

MT-500

2 way Radio

(SERVICE MANUAL)

| SUBJECT | PAGE | ISSUE NO. | APPLICATION |
|--|------|-----------|-------------|
| Specification | 2 | AA | MT-500 |
| Operating Instructions | 4 | AA | MT-500 |
| Theory of Operation | 7 | AA | MT-500 |
| Troubleshooting Hints | 10 | AA | MT-500 |
| Test Equipment Setup and Alignment Instructions | 11 | AA | MT-500 |
| Block Diagram | 16 | AA | MT-500 |
| Schematic Diagram | 17 | AA | MT-500 |
| Semiconductor Lead Identification and IC Internal Connections | 18 | AA | MT-500 |
| Top View of PCB Board | 25 | AA | MT-500 |
| Bottom View of PCB Board | 26 | AA | MT-500 |
| Voltage Chart | 27 | AA | MT-500 |
| Exploded View and Exploded View Part list | 31 | AA | MT-500 |
| Part List | 34 | AA | MT-500 |
| Issue No. AA & Date 2002-06-19 | | | |

Issue No. AA (2002-06-19) MT-500

SPECIFICATION

GENERAL

| | |
|-------------------------------------|--|
| Transmitter..... | CPU Controlled PLL Synthesizer |
| Receiver..... | CPU Controlled double conversion, superheterodyne system |
| Operating Frequencies..... | CH 1: 446.00625 MHz ~ CH 8: 446.09375 MHz |
| Battery Life..... | 8 hours (typical) |
| Battery..... | 6 V DC @400 mAH Alkaline Batteries |
| Test Temperature..... | 25°C |
| Frequency Stability..... | 0.0025% |
| Transmitter/Receiver Switching..... | Electrical |

STANDARD TEST CONDITIONS

| | |
|--------------------------------|------------------------------|
| Battery Supply Voltage..... | 6 V DC |
| Modulation..... | MT : AF 1 KHz / 1.5 KHz Dev. |
| Receiver Output..... | 300 mW at external Speaker |
| Receiver Output Impedance..... | 8 ohms, non-inductive |
| Ambient Conditions | |
| Temperature..... | -20°C ~ 50°C |
| Humidity..... | 40% ~ 70% |

RECEIVER

| Test Item | Nominal | Limit |
|--|----------|----------|
| Sensitivity (12 dB Sinad) | 0.25 V | 0.39 V |
| Squelch-Threshold | 0.25 V | 0.39 V |
| Hum & Noise Ratio (S/N) at 1 mV | 40 dB | > 35 dB |
| Max Audio Output at 1 kHz / 1.5 kHz Dev. | | > 100 mW |
| Rx STBY current | 40 mA | < 45 mA |
| OFF current | | < 10 µA |
| Audio Frequency Response | | |
| 300 Hz | -3.0 dB | ±3.0 dB |
| 2.5 kHz | -10.0 dB | ±3.0 dB |
| Audio distortion at 1 mV | 3.0% | < 10.0% |
| In Band Conducted RX Spurious | -60 dBm | -55 dBm |
| Spurious Rejection Ratio (1 st IF / 2 nd IF) | 65 dB | 60 dB |
| Image Rejection Ratio (1 st IF / 2 nd IF) | 60 dB | 50 dB |
| Adjacent Channel Rejection Ratio | 60 dB | 50 dB |
| Inter Modulation Distortion ±2,4 CH | 65 dB | 55 dB |
| Batt. Low Indicate | 4.2 V | ±0.2 V |
| Intermediate Frequency | | |
| 1 st IF..... | | 21.7 MHz |
| 2 nd IF..... | | 450 KHz |

TRANSMITTER

| Test Item | Nominal | Limit |
|---------------------------------------|-----------|-------------------|
| Conducted Tx power (@ 6.0 V DC Input) | 0.5 Watts | 0.4~0.6 Watts |
| Maximum Current (@ 6.0 V DC Input) | 250 mA | < 300 mA |
| Conducted Spurious Emission | -60 dBc | -50 dBc |
| Audio frequency Response | | |
| 300 Hz (@ 1.5 KHz Dev.) | -10.0 dB | ±3.0 dB |
| 2.5 KHz (@ 0.5 KHz Dev.) | +6.0 dB | ±3.0 dB |
| Audio Frequency Deviation | 2.3 KHz | 2.0 KHz ~ 2.5 KHz |
| (AF 1 KHz / 20 dB up 1.5 KHz Dev.) | | |
| Call deviation | 1.5 KHz | 1.2 KHz ~ 1.8 KHz |
| TX Hum & Noise | 35.0 dB | 30.0 dB |
| (AF 1 KHz / 1.5 KHz Dev.) | | |
| TX Distortion | 3.0 % | 5.0 % |
| (AF 1 KHz / 1.5 KHz Dev.) | | |
| Carrier Frequency | ±300 Hz | ±1000 Hz |
| Tolerance (2.5 ppm) | | |
| Mic. Sensitivity | 10 mV | ±3 mV |
| (AF 1 KHz / 1.5 KHz Dev.) | | |

OPERATING INSTRUCTION

Install Batteries

Note : Batteries not included with MT-500 2-way radio.

Note : Always use high quality alkaline or NiMH batteries.
Incorrect positioning can damage both the batteries and the unit.
Only the Cobra NiMH battery (Part # FA-BP) pack can be recharged.

- Pull lock tab down to remove battery cover.
- Insert four "AAA" batteries. Position batteries according to polarity markings.

Note : When batteries are low or need charging the BATT LOW indicator will blink. Replace Alkaline batteries or recharge NiMH battery pack.

Turning on Your MT-500

- Push and hold the POWER button for 2 seconds. An audible "tone" will indicate the unit is on. Adjust the volume to desired level using the VOLUME UP or VOLUME DOWN buttons Press and hold the POWER button for 2 second again to turn off the unit.

Note : Whenever the unit is on you can receive communications.

Auto Battery Power Saver

Your MT-500 has a unique circuit designed to extend battery life. If there are no transmissions within 10 seconds, the unit will automatically switch to battery save mode and "POWER SAVER" will be shown in the display.

Note : The Auto battery Save Circuit does not effect the unit's ability to receive incoming Transmissions.

Select Channel (1~ 8)

- Push and hold the POWER button for 2 seconds. An audible "tone" will indicate the unit is on. LCD will go through self-test and then go to operational mode.

Note : Units must be on same channel to communicate.

- Select channel by pushing CHANNEL UP or CHANNEL DOWN.

Note : Push and hold the **channel** buttons for fast channel advance.

Battery Low

Note : When battery is Low, the BATT LOW indicator will blink.

When in normal use the BATT LOW Icon may begin flashing. This is a warning to you that your batteries are getting low.

Note : Only the Cobra NiMH battery pack can be recharged.

Replace alkaline batteries as soon as possible and/or recharge NiMH battery pack.

Note : NiMH rechargeable battery Pack (item # FA-BP) the batteries can be charged using the optional Wall mount Charger (part no. PA-CE or PA-CU).

Calling Another Person

To alert another person that you are calling:

- Turn on your MT-500 2-way radio. An audible "tone" will indicate the unit is on.

Note : The calling and receiving units must be on same channel for the call function to work.

- Select a channel by pushing the CHANNEL button up or down.

Note : Your incoming "Call" audio ringing level is dependent on your unit's volume setting.

- Push and release **Call** button. The unit you are calling will hear a two second ringing tone.

Talking to Another Person

To send your outgoing message:

Note : Both unit must be on same channel to communicate.

- Turn ON your MT-500 2-way radio. An audible "tone" will indicate the unit is on.

Note : While **Talk** button is depressed you can not receive incoming calls.

- Push and hold **Talk** button.
- The icon will appear
- Hold mic about 2 inches from mouth. Speak in a normal voice.

Note : When you release the **Talk** button. The person you are talking to will hear a tone indicating that it's ok to talk.

- Release **Talk** button and listen for response.

Roger Beep Confirmation Tone

Your listen will hear an audible tone when you release the Talk button.

This alerts the other party that you are finished talking and it's ok for them begin talking.

Listening for a Response

When finished talking :

Note : While the Talk button is depressed you can not receive incoming communications.

- Release Talk button to receive incoming transmissions.

Your MT-500 is always in listening mode when the Talk button is not pressed.

- Adjust volume by pressing the volume down or up buttons.

Auto Squelch

Your MT-500 is equipped with Auto squelch, Which automatically shuts off weak transmissions and unwanted noise due to terrain conditions or if you have reached your rang limit.

Maximum Rang Extender

Auto squelch can be temporarily removed to allow all signals to enter (Maximum Rang Extender).

Note : Rang is dependent on battery condition and geographic territory.

- Push and hold LIGHT/MAX RANGE button to allow all signals to enter.

THEORY OF OPERATION

Circuit Composition and Operation Theory

The basic explanation for the circuit composition the one board controlling the analog circuit parts and the digital circuit parts for the other control.

Receiver

Receive parts is composed in the double conversion system, which has the 1st IF Frequency of 21.7 MHz And 2nd Frequency of 450 KHz. The 3 pole MCF used in the 1st IF, and the sensitivity repression are reduced for the more stable reception.

RF Front-End

The signal received by the antenna will be transmitted to the band pass filter through the antenna switching circuit consisted of L28. The front RF amplifier transistor Q1 consists of the L2, L6, C1, C2, C3, C4, C5, C7, C506 input band pass filter and L3, L8, C9, C10, Saw filter output band pass filter primarily diminishes the other signal rather than the 1st IF image and other signal within the reception band and amplifier only the necessary signal within the RF

1st Mixer

The receiver has been amplifier in the RF front end is provided to the base of the 1st mixer Q2. The 1st L/O signal provide from the VCO is supplied to the emitter of Q2 and converted to the 1st IF 21.7 MHz

1st IF Filter and 1st IF Amplifier

The signal converted by Q2 to 21.7 MHz, the 1st frequency, change its impedance through L1, C27 and then is infused to the fundamental MCF which has the center frequency of 21.7 MHz and the width of ± 3.75 KHz. Here, the signal reduces the image and other unwanted signal for the 2nd IF, and changes its impedance again through C75. Then the signal is infused to the Q3, the 1st IF amplifier. The signal infused to the Q3 is amplifier approximately by 20 dB in other to acquire the required reception sensitivity, and infused to the IC1 which functions as the 2nd mixer, the 2nd IF amplifier, and the FM detector.

2nd Mixer, and IF, FM Detector (IC1)

The receiver IF signal of 21.7 MHz, which has been infuse to IC1 is mixed with the 2nd L/O signal of 21.25 MHz, and converted to 450 KHz, the 2nd IF frequency. The receiver signal converted to the 2nd IF signal frequency passed through the CF2, the ceramic filter of 450 KHz again. After the limiting inside the IC1 and the FM demodulating by the quadrature detector inside the IC1, the signal offers the output through the 9th pin of IC1. The 2nd L/O signal of 21.25 MHz, which infused to the IC1 filter and uses directly the 9th pin of IC1. The squelch circuit is composed to detect the noised from the received signal demodulate in the 9th pin of the IC1. For this purpose, the noise filter is using the OP Amplifier inside the IC1.

Audio Power Amplifier (IC2)

Audio Power Amplifier (IC2) The receiver audio signal, which has been automatic adjusted to the appropriate volume in by Q15, Q16, Q39 are supplied to the 2nd pin of the IC2 amplifier approximately by 20 dB. Then, it turns up the speaker with the maximum output of 0.3 watts. The 7th pin of the IC2 is the audio mute terminal. If a voltage supply to the 6th pin of IC2 is supplied to this terminal, the IC2 stops functioning as the audio power amplifier regardless of the signal supplied to the 2nd pin of the IC2. And there is no sound from the speaker.

Transmitter

The transmitter parts of the MT-500 is designed to amplify the RF signal oscillated and modulated by the synthesizer to approximately 0.5 Watts by the power transistor of Q26, Q27, Q38.

Pre-emphasis (IC6)

The voice signal input from the microphone is pre-emphasized at the IC6A. The signal comes out of the IC6B is limited to a certain amplitude for the voice signal not to exceed the allowable bandwidth assigned for transmission.

Tx Power (Q26, Q27, Q38)

The transmitted signal of approximately 7 mW, combined at the driver TR is supplied to the base of the Q26, Q27, Q38 amplifier. The transmitted signal amplifier to 0.47 W here passes the Tx LPF of the 2nd characteristics of the L25, L26 and L27 and Rx/Tx switching takes place by the D11. After this, the signal is provided to the antenna the Tx LPF of the 1st characteristics consisted of the C316 and R306.

MT Frequency Synthesizer

Voltage Control Oscillator (VCO)

The VCO of oscillates 446.00625 MHz to 446.09375 MHz under the transmission condition and 424.30625 MHz to 424.39375 MHz under the reception condition. The VCO consist of the clip oscillator of the Q4 and contains the oscillator frequency of approximately 21.7 MHz during the transmission/reception conversion. That is since the VCO should oscillate relatively low frequency during reception compared to transmission, the D15 is biased by the Q21.

Therefore as a result, the C40 is added in parallel to the resonance circuit of the VCO to oscillate a low frequency. During transmission, a relatively high frequency should be oscillation compared to reception. Therefore, the D15 is adversely biased by the Q21, and as a result, the C40 is added unparallel to the circuit of the VCO is removed to oscillate the desired transmission frequency. The VCO is controlled by the IC4 (PLL IC) in order to oscillate accurate frequency. The output frequency of the VCO is supplied to the IC4 PLL IC immediately. At the IC4, TCXO (21.25 MHz) by the TCXO (X1) is compared to the output frequency of the VCO. The VCO is controlled the loop filter consisted of the R58, R59 and the C64, C69, C71 in order to oscillate the stable frequency wanted for the radio. The VCO controlled voltage as passed the loop filter is supplies to the D24 varicap diode, and the VCO an oscillator the PLL programmed frequency by the capacity variance in the D24. In addition, the L7 on the VCO circuit function as frequency for the VCO to be properly controlled by the IC4 PLL IC.

RX/TX Buffer Amplifier (Q8)

The RF signal oscillate at the VCO is provide to the Q2 RX 1st mixer through the Q8 during the reception, and is provide to the Q29 power driver amplifier through the Q8 during the transmission.

PLL Frequency Synthesizer (IC4)

The PLL synthesizer of the signal loop PLL circuit with the reference of 6.25 kHz. The IC4 PLL IC includes all the function such as the reference oscillator, the driver, the phase detector, the lock detector, and the programmable divider. At the reference oscillator, the 21.25 MHz TCXO of the TCXO is connected to the pin 11 of the IC4 to oscillate the frequency of 21.25 MHz. The TCXO (21.25 MHz) is the temperature compensation circuit to maintain the frequency within the allowable error range even under a low temperature of -30° C. The phase detector send out the output power to the loop filter through 3rd pin of the IC4. If the oscillation frequency of the VCO is low compared to the reference frequency, the phase detector sends out output power in positive pulse. If the oscillation frequency of the VCO is high, phase detector send put can maintain the frequency set. The programmable divider maintain the desired frequency with control from the CPU. The dividing ratio, "N" to oscillate the desired frequency is as below :

$N = \text{VCO oscillation frequency} / \text{reference frequency}$

If the desired frequency is 446.00625 MHz

TX

$N = 446.00625 \text{ MHz} / 0.00625 \text{ MHz} = 71361$

RX

$N = [446.00625 \text{ MHz} - 21.7 \text{ MHz}] / 0.00625 \text{ MHz} = 67889$

CPU and Memory

Most of the control functions of the MT-500 are controlled by the IC100 CPU. The IC100 CPU has the internal ROM in the capacity of 8 K byte, and the program for the operation of the IC100. When the power of turned on, the IC100 reads the data necessity for the operation from the internal ROM, and decide the operation channel, frequency, etc.

TROUBLESHOOTING HINTS

| Symptom | Probable Cause | Remedy |
|----------------------------|---|--|
| Unit does not work at all | <ul style="list-style-type: none"> • Defective regulator IC5. • Defective components of X2. • Broken DC power terminal. | <ul style="list-style-type: none"> • Replace • Replace defective component(s) • Replace |
| No out from speaker at all | <ul style="list-style-type: none"> • Defective external speaker line. • Measure all the voltage of IC1, Q5, IC2. • Defective internal speaker. | <ul style="list-style-type: none"> • Repair or replace • Repair or replace • Replace |
| No noise on speaker | <ul style="list-style-type: none"> • Measure all the voltage of RF. • Defective squelch circuit components compare with the voltage chart. | <ul style="list-style-type: none"> • Replace defective component(s) |
| No modulation | <ul style="list-style-type: none"> • Defective microphone. • Measure all the voltage of IC6, RV3 on the RF digital compare with the voltage chart. | <ul style="list-style-type: none"> • Replace • Replace |
| LCD does not work | <ul style="list-style-type: none"> • Measure all the voltage of X2, IC100. | <ul style="list-style-type: none"> • Replace defective component(s) |
| Black light does not work | <ul style="list-style-type: none"> • Defective components of D16, D17, Q13. | <ul style="list-style-type: none"> • Replace |

TEST EQUIPMENT SETUP AND ALIGNMENT INSTRUCTIONS

ALIGNMENT PROCEDURE

| Step | Setting | Connection | Adjuster | Adjust for |
|------|--|---|----------|--------------------|
| 1 | RX VCO voltage adjustment Frequency : 446.00625 MHz Mic : Receive Function : None Volume : Optional Squelch : Optional | DC voltmeter to VCO Test point (Figure 1) | L7 | 1.0 V DC |
| 2 | TX VCO voltage adjustment Frequency : 446.00625 MHz Mic : Transmit (Unmodulated) Function : None Volume : Optional Squelch : Optional | DC voltmeter to VCO Test point (Figure 1) | L7 | 1.0 \pm 0.3 V DC |
| 3 | Frequency adjustment Frequency : 446.04375 MHz Mic : Transmit (Unmodulated) Function : None Volume : Optional Squelch : Optional | Antenna to frequency Counter, Through Attenuator (Figure 2) | TCXO | \pm 300 Hz |

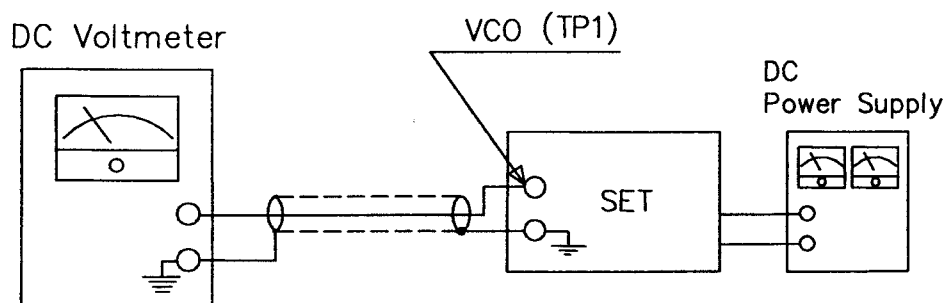


Figure 1

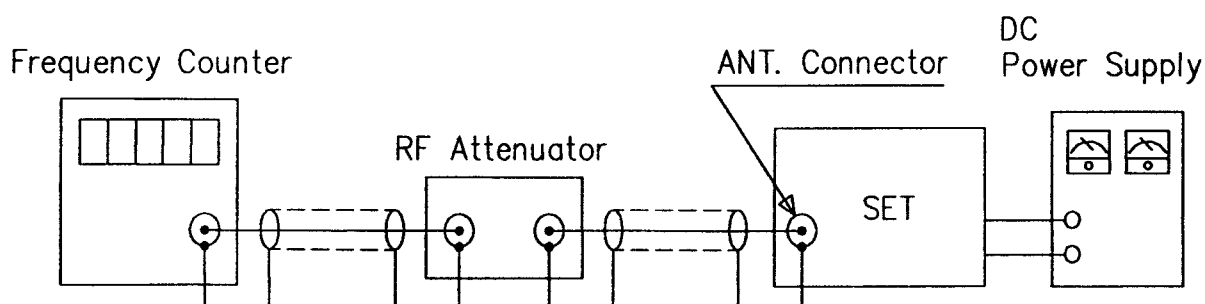


Figure 2

TRANSMITTER SECTION

Test Equipment Required

- RF power meter (RF SSVM)
- 50 ohms dummy load (non-inductive)
- RF attenuator (50 ohms non-inductive)
- Oscilloscope
- Audio generator
- DC power supply
- Spectrum analyzer
- Frequency counter
- Coupler
- Modulation meter (FM)

ALIGNMENT PROCEDURE

| Step | Setting | Connection | Adjuster | Adjust for |
|------|---|---|----------|---------------------------------|
| 1 | AF Modulation adjustment Frequency : 446.04375 MHz Mic : Transmit Function : None Volume : Optional Squelch : Optional | Connection the audio generator (set to 1 KHz) to the microphone jack. Connect the modulation meter through the RF attenuator to the ANT jack. Adjust the audio signal level to obtain by 1.5 KHz deviation. When you increase the audio Signal by 20 dB, the deviation Should not exceed 2.5 KHz deviation (Figure 3) | RV3 | 2.3 KHz DEV. (2.0 ~ 2.5 KHz) |

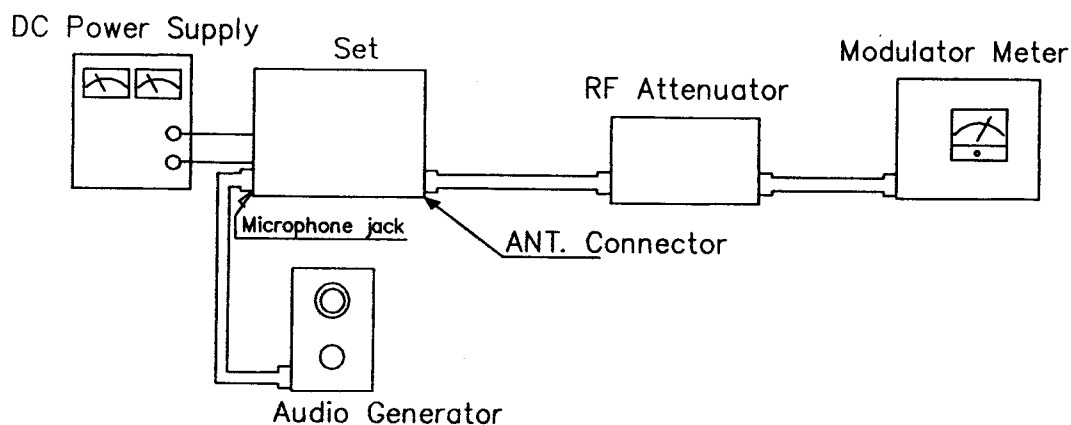


Figure 3

RECEIVER SECTION

Test Equipment Required

- Standard signal generator (SSG)
- AC level meter
- Distortion meter
- DC power supply
- 12 dB sinad meter

Alignment Procedure

| Step | Setting | Connection | Adjuster | Adjust for |
|------|---|--|----------|--|
| 1 | RX squelch adjustment Frequency : 446.04375 MHz Mic : Receive Function : None Volume : Step 6 on the display SSG : Audio 1 KHz Modulation 1.5 KHz | Connect the standard signal Generator to the EXT-ANT Jack. Connect the AC volts level meter, distortion meter and SINAD meter across the EXT speaker jack with an 8 ohm dummy load. (Figure 4) | RV1 | Maximum sensitivity indication on 12 dB SINAD meter. Adjust until the audio output appears |
| 2 | Distortion adjustment Frequency : 446.04375 MHz Mic : receive Function : None Volume : Step 6 on the display SSG : Audio 1 KHz Modulation 1.5 KHz | Connect the standard signal Generator to the EXT-ANT Jack. Connect the AC volts level meter, distortion meter and SINAD meter across the EXT speaker jack with an 8 ohm dummy load. (Figure 4) | L11 | Maximum indication on distortion meter |

DC Power Supply

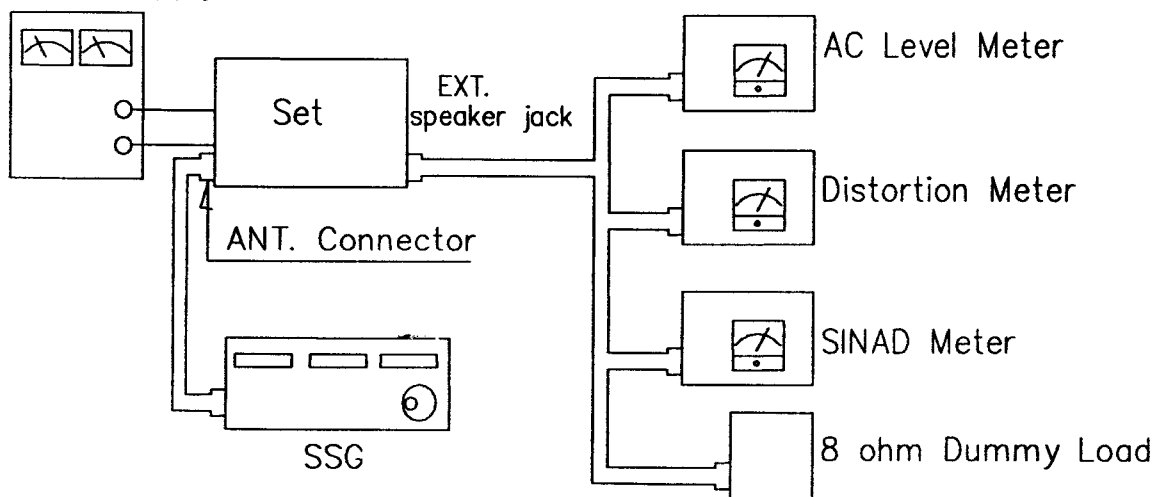


Figure 4

ALIGNMENT INSTRUCTIONS

WARNING

Any repairs or adjustment should be made under the supervision of a qualified radio-telephone technician.

TRANSMITTER

1. Power Supply Voltage

The power supply voltage should be set for 6.0 V DC measured at the radio during transmit. Periodically check the supply voltage during the alignment procedure.

2. Frequency Setting

- A. Connect a frequency counter or Communications Service Monitor to the antenna connector through an RF power attenuator (10 watt minimum rating, 20 dB minimum attenuation).
- B. Depress the PTT switch.
- C. Adjust the CT1 for output frequency is equal to the channel frequency with a maximum error of ± 300 Hz.
- D. Release the PTT switch.

3. Output Power Alignment

- A. Set the power supply voltage for 6.0 V DC.
- B. Connect a Communications Service Monitor or a wattmeter and dummy load to the antenna connector
- C. Depress the PTT switch.
- D. To be convinced for 0.5 watt output power with a maximum error of ± 0.1 watt.
- E. Release the PTT switch.

4. Deviation Adjustment

- A. Connect an audio generator to the microphone jack JIG. The audio frequency should be set at 1 KHz
- B. Connect an FM deviation meter or Communication Service Minitor to the antenna connector through an RF power attenuator (10 watt minimum rating, 20 dB minimum attenuator). Set the monitor to read peak deviation.
- C. Depress the PTT switch.
- D. Adjust the audio generator level 100 mV rms.
- E. Adjust RV3 for 2.3 KHz maximum deviation. (1 KHz dev. 20 dB up)
- F. Release the PTT switch.

RECEIVER

Note : Insure that the proper channel has been selected before proceeding with the alignment procedure.

1. Power Supply Voltage

The proper voltage for testing is 6.0 V DC.

2. Receiver Alignment

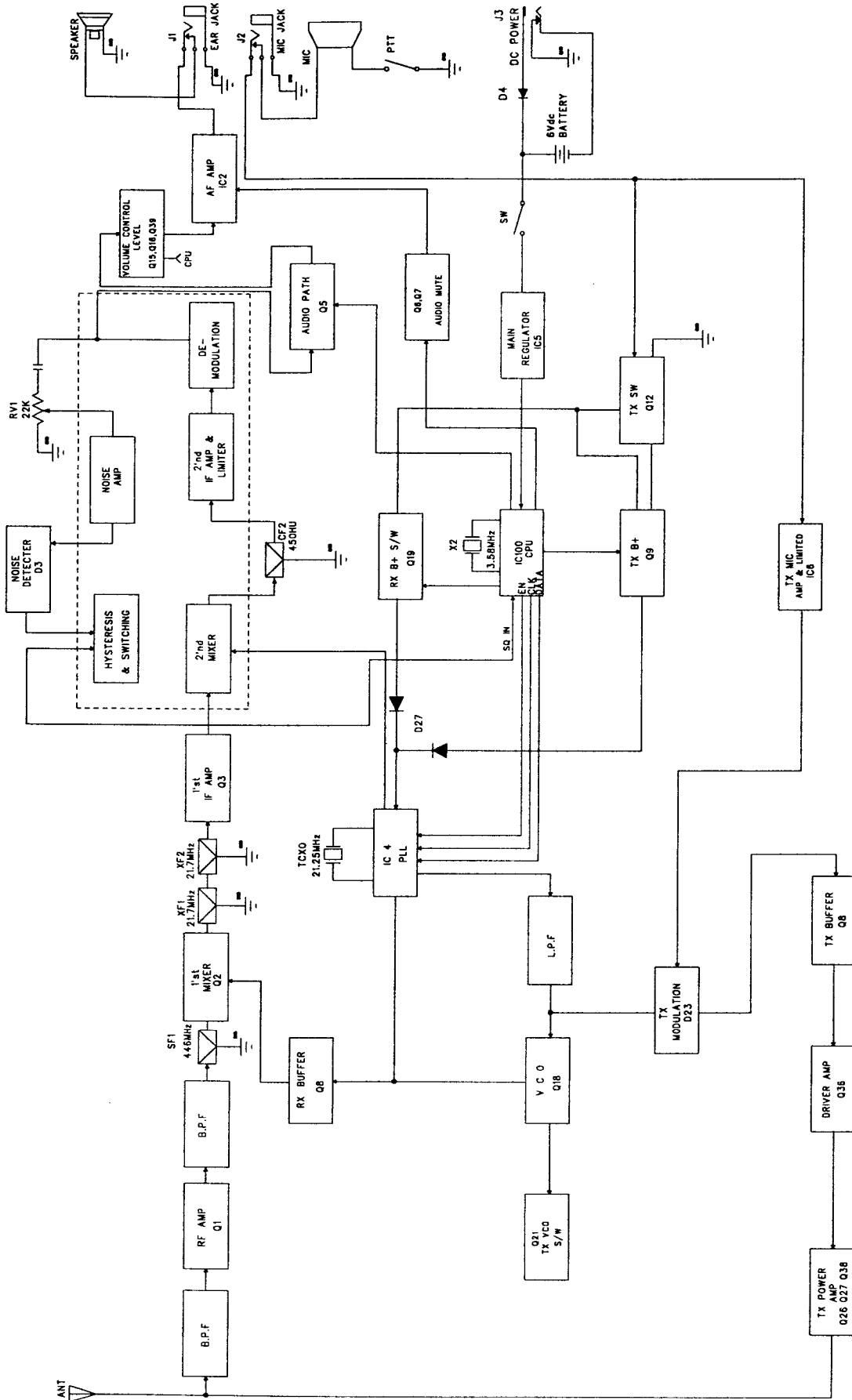
- A. Connect an RF signal generator or Communications Service Monitor to the antenna connector.
- B. Connect a SINAD meter and oscilloscope across the speaker terminals.
- C. Set the output level of the RF signal generator for - 47 dBm the generator should be set for ± 1.5 KHz deviation of a 1 KHz tone.
- D. Set the audio output level for 0.6 Vrms by adjusting volume.
- E. Adjust T1 for maximum audio output.
- F. Reduce the output level of the RF signal generator for produce a 12 dB SINAD indication.

CHANNEL FREQUENCY GENERATION TABLE

“MT” Frequency Chart

| CHANNEL | FREQUENCY (MHz) | CHANNEL | FREQUENCY (MHz) |
|---------|-----------------|---------|-----------------|
| 1 | 446.00625 | 5 | 446.05625 |
| 2 | 446.01875 | 6 | 446.06875 |
| 3 | 446.03125 | 7 | 446.08125 |
| 4 | 446.04375 | 8 | 446.09375 |

BLOCK DIAGRAM

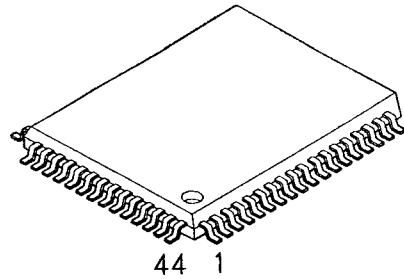


Issue No. AA (2002-06-19) MT-500

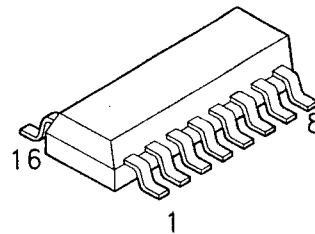
SEMICONDUCTOR LEAD IDENTIFICATION AND IC INTERNAL CONNECTIONS

INTEGRATED CIRCUITS

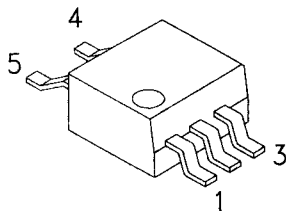
IC100 KS57P21208



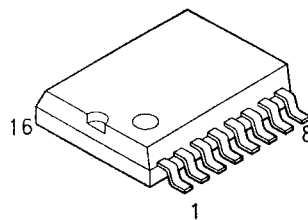
IC1 MC3361B



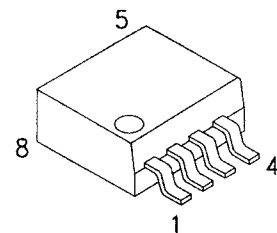
IC5 TAR5S40



IC4 KB8825

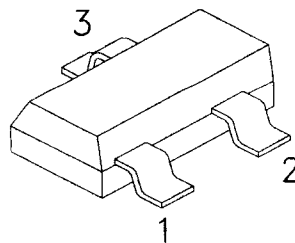


IC2 LM386
IC6 KIA4558F



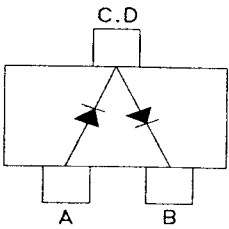
TRANSISTOR

2SC5084
BFQ67W
KRA104
KRA105
KRA226
KRC104
KRC110
KRC112
KTA1504
KTC3875
KTC3880

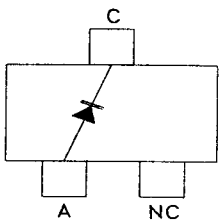


DIODES

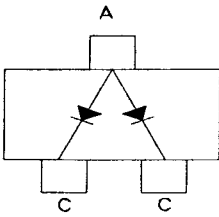
KDS226



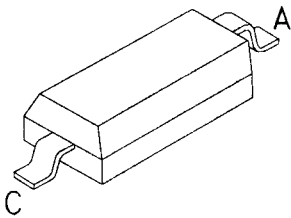
MMBV3401



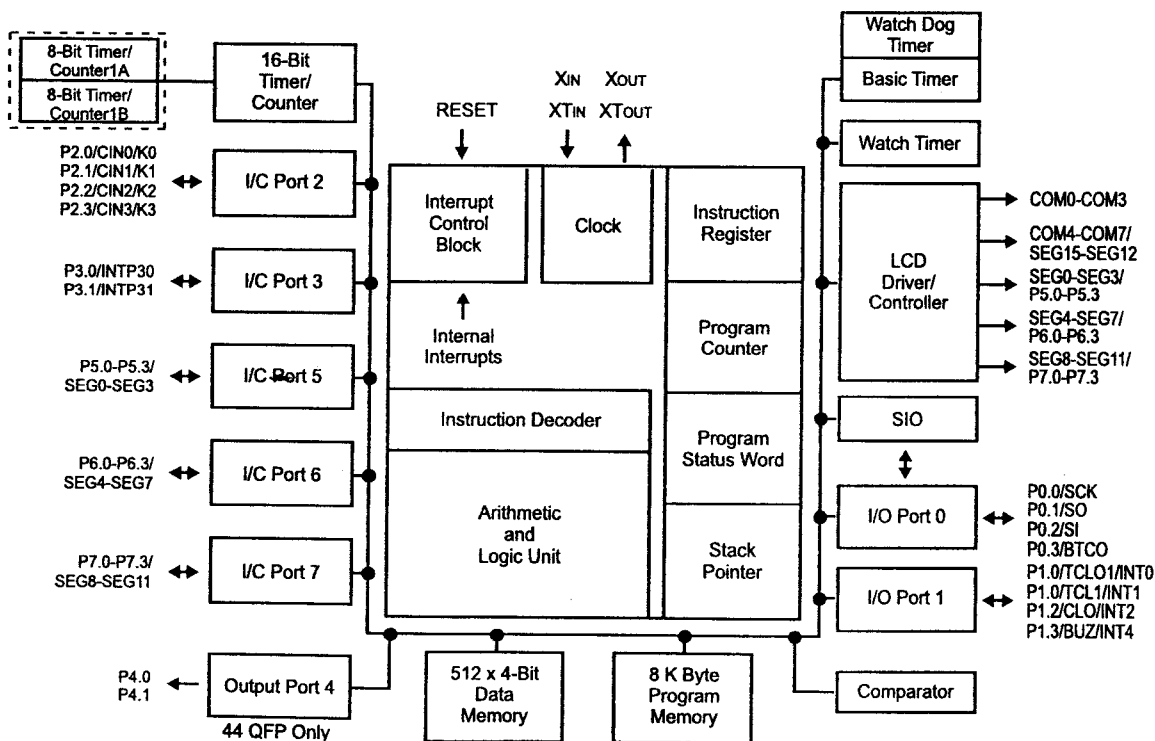
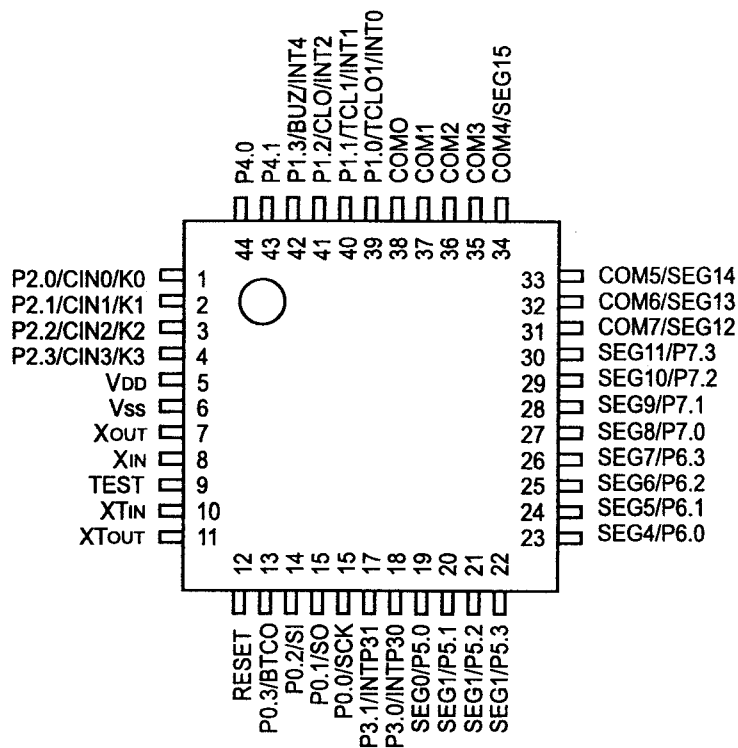
KDS181



ISS314
ISV229

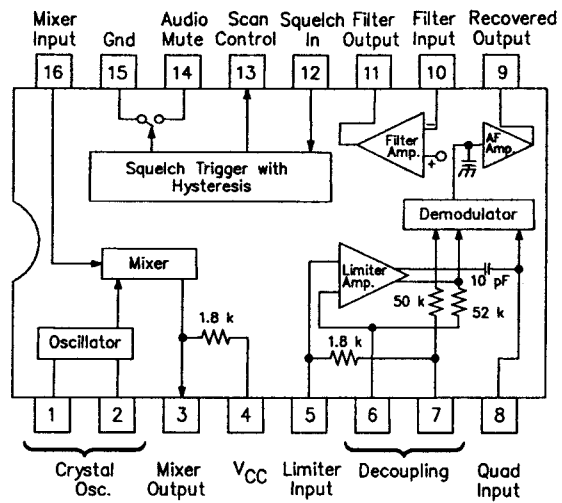
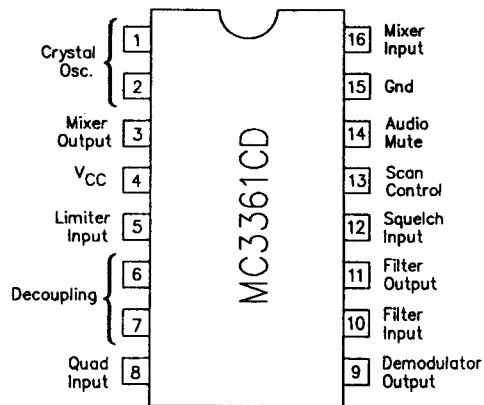


KS57P212028

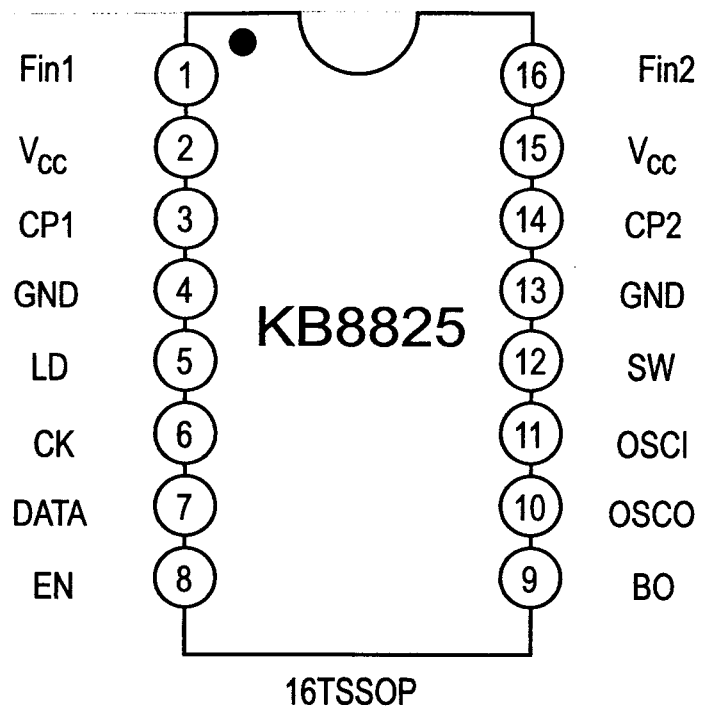


Issue No. AA (2002-06-19) MT-500

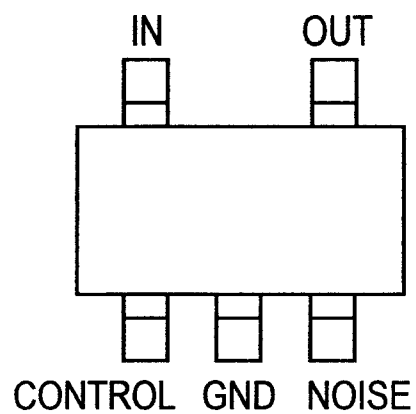
MC3361



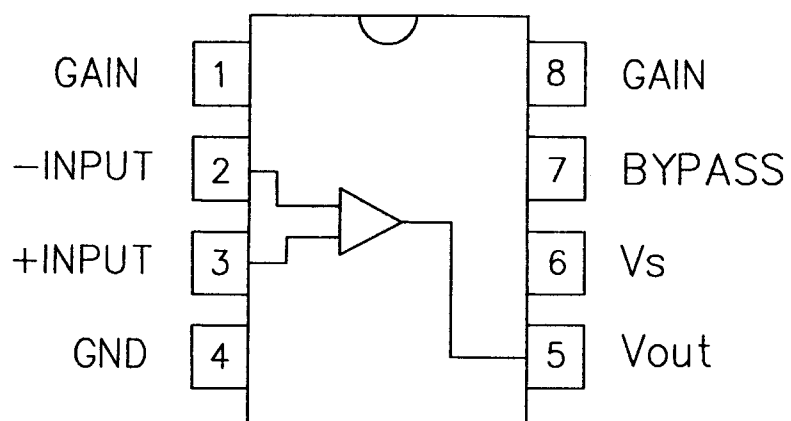
KB8825



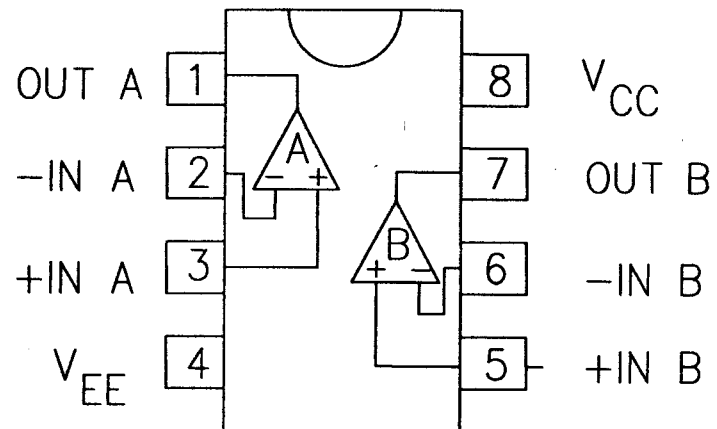
TAR5S40



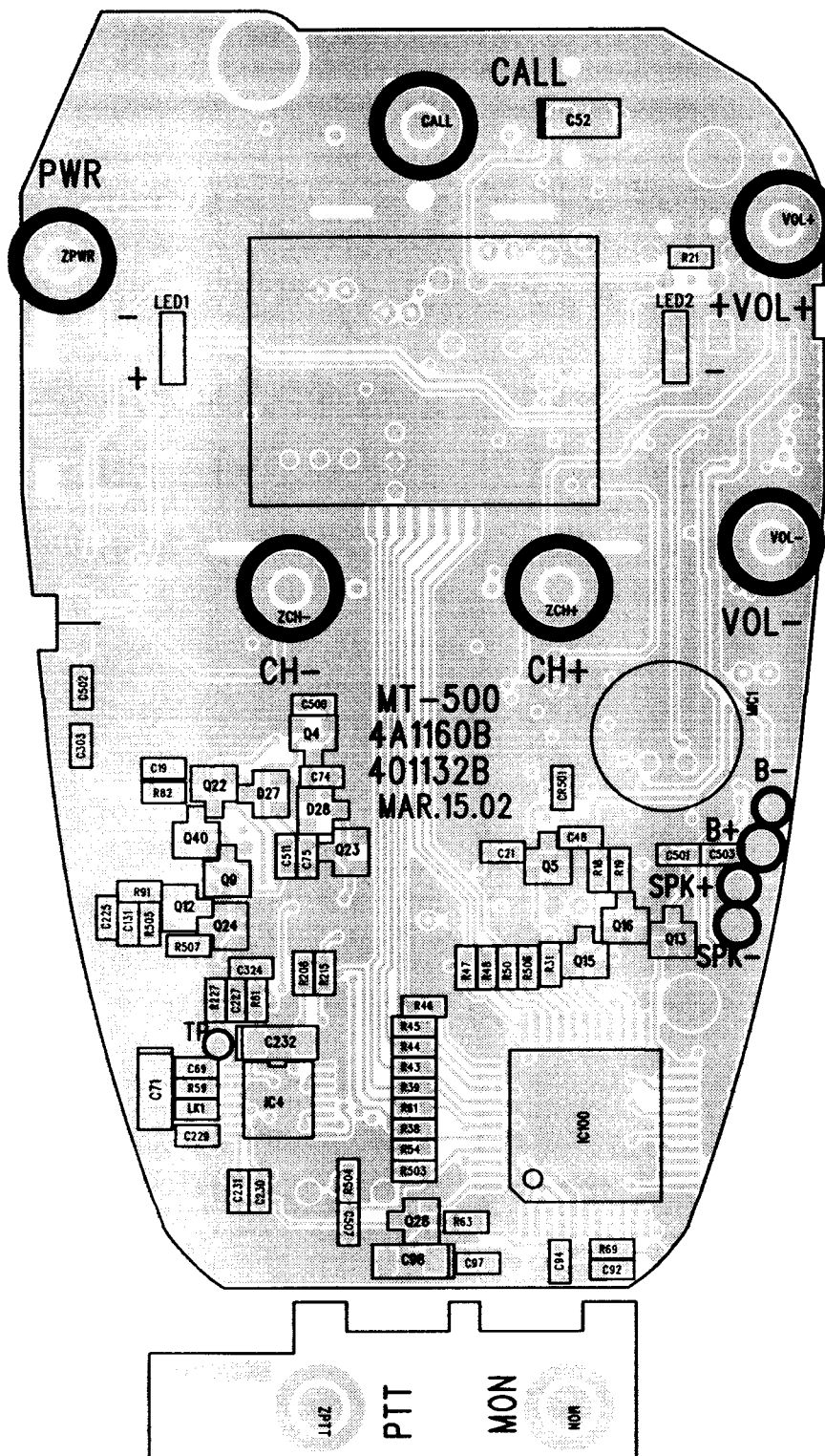
LM386



KIA4558F

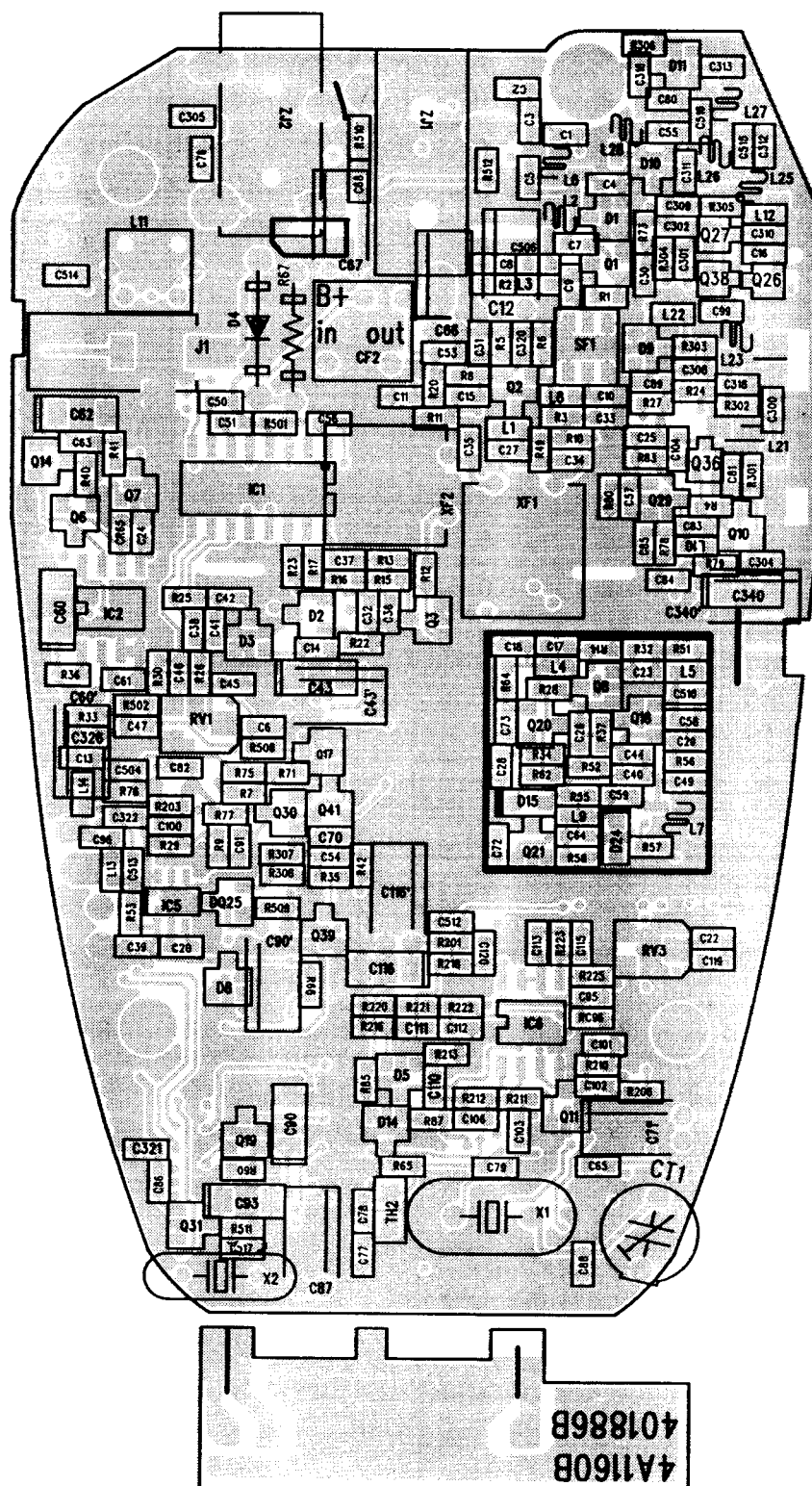


TOP VIEW OF PCB BOARD



Issue No. AA (2002-06-19) MT-500

BOTTOM VIEW OF PCB BOARD



VOLTAGE CHART

1. IC's

| IC | Pin NO. | RX | TX |
|-----|---------|------|-----|
| IC1 | 1 | 3.9 | 0 |
| | 2 | 3.2 | 0 |
| | 3 | 3.5 | 0 |
| | 4 | 3.9 | 0 |
| | 5 | 2.8 | 0 |
| | 6 | 2.8 | 0 |
| | 7 | 2.8 | 0 |
| | 8 | 3.9 | 0 |
| | 9 | 2.4 | 0 |
| | 10 | 0.9 | 0 |
| | 11 | 1.8 | 0 |
| | 12 | 1.1 | 0 |
| | 13 | 0 | 0 |
| | 14 | 3.9 | 0 |
| | 15 | 0 | 0 |
| | 16 | 1.9 | 0 |
| IC2 | 1 | 1.27 | 1.3 |
| | 2 | 0 | 0 |
| | 3 | 0 | 0 |
| | 4 | 0 | 0 |
| | 5 | 3 | 1.3 |
| | 6 | 5.8 | 5.8 |
| | 7 | 2.9 | 5.6 |
| | 8 | 1.27 | 1.4 |
| IC4 | 1 | 3.7 | 3.7 |
| | 2 | 3.7 | 3.7 |
| | 3 | 1 | 0.9 |
| | 4 | 0 | 0 |
| | 5 | 0.5 | 1 |
| | 6 | 0 | 0 |
| | 7 | 0 | 0 |
| | 8 | 0 | 0 |

| IC | Pin NO. | RX | TX |
|-----|---------|-----|-----|
| IC4 | 9 | 2.5 | 2.5 |
| | 10 | 2.8 | 2.8 |
| | 11 | 3.5 | 3.6 |
| | 12 | 0.7 | 1.2 |
| | 13 | 0 | 0 |
| | 14 | 0.8 | 0.5 |
| | 15 | 3.7 | 3.7 |
| | 16 | 3.7 | 3.7 |
| IC5 | 1 | 4 | 4 |
| | 2 | 0 | 0 |
| | 3 | 1.3 | 1.3 |
| | 4 | 4 | 4 |
| | 5 | 6 | 5.8 |
| IC6 | 1 | 0 | 2.3 |
| | 2 | 0 | 2.3 |
| | 3 | 0 | 2.3 |
| | 4 | 0 | 0 |
| | 5 | 0 | 2 |
| | 6 | 0 | 2 |
| | 7 | 0 | 2 |
| | 8 | 0 | 3.7 |

| IC | Pin NO. | RX | TX |
|-------|---------|-----|-----|
| IC100 | 1 | 3.5 | 3.4 |
| | 2 | 4 | 4 |
| | 3 | 0 | 0 |
| | 4 | 3.9 | 3.9 |
| | 5 | 4.0 | 4 |
| | 6 | 0 | 0 |
| | 7 | 1.9 | 1.9 |
| | 8 | 2 | 2 |
| | 9 | 0 | 0 |
| | 10 | 0 | 0 |
| | 11 | 4 | 4 |
| | 12 | 4 | 4 |
| | 13 | 0 | 0 |
| | 14 | 0 | 0 |
| | 15 | 0 | 0 |
| | 16 | 0 | 4 |
| | 17 | 4 | 4 |
| | 18 | 4 | 4 |
| | 19 | 0 | 1.8 |
| | 20 | 0 | 1.8 |
| | 21 | 0 | 1.8 |
| | 22 | 0 | 0 |
| | 23 | 0 | 0 |
| | 24 | 4 | 0 |
| | 25 | 4 | 4 |
| | 26 | 0 | 0 |
| | 27 | 0 | 0 |
| | 28 | 0 | 4 |
| | 29 | 4 | 4 |
| | 30 | 0 | 0 |
| | 31 | 2 | 2 |
| | 32 | 1 | 2 |
| | 33 | 2 | 2 |
| | 34 | 2 | 2 |
| | 35 | 2 | 2 |

| IC | Pin NO. | RX | TX |
|-------|---------|----|-----|
| IC100 | 36 | 2 | 2 |
| | 37 | 2 | 2 |
| | 38 | 2 | 2 |
| | 39 | 4 | 4 |
| | 40 | 0 | 0 |
| | 41 | 0 | 4 |
| | 42 | 0 | 0 |
| | 43 | 0 | 4 |
| | 44 | 4 | 0.1 |

Issue No. AA (2002-06-19) MT-500

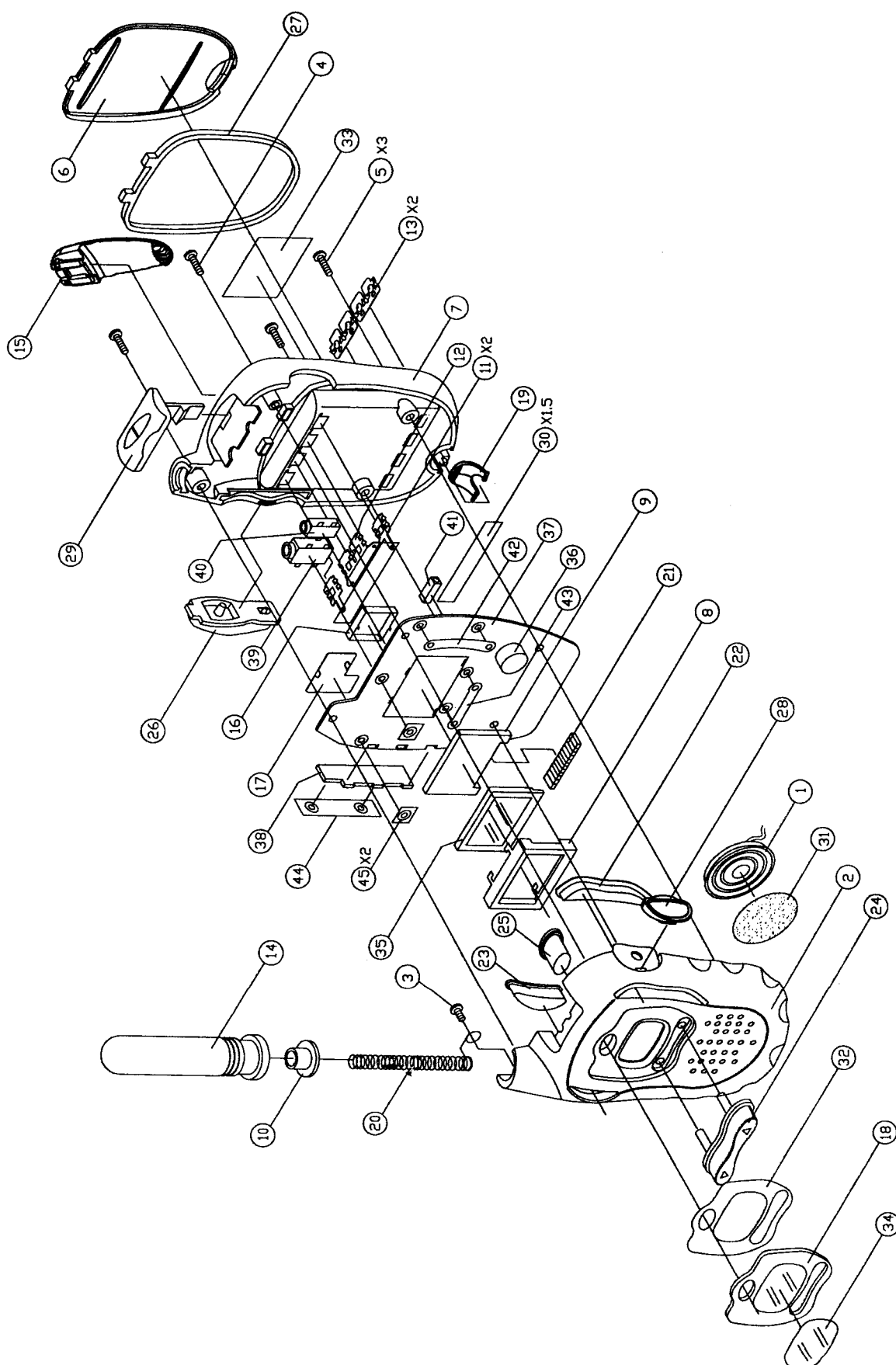
2. TRANSISTORS

| Ref. No. | Receiver | | | Transmitter | | |
|----------|----------|------|------|-------------|------|------|
| | B | E | C | B | E | C |
| Q1 | 0.8 | 0 | 3.4 | 0.3 | 0.1 | 0.1 |
| Q2 | 0.92 | 0.29 | 3.8 | 0 | 0.1 | 0 |
| Q3 | 0.7 | 0.13 | 1.5 | 0 | 0 | 0 |
| Q4 | 0 | 0 | 3.48 | 4 | 0.12 | 0.18 |
| Q5 | 1.5 | 2 | 2 | 4.12 | 0 | 0.4 |
| Q6 | 5.5 | 5.8 | 2.9 | 5.1 | 5.7 | 5.7 |
| Q7 | 0 | 0 | 5.3 | 4 | 0.1 | 0.1 |
| Q8 | 1.9 | 1.2 | 3.7 | 1.98 | 1.29 | 3.8 |
| Q9 | 4 | 4 | 0 | 0.28 | 4.1 | 4 |
| Q10 | 0 | 0 | 0 | 0.1 | 4 | 4 |
| Q11 | 4 | 0 | 0 | 0.1 | 0 | 2.3 |
| Q12 | 4 | 4 | 0 | 3.5 | 3.5 | 4.12 |
| Q13 | 0 | 0 | 2.7 | 0.14 | 0.14 | 2.58 |
| Q14 | 3.6 | 5.8 | 5.88 | 3.5 | 5.7 | 5.7 |
| Q15 | 0 | 0 | 0 | 0.14 | 0.14 | 0.14 |
| Q16 | 0 | 0 | 0 | 0.14 | 0.14 | 0.14 |
| Q17 | 3.9 | 0 | 0 | 3.9 | 0 | 0 |
| Q18 | 1.3 | 0.6 | 2.8 | 1.33 | 0.6 | 2.9 |
| Q19 | 0 | 4 | 4 | 4 | 4 | 0 |
| Q20 | 3.6 | 3 | 3.7 | 3.7 | 3 | 3.8 |
| Q21 | 3.45 | 0 | 0 | 0.12 | 0 | 3.7 |
| Q22 | 0.6 | 3.7 | 3.6 | 0.7 | 3.8 | 3.8 |
| Q23 | 3.9 | 0 | 0 | 0 | 0.14 | 1.3 |
| Q24 | 3.9 | 0 | 0 | 3.9 | 0.14 | 0.14 |
| Q26 | 0 | 0 | 5.9 | 0.7 | 0.1 | 5.7 |
| Q27 | 0 | 0 | 5.9 | 0.7 | 0.1 | 5.7 |
| Q28 | 3.9 | 3.9 | 4 | 4 | 0.2 | 0.2 |
| Q29 | 0 | 0 | 0 | 1.18 | 0.5 | 3.6 |
| Q30 | 3.9 | 3.2 | 4 | 3.9 | 3.2 | 4 |
| Q31 | 0 | 0 | 4 | 0 | 0 | 4 |

Issue No. AA (2002-06-19) MT-500

| Ref. No. | Receiver | | | Transmitter | | |
|----------|----------|-----|-----|-------------|-----|------|
| | B | E | C | B | E | C |
| Q36 | 0 | 0 | 5.9 | 0.7 | 0.1 | 5.39 |
| Q38 | 0 | 0 | 5.9 | 0.7 | 0.1 | 5.7 |
| Q39 | 4 | 0 | 0 | 4 | 0.1 | 0.1 |
| Q40 | 2.69 | 4 | 4 | 2.78 | 4 | 4 |
| Q41 | 3.9 | 5.5 | 4 | 4 | 0.1 | 0.1 |

EXPLODED VIEW AND EXPLODED VIEW PART LIST



Issue No. AA (2002-06-19) MT-500

EXPLODED VIEW PART LIST

| Ref. No. | Description | Q'ty | Mfr's Part No. |
|----------|--|------|----------------|
| 1 | SPEAKER MICRO 8 OHM 0.5W 28MM YD28-1B | 1 | 420-125-6Z |
| 2 | UPPER COVER ASS'Y MT500-2 | 1 | 508-882-A |
| 3 | (+)MACHINE W/S(PH) M2X5 WD=4.7 BLK | 1 | 612-310 |
| 4 | (+)TAPPING SCREW(PH)T2.6X13-2S (+)PH BLACK | 1 | 621-486 |
| 5 | (+)TAPPING SCREW(PH)T2.6X7-2S (+)PH BLK | 3 | 621-488 |
| 6 | COVER BATTERY ABS | 1 | 71A-038-A |
| 7 | COVER BOTTOM ABS | 1 | 71A-039-A |
| 8 | BRACKET LCD SPTE T0.3 | 1 | 723-994 |
| 9 | REFLECTOR P.C CLEAR | 1 | 733-021 |
| 10 | HOLDER ANTENNA ABS(BLACK) | 1 | 733-022 |
| 11 | TERMINAL "A" SUS304-3/4H T0.2 | 2 | 753-149 |
| 12 | TERMINAL "B" SUS304-3/4H T0.2 | 1 | 753-150 |
| 13 | TERMINAL SUS304-1/4H T0.2 | 2 | 753-167 |
| 14 | ANTENNA TUBE PVC 80P 50' | 1 | 753-207 |
| 15 | BELT CLIP P.C BLACK | 1 | 753-208 |
| 16 | VCO CAN SPTE T0.3 | 1 | 772-503 |
| 17 | SHIELD PLATE SPTE T0.3 | 1 | 772-590 |
| 18 | LENS ACRYL | 1 | 814-405 |
| 19 | KNOB LOCK ABS | 1 | 826-507-A |
| 20 | SPRING ANT. SWP3 &0.8 | 1 | 881-693 |
| 21 | ZEBRA CONTACT SILICONE RUBBER | 1 | 895-971 |
| 22 | KEY PAD VOL SILICONE RUBBER | 1 | 895-972 |
| 23 | KEY PAD POWER SILICONE RUBBER | 1 | 895-973 |
| 24 | KEY PAD CH SILICONE RUBBER | 1 | 895-975 |
| 25 | KEY PAD FUNCTION SILICONE RUBBER | 1 | 895-976 |
| 26 | RUBBER PTT SILICONE RUBBER | 1 | 895-977 |
| 27 | GASKET SILICONE RUBBER | 1 | 895-978 |
| 28 | CAP DUST CHG NBR | 1 | 895-979 |
| 29 | CAP DUST SP NBR | 1 | 895-981 |
| 30 | INSULATION PLATE 10X42.5XT0.18 INSUPAPER | 1.5 | 906-776 |
| 31 | FELT FELT T0.2 | 1 | 907-101 |
| 32 | DOUBLE TAPE(LENS) TESA 4959 T0.1 | 1 | 907-170 |
| 33 | LABEL NAME POLYESTER 29X23 | 1 | 95A-997-A |
| 34 | LABEL LCD PVC CLEAR 31.6X22.3 | 1 | 95B-007 |
| 35 | LCD DISPALY TCM-3108 | 1 | 252-282-5 |

Issue No. AA (2002-06-19) MT-500

| Ref. No. | Description | Q'ty | Mfr's Part No. |
|----------|-----------------------------------|------|----------------|
| 36 | MIC CONDENSER EM-54L-P | 1 | 420-274-1Z |
| 37 | P.C.B MAIN 53.2 X85 X1.0 FR4 2/S | 1 | 401-132-B |
| 38 | P.C.B PTT 32.2 X10.8 X1.0 FR4 2/S | 1 | 401-886-B |
| 39 | JACK STEREO EARPHONEEJS-4-4035S | 1 | 420-806-2U |
| 40 | JACK STEREO EARPHONEEJS-4-4125S | 1 | 420-807-3V |
| 41 | JACK SKJS-038S-2 | 1 | 420-856-7 |
| 42 | DOM KEY ASS'Y SKDS-42001MA | 1 | 509-358-A |
| 43 | DOM KEY ASS'Y SKDS-42001M | 1 | 509-358-B |
| 44 | DOM KEY ASS'Y SKDS-52001M | 1 | 509-358-C |
| 45 | DOM KEY ASS'Y SKDS-14001M | 2 | 509-360 |

Issue No. AA (2002-06-19) MT-500

PART LIST

| Seq | Part No. | Name & Description | Q'ty | Reference |
|-----|------------|---|------|-------------------------|
| 1 | 538-72C-A | COVER ASS'Y | 1 | SPK1 |
| | 420-125-6Z | SPEAKER MICRO 80HM 0.5W 28MM YD28-1B | 1 | |
| | 508-882-A | UPPER COVER ASS'Y MT500-2 | 1 | |
| | 71A-037 | COVER UPPER ABS | 1 | |
| | 853-249 | INSERT BSBM | 1 | |
| | 612-310 | (+)MACHINE W/S(PH) M2X5 WD=4.7 BLK | 1 | |
| | 621-486 | (+)TAPPING SCREW(PH) T2.6X13-2S (+)PH BLACK | 1 | |
| | 621-488 | (+)TAPPING SCREW(PH) T2.6X7-2S (+)PH BLK | 3 | |
| | 71A-038-A | COVER BATTERY ABS | 1 | |
| | 71A-039-A | COVER MOTTOM ABS | 1 | |
| | 723-994 | BRACKET LCD SPTE T0.3 | 1 | |
| | 733-021 | REFLECTOR P.C CLEAR | 1 | |
| | 733-022 | HOLDER ANTENNA ABS BALCK | 1 | |
| | 753-149 | TERMINAL "A" SUS304-3/4H T0.2 | 2 | |
| | 753-150 | TERMINAL "B" SUS304-3/4H T0.2 | 1 | |
| | 753-167 | TERMINAL SUS304-1/4H T0.2 | 2 | |
| | 753-207 | ANTENNA TUBE PVC 80P 50' | 1 | |
| | 753-208 | BELT CLIP P.C BLACK | 1 | |
| | 772-369 | SHIELD PLATE AL FOIL | 1 | ATTACHE ON SHIELD CAN |
| | 772-503 | VCO CAN SPTE T0.3 | 1 | |
| | 772-590 | SHIELD PLATE SPTE T0.3 | 1 | |
| | 814-405 | LENS ACRYL | 1 | |
| | 826-507-A | KNOB LOCK ABS | 1 | |
| | 881-693 | SPRING ANT. SWP3 &0.8 | 1 | |
| | 895-971 | ZEBRA CONTACT SILICONE RUBBER | 1 | |
| | 895-972 | KEY PAD VOL SILICONE RUBBER | 1 | |
| | 895-973 | KEY PAD POWER SILICONE RUBBER | 1 | |
| | 895-975 | KEY PAD CH SILICONE RUBBER | 1 | |
| | 895-976 | KEY PAD FUNCTION SILICONE RUBBER | 1 | |
| | 895-977 | RUBER PTT SILICONE RUBBER | 1 | |
| | 895-978 | GASKET SILICONE RUBBER | 1 | |
| | 895-979 | CAP DUST CHG. NBR | 1 | |
| | 895-981 | CAP DUST SP NBR | 1 | |
| | 906-776 | INSULATION PLATE 10X42.5XT0.18 INSUPAPER | 1 | |
| | 907-101 | FELT FELT T0.2 | 1 | |
| | 907-170 | DOUBLE TAPE TESA 4959 T0.1 | 1 | |
| | 95A-997-A | NAME LABEL POLYESTER 29X23 | 1 | |
| | 95B-007 | LABEL LCD PVC CLEAR 61.6X22.3 | 1 | |
| 2 | 538-72M-PM | MAIN PCB MANUAL ASS'Y | 1 | C67 C66 LCD X1 |
| | 101-053-4Z | CAPACITOR ELECT 100UF 10V SMS(M):5X11 | 1 | |
| | 104-711-0Z | ELECT CAPACITOR 47UF 10V 20% 5X11 | 1 | |
| | 252-282-5 | LCD DISPLAY TCM-3108 | 1 | |
| | 263-468-5 | CRYSTAL OSCILLATOR 21.25MHZ | 1 | |

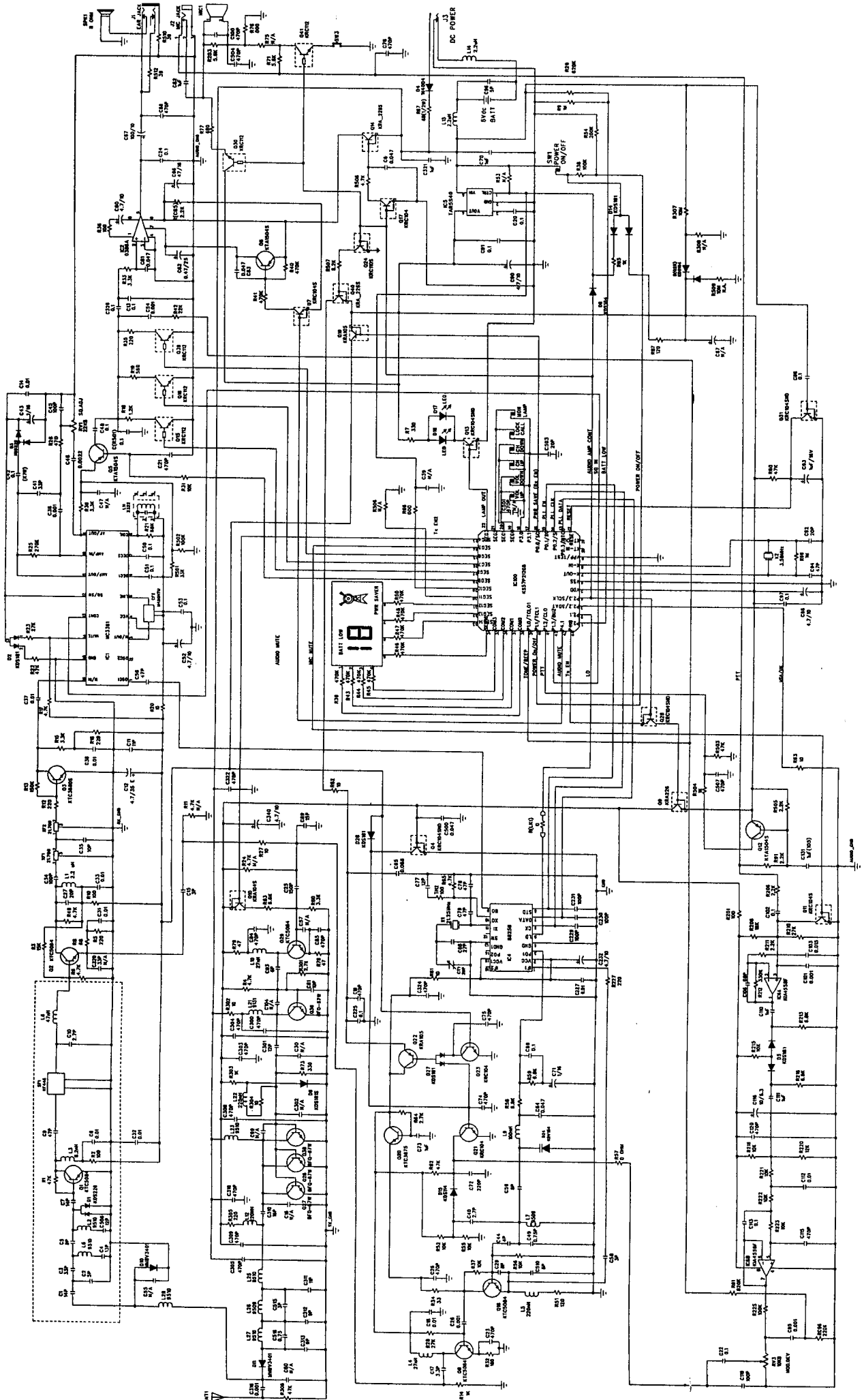
| Seq | Part No. | Name & Description | Q'ty | Reference |
|-----|------------|------------------------------------|------|--|
| 3 | 270-065-2X | RESONATOR CERAMIC ZTA 3.587MG | 1 | X2 |
| | 270-352-1 | FILTER CERAMIC LTM450HTU | 1 | CF2 |
| | 271-193-9 | FILTER SAW KF446V | 1 | SF1 |
| | 271-220-0Y | FILTER CRYSTAL UM-5-21T7B | 2 | XF1, 2 |
| | 320-232-2W | COIL IFT 455KHZ | 1 | L11 |
| | 420-274-1Z | MIC CONDENSER EM-54L-P | 1 | MIC1 |
| | 538-72M-PS | MAIN PCB SMD ASS'Y | 1 | |
| | 030-680-3Z | FILM RESISTOR 68 1/2W 5% ST MINI | 1 | R67 |
| | 05B-000-5Z | CHIP RESISTOR 0 1/16W 5% T 1608 | 3 | R57, 66, 76 |
| | 05B-100-2Z | CHIP RESISTOR 10 1/16W 5% T 1608 | 7 | R20, 27, 63, 81, 82, 302, 304 |
| | 05B-101-3Z | CHIP RESISTOR 100 1/16W 5% T 1608 | 4 | R2, 10, 36, 201 |
| | 05B-102-4Z | CHIP RESISTOR 1K 1/16W 5% T 1608 | 4 | R14, 85, 303, 504 |
| | 05B-103-5Z | CHIP RESISTOR 10K 1/16W 5% T 1608 | 10 | R31, 37, 52, 55, 56, 215, 218, 221, 222, 223 |
| | 05B-104-6Z | CHIP RESISTOR 100K 1/16W 5% T 1608 | 3 | R38, 225, 502 |
| | 05B-105-7Z | CHIP RESISTOR 1M 1/16W 5% T 1608 | 2 | R9, 69 |
| | 05B-106-8Z | CHIP RESISTOR 10M 1/16W 5% T 1608 | 1 | R307 |
| | 05B-121-1Z | CHIP RESISTOR 120 1/16W 5% T 1608 | 2 | R51, 87 |
| | 05B-122-2Z | CHIP RESISTOR 1.2K 1/16W 5% T 1608 | 1 | R18 |
| | 05B-123-3Z | CHIP RESISTOR 12K 1/16W 5% T 1608 | 1 | R220 |
| | 05B-153-0Z | CHIP RESISTOR 15K 1/16W 5% T 1608 | 1 | R3 |
| | 05B-154-1Z | CHIP RESISTOR 150K 1/16W 5% T 1608 | 1 | R13 |
| | 05B-181-5Z | CHIP RESISTOR 180 1/16W 5% T 1608 | 1 | R32 |
| | 05B-183-7Z | CHIP RESISTOR 18K 1/16W 5% T 1608 | 1 | R208 |
| | 05B-204-3Z | CHIP RESISTOR 200K 1/16W 5% T 1608 | 1 | R54 |
| | 05B-221-8Z | CHIP RESISTOR 220 1/16W 5% T 1608 | 6 | R5, 12, 16, 35, 227, 305 |
| | 05B-222-9Z | CHIP RESISTOR 2.2K 1/16W 5% T 1608 | 5 | R91, 206, 211, 505, R(C65) |
| | 05B-223-0Z | CHIP RESISTOR 22K 1/16W 5% T 1608 | 1 | R42 |
| | 05B-224-1Z | CHIP RESISTOR 220K 1/16W 5% T 1608 | 1 | R(C96) |
| | 05B-242-7 | CHIP RESISTOR 2.4K 1/16W 5% T 1608 | 1 | R30 |
| | 05B-272-4Z | CHIP RESISTOR 2.7K 1/16W 5% T 1608 | 1 | R64 |
| | 05B-273-5Z | CHIP RESISTOR 27K 1/16W 5% T 1608 | 2 | R28, 210 |
| | 05B-274-6Z | CHIP RESISTOR 270K 1/16W 5% T 1608 | 1 | R25 |
| | 05B-330-3Z | CHIP RESISTOR 33 1/16W 5% T 1608 | 1 | R34 |
| | 05B-331-4Z | CHIP RESISTOR 330 1/16W 5% T 1608 | 1 | R7 |
| | 05B-332-5Z | CHIP RESISTOR 3.3K 1/16W 5% T 1608 | 3 | R15, 33, 80 |
| | 05B-333-6Z | CHIP RESISTOR 33K 1/16W 5% T 1608 | 1 | R501 |
| | 05B-334-7Z | CHIP RESISTOR 330K 1/16W 5% T 1608 | 1 | R212 |
| | 05B-390-7Z | CHIP RESISTOR 39 1/16W 5% T 1608 | 2 | R510, 512 |
| | 05B-470-6Z | CHIP RESISTOR 47 1/16W 5% T 1608 | 2 | R78, 79 |
| | 05B-471-7Z | CHIP RESISTOR 470 1/16W 5% T 1608 | 1 | R26 |
| | 05B-472-8Z | CHIP RESISTOR 4.7K 1/16W 5% T 1608 | 6 | R4, 6, 17, 49, 65, 508 |
| | 05B-473-9Z | CHIP RESISTOR 47K 1/16W 5% T 1608 | 6 | R1, 22, 60, 62, 306, 503 |

| Seq | Part No. | Name & Description | Q'ty | Reference |
|-----|------------|--|------|--|
| | 05B-474-0Z | CHIP RESISTOR 470K 1/16W 5% T 1608 | 10 | R39, 40, 41, 43, 44, 45, 46, 47, 48, 50 |
| | 05B-513-2 | CHIP RESISTOR 51K 1/16W 5% T 1608 | 1 | R23 |
| | 05B-561-5Z | CHIP RESISTOR 560 1/16W 5% T 1608 | 1 | R19 |
| | 05B-562-6Z | CHIP RESISTOR 5.6K 1/16W 5% T 1608 | 2 | R71, 203 |
| | 05B-624-9Z | CHIP RESISTOR 620K 1/16W 5% T 1608 | 1 | R29, |
| | 05B-680-9 | CHIP RESISTOR 68 1/16W 5% T 1608 | 1 | R8 |
| | 05B-682-1Z | CHIP RESISTOR 6.8K 1/16W 5% T 1608 | 6 | R58, 59, 77, 83, 213, 216 |
| | 05B-683-2Z | CHIP RESISTOR 68K 1/16W 5% T 1608 | 1 | R21 |
| | 05B-822-1Z | CHIP RESISTOR 8.2K 1/16W 5% T 1608 | 1 | R507 |
| | 05B-824-3Z | CHIP RESISTOR 820K 1/16W 5% T 1608 | 1 | R61 |
| | 075-103-6 | RES. CHIP TRIMMER 10K RH03E1C14X | 1 | RV3 |
| | 075-223-1 | RES. CHIP TRIMMER 22K RH03E1CJ4X | 1 | RV1 |
| | 097-101-0 | THERMISTOR 100 NTCG163EH101J | 1 | TH2 |
| | 104-745-1 | ELECT CAPACITOR 4.7UF 36V 20% 4X7 | 1 | C12 |
| | 130-A01-7Y | CHIP CERAMIC 0.015UF GRM39 X7R153K 25V PT | 1 | C103 |
| | 130-A73-6Y | CHIP CERAMIC 0.01UF GRM39 X7R103K 25V | 10 | C8 14, 18, 31, 32, 33, 36, 37, 112, 227 |
| | 130-A75-8Y | CHIP CERAMIC 0.001UF GRM39 X7R102K 50V PT | 6 | C26, 38, 54, 95, 101, 316 |
| | 130-249-9 | CHIP CERAMIC 0.0022UF GRM39 X7R222J 50V PT | 1 | C46 |
| | 130-440-4Y | CHIP CERAMIC 0.047UF GRM39 Y5V473Z 50V PT | 4 | C6, 63, 64, 500 |
| | 130-622-2 | CHIP CERAMIC 0.068UF GRM39 Y5V683K 50V PT | 2 | C61, 65 |
| | 130-704-3Y | CHIP CERAMIC 0.75PF GRM39 COGOR75C 50V PT | 2 | C49, 516 |
| | 131-092-8Y | CHIP CERAMIC 10PF GRM39 COG100D 50V PT | 2 | C35, 81 |
| | 131-093-9Y | CHIP CERAMIC 100PF GRM39 COG101J 50V PT | 6 | C34, 45, 119, 229, 230, 231 |
| | 131-100-6Y | CHIP CERAMIC 0.1UF GRM39 X7R104K 50V PT | 17 | C42, (R501), 13, 20, 22, 48, 50, 51, 53, 69, 86, 91, 97, 102, 225, 326+, 113 |
| | 131-105-7Y | CHIP CERAMIC 11PF GRM39 COG110J 50V PT | 2 | C11, 311 |
| | 131-135-4Y | CHIP CERAMIC 1UF GRM39 Y5V105Z 10V | 7 | C70, 73, 82, 110, 111, 131, 321 |
| | 131-240-5Y | CHIP CERAMIC 12PF GRM39 COG120J 50V PT | 3 | C77, 301, 506 |
| | 131-306-2Y | CHIP CERAMIC 13PF GRM39 COG130J 50V PT | 1 | C4 |
| | 131-405-8Y | CHIP CERAMIC 14PF GRM39 COG140J 50V PT | 2 | C1, 7 |
| | 131-564-8Y | CHIP CERAMIC 15PF GRM39 COG150J 50V PT | 1 | C89 |
| | 131-575-8Y | CHIP CERAMIC 150PF GRM39 COG151J 50V PT | 1 | C25 |
| | 131-604-1Y | CHIP CERAMIC 16PF GRM39 COG160J 50V PT | 1 | C310 |
| | 132-025-3Y | CHIP CERAMIC 20PF GRM39 COG200J 50V PT | 3 | C27, 92, 503 |
| | 132-260-8Y | CHIP CERAMIC 220PF GRM39 COG221J 50V PT | 1 | C72 |
| | 132-733-9Y | CHIP CERAMIC 2.7PF GRM39 COG2R7C 50V PT | 2 | C10, 40 |
| | 132-734-0Y | CHIP CERAMIC 27PF GRM39 COG270J 50V PT | 1 | C88 |
| | 133-102-4Y | CHIP CERAMIC 3PF GRM39 COG030C 50V PT | 4 | C15, 58, 83, 515 |
| | 133-348-0Y | CHIP CERAMIC 3.3PF GRM39 COG3R3C 50V PT | 1 | C17 |
| | 133-349-1Y | CHIP CERAMIC 33PF GRM39 COG330J 50V PT | 2 | C3, 41 |

| Seq | Part No. | Name & Description | Q'ty | Reference |
|-----|------------|---|------|---|
| | 134-012-1Y | CHIP CERAMIC 4PF GRM39 COG040C 50V PT | 1 | C44 |
| | 134-757-1Y | CHIP CERAMIC 47PF GRM39 COG470J 50V PT | 5 | C9, 56, 78, 79, 94 |
| | 134-770-2Y | CHIP CERAMIC 470PF GRM39 X7R471K 50V PT | 24 | C19, 21, 23, 28, 74, 75, 76, 84, 85, 100, 115, 120, 300, 303, 304, 305, + 308, 309, 318, 322, 324, 504, 507 |
| | 135-021-4Y | CHIP CERAMIC 5PF GRM39 COG050C 50V PT | 2 | C2, 96 |
| | 136-014-3Y | CHIP CERAMIC 6PF GRM39 COG060D 50V PT | 1 | C510 |
| | 136-839-2Y | CHIP CERAMIC 68PF GRM39 COG680J 50V PT | 1 | C106 |
| | 138-011-0Y | CHIP CERAMIC 8PF GRM39 COG080D 50V PT | 2 | C29, 59 |
| | 139-005-0Y | CHIP CERAMIC 9PF GRM39 COG090D 50V PT | 3 | C5, 312, 313 |
| | 140-405-6 | CHIP TANTALUM 0.47UF TCA10474MR 20V | 1 | C62 |
| | 141-036-1Z | CHIP TANTALUM 1UF 293D105X0016A2T 16V | 2 | C43, 93, |
| | 141-059-2 | CHIP TANTALUM 10UF 293D106X06R3A2T 6.3V | 1 | C116 |
| | 143-312-0 | CHIP TANTALUM 3.3UF 293D335X0010A2T 10V | 1 | C71 |
| | 144-722-2Z | CHIP TANTALUM 4.7UF 293D475X0010A2T 10V | 6 | C52, 60, 90, 98, 232, 340 |
| | 172-015-6W | DIP TRIMMER 20PF CVN620 | 1 | CT1 |
| | 200-059-6 | TRANSISTOR BFQ67W (SOT-323) | 4 | Q26, 27, 36, 38 |
| | 200-067-3Z | TRANSISTOR KTC5084(0) | 5 | Q1, 2, 8, 18, 29 |
| | 200-082-8 | TRANSISTOR KRA226S (SOT-23) | 3 | Q9, 14, 40 |
| | 202-082-6 | TRANSISTOR KTA1504ST1(G) | 3 | Q5, 6, 12 |
| | 202-095-8Z | TRANSISTOR KRC104SND | 9 | Q4, 7, 11, 13, 17, 21, 23, 28, 31 |
| | 202-096-9 | BRT KRC110S NK | 1 | Q24 |
| | 202-112-0 | TRANSISTOR KTC3875S (GR) | 1 | Q20 |
| | 202-129-6Z | TRANSISTOR KRC112ST1 | 5 | Q15, 16, 30, 39, 41 |
| | 202-153-7 | TRANSISTOR KTC3880SY | 1 | Q3 |
| | 202-155-9 | TRANSISTOR KRA105S | 2 | Q19, 22 |
| | 218-057-7Z | TRANSISTOR KRA104S | 1 | Q10 |
| | 220-366-9Z | I.C PLL S1T8825B01-R0B0 | 1 | IC4 |
| | 221-373-0Z | I.C VOLT REGULATOR TAR5S40 | 1 | IC5 |
| | 221-729-9Z | I.C CPU S3C72C8X52-QZR8 | 1 | IC100 |
| | 222-027-3 | I.C OP AMP KIA4558F | 1 | IC6 |
| | 223-116-5Z | I.C IF S1T3361D01 | 1 | IC1 |
| | 231-038-1Z | I.C S1A0386A01-SOTO&SOP | 1 | IC2 |
| | 242-022-4Z | DIODE KDV154 | 1 | D24 |
| | 243-012-0 | DIODE MMBV3401LT1 | 2 | D10, 11 |
| | 243-049-4Z | DIODE CHIP KDS226 | 2 | D1,3 |
| | 243-051-5 | DIODE SI CHIP KDS184S | 2 | D8, (Q25) |
| | 243-063-6 | DIODE SWIRCHING KDS181S A3 | 6 | D2, 5, 9, 14, 27, 28 |
| | 243-080-1Z | DIODE KDS114 | 1 | D15 |
| | 245-015-3X | DIODE RECTIFIER 1N4004 | 1 | D4 |
| | 251-290-7 | LED LAMP CHIP KPA-3010SGC | 2 | D16, 17 |
| | 310-913-1W | COIL SPRING 1X0.45X4T:R | 1 | L21 |
| | 311-269-8 | COIL CHIP 8.2NH HK16088N2J-T | 1 | L3 |

| Seq | Part No. | Name & Description | Q'ty | Reference |
|-----|------------|-------------------------------------|-------|--------------------------------|
| 4 | 311-324-4Z | COIL CHIP 27NH CIH10T27NJNC | 2 | L4, 10 |
| | 311-372-7 | COIL CHIP 33NH HK160833NJ | 1 | L8 |
| | 311-376-1Z | COIL CHIP 220NH CIL10NR22KNC | 3 | L5, 12, 22 |
| | 311-377-2Z | COIL CHIP 100NH CIH10TR10JNC | 1 | L9 |
| | 311-950-9 | COIL SPRING 1.0X0.3X 4T:R | 2 | L7, 26 |
| | 311-951-0X | COIL SPRING 1X0.3X 5T:R | 6 | L2, 6, 23, 25, 27, 28 |
| | 311-991-6 | CHIP INDUCTOR 2.2UH (CIL10T2R2JNC) | 3 | L1, 13, 14 |
| | 4A1-160-B | P.C.B ASS'Y 221.8X105.7X1.0 FR4 2/S | 1 | |
| | 401-132-B | P.C.B MAIN 53.2X85X1.0 FR4 2/S | 1 | |
| | 401-886-B | P.C.B PTT 32.2X10.8X1.0 FR4 2/S | 1 | |
| | 420-806-2U | JACK STEREO EARPHONE EJS-4-4035S | 1 | J1 |
| | 420-807-3V | JACK STEREO EARPHONE EJS-4-4125S | 1 | J2 |
| | 420-856-7 | JACK SKJS-038S-1 | 1 | J3 |
| | 509-358-A | DOM KEY ASS'Y SKDS-42001MA | 1 | DOME SW |
| | 509-358-B | DOM KEY ASS'Y SKDS-42001M | 1 | DOME SW |
| | 509-358-C | DOM KEY ASS'Y SKDS-52001M | 1 | DOME SW |
| | 509-360 | DOM KEY ASS'Y SKDS-14001M | 2 | DOME SW |
| | 538-72P-A | PACKING ASS'Y | 1 | |
| | 732-750-B | HAND STRAP NYLON | 1 | |
| | 907-178 | BLISTER PACK UP (PAIR) PVC T0.6 | 0.5 | |
| | 907-179 | BLISTER PACK BO (PAIR) PVC T0.6 | 0.5 | |
| | 91D-167 | PAD DW1E 270(W)X225(D) | 0.125 | |
| | 91D-168-B | BOX OUT DW1E 276(W)X262(D)X228(H) | 0.125 | |
| | 923-040-E | POLYBAG P.E 300X400XT0.05 | 0.5 | |
| | 937-716 | MANUAL OWNER'S | 0.5 | |
| | 943-796 | CARD BOARD(PAIR) ART PAPER 206X253 | 0.5 | |
| | 95A-691 | SENSOR LABEL PVC 44X18 | 0.5 | |
| | 95A692 | CHECK POINT LABEL POLYESTER 42X38 | 0.5 | |
| 5 | 538-72W-A | WIRE ASS'Y | 1 | |
| | 427-188-2 | WIRE VINYL 080D (7/0.12) BLK | 0.075 | BATT(-) --- BATT(-) 0.5:0.5 |
| | 427-190-3 | WIRE VINYL 080D (7/0.12) RED | 0.075 | BATT(+) --- BATT(+) 0.5:0.5 |
| | 427-192-5 | WIRE VINYL 080D (7/0.12) YEL | 0.05 | SPK(+) --- SPK(+) 0.5:0.5 |
| | 427-193-6 | WIRE VINYL 080D (7/0.12) GRN | 0.05 | SPK(-) --- SPK(-) 0.5:0.5 |

SCHEMATIC DIAGRAM



Issue No. AA (2002-06-19) MT-500

