

MAINTENANCE MANUAL
TRANSMITTER/RECEIVER/SYNTHESIZER BOARD
FOR
TMX-8615 & TMX-8630

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DESCRIPTION

The transmitter/receiver synthesizer (TRS) board for the TMX-86 Series trunked mobile radio consists of the following circuits:

- A frequency synthesizer for generating the transmitter output frequencies and the receiver 2ND IF injection frequencies
- The transmitter exciter, driver, PA and power control stages
- The receiver front end, IF and audio stages
- Voltage regulators
- System interface connectors for power on-off and volume controls, battery, microphone, TQ2310 programmer, test handset, and an optional external speaker

Operation of the TRS board is controlled by the microcomputer circuitry located on the logic board.

The TRS board is mounted at the bottom of the "U" frame chassis, under the logic board. Refer to the Table of Contents for a Block Diagram of the complete radio, and for Service Sheets with pinout information on integrated circuits and modules.

CIRCUIT ANALYSIS

POWER DISTRIBUTION

Power connections to the radio are made to system connector J23. Power from the battery (+13.6 Volts nominal) is connected to J23-11. The battery input is filtered by C201, C202, C203, L151, L152 and surge protector Z31, and is applied to relay contact K2-4. Reverse polarity protection is provided by diode CR31.

A continuous 13.6 Volt supply is taken from the junction of L51 and L52, and applied to the following circuits:

- Logic board reset/memory stage and 5-Volt regulator (A16)
- Driver module final amplifier (A11)
- PA collector bias (Q12)
- Antenna relay K1

The 13.6 Volts from the ignition switch is applied to J23-1. This input is filtered by C208 and C209, and applied to the power on-off switch on the control panel. Reverse polarity protection is provided by CR32.

Pressing in the power-on switch energizes power relay K2. Energizing the relay applies the switched 13.6 Volts to the following:

- Logic board timer A21 and 5-Volt regulators A17, A18
- PA Driver module A11
- External alarm relay drivers
- Antenna relay K1
- Voltage regulators

FREQUENCY SYNTHESIZER

The frequency synthesizer circuit consists of reference oscillator module Z1, phase-lock loop (PLL) module A5, dual modulus pre-scaler A6, charge pump Q2 and Q3, voltage-controlled oscillator (VCO) Z2, a loop filter and associated circuitry. A block diagram of the synthesizer circuit is shown in Figure 1.

Reference Oscillator Module

Reference oscillator Z1 operates at a frequency of 12.8 MHz. The oscillator is temperature compensated to provide a frequency stability of 2.5 PPM. Voltage for the oscillator is supplied by 5-Volt regulator A2. The oscillator output is applied to PLL module A5 on pin 17.

PLL Module

PLL module A5 consists of a 1024-divider, a phase detector, and a divide-by-N counter. (See Figure 2).

When the PTT switch is pressed (transmit) or released (receive), new frequency data is received on the clock, data, and enable lines and the synthesizer immediately begins generating the new RF frequency. This serial data determines the VCO frequency by setting the internal dividers. The reference oscillator frequency applied to the programmable divide-by-N counter is divided down to some lower frequency as indicated by the input data and applied to the internal phase detector.

The phase detector compares this signal with the output of the internal divide-by-N counter. The output of the divide-by-N counter is a function of the RF frequency which is divided down by the dual modulus prescaler and the divide-by-N counter. When operating on the correct frequency, the inputs to the phase detector are identical and the output voltage of the phase detector is constant. Under these conditions, the VCO is stabilized or locked on frequency.

If the compared frequencies (phases) differ, an error voltage is generated and applied to the VCO through the frequency acquisition circuit causing the phase-lock loop to acquire the new frequency. The SYNTH UNLOCK line provides the PLL lock status information to the micro-computer on the logic board. When the PLL is out of lock, the SYNTH UNLOCK lead goes low. When locked on frequency, the lead goes high.

VCO Module

The output of the PLL module at A5-12 and A5-13 are applied to a charge pump consisting of Q2 and Q3. The transistors "sum" the two outputs of A5 and apply the PLL output to a loop filter.

The loop filter consists of C26, C27, C28, R17 and R18. The filter reduces any spurious output from the phase detector, and controls the loop stability. The filter output is applied to the voltage control input of the VCO (Z2).

The charge pump output voltage changes with frequency, changing the VCO output frequency approximately 5 MHz per volt. The charge pump output is metered at TP1 with typical readings of 2.0 to 6.0 Volts.

Modulated audio from the CODEC on the logic board is applied to amplifier A7 through the DA Out lead. The gain of the amplifier stage is adjusted by switching resistors R64 through R67 in the feedback path of A7.

The AREA 0 and AREA 1 outputs from the logic board change with changes in frequency, switching one of resistors R64 through R67 in parallel with feedback resistor R50 to increase the gain as the frequency increases. This keeps the modulated signal applied to the VCO more constant over the frequency range. The output of the VCO is 806 to 825 MHz.

- NOTE

The modulation is adjusted by MOD ADJDUST potentiometer R52 on the logic board.

The modulated output of the VCO is coupled through an attenuator network and an impedance-matching circuit to the base of RF buffer-amplifier Q4. The attenuator network consists of R32, R33 and R34. The matching circuit consists of C30, L3 and R19. Bias voltage for the buffer stage is metered at TP3.

The buffer amplifier output is applied to an RF "splitter" (L5, C36 and T1) to provide drive for transmitter

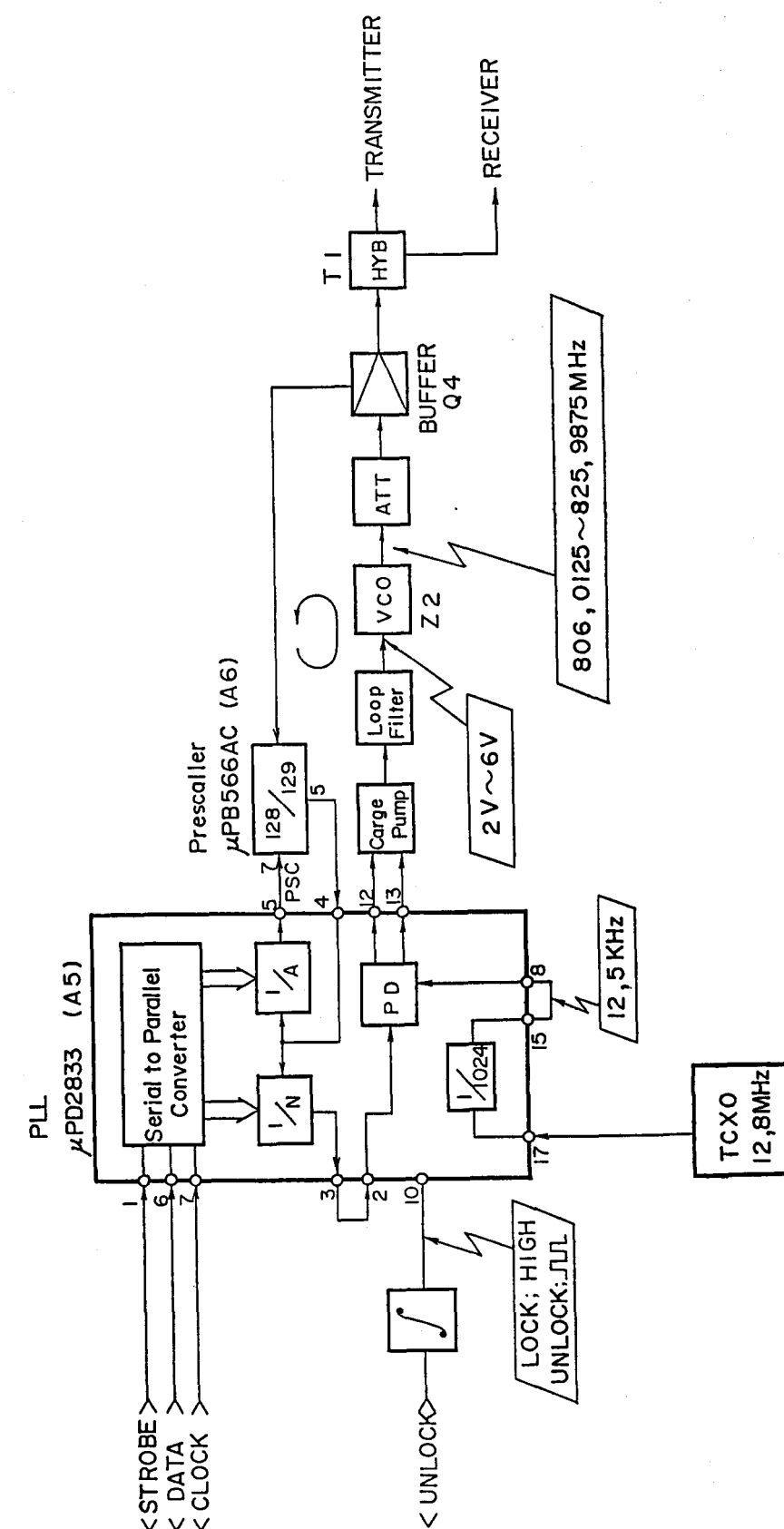


Figure 1 - Synthesizer Block Diagram

exciter module A9 and to receiver injection amplifier Q9.

TRANSMITTER

The transmitter consists of exciter module A9, driver module A11, PA transistor Q12, isolator Z15, a low-pass filter, and power control circuit. Supply voltage for the exciter is provided by a switched Tx 8-Volt regulator.

8-Volt Regulator

The 8-Volt regulator operates from the 13.6 volt ignition switch voltage. The regulator circuit consists of 8-Volt regulator A10 and Tx 8-Volt switches Q7 and Q8. Switches Q7 and Q8 are controlled by the D-PTT lead from the logic board. (See Figure 3).

When the D-PTT lead is activated, Q8 turns on. This turns on transistor switch Q7 and applies the regulator output at A10-3 to exciter module A9.

The Tx 8-Volts also powers the mobile microphone through J22-4 (MIC HI), and is applied to the test handset through J23-7. TP5 is used to meter the regulator output (typically 7.6 Volts).

Exciter

Applying the Tx 8-Volts to the exciter forward-biases diode CR5, allowing the VCO output from the RF splitter circuit to be applied to exciter input A9-1. The exciter input is coupled through an attenuator circuit (R24, R25 and R26) which provides approximately 3 dB attenuation. The RF input is amplified to provide 400 milliwatts drive to either the PA module in 15-Watt transmitters (TMX-8615) or to the driver module in 30-Watt transmitters (TMX-8630).

15-Watt Transmitters

The 15-Watt transmitter uses PA module A11 to provide the rated power output.

30 Watt Transmitter

The 30-Watt transmitter uses driver module A11 and PA transistor Q12 to provide the 30-Watt RF power output.

Driver module A11 contains three broadband, fixed-tuned amplifiers that amplify the 400 milliwatt exciter output to provide 15 Watts drive to the PA. The driver module is supplied by both the continuous and switched 13.6 Volts. The switched 13.6 Volts supply the 1st and 2nd amplifiers, and the continuous 13.6 Volts supplies the final driver stage. Final amplifier supply voltage is metered at TP12.

The 15-Watt driver output is matched to the emitter of PA transistor Q12 by C85, C87, C88 and the 50-ohm stripline (part of printed board). L28 provides an isolated DC return path for the emitter of Q12, which operates as a fixed-tuned, Class C amplifier. The continuous 13.6-Volt supply is applied to the collector of Q12 through a collector feed network consisting of L29 and associated circuitry. The 50-ohm PA output is provided by the 50-ohm stripline, C89, C90 and C95. C96 provides DC blocking in the output circuit. The PA collector voltage is metered at TP14.

The PA output is coupled through isolator module Z15 and a low-pass filter to antenna relay K1.

Antenna Relay

Antenna relay K1 is controlled by the delayed PTT output of the logic board. When the DPTT output goes high, Q26 turns on. Turning on Q26 turns off Q18, allowing Q17 to conduct and energize the relay.

PA Control Circuits

The power control circuit protects the transmitter PA from damage due to excessive output power, reflected power or temperature.

The output power control circuit allows the RF output power to be set at the rated output by R87.

If the output power of the PA increases, more RF power is rectified by CR11 and applied to A12-5. This causes the output at A12-1 to decrease, causing Q14 to conduct less. Q14 conducting less increases the base voltage on PNP pass transistor Q15, causing it to conduct less. This results in less voltage being applied to the first amplifier stage in the driver/PA stage, reducing the power output of the driver/PA in proportion to the increase in output power detected by the circuit.

To protect the PA against badly mismatched loads, a reverse power (VSWR) detector consisting of isolator Z15, diode CR12, transistor Q13, A12, Q14 and pass transistor Q15 detect reverse (reflected) power. When sufficient power is detected by CR12 to cause Q13 to conduct, this reduces the voltage at the collector of Q15, causing the driver/PA module to produce less output power, protecting the PA. The reverse power level is set by R83.

The PA is protected against temperature increases by thermal detector Z13, A12, Q14 and Q15.

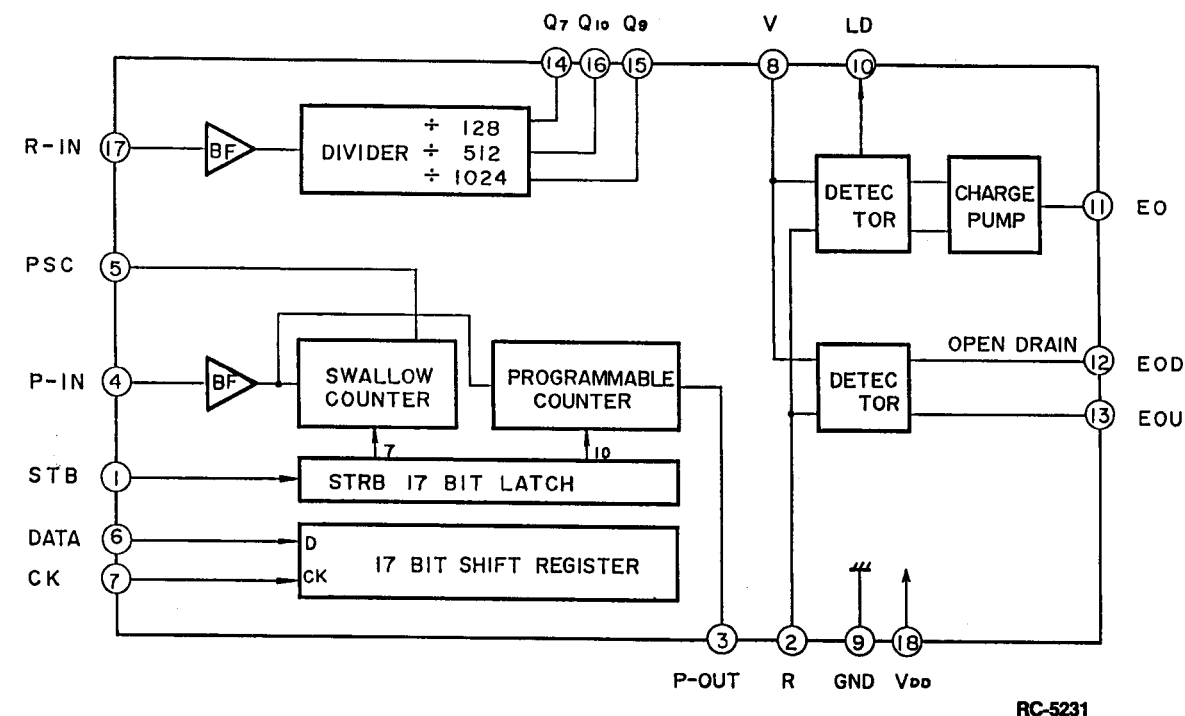


Figure 2 - PLL Module Simplified Diagram

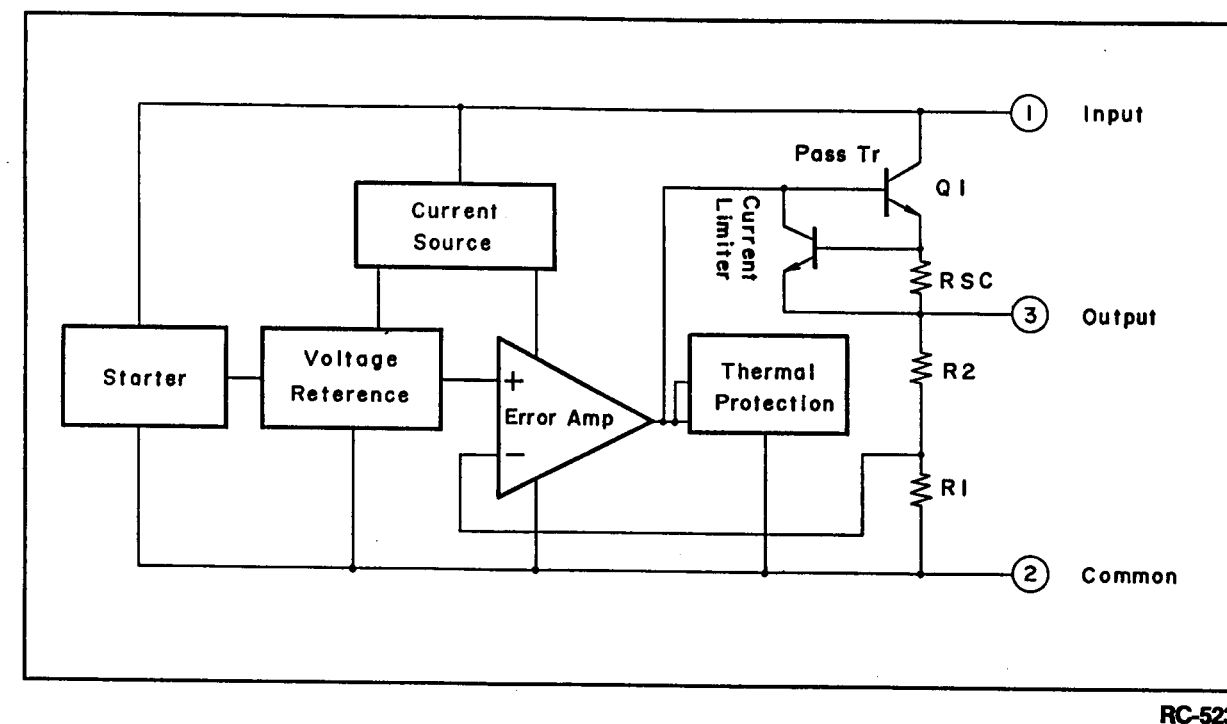


Figure 3 - 8-Volt Regulator Simplified Diagram

As the temperature increases, the resistance to ground of thermal detector Z13 decreases. This causes Q15 to conduct less, causing a decrease in the PA output until the temperature is reduced. The temperature level is set by R97.

Instructions for setting R83, R87 and R97 are provided in the Transmitter Alignment Procedure.

RECEIVER

The receiver is a dual conversion, superheterodyne FM receiver for operation in the 851 to 870 MHz range. A regulated 9-Volt supply is used for all receiver stages except for audio PA module A26. The audio PA module operates off of the 13.6 Volt switched supply.

The receiver uses intermediate frequencies of 45.000 MHz and 455 kHz. Adjacent channel selectivity is obtained by using two bandpass filters: a 45.000 MHz crystal filter and a 455 kHz ceramic filter.

All receiver circuitry is mounted on the transmitter/receiver/synthesizer (TRS) board. The receiver consists of:

- Receiver Front End and First Mixer
- 45.000 MHz First IF Circuitry
- Second Oscillator
- 455 kHz Second IF Circuitry with FM Detector
- Audio PA Circuit

All squelch functions are performed by the logic board circuitry.

Receiver Front End

RF from the antenna is coupled through dielectric filter (FL2) to the base of RF amplifier Q21. Q21 is a Class A, common emitter amplifier that provides a gain of approximately 10 dB to 12 dB. The amplified output is coupled through dielectric filter (FL3) to the first mixer. The two dielectric filters provide the front end selectivity.

First Mixer

The first mixer is a double-balanced diode mixer that converts a signal in the 851 MHz - 870 MHz range to the 45.000 MHz first IF frequency.

RF from the front end dielectric filter is coupled to mixer directly. The

standard low side injection input from the synthesizer is coupled through an attenuator (R44, R45 and R46) to 1st mixer Z21. The injection input port is isolated from the RF input and IF output by a balancing transformer in the mixer.

The first mixer output is coupled through a tuned circuit (L42, C138 and C139) that matches the mixer output to gate of first IF amplifier Q22.

First IF Amplifier and Filter

IF Amplifier Q22 is a single gate FET that provides good intermodulation and desensitization characteristics. The amplifier also acts as a buffer between the variable balanced mixer output impedance and the crystal filter.

The IF output signal at the drain of Q22 is coupled through a tuned circuit (L43 and C143) that sets the impedance to crystal filter FL5.

FL5 is a 45.000 MHz, four-pole crystal filter that provides a minimum of 25 dB adjacent channel rejection. The filter output is coupled through a tuned circuit (L44 and C146) that matches the output impedance of FL5 to the second IF amplifier.

Second IF AMPL

The output of filter FL5 is applied to base of 2nd IF Amplifier Q23 and the output is taken from the collector. The amplifier provides approximately 20 dB of IF gain. The output of Q23 is coupled through C150 to the input of 2nd Mixer/Detector A21.

Second Osc/Mixer and Detector

The second oscillator, mixer and detector circuit consists of A21 and associated circuitry. The 2nd oscillator operates at 44.545 MHz. The oscillator crystal is Y1. The 45.000 MHz input frequency is mixed with the oscillator frequency to provide the second IF frequency of 455 kHz. L46 is used to set the 2nd oscillator frequency. The 2nd oscillator circuit can be metered at TP22. (See Figure 4).

The output of the 2nd mixer at A21-5 is coupled through ceramic filter FL6 which provides the 455 kHz selectivity. The filter output is then applied to A21-7.

Following filter FL6 is a 455 kHz limiter and a quadrature FM detector. L47 is used to tune the detector output. The circuit is metered at TP25. The detector output is applied to amplifier A23.

Audio Circuits

The output at A23-2 is coupled through C168 to the CODEC IC on the logic board. The CODEC converts the analog audio to a serial format and applied to a digital signal processor on the logic board. The signal processor provides the busy tone notching, tone detection and alert tone generation to alert the operator. The processor output is applied to the CODEC for processing, and then applied to the TRS board (RX AUDIO) and to active high pass filters A23 and A25. R165 and C170 in the feedback loop of A23 provide the receiver de-emphasis. The filter output is then coupled through the volume control on the control panel and then to audio PA stage A26. Audio amplifier IC A26 drives the speaker at the desired audio level. The feedback loop containing R190, R191 and C179 determines the amplifier closed loop gain.

Rx Mute Circuit

Receiver muting is controlled by the Rx Mute output from the logic board. A

high output from the RX Mute lead turns on Q30, which turns on Q29. Turning on Q29 turns off audio PA A26, muting the receiver.

Handset 9-Volt Regulator

A 9-Volt regulator (A31) is supplied from the switched 13.6 Volt input to the TRS board. The regulator output is used to provide power for the test handset when servicing the TRS board.

Alarm Relay Control

The external relay control circuit is controlled by the EXT ALARM output from the logic board. The circuit includes Q31 and Q32.

The EXT ALARM output from the logic board is normally high, keeping Q31 on and Q32 off. When an alarm condition exists, the EXT ALARM output goes low, turning off Q31. This allows Q32 to turn on, supplying the ground return for the customer supplied relay. Current required to operate the relay should not exceed 250 milliamperes.

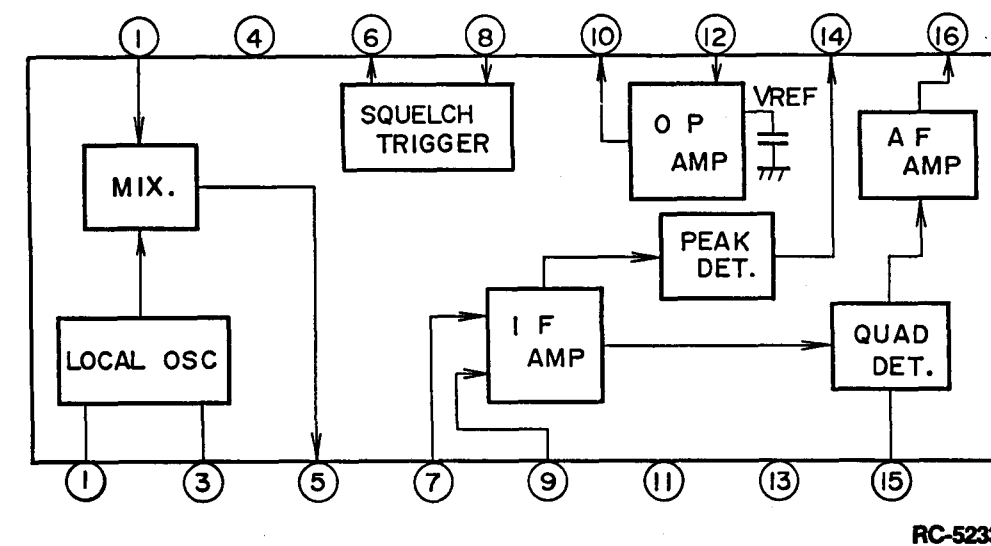


Figure 4 - 2nd Osc/Mixer and Detector Diagram

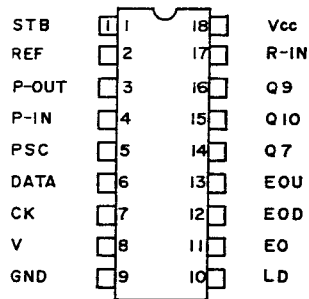
GENERAL ELECTRIC COMPANY • MOBILE COMMUNICATIONS DIVISION
WORLD HEADQUARTERS • LYNCHBURG, VIRGINIA 24502 U.S.A.

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U.S.A.

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PLL MODULE
A5

PIN CONFIGURATION



(TOP VIEW)

PLL
A5

PIN ASSIGNMENT

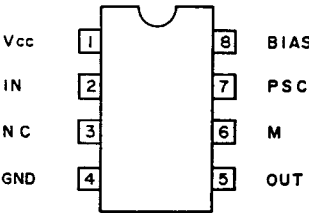
PIN NO.	NAME	FUNCTION
1	STB	STROBE INPUT PIN FOR 17 BITS LATCH TO SPECIFY "N" VALUE
2	REF	REFERENCE SIGNAL INPUT
3	P-OUT	OUTPUT PIN OF PROGRAMMABLE DIVIDER
4	P-IN	INPUT PIN OF PROGRAMMABLE DIVIDER
5	PSC	*PRESCALER CONTROL OUTPUT CONTINUOUS
6	DATA	DATA INPUT PIN OF 17 BIT SHIFT RESISTOR
7	CK	CLICK INPUT PIN OF 17 BIT SHIFT RESISTOR
8	V	VARIABLE INPUT OF PHASE COMPARATOR.
9	GND	GND
10	LD	*LOCK DETECTOR, HIGH =LOCK
11	EO	PHASE COMPARATOR OUTPUT
12	EOD	* PHASE COMPARATOR OUTPUT
13	EOU	* PHASE COMPARATOR OUTPUT
14	Q7	REF. FREQUENCY DIVIDER OUTPUT 128
15	Q10	REF. FREQUENCY DIVIDER OUTPUT 1024
16	Q9	REF. FREQUENCY DIVIDER OUTPUT 512
17	R-IN	RF. FREQUENCY DIVIDER OUTPUT 1V P-P
18	VDD	SUPPLY VOLTAGE (+5V)

* PIN NO. 5 PRESCALER CONTROL OUTPUT, N = HIGH, (N+1)=LOW
* PIN NO. 10 LOCK DETECTOR, HIGH OUTPUT, LOCKED, PULSED OUTPUT, NOT LOCKED
* PIN NO. 12 PHASE COMPARATOR OUTPUT FOR EXTERNAL CHARGE PUMP, NCH OPEN DRAIN
* PIN NO. 13 PHASE COMPARATOR OUTPUT FOR EXTERNAL CHARGE PUMP, CMOS OUTPUT.

SERVICE SHEET

INTEGRATED CIRCUITS

DUAL MODULUS PRESCALER
A6

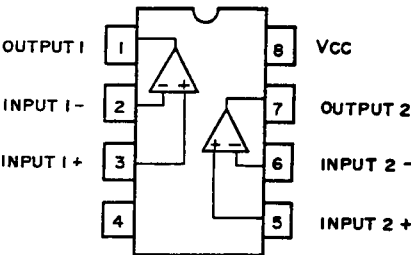


(TOP VIEW)

PIN

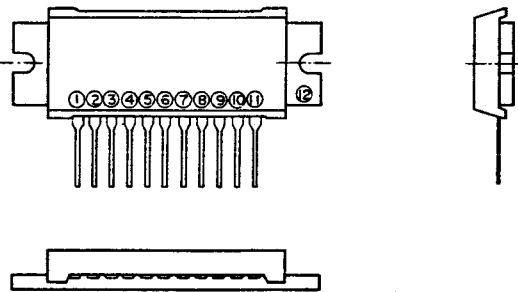
- 1 Vcc POWER SUPPLY
- 2 IN SIGNAL INPUT
- 3 - NO CONNECTION
- 4 GND GROUND
- 5 OUT SIGNAL OUT
- 6 M DIVISION RADIO CONTROL (Vcc 64/65, OPEN 128/129)
- 7 PSC MODULUS CONTROL INPUT
- 8 BIAS REFERENCE BIAS INPUT

OP - AMPS
A23/A25



TOP VIEW

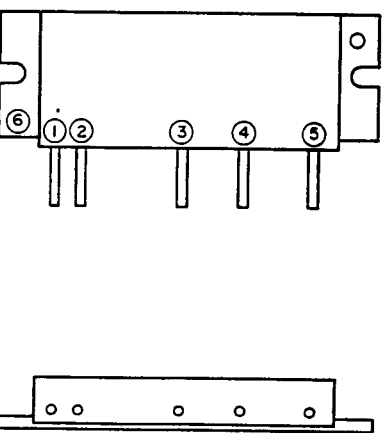
EXCITER
A9



PIN

- 1 INPUT TERMINAL
- 2-4 GND
- 5 1st STAGE DC SUPPLY TERMINAL
- 6-8 GND
- 9 FINAL STAGE DC SUPPLY TERMINAL
- 10 GND
- 11 OUTPUT TERMINAL
- 12 FIN (GND)

DRIVER
A11

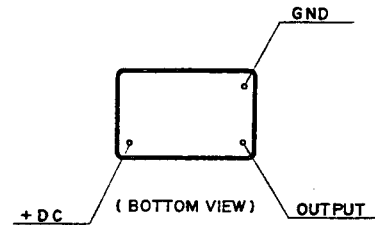
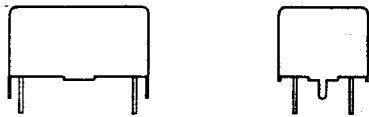


PIN

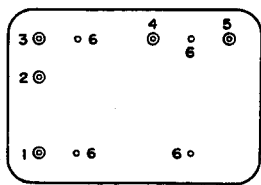
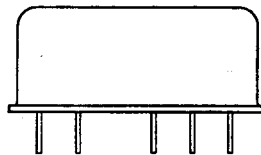
- 1 INPUT TERMINAL
- 2 1st STAGE DC SUPPLY TERMINAL
- 3 2nd STAGE DC SUPPLY TERMINAL
- 4 FINAL STAGE DC SUPPLY TERMINAL
- 5 OUTPUT TERMINAL
- 6 FIN (GROUND)

OSCILLATORS

12.8MHz TCXO
Z1



VCO
Z2

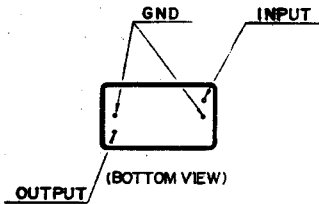
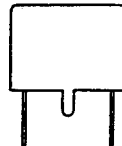


(VOTTOM VIEW)

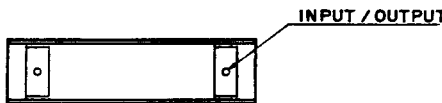
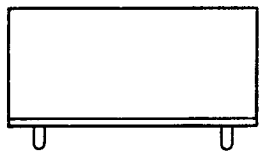
- PIN
- 1. CONTROL VOLTAGE
 - 2. MOD INPUT
 - 3. Vcc
 - 4. Vcc
 - 5. OUTPUT
 - 6. GND

FILTERS

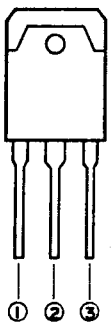
4-POLE QUARTZ FILTER
FL5



DIELECTRIC FILTER
FL3

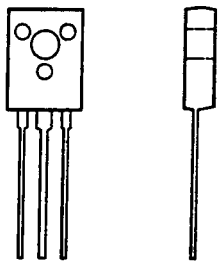


5-VOLT REGULATOR
A1



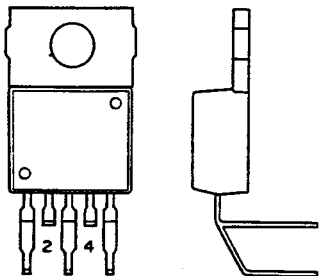
- PIN
- 1 GND
 - 2 OUTPUT
 - 3 INPUT

5- & 9-VOLT REGULATOR
A2,A3,A4



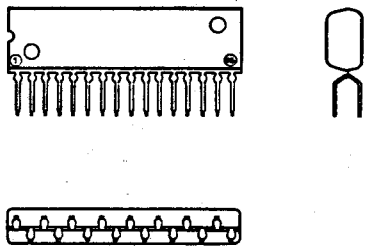
- PIN
- 1 INPUT
 - 2 COMMON
 - 3 OUTPUT

AUDIO PA
A26

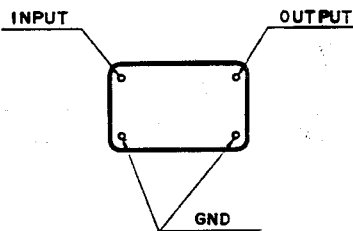
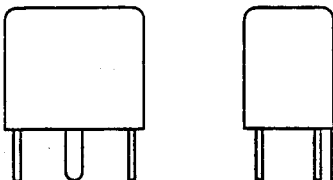


- PIN
- 1 INPUT
 - 2 NFB
 - 3 GND
 - 4 OUTPUT
 - 5 Vc

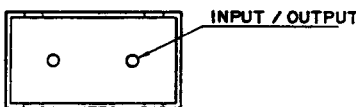
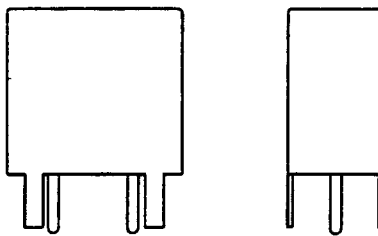
MIXER-IF-DETECTOR
A21



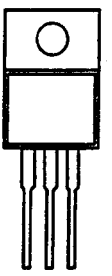
CERAMIC FILTER
FL6



DIELECTRIC FILTER
FL2

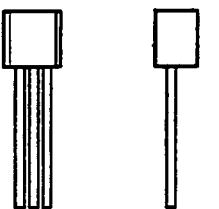


9-VOLT REGULATOR
A4



- PIN
- 1 INPUT
 - 2 COMMON
 - 3 OUTPUT

9-VOLT REGULATOR
A31



- PIN
- 1 INPUT
 - 2 OUTPUT
 - 3 COMMON

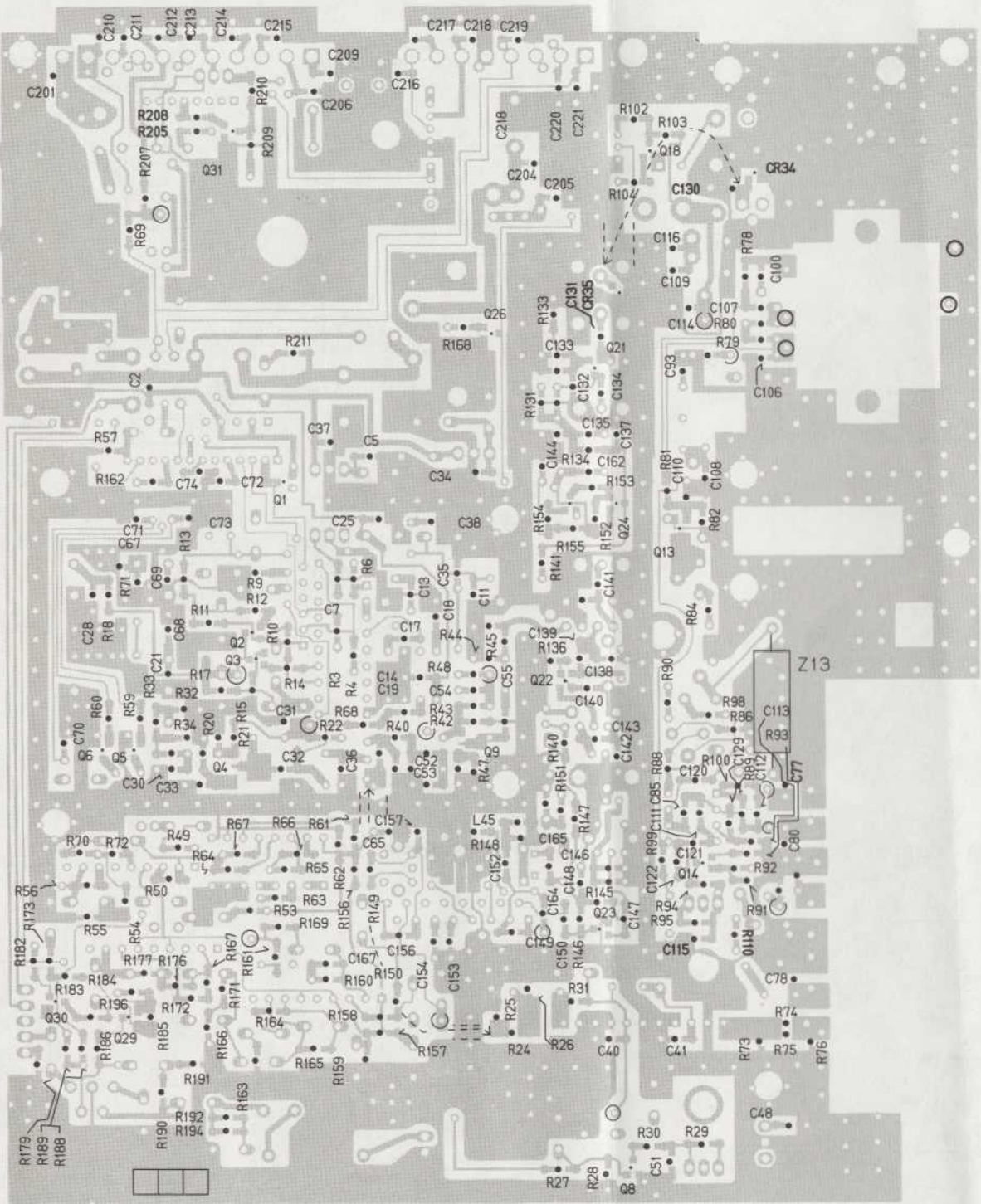
RC5235

SERVICE SHEET

INTEGRATED CIRCUITS

Issue 1

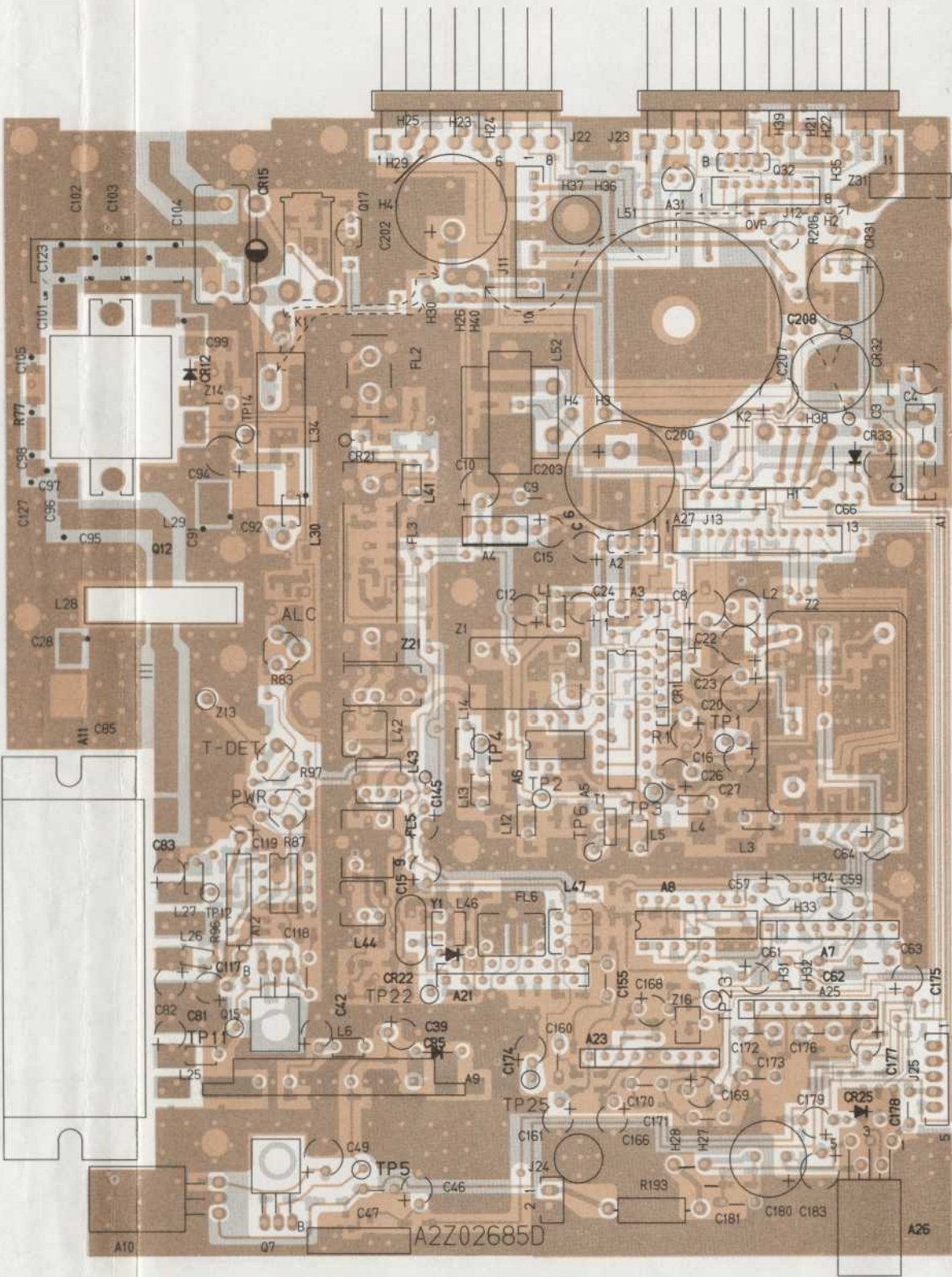
11



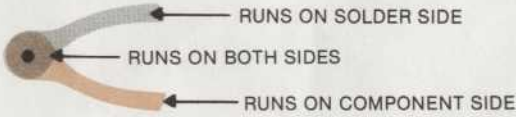
(A2Z02685D, SB)
(A2Z02685D, TB)

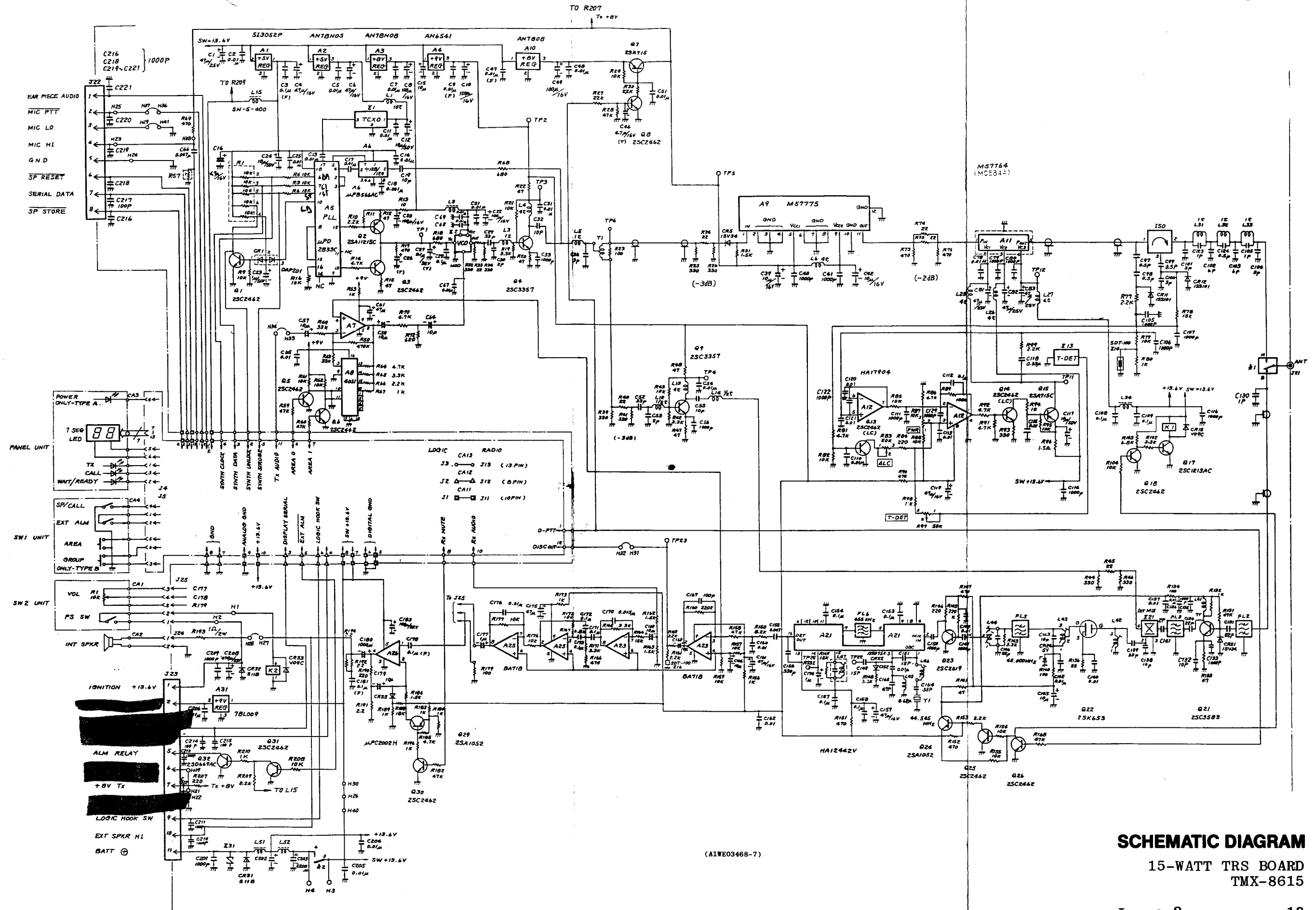
OUTLINE DIAGRAM

TRS BOARD-FOR TMX 8415



(A2Z02685D, SA)
(A2Z02685D, TA)
(A2Z02685D, TB)



**SCHEMATIC DIAGRAM**15-WATT TRS BOARD
TMX-8615

SCHEMATIC DIAGRAM

30-WATT TRS BOARD

PARTS LIST

TRANSMIT/RECEIVE/SYNTHESIZER
BOARD
ISSUE 3

SYMBOL	PART NO.	DESCRIPTION
----- INTEGRATED CIRCUITS -----		
A1	KEC/2AAE033243	VTG-REG SI3052P
A2	KEC/2AAE049146	VTG-REG AN78N05
A3	KEC/2AAE049153	VTG-REG AN78N08
A4	KEC/2AAE049041	VTG-REG AN6541
A5	KEC/2AAH025048	upD2833C
A6	KEC/2AAH025055	upB566AC
A7	KEC/2AAB020011	BA718
A8	KEC/2ABC038022	TC4051
A9	KEC/2AAA013070	M57775
A10	KEC/2AAE049038	VTG-REG AN7808
A11	KEC/2AAA013088	M57764
A12	KEC/2AAB005145	HA17904GS
A21	KEC/2AAJ008089	HA12442V
A23	KEC/2AAB020011	BA718
A25	KEC/2AAB020011	BA718
A26	KEC/2AAJ009073	upC2002H
A27	KEC/2AAE050037	KLH5539
A31	KEC/2AAE049108	VTG-REG AN78L09
----- CAPACITORS -----		
C1	KEC/2CBJ001254	Fixed elect A1 KME25VB 47 uF ±20%
C2	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C3	KEC/2CDC001012	Fixed film, ECQ-V1H104JZ 0.1 uF ±5%, 50V.
C4	KEC/2CCF003088	Fixed, tantalum 204M1602-475MC
C5	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C6	KEC/2CBJ001239	Fixed elect A1 KME16VB 47 uF ±20%
C7	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C8	KEC/2CBB042132	Fixed elect A1 KME16VB 100 uF ±20%
C9	KEC/2CDC001038	Fixed film, ECQ-B1H103HZ 0.01 uF ±5%, 50V.
C10	KEC/2CBB042132	Fixed elect A1 KME16VB 100 uF ±20%
C11	KEC/2CAK005391	Ceramic Chip, 0.01 uF ±10%, 50V.
C12	KEC/2CBJ001221	Fixed elect A1 KME50VB 10 uF ±20%
C13 and C14	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C15	KEC/2CBJ001221	Fixed elect A1 KME50VB 10 uF ±20%
C16	KEC/2CCF001470	Fixed, tantalum, 204M1602-475MB 4.7 uF ±20%
C17	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50 V.
C18	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C19	KEC/2CAK005110	Ceramic chip, 10 pF CH ±0.5 pF, 50V.
C20	KEC/2CBB042132	Fixed elect A1 KME16VB 100 uF ±20%
C21	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C22	KEC/2CBB042132	Fixed elect A1 KME16VB 100 uF ±20%
C23	KEC/2CBJ001213	Fixed elect A1 KME50VB 1 uF ±20%
C24	KEC/2CBJ001221	Fixed elect A1 KME50VB 10 uF ±20%
C25	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C26	KEC/2CCF001470	Fixed tantalum 204M1602-475MB ±20%
C27	KEC/2CCF001496	Fixed tantalum 204M3502-104MB ±20%

SYMBOL	PART NO.	DESCRIPTION
C28	KEC/2CAK005508	Ceramic chip, 0.1 uF +80/-20%, 50V.
C29	KEC/2CAK005169	Ceramic chip, 33 pF ±5%, 50V.
C30	KEC/2CAK005045	Ceramic chip, 2 pF CK ±0.25 pF, 50V.
C31	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C32	KEC/2CAK005110	Ceramic chip, 10 pF CH ±0.5 pF, 50V.
C33	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C34	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%
C35	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C36	KEC/2CAK005052	Ceramic chip, 3 pF CJ ±0.25 pF, 50V.
C37 and C38	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V
C39	KEC/2CBB042124	Fixed elect A1 KME16VB 10 uF ±20%.
C40 and C41	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C42	KEC/2CBB042124	Fixed elect A1 KME16VB 10 uF ±20%.
C43	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C46	KEC/2CCF001470	Fixed tantalum, 204M1602-475MB, 4.7 uF ±20%.
C47	KEC/2CDC001061	Fixed film, ECQ-B1H103JZ, 0.01 uF ±5%, 50V.
C48	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C49	KEC/2CBB042132	Fixed elect, A1 KME16VB, 100 uF ±20%
C51	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10% 50V.
C52	KEC/2CAK005169	Ceramic chip, 33 pF CH ±5%, 50V.
C53	KEC/2CAK005045	Ceramic chip, 2 pF CK ±0.25 pF, 50V.
C54	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C55	KEC/2CAK005185	Ceramic chip, 10 pF RH ±0.5 pF, 50V.
C56	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C57	KEC/2CBJ001221	Fixed elect, A1 KME50VB, 10 uF ±20%
C59	KEC/2CAJ001221	Fixed elect, A1 KME50VB, 10 uF ±20%
C61	KEC/2CBB001239	Fixed elect, A1 KME16VB, 47 uF ±20%
C64	KEC/2CBJ001221	Fixed elect, A1 KME50VB, 10 uF ±20%
C65	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C66	KEC/2CDC001129	Fixed film, ECQ-1VH473JZ, 0.047 uF ±5%, 50V.
C67 thru C69	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C70 and C71	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%, 50V.
C72	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C73	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%, 50V.
C74	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C75	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%, 50V.
C76 and C77	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V
C78	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C79 and C80	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C81	KEC/2CCC032023	Fixed tantalum, 204M2502-476M, ±20%
C82 and C83	KEC/2CBJ001019	Fixed elect A1 KME25VB 47 uF ±20%
C85	KEC/2CGB001230	Air Variable, A11-5, 5 pF
C87 and C88	KEC/2CFA098102	Mica chip, UC232H0100C, 10 pF ±0.25 pF, 500V.
C89A	KEC/2CFA098110	Mica chip, UC232H0220F, 22 pF ±1%, 500V
C89B	KEC/2CFA098086	Mica chip, UC232H0050C, 5 pF ±0.25 pF, 500V
C90	KEC/2CFA098110	Mica chip, UC232H0220F, 22 pF ±1%, 500V

SYMBOL	PART NO.	DESCRIPTION
C91	KEC/2CAK005110	Ceramic chip, 10 pF CH ±0.5 pF, 50V.
C92	KEC/2CAK005136	Ceramic chip, 15 pF CH ±0.5 pF, 50V.
C93	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C94	KEC/2CBB043163	Fixed elect A1 KME25VB, 100 uF ±20%.
C95	KEC/2CGB001230	Air Variable, A11-5, 5 pF
C96	KEC/2CFA098110	Mica chip, UC232H0220F, 22 pF ±1%, 500V.
C97 thru C99	KEC/2CAK005011	Ceramic chip, 0.5 pF CK ±0.25 pF, 50V.
C100	KEC/2CAK005052	Ceramic chip, 3 pF CJ ±0.25 pF, 50V.
C101 thru C104	KEC/2CFA098080	Mica chip, UC232H0030C, 3 pF ±0.25 pF, 500V.
C105 thru C107	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C108 and C109	KEC/2CAK005508	Ceramic chip, 0.1 uF +80/-20%, 50V.
C110	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C111	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C112	KEC/2CAK005508	Ceramic chip, 0.1 uF +80/-20%, 50V.
C113	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C114	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C115	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C116	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C117	KEC/2CBJ001221	Fixed elect A1 KME50VB 10 uF ±20%
C118	KEC/2CDC001158	Fixed film, ECQ-V1H334JZ, 0.33 uF ±5%, 50V.
C119	KEC/2CBB001239	Fixed elect A1 KME16VB 47 uF ±20%
C120 and C121	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C122	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V
C123	KEC/2CFA098094	Mica chip, UC232H01R5C, 1.5 pF ±0.25 pF, 500V.
C124	KEC/2CFA098151	Mica chip, UC232H00R5C, 0.5 pF ±0.25 pF, 500V.
C125	KEC/2CFA098094	Mica chip, UC232H01R5C, 1.5 pF ±0.25 pF, 500V.
C126	KEC/2CAK005029	Ceramic chip, 1 pF CK ±0.25 pF, 50V
C127	KEC/2CCF001496	Fixed tantalum 204M3502-104MB, 0.1 uF ±20%
C129	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V
C130	KEC/2CAK005029	Ceramic chip, 1 pF CK ±0.25 pF, 50V
C131	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%, 50V
C132	KEC/2CAK005115	Ceramic chip, 10 pF CH ±5%, 50V
C133	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C134	KEC/2CAK005151	Ceramic chip, 22 pF CH ±5%, 50V.
C135	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C136 and C137	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C138	KEC/2CAK005185	Ceramic chip, 10 pF RH ±0.5 pF, 50V.
C139	KEC/2CAK005227	Ceramic chip, 33 pF RH ±5%, 50V.
C140	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C141	KEC/2CAK005040	Ceramic chip, 2 pF CK ±0.25 pF, 50V.
C142	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.
C143	KEC/2CAK005185	Ceramic chip, 10 pF RH ±0.5 pF, 50V.
C144	KEC/2CAK005383	Ceramic ship, 1000 pF ±10%, 50V
C145	KEC/2CBJ001221	Fixed elect A1 KME50VB, 10 uF ±20%
C146	KEC/2CAK005201	Ceramic chip, 22 pF RH ±5%, 50V.
C147	KEC/2CAK005383	Ceramic chip, 1000 pF ±10%, 50V.
C148	KEC/2CAK005391	Ceramic chip, 0.01 uF ±10%, 50V.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

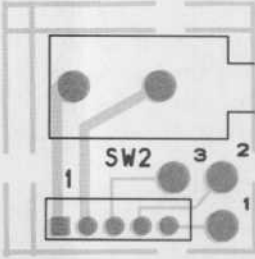
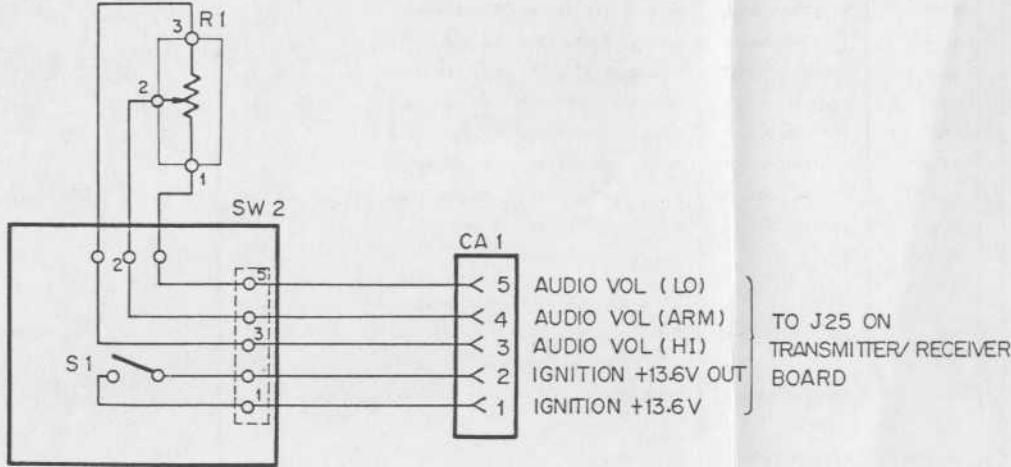
SYMBOL	PART NO.	DESCRIPTION
C149	KEC/2CAK005193	Ceramic chip, 15 pF RH $\pm 10\%$, 50V.
C150	KEC/2CAK005383	Ceramic chip, 1000 pF $\pm 10\%$, 50V.
C151	KEC/2CAK005193	Ceramic chip, 15 pF RH $\pm 5\%$, 50V.
C152	KEC/2CAK005391	Ceramic chip, 0.01 uF $\pm 10\%$, 50V.
C153 and C154	KEC/2CAK005508	Ceramic chip, 0.01 uF $\pm 80/-20\%$, 50V.
C155	KEC/2CDC001129	Fixed film, ECQ-V1H473JZ, 0.047 uF $\pm 5\%$, 50V.
C156	KEC/2CAK005284	Ceramic chip, 330 pF RH $\pm 5\%$, 50V.
C157 and C158	KEC/2CAK005508	Ceramic chip, 0.1 uF $\pm 80/-20\%$, 50V.
C159	KEC/2CBB01239	Fixed elect A1 KME16VB, 47 uF $\pm 20\%$
C160	KEC/2CDC001061	Fixed film, ECQ-B1H013JZ, 0.01 uF $\pm 5\%$, 50V.
C161	KEC/2CBB001239	Fixed elect A1 KME16VB, 47 uF, $\pm 20\%$
C162	KEC/2CAK005391	Ceramic chip, 0.01 uF $\pm 10\%$, 50V.
C164	KEC/2CAK005227	Ceramic chip, 33 pF RH $\pm 5\%$, 50V.
C165	KEC/2CAK005235	Ceramic chip, 47 pF RH $\pm 5\%$, 50V.
C166	KEC/2CBJ001221	Fixed elect A1 KME50VB, 10 uF $\pm 20\%$
C167	KEC/2CAK005250	Ceramic chip, 100 pF RH $\pm 5\%$, 50V.
C168 and C169	KEC/2CBJ001221	Fixed elect A1 KME50VB, 10 uF $\pm 20\%$
C170	KEC/2CDC001141	Fixed film, ECQ-B1H153JZ, 0.015 uF.
C171 thru C173	KEC/2CDC001012	Fixed film, ECQ-V1H104JZ, 0.1 uF $\pm 5\%$, 50V.
C174	KEC/2CBJ001213	Fixed elect A1 KME50VB, 1 uF $\pm 20\%$
C175	KEC/2CBB001239	Fixed elect A1 KME16VB, 47 uF $\pm 20\%$
C176	KEC/2CDC001061	Fixed film, ECQ-B1H103JZ, 0.01 uF $\pm 5\%$, 50V
C177	KEC/2CBJ001213	Fixed elect A1 KME50VB, 1 uF $\pm 20\%$
C178	KEC/2CDC001012	Fixed film, ECQ-V1H104JZ, 0.1 uF $\pm 5\%$, 50V.
C179	KEC/2CBJ001221	Fixed elect, A1 KME50VB, 10 uF $\pm 20\%$
C180	KEC/2CBB042132	Fixed elect A1 KME16VB, 1000 uF $\pm 20\%$
C181	KEC/2CCD001012	Fixed film, ECQ-V1H104JZ, 0.1 uF $\pm 5\%$, 50V.
C183	KEC/2CBB043163	Fixed elect A1 KME25VB, 100 uF $\pm 20\%$
C190 thru C192	KEC/2CAK005151	Ceramic chip, 22 pF CH $\pm 5\%$, 50V.
C193	KEC/2CAK005081	Ceramic chip, 6 pF CH $\pm 5\%$, 50V.
C200	KEC/2CCD001012	Fixed film, ECQ-V1H104JZ, 0.1 uF $\pm 5\%$, 50V.
C201	KEC/2CAK005383	Ceramic chip, 1000 pF $\pm 10\%$, 50V.
C202	KEC/2CBB083037	Fixed elect A1 SXE25VB, 4700 uF $\pm 20\%$
C203	KEC/2CBB083015	Fixed elect A1 SXE25VB, 2200 uF $\pm 20\%$
C204 thru C206	KEC/2CAK005391	Ceramic chip, 0.01 uF $\pm 10\%$, 50V.
C207	KEC/2CBJ001221	Fixed elect A1 KME50VB, 10 uF $\pm 20\%$
C208	KEC/2CBB043171	Fixed elect A1 KME25VB, 470 uF $\pm 20\%$
C209 thru C213	KEC/2CAK005383	Ceramic chip, 1000 pF $\pm 10\%$, 50V.
C214 and C215	KEC/2CAK005250	Ceramic chip, 100 pF RH $\pm 5\%$, 50V.
C216	KEC/2CAK005383	Ceramic chip, 1000 pF $\pm 10\%$, 50V.
C217	KEC/2CAK005250	Ceramic chip, 100 pF RH $\pm 5\%$, 50V.
C218 thru C221	KEC/2CAK005383	Ceramic chip, 1000 pF $\pm 10\%$, 50V.
C230	KEC/2CFA098078	Mica chip, UC232H0040C, 4 pF ± 0.25 pF, 500V.
C232	KEC/2CFA098078	Mica chip, UC232H0040C, 4 pF ± 0.25 pF, 500V.

SYMBOL	PART NO.	DESCRIPTION
CR1	KEC/2QBA015084	Silicon DAP201.
CR5	KEC/2QBA001188	Silicon 1SV34.
CR11 and CR12	KEC/2QBA001105	Silicon 1SS101.
CR15	KEC/2QBC008371	Silicon V08C.
CR21	KEC/2QBA001188	Silicon 1SV34.
CR22	KEC/2QBA006161	Silicon 1S2075K.
CR24	KEC/2QBB001138	Zener HZ-5B.
CR25	KEC/2QBA006161	Silicon 1S2075K.
CR31 and CR32	KEC/2QBC008124	Silicon S11B.
CR33	KEC/2QBC008371	Silicon V08C.
FL2	KEC/2KDB003021	Dielectric 861 MHz CF8112101.
FL3	KEC/2KDB003039	Dielectric 861 MHz EEPB861ET31.
FL5	KEC/2FAA103033	Crystal, 45 MHz A4WX10301.
FL6	KEC/2FAD005136	Ceramic, SLP-D-15.
K1	KEC/2KCA001026	RF CX-1051.
K2	KEC/2KBA003800	G6B-1003H.
L1	KEC/2LAB013122	RF, 0.5 uH, 10T, A4WX00027.
L2	KEC/2LAA01292	Choke, FL5H, 101K.
L3	KEC/2LAB013031	RF, 0.5 uH, 1T, A4WX00027.
L4	KEC/2LAB013064	RF, 0.5 uH, 4T, A4WX00027.
L5	KEC/2LAB013031	RF, 0.5 uH, 1T, A4WX00027.
L6	KEC/2LAB014064	RF, 0.5 uH, 4T, A4WX00027.
L7	KEC/2LAB013044	RF, 0.5 uH, 2T, A4WX00027.
L12	KEC/2LAB014856	RF, 0.5 uH, 1/2T, A4WX00027.
L13	KEC/2LAB013064	RF, 0.5 uH, 4T, A4WX00027.
L14	KEC/2LAB014856	RF, 0.5 uH, 1/2T, A4WX00027.
L15	KEC/2LAA007280	SN-5-400
L25 thru L27	KEC/2LAB013064	RF, 0.5 uH, 4T, A4WX00027.
L28	KEC/2LAB013051	RF, 0.5 uH, 3T, A4WX00027.
L29	KEC/2LAB014229	RF, 0.8 uH, 2T, A4WX00027#29.
L30	KEC/2LAB013064	RF, 0.5 uH, 4T, A4WX00027.
L34	KEC/2LAA021118	Choke, 0.8 uH, 11T, A4ES62846.
L41	KEC/2LAB013098	RF, 0.5 uH, 7T.
L42	KEC/2LAB014865	A4WX00343
L43	KEC/2LAB014877	A4WX00342
L44	KEC/2LAB025183	A4WX00312
L45	KEC/2LAD001062	Chip, MFL3216D-R68K, 0.68 uH.
L46	KEC/2LAB014901	A4WX01334
L47	KEC/2LAB030022	7MC-101000ZD
L51	KEC/2LAA007344	Choke SN-M-108G.
L52	KEC/2LAA024088	Choke 1mH 2A.
Q1	KEC/2QAA012765	Silicon 28C2462LC.
Q2	KEC/2QAA011390	Silicon 28A11218C.

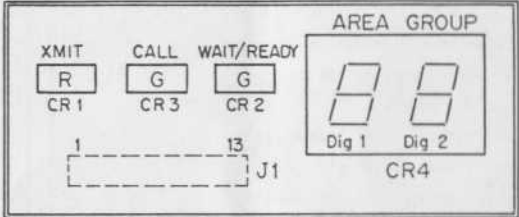
SYMBOL	PART NO.	DESCRIPTION
Q3	KEC/2AAA012765	Silicon 28C2462LC.
Q4	KEC/2QAA002436	Silicon 28C3357.
Q5 and Q6	KEC/2QAA012765	Silicon 28C2462LC.
Q7	KEC/2QAA011213	Silicon 28A715C.
Q8	KEC/2QAA012765	Silicon 28C2462LC.
Q9	KEC/2QAA002436	Silicon 28C3357.
Q12	KEC/2QAB006274	Power TR, 30-Watt only.
Q13 and Q14	KEC/2QAA012765	Silicon 28C2462LC.
Q15	KEC/2QAA011213	Silicon 28A715C.
Q17	KEC/2QAA012443	Silicon 28C1213AC.
Q18	KEC/2QAA012765	Silicon 28C2462LC.
Q21	KEC/2QAA002506	Silicon 28C2462LC.
Q22		FET, 28K653
Q23	KEC/2QAA012836	Silicon 28C2619C.
Q24	KEC/2QAA011338	Silicon 28A1052.
Q25 and Q26	KEC/2QAA012765	Silicon 28C2462LC.
Q29	KEC/2QAA011338	Silicon 28A1052SC.
Q30 and Q31	KEC/2QAA012765	Silicon 28C2462LC.
Q32	KEC/2QAB013275	Silicon 28D669AC.
R1	KEC/2RRA034047	RML5-103J, 10K ohm $\pm 5\%$.
R3 and R4	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R6	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R9	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R10	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.
R11	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.
R12	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.
R13	KEC/2RGC001010	Square chip, 1/8W, 10 ohm $\pm 5\%$.
R14	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.
R15	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.
R16	KEC/2RAA002260	Fixed carbon, 1/4W, 10K ohm $\pm 5\%$.
R17	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.
R18	KEC/2RGC001143	Square chip, 1/8W, 680 ohm $\pm 5\%$.
R19	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.
R20	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.
R21	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R22	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.
R23	KEC/2RGC001093	Square chip, 1/8W, 100 ohm $\pm 5\%$.
R24	KEC/2RGC001044	Square chip, 1/8W, 22 ohm $\pm 5\%$.
R25 and R26	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.
R27	KEC/2RGC001242	Square chip, 1/8W, 22K ohm $\pm 5\%$.
R28	KEC/2RGC001275	Square chip, 1/8W, 47K ohm $\pm 5\%$.
R29	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R30	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.
R31	KEC/2RGC001168	Square chip, 1/8W, 1.5K ohm $\pm 5\%$.
R32	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.
R33	KEC/2RGC001044	Square chip, 1/8W, 22 ohm $\pm 5\%$.

SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION	SYMBOL	PART NO.	DESCRIPTION
R34	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R98	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	R191 and R192	KEC/2RGC001064	Square chip, 1/8W, 2.2 ohm $\pm 5\%$.
R39	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R99	KEC/2RGC001242	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.	R193	KEC/2RBA013120	RNM2FB 1 ohm $\pm 5\%$.
R40	KEC/2RGC001044	Square chip, 1/8W, 22 ohm $\pm 5\%$.	R100	KEC/2RGC001015	Square chip, 1/8W, 0 ohm $\pm 5\%$.	R194	KEC/2RGC001064	Square chip, 1/8W, 2.2 ohm $\pm 5\%$.
R41	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R101	KEC/2RAA001168	Carbon, RD12S, 680 ohm $\pm 5\%$.	R196	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.
R42	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.	R102	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.	R204	KEC/2RAA002448	Carbon, 1/4W, 150K ohm $\pm 5\%$.
R43	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R103	KEC/2RGC001200	Square chip, 1/8W, 6.8K ohm $\pm 5\%$.	R205	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.
R44	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R104	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R206	KEC/2RFB017068	Variable, RGS6-FAN, 10K ohm $\pm 30\%$.
R45	KEC/2RGC001044	Square chip, 1/8W, 22 ohm $\pm 5\%$.	R131	KEC/2RGC001275	Square chip, 1/8W, 47K ohm $\pm 5\%$.	R207	KEC/2RGC001119	Square chip, 1/8W, 220 ohm $\pm 5\%$.
R46	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R132	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	R208	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.
R47 and R48	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.	R133	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.	R209	KEC/2RAA001176	Square chip, 1/4W, 2.2K ohm $\pm 5\%$.
R49	KEC/2RGC001259	Square chip, 1/8W, 33K ohm $\pm 5\%$.	R134	KEC/2RGC001093	Square chip, 1/8W, 100 ohm $\pm 5\%$.	R210	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.
R50	KEC/2RGC001341	Square chip, 1/8W, 470K ohm $\pm 5\%$.	R136	KEC/2RGC001192	Square chip, 1/8W, 22 ohm $\pm 5\%$.	R211	NOT AVAILABLE	Square chip, 680 ohm $\pm 5\%$.
R53	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	R140	KEC/2RGC001184	Square chip, 1/8W, 100 ohm $\pm 5\%$.			----- TEST POINTS -----
R59 and R60	KEC/2RGC001275	Square chip, 1/8W, 47K ohm $\pm 5\%$.	R141	KEC/2RGC001069	Square chip, 1/8W, 47 ohm $\pm 5\%$.	TP1 thru TP5	KEC/2PYD006016	75404-041
R61 and R62	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R143	KEC/2RGC001184	Ceramic chip, 1/8W, 3.3K ohm $\pm 5\%$.	TP11 and TP12	KEC/2PYD006016	75404-041
R63	KEC/2RGC001259	Square chip, 1/8W, 33K ohm $\pm 5\%$.	R145	KEC/2RAA001325	Square chip, 1/8W, 220K ohm $\pm 5\%$.	TP14	KEC/2PYD006016	75404-041
R64	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R146	KEC/2RGC001114	Square chip, 1/8W, 220 ohm $\pm 5\%$.	TP22 and TP23	KEC/2PYD006016	75404-041
R65	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.	R147	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	TP25	KEC/2PYD006016	75404-041
R66	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.	R148	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.			----- CONNECTORS -----
R67	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	R149	KEC/2RGC001226	Square chip, 1/8W, 15K ohm $\pm 5\%$.	J11	KEC/2PDA012026	IL-S-10P-S2T2-EF
R68	KEC/2RGC001143	Square chip, 1/8W, 680 ohm $\pm 5\%$.	R150	KEC/2RGC001676	Square chip, 1/8W, 8.2K ohm $\pm 5\%$.	J12	KEC/2PDA012018	IL-S-8P-S2T2-EF
R69	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	R151 and R152	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	J13	KEC/2PDA012034	IL-S-13P-S2T2-EF
R70	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R153	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.	J21	KEC/2PCB007279	RF N-R A4WX01345
R72	KEC/2RGC001353	Square chip, 1/8W, 620 ohm $\pm 5\%$.	R154 and R155	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	J22A & B	KEC/2PDA020107	5274-04A
R73	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	R156	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	J23A	KEC/2PDA020123	5274-06A
R74 and R75	KEC/2RGC001044	Square chip, 1/8W, 22 ohm $\pm 5\%$.	R157	KEC/2RGC001218	Square chip, 1/8W, 47K ohm $\pm 5\%$.	J23B	KEC/2PDA020115	5274-05A
R76	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	R158	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	J24	KEC/2PDA010738	TSL-P05P-B1
R77	KEC/2RGC001242	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.	R159	KEC/2RGC001325	Square chip, 1/8W, 220K ohm $\pm 5\%$.	J25	KEC/2PDA010720	TSL-P02P-B1
R78	KEC/2RGC001226	Square chip, 1/8W, 15K ohm $\pm 5\%$.	R160	KEC/2RGC001325	Square chip, 1/8W, 220K ohm $\pm 5\%$.			----- CRYSTALS -----
R79	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R161	KEC/2RGC001176	Square chip, 1/8W, 22K ohm $\pm 5\%$.	Y1	KEC/2YAA181640	HC-18u 44.545 MHz A4WX01321
R80	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	R162 thru R164	KEC/2RGC001168	Square chip, 1/8W, 1.5K ohm $\pm 5\%$.			----- OTHERS -----
R81	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R165	KEC/2RGC001259	Square chip, 1/8W, 33K ohm $\pm 5\%$.	Z1	KEC/2YBA103246	TCX0, 12.8 MHz A4WX01300#1
R82	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R166	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	Z2		VCO, 800 MHz KLH3550
R83	KEC/2RFB017076	Variable, RGS6-FAN, 50K ohm $\pm 30\%$.	R167	KEC/2RGC001200	Square chip, 1/8W, 6.8K ohm $\pm 5\%$.	Z12	KEC/2LDA014018	Core, 5.8 x 6.4 x 2.0
R84	KEC/2RGC001119	Square chip, 1/8W, 220 ohm $\pm 5\%$.	R168	KEC/2RGC001275	Square chip, 1/8W, 47K ohm $\pm 5\%$.	Z13	KEC/2KPD002134	Thermal detector ODH1-80W
R85	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R169	KEC/2RGC001176	Square chip, 1/8W, 2.2K ohm $\pm 5\%$.	Z14	KEC/2QBD005038	Thermistor SDT-100
R86	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R171	KEC/2RGC001184	Square chip, 1/8W, 3.3K ohm $\pm 5\%$.	Z15	KEC/2EEA004028	Isolator 3032A
R87	KEC/2RFB017068	Variable, RGS6-FAN, 10K ohm $\pm 30\%$.	R172	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	Z16	KEC/2QBD005038	Thermistor SDT-100
R88	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R173	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	Z21	KEC/5UAY001064	Double balance mixer UST-3L A4WX01377
R89	KEC/2RGC001309	Square chip, 1/8W, 100K ohm $\pm 5\%$.	R176 and R177	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	Z22	KEC/2YYZ001064	Silicon damper MB-0252-0.5t
R90	KEC/2RGC001135	Square chip, 1/8W, 470 ohm $\pm 5\%$.	R179	KEC/2RGC001093	Square chip, 1/8W, 100 ohm $\pm 5\%$.	Z31	KEC/2QBD011275	Surge Absorber ERZ-C10DK330
R91	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R182	KEC/2RGC001275	Square chip, 1/8W, 47K ohm $\pm 5\%$.			----- CONNECTOR ASSY -----
R92	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	R183 and R184	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.	CA11	KEC/2VHE002840	10 Pin A4WX01349
R93	KEC/2RGC001127	Square chip, 1/8W, 330 ohm $\pm 5\%$.	R185	KEC/2RGC001192	Square chip, 1/8W, 4.7K ohm $\pm 5\%$.	CA12	KEC/2VHE002898	8 Pin A4WX01350
R94	KEC/2RGC001028	Square chip, 1/8W, 10 ohm $\pm 5\%$.	R186	KEC/2RGC001168	Square chip, 1/8W, 1.5K ohm $\pm 5\%$.	CA13	KEC/2VHE002946	13 Pin A4WX01351
R95	KEC/2RGC001218	Square chip, 1/8W, 10K ohm $\pm 5\%$.	R188	KEC/2RGC001234	Square chip, 1/8W, 18K ohm $\pm 5\%$.			
R96A	KEC/2RBA013153	Carbon, 1.5 ohms $\pm 5\%$.	R189	KEC/2RGC001150	Square chip, 1/8W, 1K ohm $\pm 5\%$.			
R96B	KEC/2RDA001027	W1/2P 0.1 ohm $\pm 5\%$.	R190	KEC/2RGC001119	Square chip, 1/8W, 220 ohm $\pm 5\%$.			
R97	KEC/2RFB017076	Variable, 50K ohm $\pm 5\%$.						

VOLUME/POWER
SWITCH

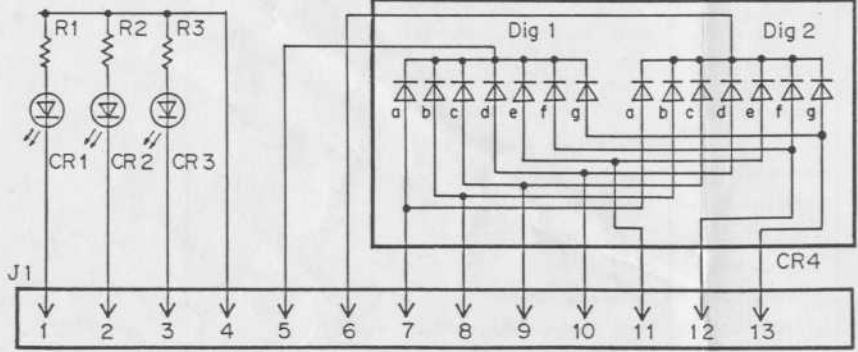


(A3202744, SA)
(A3202744, TA)
(A3202744, TB)

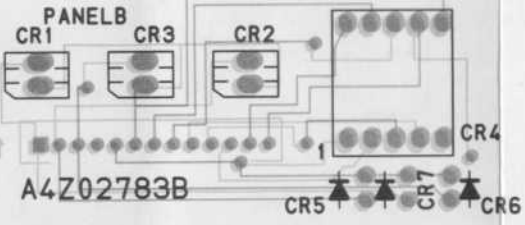


DISPLAY PANEL

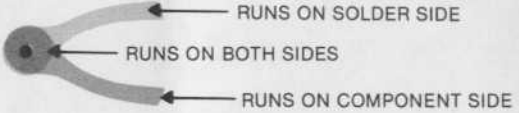
PARTS LOCATION (FRONT VIEW)
LED BOARD (PANEL 1)



TO J4 ON LOGIC BOARD



(SA A4202783B)
(TA A4202783B)
(TB A4202783B)
(SB A4202783B)

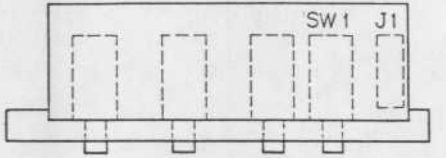
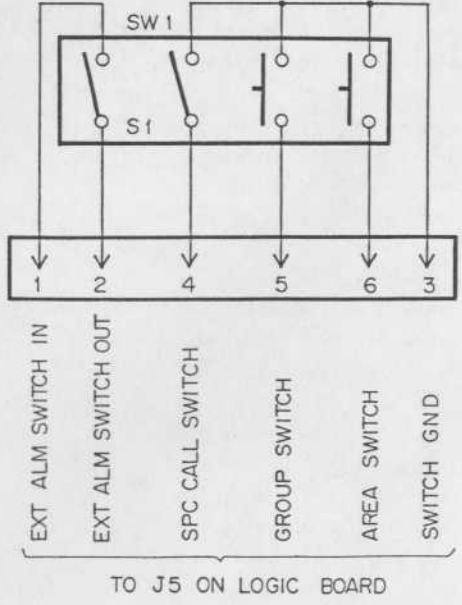


SERVICE SHEET

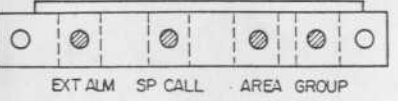
TMX-86 SERIES

SWITCH PANEL

PARTS LOCATION



TOP VIEW



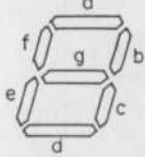
FRONT VIEW

PARTS LIST

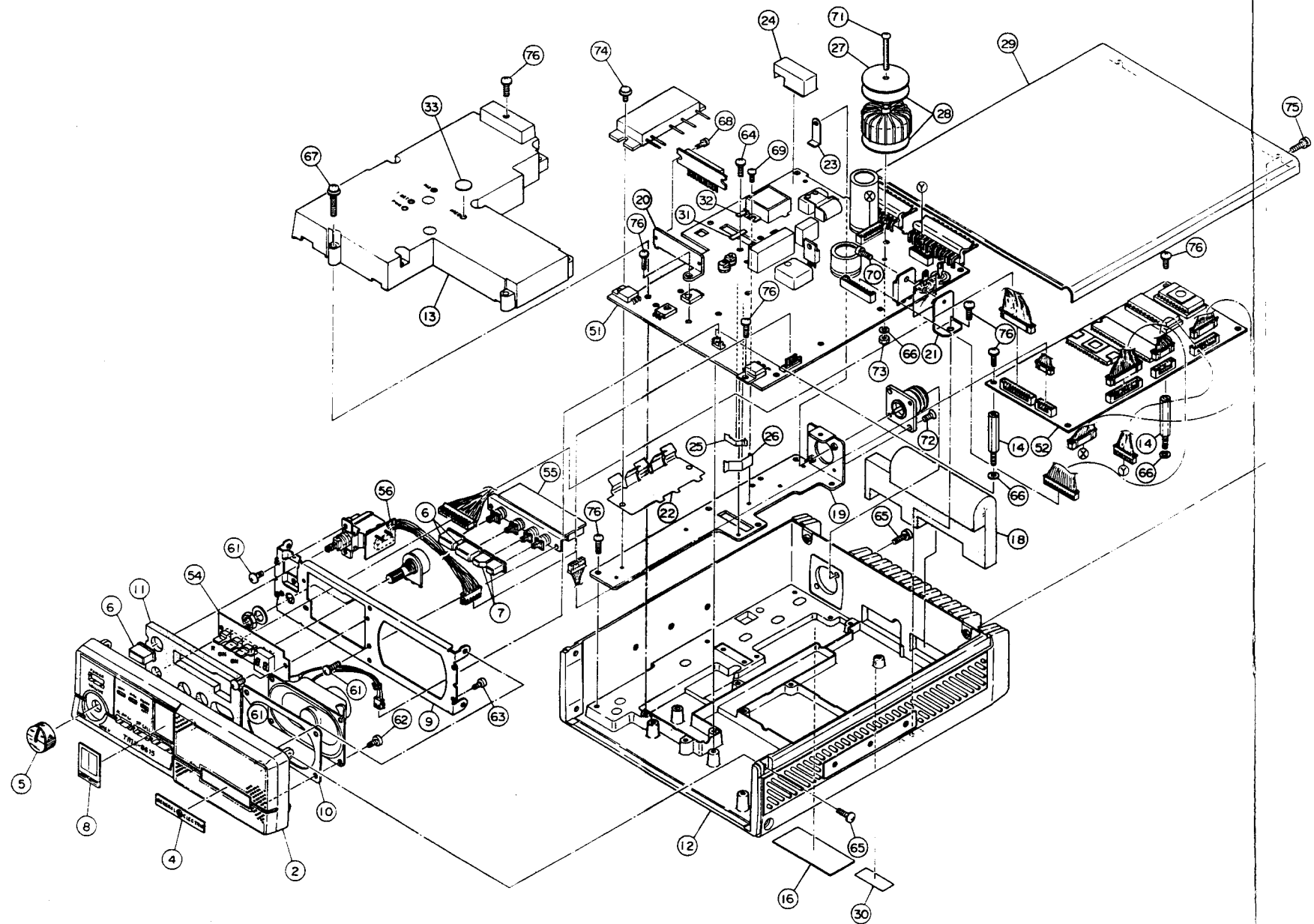
TMX-86 SERIES
CONTROL PANEL
ISSUE 2

SYMBOL	PART NO.	DESCRIPTION
----- LEDs -----		
CR1	KEC/2HAA014055	Diode, Light Emitting, Red.
CR2 and CR3	KEC/2HAA014063	Diode, Light Emitting, Green.
CR4	KEC/2HAC010051	Dual 7-Segment Display, Green.
----- JACKS -----		
J1	KEC/2PDA012034	Jack, 13-Pin.
----- RESISTORS -----		
R1	KEC/2RAA002054	Fixed, carbon, 1K ohm $\pm 5\%$, 1/4 w.
R2 and R3	KEC/2RAA002013	Fixed, carbon, 620 ohm $\pm 5\%$, 1/4 w.
----- SWITCH ASSEMBLY -----		
SW1	KEC/2KJB004045	Area, Group, Alarm, SP Call.
----- JACKS -----		
J1	KEC/2PDA012281	6-Pin.
----- CABLE ASSEMBLY -----		
CA1	KEC/2WHE002914	Power, Volume.
CA2	KEC/2WHE002922	Speaker.
CA3	KEC/2WHE002864	Power-On.
CA4	KEC/2WHE002872	Area, Group, etc.
----- SPEAKER -----		
SP1	KEC/2SDA005121	3-Watt/4 ohm.
----- RESISTORS -----		
R1	KEC/2REA045016	Variable, Volume.
----- SWITCHES -----		
S1	KEC/2KJB004052	Power-On.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES



7 SEGMENT
ARRANGMENT

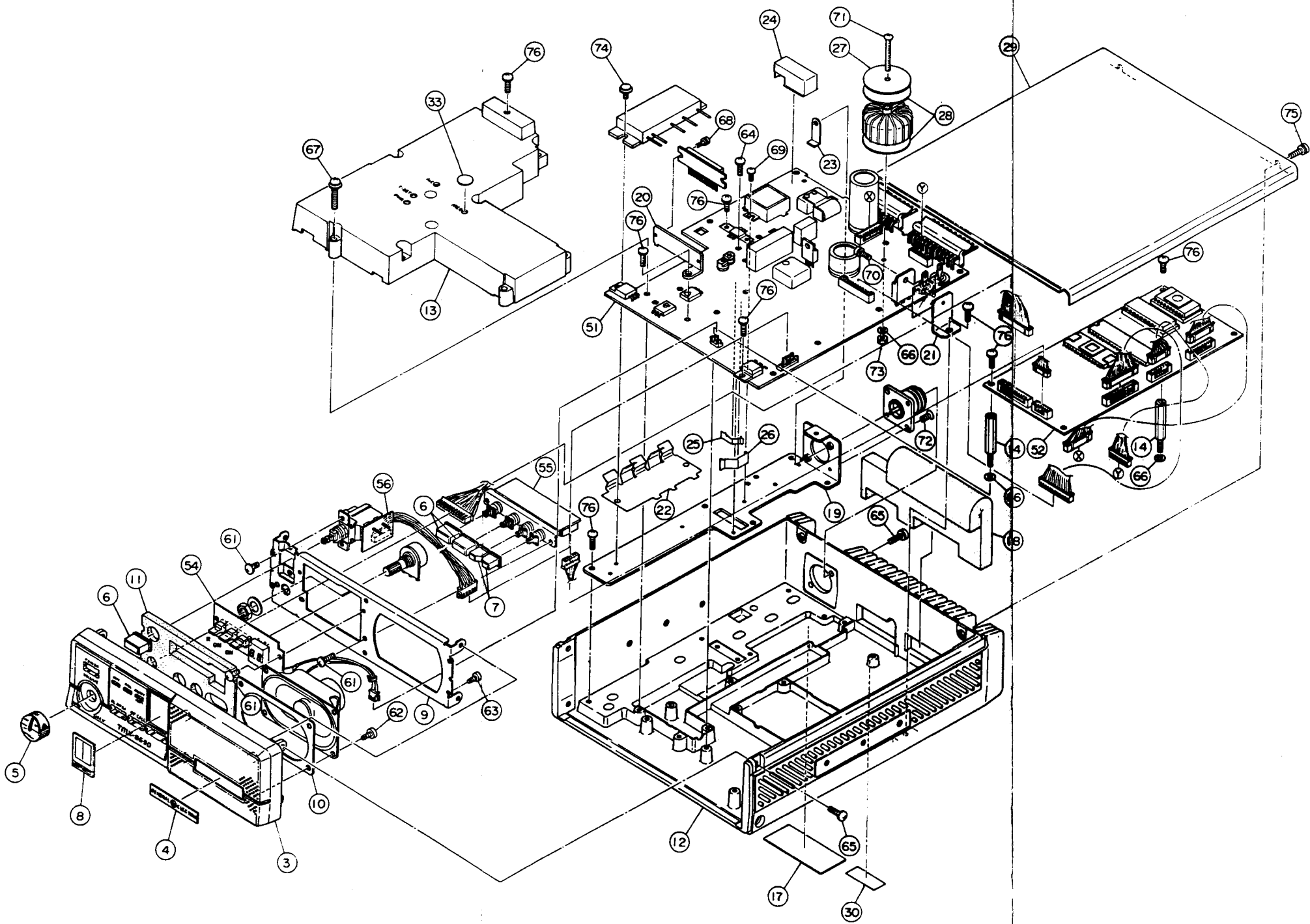
TMX-8615

PART NO.	DESCRIPTION	DRAWING NO.
1	NA	NA
2	Front Cap B1 SubAssy	KEC/A3WL07339
3	NA	NA
4	Name Plate	KEC/A4WL07406
5	Volume Knob	KEC/A4WL07243
6	Button A	KEC/A4WL07244
7	Button B	KEC/A4WL07245
8	Window	KEC/A4WL07246
9	Switch Panel	KEC/A2WL07247
10	Spacer	KEC/A4WL07248
11	Sponge A	KEC/A4WL07367
12	Frame	KEC/A1WL07249
13	Shield Cover	KEC/A1WL07281
14	Post	KEC/A4WL07317
15	NA	NA
16	FCC Name Plate	KEC/A4WL07346
17	NA	NA
18	Sponge B	KEC/A4WL07368
19	Heat Sink Plate	KEC/A3WL07313
20	Heat Sink A	KEC/A4WL07314
21	Heat Sink B	KEC/A4WL07315
22	Plate For PA Pack IC	KEC/A4WL07316
23	Antenna Lead	KEC/A4WL07405
24	Filter Cover	KEC/A4WL07596
25	Shield A	KEC/A4WL07597
26	Shield B	KEC/A4WL07598
27	Core Plate	KEC/A4WL05645
28	Spacer	KEC/A4WL04937
29	Cover	KEC/A3WL07250
30	Date Code Label	KEC/A3WL07648
31	Strip	KEC/A4WL07602
32	Short Bar	KEC/A4WL07726
33	Sheet	KEC/A4WL07723
51	Radio P.W.B.	KEC/A2Z02685
52	Logic P.W.B.	KEC/A3Z02677
53	NA	NA
54	Led B P.W.B.	KEC/A4Z02678
55	Switch P.W.B.	KEC/A4Z02680
56	Power SW P.W.B.	KEC/A4Z02681
61	Pan Hd Scr, M3x6	19A700031P406
62	Pan Hd Tap Scr, M3x6	19A700036P406
63	Pan Hd Tap Scr, M2.5x6	19A700036P306
64	Pan Hd Scr, M3x8	19A700031P408
65	Pan Hd Scr, M3x10	19A700031P410
66	Lock Washer, M3	19A700033P5
67	Pan Hd Scr, M3x20	19A700031P420
68	Pan Hd Scr, M2x6	19A700031P206
69	Pan Hd Scr, M2.5x6	19A700031P306
70	Pan Hd Scr, M2.5x8	19A700031P308
71	Pan Hd Scr, M3x25	19A700031P425
72	Flat Hd Scr, M3x6	19A700035P406
73	Nut, Hex, M3	19A700034P4
74	Pan Hd Scr, M3x8	19A700031P408
75	Pan Hd Scr, M3x10	19A700031P410
76	Pan Hd Scr, M3x10	19A700031P410
	Lock Washer, M2	19A700033P1
	Lock Washer, M2.5	19A700033P3
	Lock Washer, M3	19A700033P5
	Fiat Washer, M3	19A701312P4

NA: NOT APPLICABLE

MECHANICAL PARTS BREAKDOWN

TMX-8615



TMX-8630

PART NO.	DESCRIPTION	DRAWING NO.
1	NA	NA
2	NA	NA
3	Front Cap B2 SubAssy	KEC/A3WL07699
4	Name Plate	KEC/A4WL07406
5	Volume Knob	KEC/A4WL07243
6	Button A	KEC/A4WL07244
7	Button B	KEC/A4WL07245
8	WINDOW	KEC/A4WL07246
9	Switch Panel	KEC/A2WL07247
10	Spacer	KEC/A4WL07248
11	Sponge A	KEC/A4WL07367
12	Frame	KEC/A1WL07249
13	Shield Cover	KEC/A1WL07281
14	Post	KEC/A4WL07317
15	NA	NA
16	NA	NA
17	FCC Name Plate	KEC/A4WL07347
18	Sponge B	KEC/A4WL07368
19	Heat Sink Plate	KEC/A3WL07313
20	Heat Sink A	KEC/A4WL07314
21	Heat Sink B	KEC/A4WL07315
22	Plate For PA Pack IC	KEC/A4WL07316
23	Antenna Lead	KEC/A4WL07405
24	Filter Cover	KEC/A4WL07596
25	Shield A	KEC/A4WL07597
26	Shield B	KEC/A4WL07598
27	Core Plate	KEC/A4WL05645
28	Spacer	KEC/A4WL04937
29	Cover	KEC/A3WL07250
30	Date Code Label	KEC/A3WL07648
31	NA	NA
32	NA	NA
33	Sheet	KEC/A4WL07723
51	Radio P.W.B.	KEC/A2Z02685
52	Logic P.W.B.	KEC/A3Z02677
53	NA	NA
54	Led B P.W.B.	KEC/A4Z02678
55	Switch P.W.B.	KEC/Z4Z02680
56	Power SW P.W.B.	KEC/Z4Z02681
61	Pan Hd Scr, M3x6	19A700031P406
62	Pan Hd Tap Scr, M3x6	19A700036P406
63	Pan Hd Tap Scr, M2.5x6	19A700036P306
64	Pan Hd Scr, M3x8	19A700031P408
65	Pan Hd Scr, M3x10	19A700031P410
66	Lock Washer, M3	19A700033P5
67	Pan Hd Scr, M3x20	19A700031P420
68	Pan Hd Scr, M2x6	19A700031P206
69	Pan Hd Scr, M2.5x6	19A700031P306
70	Pan Hd Scr, M2.5x8	19A700031P308
71	Pan Hd Scr, M3x25	19A700031P425
72	Flat Hd Scr, M3x6	19A700035P406
73	Nut, Hex, M3	19A700034P4
74	Pan Hd Scr, M3x8	19A700031P408
75	Pan Hd Scr, M3x10	19A700031P410
76	Pan Hd Scr, M3x10	19A700031P410
	Lock Washer, M2	19A700033P1
	Lock Washer, M2.5	19A700033P3
	Lock Washer, M3	19A700033P5
	Flat Washer, M3	19A701312P4

NA: NOT APPLICABLE

MECHANICAL PARTS BREAKDOWN

TMX-8630

PARTS LIST

800 MHz ANTENNA
19B209568P4
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
	19B209018P5	Whip assembly. 068110-001. Whip nut assembly. 068047-001. Base nut assembly. 068048-001. "O" Ring (LARGE). 007059-122. Stud assembly. 068046-001. Plug, Type N; sim to UG536A/U. Cable. (Included as part of complete antenna assembly only).

PARTS LIST

MIKE HANGER/HOOKSWITCH
19C320318G4
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
S2	19A116076P1	----- SWITCHES ----- Sensitive: SPDT, 5 amps at 24 VDC or 5 amps at 250 VRMS; sim to Microswitch 111SM1-T2.
W1	19A129414G1	----- CABLES ----- 2 conductor cable: approx 5 feet long, includes (2) 19A116781P5 contacts.
	19B219694P1	----- MISCELLANEOUS ----- Base plate.
	19B219698G5	Housing.
	19A702464P2	Strain relief. (W1).
	N193P1410C6	Tap screw, phillips head: No. 8-18 x 5/8. (Secures assembly to mounting surface).
		ASSOCIATED PARTS
		MIKE KIT 7141414G2
	4031457P1	Support.
	4031458P1	Spring.
	N193P1408C6	Tap screw, phillips head: No. 8-18 x 1/2.
	19A116773P105	Tap screw, phillips POZIDRIV®: No. 7-19 x 5/16.

PARTS LIST

EXTERNAL ALARM RELAY
19B226025G4
ISSUE 2

SYMBOL	GE PART NO.	DESCRIPTION
CR1701	19A704142P2	----- DIODES AND RECTIFIERS ----- General Purpose Silicon; sim to 1N4005.
K1701	7486515P2	----- RELAYS ----- Armature, enclosed: 12 VDC nominal, 85 to 90 ohms coil res, 1 form A contact rated at 15 amps. FUSED LEAD 19B226454G1 Quick blowing: 1 amp at 250 v; sim to Littelfuse 312001 or Bussmann AGC-1. Fuseholder: sim to Bussmann 9835. Knob assembly: sim to Bussmann 9953 1/2. Spring: sim to Bussmann 1A1853. Contact: sim to Littelfuse 904-88. (Crimped on wires inside holder). WIRE ASSEMBLY 19A129837G2 Terminal, solderless: wire range No. 22-16; sim to AMP41310. Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106. ----- MISCELLANEOUS ----- Machine screw: No. 6-32 x 5/16. (Secures relay to support). Lockwasher, internal tooth: No. 6. (Secures relay to support). Flatwasher: No. 6. (Secures relay to support). Machine screw, phillips head: No. 8-32 x 5/16. (Secures wire to relay terminals). Support. (K1701). Tap screw: No. 10-16 x 1/2. (Secures relay support).

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PARTS LIST

3 X 5 INCH SPEAKER
19C850550G6 DASH MOUNT - 4 OHM
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
LS1	19A702080P3	----- LOUDSPEAKERS ----- Permanent magnet: 76 x 1 mm, 8 ohms $\pm$ 10% imp at 400 Hz, 18 w.
	19A129414G1	----- CABLES ----- 2 conductor cable: approx 5 feet long, includes (2) 19A116781P5 contacts.
W1	19B800534G4	----- MISCELLANEOUS ----- Housing.
	19C850549P2	Grille.
	19A701354P1	Nameplate. (GENERAL ELECTRIC).
	19C320016P2	Mounting bracket. (Secures speaker assembly to mounting surface).
	19A701631P516	Machine screw: No. 10-32 x 5/16. (Secures speaker housing to mounting support).
	19A701312P7	Lockwasher: No. 10. (Secures speaker housing to mounting support).
	19A700033P10	Lockwasher, external tooth: No. 10. (Secures speaker housing to mounting support).
	19A116986P112	Screw, thd forming, assembled washer: Phillips POZIDRIVE, HI-LO thread, No. 7-19 x 3/4. (Secures grille to housing).
		BREAKAWAY MOUNTING KIT 19A129461G1
	19C320022P1	Retaining bracket. (With locking jaws).
	19B219578G1	Safety Release Disc. (Mates with mounting surface).
	N187P16010C6	Machine screw, hexhead, slotted: No. 10-32 x 5/8. (Quantity 1 - Used with safety release disc with retaining bracket).
	N130P1612C6	Tap screw, thd. forming: No. 10-16 x 3/4. (Quantity 3 - Used without safety release disc & retaining bracket).
	N130P1624C6	Tap screw, thd. forming: No. 10-16 x 1-1/2. (Quantity 3 - Used without safety release disc & retaining bracket - for extra thick carpet).
	N402AP9C6	Flatwasher: No. 10. (Used with 10-16 thread forming screws).

PARTS LIST

LBI31642
ASSOCIATED ASSEMBLIES
FOR
TMX-8415 and TMX-8615, TMX-8630
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
P010	19A134653P4008	MICROPHONE 19B801398P2 MOUNTING HARDWARE KIT 19A138051G5 (BLACK) Bolt, machine, hex: Metric, 8MM. (Secures radio to mounting bracket).
	19A700032P7	Lockwasher, internal tooth: No. M2.2. (Metric). (Secures radio to mounting bracket).
	19J706152P9	Retaining strap: sim to Deanticon BAR-LOK 08471. (Secures power leads under dash).
	N130P1610C6	Screw, thread forming: No. 10-16 x 5/8. (Secures mounting bracket to mounting surface with thin mounting surface).
	N130P1624C6	Screw, thread forming: No. 10-16 x 1-1/2. (Secures mounting bracket to mounting surface when thick carpet is on mounting surface).
	5490407P6	Rubber grommet. (Located in firewall).
	19C850638P2	Mounting bracket. (Black).
		POWER CABLE 19B232925G2
		----- PLUGS ----- Connector. Includes: Shell. Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
	19A116659P143	
	19A116781P5	
		----- MISCELLANEOUS ----- Lead, black. (Includes 19A116781P5 contact).
		15 AMP FUSED LEAD 19A137618G9
	7484390P3	Cartridge, quick blow: 15 amp at 250 v; sim to Bussmann ABC15.
	19A115776P6	Fuseholder: sim to Bussmann 9835. (Mates with 19A115776P5 knob).
	19A115776P5	Knob. (Mates with fuseholder to capivate fuse).
	19A115776P7	Spring: sim to Bussmann 1A1853. (Located inside fuseholder).
	19A115776P3	Contact: sim to Littelfuse 904-88. (Quantity 2- crimped on wire inside fuseholder).
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
		2 AMP FUSED LEAD 19A137618G10
	1R16P5	Quick blowing: 2 amp at 250 v; sim to Littelfuse 312002 or Bussmann AGC-2.
	19A115776P6	Fuseholder: sim to Bussmann 9835. (Mates with 19A115776P5 knob).
	19A115776P5	Knob. (Mates with fuseholder to capivate fuse).
	19A115776P7	Spring: sim to Bussmann 1A1853. (Located inside fuseholder).
	19A115776P3	Contact: sim to Littelfuse 904-88. (Quantity 2- crimped on wire inside fuseholder).
	19A116781P5	Contact, electrical: wire range No. 18-24 AWG; sim to Molex 08-50-0106.
	19B209280P21	Terminal, solderless: wire range No. 16-14; sim to AMP 42752-2.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES.

PRODUCTION CHANGES

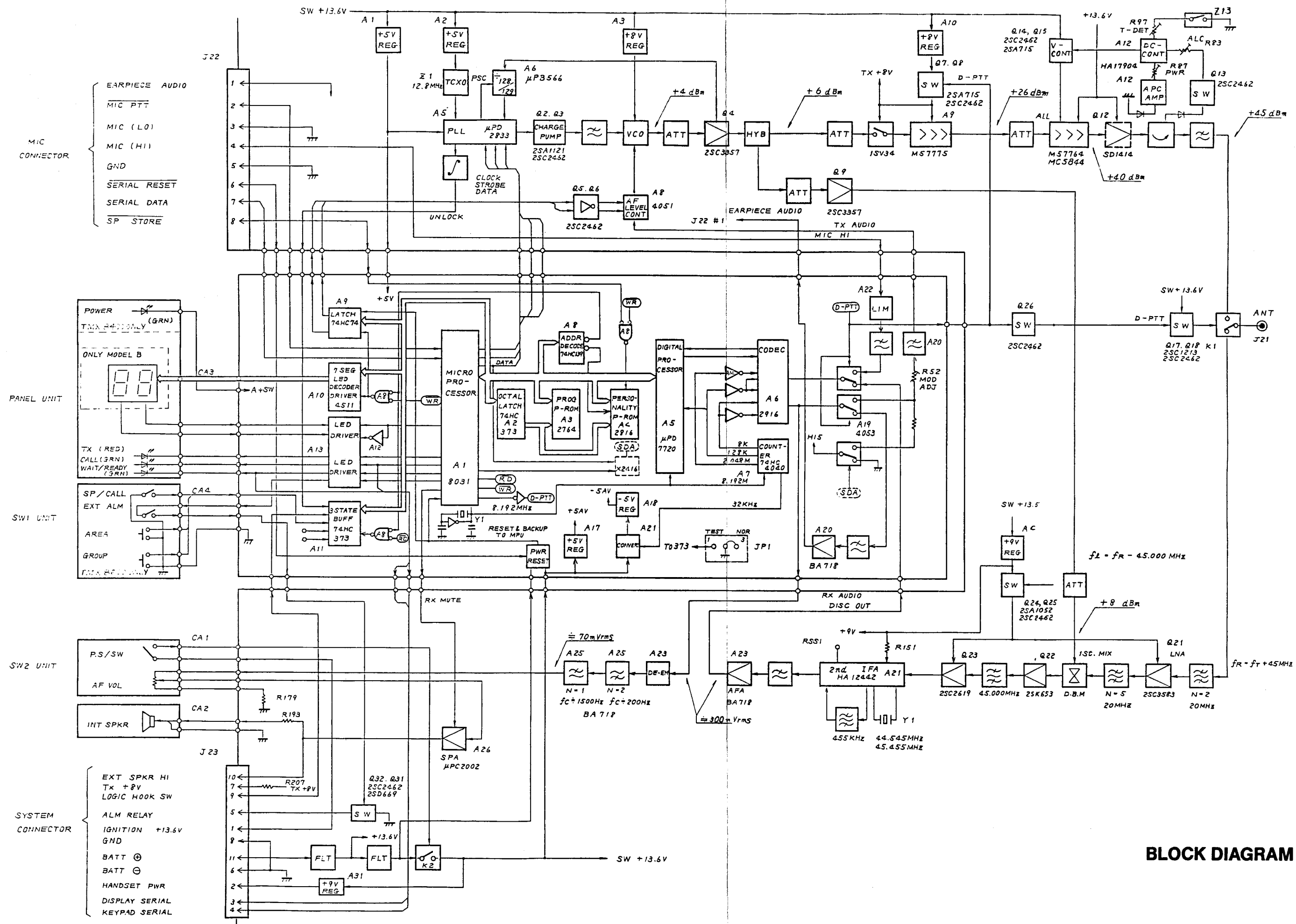
Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter," which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

BOARD NO.	REVISION	CHANGES AND/OR PARTS	REASONS FOR CHANGE
TR Board A4WE03581	A	Changed R208 to 10K ohm (KEC/2RGC001218), R209 to 2.2K ohm (KEC/2RGC001176), R210 to 1K ohm (KEC/2RGC001150). R209 connected to L15 (+5V).	Improve EXT ALM circuit.
TR Board A4WE03581	B	1. PWB changed to A2Z02685C. 2. Add C34,C35,C37,C38, C70-C74,C144 (KEC/2CAK005383) 1000 pF 3. Add C76,C77, (KEC/2CAK005383) 1000 pF 4. Delete test point TP21 5. Add R100 (KEC/2RCG001015) 0 ohms 6. Change type of R91 from fixed carbon to square chip 4.7K ohm (KEC/2RGC001192)	Revise patterns By-pass capacitors RF power decoupling for APC APC loop gain adjustment
TR Board A4WE03581	C	1. PWB changed to A2Z02685B 2. Add R16 (KEC/2RAA002260) 10K ohms	Revise patterns Improve adjacent channel selectivity
TR Board A4WE03581	E	1. PWB changed to A2Z02685C 2. Add R16 (KEC/2RAA002260) 10K ohms	Revise patterns Improve adjacent channel selectivity
TR Board A4WE03581	F	Change C1,C6,C61,C119,C159, C161,C175 (KEC/2CBJ001254) to 47 uF; C8,C10,C20,C22, C49 (KEC/2CBB042132) to 100 uF; C12,C15,C24,C57,C59,C64, C117,C145,C166-C169,C179 (KEC/2CBJ001221) to 10 uF; C23,C177,C174 (KEC/2CBJ001213) to 1 uF; C27, C127 (KEC/2CCF001496) to 104MB; C46 (KEC/2CCF001342) to 106MB; C180 (KEC/2CBB042132) to 1000 uF; C183 (KEC/2CBB043163) to 100 uF; C208 (KEC/2CBB043171) to 470 uF.	Improve temperature characteristic
TR Board A4WE03581	G	1. PWB changed to A2Z02685D 2. Change C34,C70,C71,C73 (KEC/2CAK005151) to 22 pF. Added C190-C193 (KEC/2CAK005151) 22 pF and L7 (KEC/2LAB013044). 3. Added A27 (KEC/2AAE050037); C200 (KEC/2CCD001012) 0.1 uF; C207 (KEC/2CBJ001221) 10 uF; R204 (KEC/2RAA002468) 150K ohms; R205 (KEC/2RGC001176) 2.2K ohms; R206 (KEC/2RFB017068) 10K ohm; R211 (KEC/2RGC001148) 680 ohms. 4. Change C102,C103 (KEC/2CFA098060) to 3 pF. C123,C125 (KEC/2CFA098094) to 1.5 pF. Added C230 (KEC/2CFA098078) 4 pF. Changed L31 and deleted L32 and L33. 5. Added C43 (KEC/2CAK005383) 1000 pF and C75 (KEC/2CAK005151) 22 pF. Change L2 (KEC/2LAA01292).	Revise pattern Improve beat note. Overvoltage protection circuit added Improvement of low-pass filter characteristic Improve adjacent channel selectivity.

This addendum provides a block diagram to replace the diagram that was printed on page 9 of this publication.

Also included are part numbers to be used when ordering replacement component boards. The numbers supplied are to be used only when ordering complete assembled boards.

A4WE03581	Transmitter/Receiver Board Assembly (TMX8415/8615)
A4WE03582	Transmitter/Receiver Board Assembly (TMX8630)
A4WE03583	Logic Board Assembly (TMX8415/8615/8630)
A4WE03584	LED Board Assembly (TMX8415)
A4WE03585	Panel 1 Board Assembly (TMX8615/8630)
A4WE03586	SW 1 Switch Board Assembly (TMX8615/8630)
A4WE03587	Power Switch Board Assembly (TMX8415/8615/8630)



BLOCK DIAGRAM

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the number on the printed wire board (e.g., A4WE03581-C). The revision stamped on the board or unit includes all previous revisions. Refer to the Parts List for descriptions of parts affected by these revisions.

BOARD NO.	REVISION	CHANGES AND/OR PARTS	REASON FOR CHANGE
TR Board A4WE03581	J	Deletes C191, C193 and L7. Change crystal filter FL5 to 45.0125 MHz (KEC/ A4WX01658) and crystal Y1 to 44.5575 MHz (KEC/ A4WX01659). FCC nameplate marked "Rev. A".	Beat note problem. Installed OFF-SET IF modification.
TR Board A4WE03582	C		

PARTS LIST CHANGES

The prefix of Service Parts replacement part numbers listed in the various Parts Lists included in this maintenance manual have been changed from "KEC/" to "K19/". All other characters remain the same as displayed. When this manual is next reprinted, all replacement parts lists will show only the "K19/" prefix.

When ordering replacement parts listed in this manual from the GE Mobile Communications Service Parts Operation, please use only the "K19/" prefix. The "K19/" prefix will be the only one shown in any future SERVICE PARTS PRICE LIST.

ADDENDUM NO 4 TO LBI-31557B
(PCTM)

This addendum adds the correct part number for C180 on the Transmit/Receive/Synthesizer board. The correct part number is K19/2CBB042199.

Addendum No. 5 to LBI-31557B

This addendum updates the Schematic Diagram to reflect the addition of the over voltage protection circuitry. The circuit consists of A27, C207, R206 thru R206 and is connected between the 13.6 Vdc input at J23-1 and ground. The part numbers and descriptions are listed in the current issue of this manual. A partial of the Schematic Diagram is shown below:

CIRCUIT ANALYSIS

Overvoltage protection circuit, A27, monitors the battery voltage applied to A21-1 through resistors R205 and R206. Variable resistor R206 sets the threshold at which the overvoltage circuit actuates. When an overvoltage occurs relay K2 is actuated and interrupts the 13.6 Vdc applied to the ignition switch through J23-1.

SCHEMATIC DIAGRAM (Partial)

