHICAGO, ILLINOIS 60707