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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

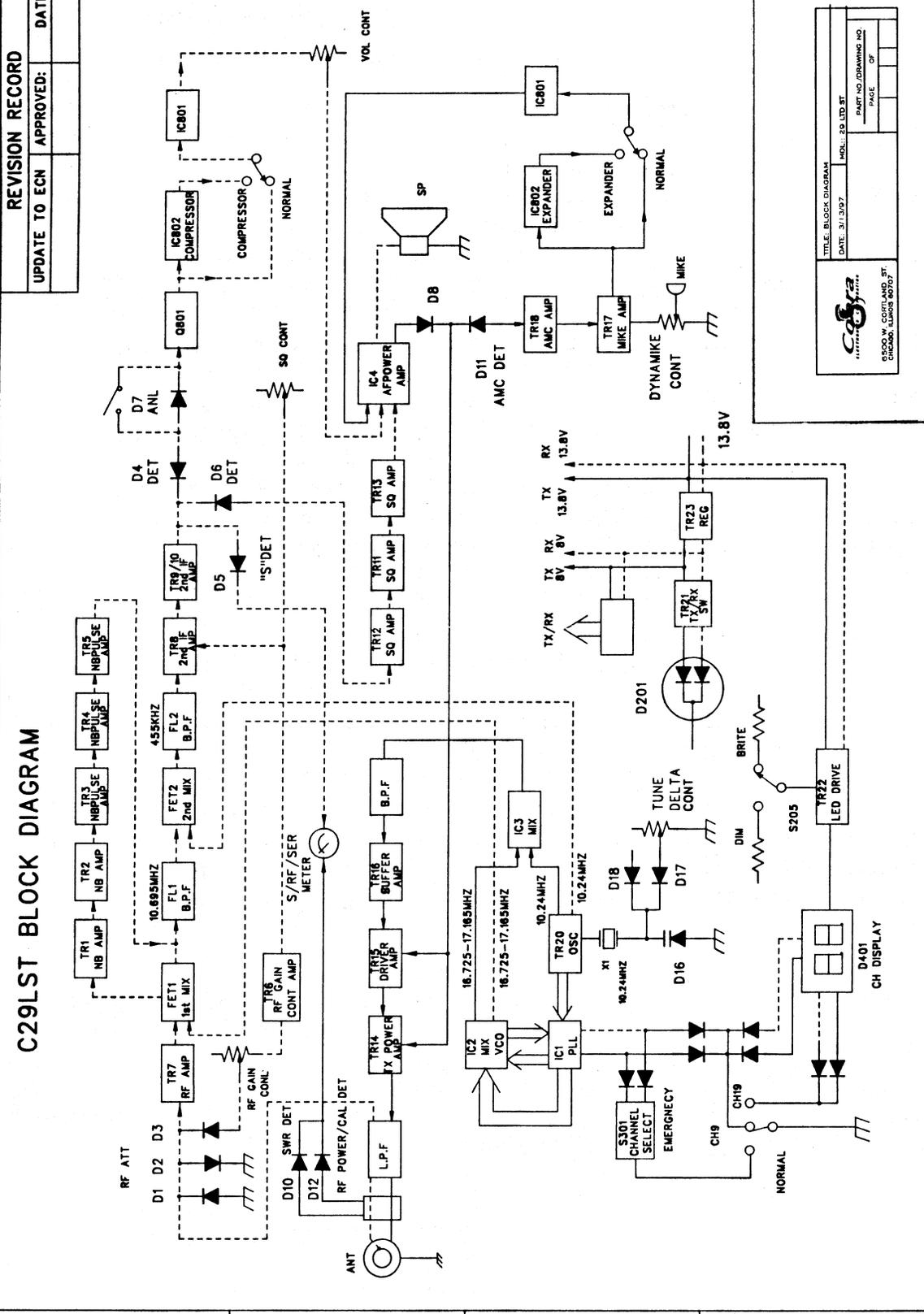
3.1 With the CB-WX switch set at WX position, the 162 MHz weather signal (frequency modulated) picked up by the antenna is magnified by Q601 and fed to the mixer Q606. In the meantime, Q602 and crystal oscillator generate a local oscillation frequency in the range of 162 MHz, also fed to Q606 for mixing. 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.

C29LST BLOCK DIAGRAM

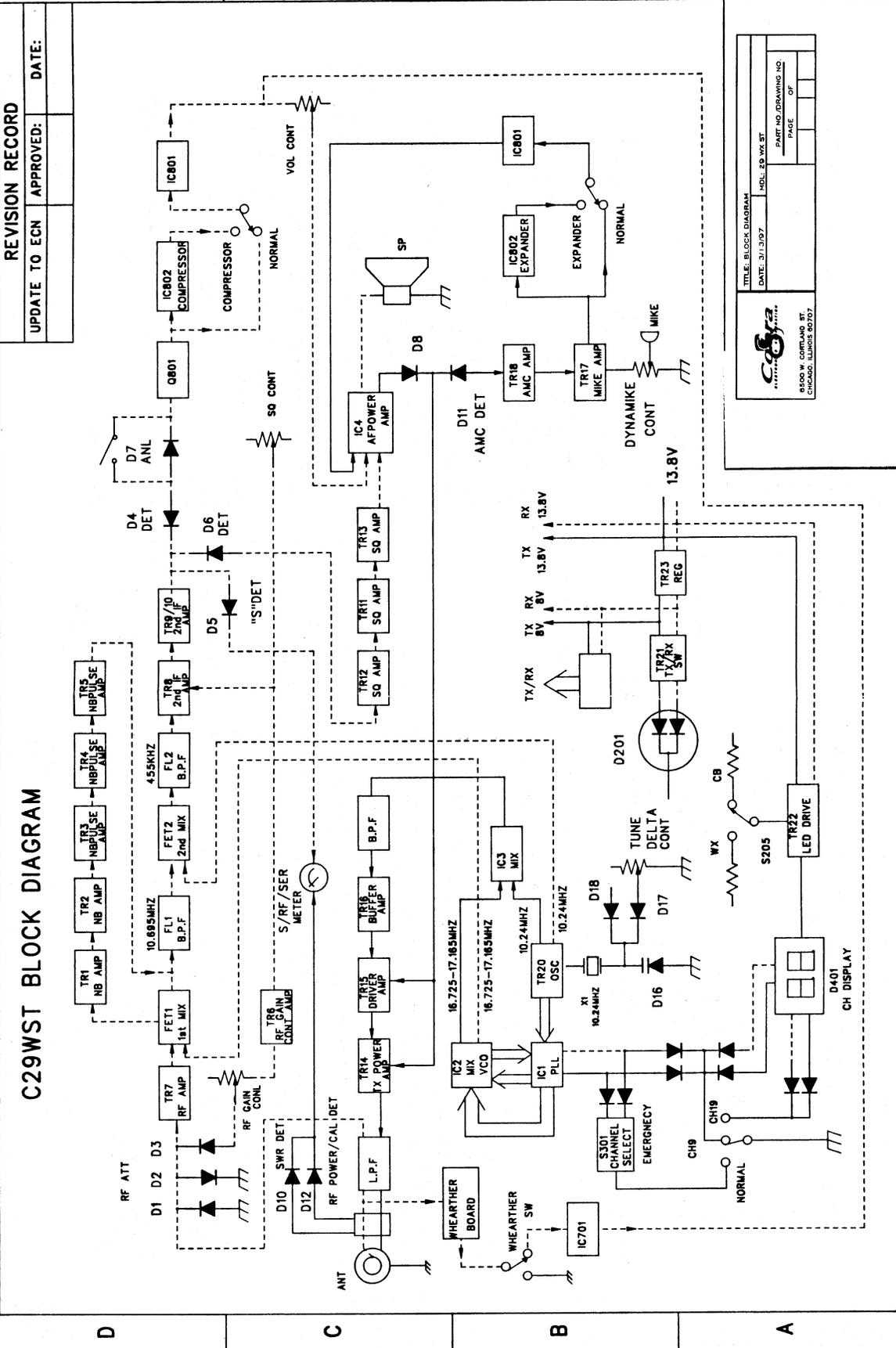
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C29WST BLOCK DIAGRAM

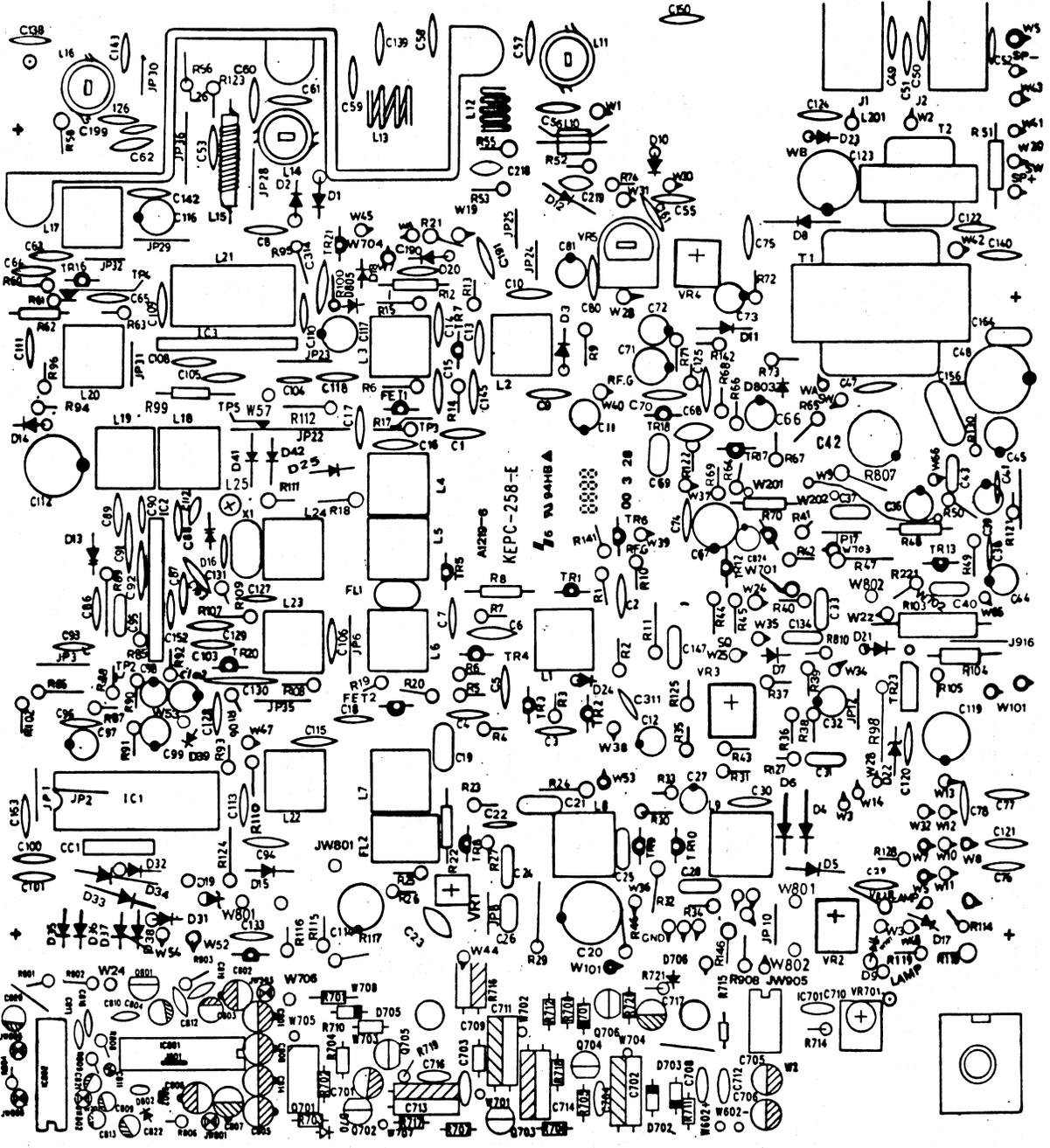
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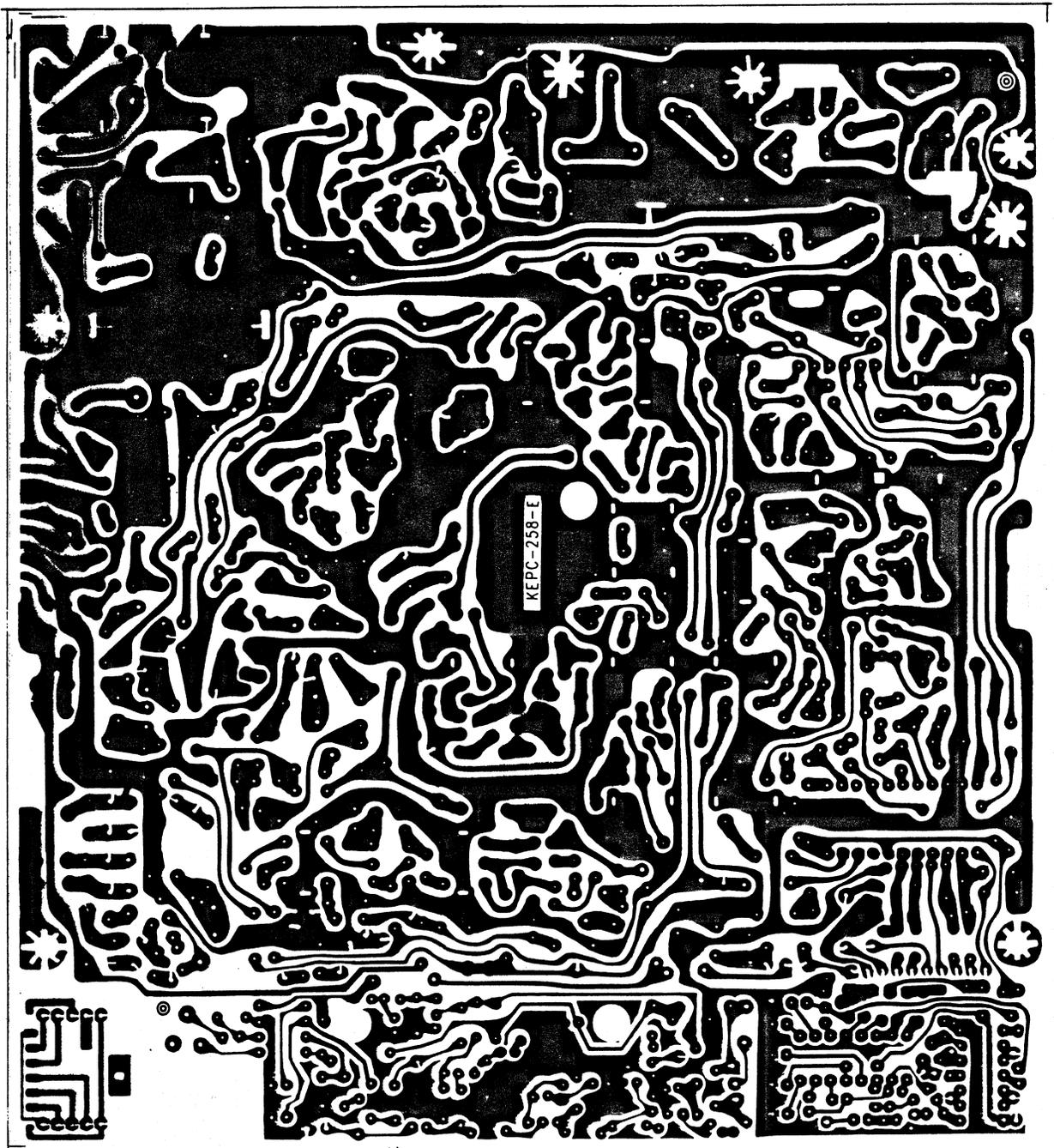


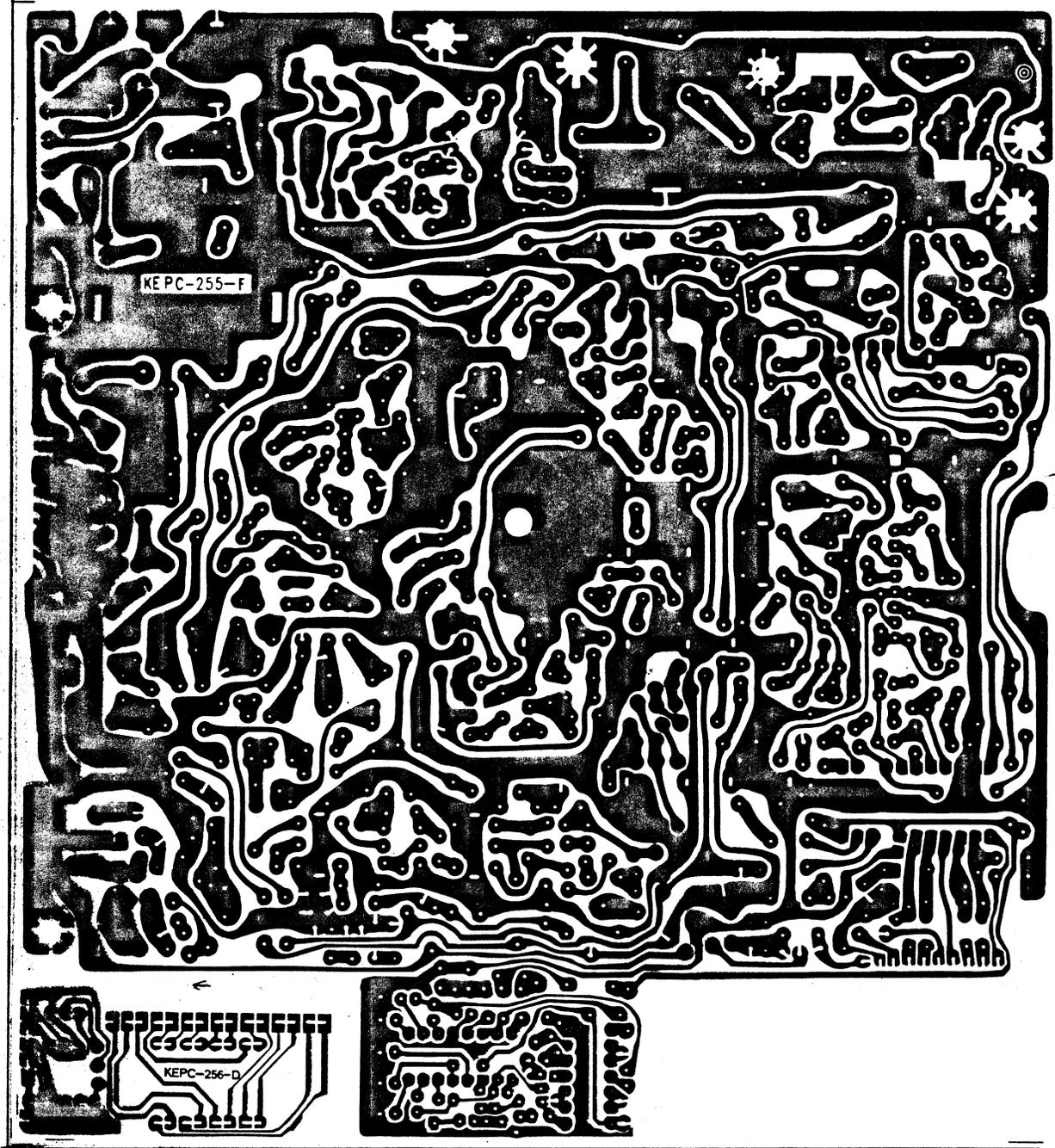
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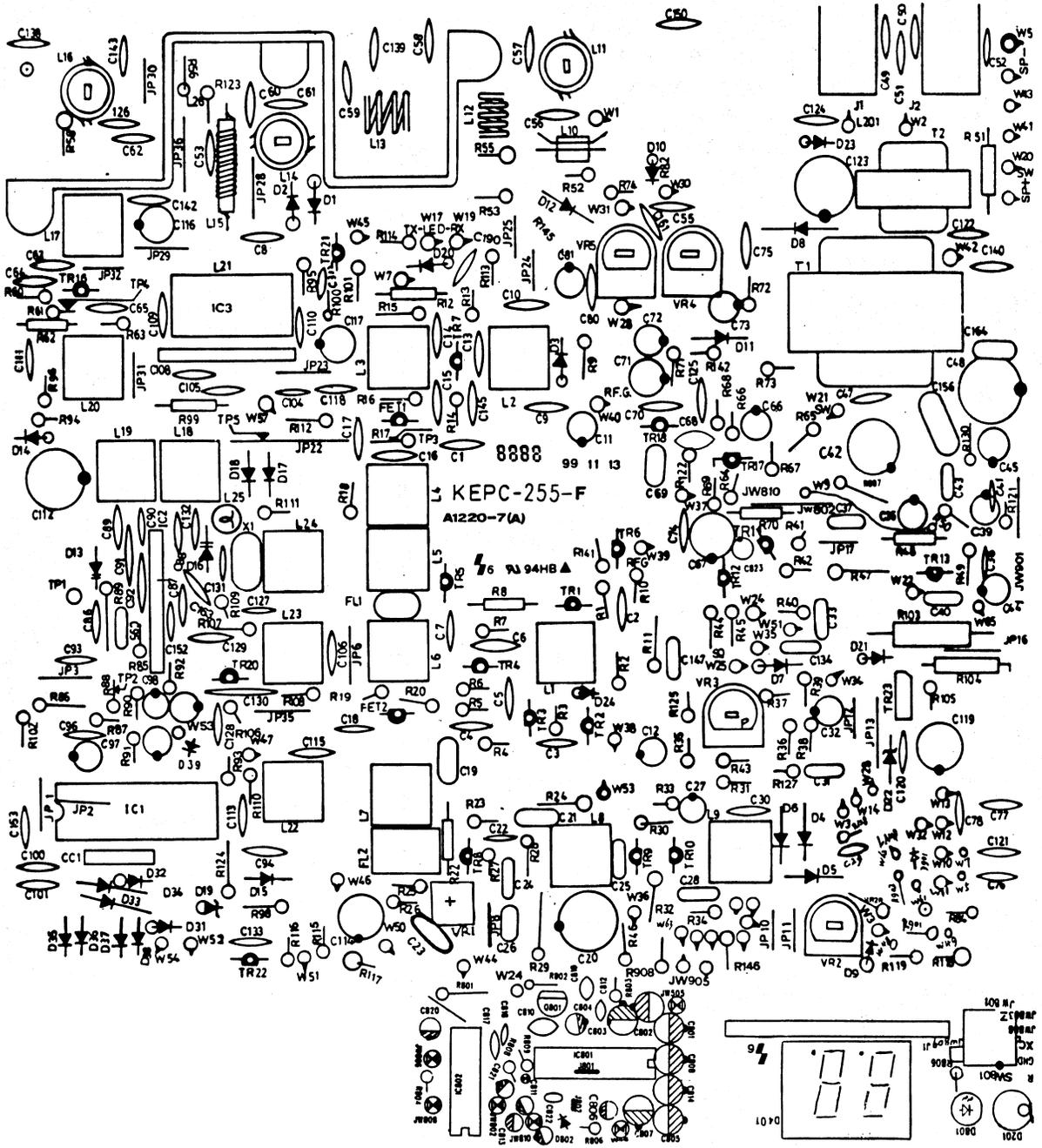
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COMMUNICATIONS SYSTEMS ASSOCIATES
CHICAGO, ILLINOIS 60677

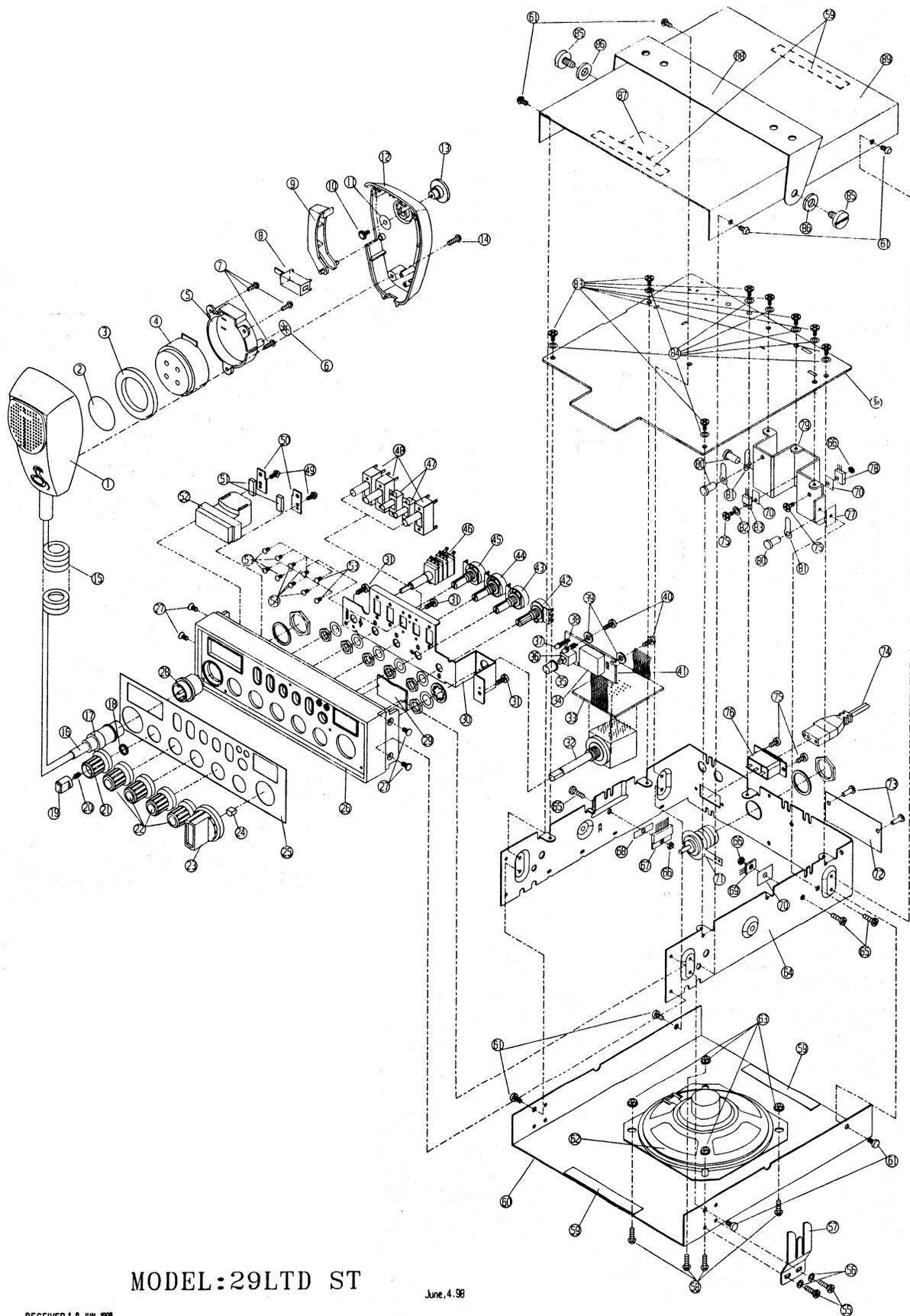
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MODEL:29LTD ST

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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

