

K U R Z W E I L

Music Systems

YOUNG CHANG AMERICA, INC

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TECHNICAL

HELP



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K2000 Modification List

Changes for the K2000

Engine PCB

- U23 should be a GS 74HCU04 versus Motorola brand. U23 is used for rounding the main processor clock for FCC compliance. When the Motorola IC heats up, the clock signal shrinks causing the frequency to change. The GoldStar brand fixes this problem.
- Engine version 3.18 or higher is recommended. Earlier versions will not support both ROM blocks and may cause other difficulties.
- Pseudo version 4 and Godot version 5 are highly recommended.

Audio PCB

- A FET PROTECTION PCB should be attached. This protects the output FETs from blowing.
- U62 should be an LF351 versus a KF351. The KF351 IC has been found to go into oscillation.
- C202 (the 22,000 micro Farad, 16 volt capacitor) should not be a SAMWHA with a date code of 9504. The date is printed in black and may be hard to read. This batch of caps is known to cause problems. The electrolyte leaks and/or dries up. To check Ripple on C202, use an O'scope to look at TP17 for a sawtooth waveform no more than 1 Volt Peak to Peak.
- 2 Diodes should be placed on U9. The first one: Anode on pin 6 and Cathode on pin 1. The second one: Anode on pin 10 and Cathode on pin 16. This mod dampens the pop that sometimes occurs on powering on the unit.
- Replacing R178 with a 4.7K ohm resistor also helps in suppressing this pop.
- RP1 and RP2 SIPS should be 22-ohm resistor packs. (On keyboard version only). Changing these fixes the death-chord problem where hitting every 8th note at the same time causing the notes to repeat or "ring" and other unwanted effects.
- Check gal on P-RAM, should be "QJ" **NOT** "LJ".
- If audio board is Rev. B then call for contrast adjust mod document.
- **On VX models**, check to make sure the battery back-up line (C15) is attached to pin 1 of P-RAM (pin 1 is the square pad where cable plugs in – this can be seen on bottom of P-RAM assy)

Parts # Used In This List

- | | |
|--|--|
| • D51001090 – R178 Loc., 4.7K OHM Resistor | • D62005802 – IC, Digital GAL Godot 20V8-15LP V5 |
| • D5300801 – U9 Loc., Diode, 1N4148 | • D62005702 – IC, Digital GAL Pseudo IC V4 |
| • DFETK - FET PCB Assy K2000 | • D64010201 – U62 Loc., IC, Linear LF351N DIP |
| • DFETKR - FET PCB Assy K2000 Rack | • D51001040 – C202 Loc., 22,000mf/16V Capacitor |



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K2500 Modification List

CHANGES FOR THE K2500

ENGINE MOTHER:

- The DAC Control Chip should be labeled DACCTLV4
- The Sound MEM Control Chip should be labeled SMCTLV8
- The SCSI Mod should be performed. (See K2500 Service Manual)
- L2 Must Be Installed for **Racks**, This is the 32Mhz Clock for the Effects
- L2 Must be removed for **Keyboards** (For FCC Compliance) clock signal is on the Audio PCB.
- If L13 Is a T-Filter, replace with a 22Ohm Resistor.
- If L4 is a T-Filter, replace with a 22Ohm Resistor

ENGINE DAUGHTER:

- D2 is a 1N270 (Glass Diode) this is for the reset Line
- R55 Must be removed on **REV A thru REV E** boards **only**
- The control chip on the daughter board must be a 340CTLV9

RACK AUDIO:

- The program RAM Modification must be done (See K2500 Service Manual)
- R178 needs to be a 4.7K Ohm resistor

KEYBOARD AUDIO:

- Replace VR1 with a 78L05
- U13 needs to be a LF351 not a KF351
- U2 Kscan version needs to be V3.20 or higher to work right for OS 2.52 or higher

KEYBOARD POWER SUPPLY:

- Replace R9 with a 4.7K Ohm resistor
- The rubber pads on VR3 & VR5 need to be replaced with Mica Pads
- U1 Needs to be a LF351 not a KF351

Parts # Used In This List

- | | |
|---|---|
| • D61017032-2 – U13 Loc., IC DIGITAL, PALSMCTLV8 | • D51001090 – R178 & R9 Loc., Resistor, 4700 Ohm 1/8W 5% |
| • D61017032-3 – U10 Loc., IC DIGITAL, PALDACTL V4 | • D64001301 – VR1 Loc., IC, Linear LM78L05ACZ +5 100MA 5% TO-92 |
| • D61017032-4 – U1 Loc., IC DIGITAL, PAL340CTLV9 | • D64010201 – U13 Loc., IC, Linear LF351N DIP |
| • D51001040 – L13 & L4 Loc., Resistor, 22 OHM 1/4W 1% | • D53000401 – D2 Loc., Diode, 1N270 |

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K2500 PROBLEM

DIAGNOSIS

PROBLEM

POSSIBLE FIX

CRACKS AND POPS/NO EFFECTS/NO SOUND	L13 SHOULD BE A 22OHM RESISTOR
INTERMITTENT DISTORTION ON SAMPLE RAM	REPLACE SMCTL TO V8/ CHECK SIMMS
SLIGHT POPS IN AUDIO	CHANGE DACCTLV4 CHIP
BLANK SCREEN/ UNIT NOT WORKING	REPLACE 340CTLV9
SCREEN GOES WHITE (WITH CC PEDAL)	Q1 BACKWARD ON DIGITAL IO
DISTORTION IN ROM 700-900	DO MOD TO RMB-P2/ RESEAT RMB-P2
HIGH PITCHED WHINE ON SAMPLE WITH WITH KDFX INSTALLED	JUMPER GJ1 ON SAMPLING OPTION
DISTORTION WHEN ROM BLOCKS ARE ADDED	L4 SHOULD BE A 22OHM RESISTOR

REV B

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MODELS INVOLVED:

K2500, K2500X, K2500XS, K2500R, K2500RS

K2000, K2000S, K2000R

MARK5, MARK10, MARK12, MARK150, MARK152

Subject: Oscillation in 5v power supply caused by a KF351 comparator in +5 volt regulator circuit.

Inspect: Affected assemblies in all revisions of the above models with date of manufacture earlier than 6/97.

Affected assemblies:

K2500/K2500X, Power supply – U1

K2500/K2500, Audio board – U13

K2000R/K2500R, Audio board – U62

K2000, Audio board – U62

Mark5/10/12/150/152, Audio board – U1

Problem: Samsung KF351's or other brand parts that may have been used in this circuit. These parts can oscillate which causes audio noise, erratic operation, high floppy and hard disk error rates, and other symptoms.

Diagnosis: U1 on the K2500/X power supply, U13 on the K2500/X audio board, U62 on the K2000R/K2500R audio board, and U1 on the Mark5/10/12/150/152 audio board, must be a National Semiconductor LF351N (or other Kurzweil approved part), Kurzweil part number D64010201. At this time, the National Semiconductor LF351N is the only approved replacement.

Resolution: K2500 & K2500X all versions

Inspect the audio board to determine if U1 is a National Semiconductor LF351N. Inspect U13 on the audio board to determine if U13 is a National Semiconductor LF351N. If KF351 or any non-approved part is in location U1 or U13, order and install a LF351N, Kurzweil part number D64010201.

Resolution: Mark5, Mark10, Mark12, Mark150, Mark152

Inspect the audio board to determine if U1 is a National Semiconductor LF351N. If KF351 or any non-approved part is in location U1, order and install a LF351N, Kurzweil part number D64010201.

Resolution: K2000r & K2500R all versions

Inspect the audio board to determine if U62 is a National Semiconductor LF351N. If KF351 or any non-approved part is in location U62, order and install a LF351N, Kurzweil part number D64010201.

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KNOWN DATE CODE OF CAPACITOR FAILURES

Affected Audio PCBs:

- Mark 5 – Location C3
- Mark 10 – Location C3
- Mark 110 – Location C3
- Mark 150 – Location C5

The capacitor at these locations are a 22,000mf/16V that were manufactured by "SAM WHA" and will have a gold printed label with a dated stamp code of "9504". It may be hard to read the black print on the dark green plastic sleeve, so a flashlight may be handy in finding this date code.

Note: This is a known capacitor problem for our older keyboards. The capacitor was installed into the above keyboards during 1995 to 1997.

Problem:

These caps leak, or the electrolytic material dries up so that the capacitor doesn't do its job of filtering the D.C. from the 1/2 wave bridge rectifier for the input to the +5 volt regulator circuit. **Regardless of the condition of the capacitor, it should be replaced since there is a good chance that this capacitor will fail in the future.**

Symptoms:

The following may indicate a problem with the 22,000mf/16V capacitor.

- Doesn't light up – appears to be dead
- Lights up, but has no audio
- Lights up, but audio output is very distorted
- Lights up and hangs in initialization
- Lights up, but disk drive appears to "chatter"

To check for a bad capacitor:

To check for a faulty capacitor, test at J502 PIN 1 (**Digital Ground**) and J502 PIN 7 (**Power OK**). It should be approximately +15 volts D.C. with no A.C. voltage riding the line. When it is defective, it usually reads approximately +9 volts D.C., (although occasionally you may see a voltage higher than 9 volts), but no matter what the voltage, if you find an A.C. voltage present on the line, this capacitor is considered faulty.

Part Number for Replacement: D52005202

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Common Symptoms of the RG200 and MARK 3 Keyboards

Before ordering a replacement board for RG200's and Mark 3 keyboards, you *should* perform a diagnostic test. This test should take approximately one to two minutes to complete.

- In most cases, this diagnostic test will fix your customer's problem. Remember, this unit has a limited amount of recordable memory; therefore, if the memory becomes full, the processor gets confused and is unable to recover. The test is a memory test that forces all areas of the memory to be rewritten and read. This clearing of the memory will allow the processor to recover.

Symptoms of a Memory Overload:

- Unit will not come up.
- Unit comes up, but will not play
- Unit comes up, but plays strangely
- Unit comes up, but locks up when played, or when trying to record a new song
- Unit will not record any longer

Diagnostic Test Instructions:

1. With the unit "on", push the "select" button. The LED should light up.
2. Then press the second D# down from the high end of the keyboard. The unit should make a clunking sound, and the green "Play" LED should light up. The "select" light should go out
3. Next, press the "room/stage" button. This will start the unit in the "burn in" test mode of diagnostics. Note: The LEDs will flash individually in sequence from left to right.
4. After the LEDs have gone through the sequence two times, turn the unit off.
5. Turn the unit back on and check to see if the unit is operating correctly now.

**** If this diagnostic test does not correct the problem, you may order a replacement board.**

Side Note: Check Power Supply to the unit. Power supply should state 13.5V DC, please call for a new power supply for any that state 15V DC. (Only Kurzweil unit to use a 15V DC supply is the RG200. All Mark 1,2,3's, RG100's and Troubadór's use the 13.5V DC)



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NOTICE:
FOR INSTALLING NEW ENGINE & AUDIO BOARDS

For the following units manufactured before July of 1999**

- Mark 10
- Mark 110
- Mark 150

It is very important that you check the +5 volts after installing a new engine or audio board. This voltage must be adjusted so that the voltage is between +4.80 volts and +4.85 volts for the correct operation of these units.

Location:

The adjustment trimmer is located on the power/amplifier board. It is labeled "R5" on the Mark 150 & "R82" on the Mark 10 & Mark 110.

** Engine boards manufactured after June of 1999 will have surface mounted Eproms.

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AC ADAPTERS FOR KURZWEIL PRODUCTS

PART #	UNIT	VOLT	MODEL #	MANUFACTURE
D52001011	RG200	15.0V DC	PD150-25A	DONG HO
D52001005	RG100	13.5V DC	PP135-17	DONG HO
	MARK 1			
	MARK 2			
	MARK 3			
	TROUBADOR			
D52001018	SP76	12.0V DC	A31265Q	LZR
	SP88			
	SP88X			
D52001001	XM-1*	12.0V DC	YK-1205OU	YOU KYOUNG
D52001000	PC88	9.5V AC	PP95-20	DONG HO
D52001021	PC2	9V DC/ 14.0 AC	PM0025-001	DONG HO
	PC2X			
	PC2R			
D58801002	KMP1	9V AC	AA091A	LZR
D52002000	KTL	14V AC	420A0002	TAMURA

* EXPRESSION MATE

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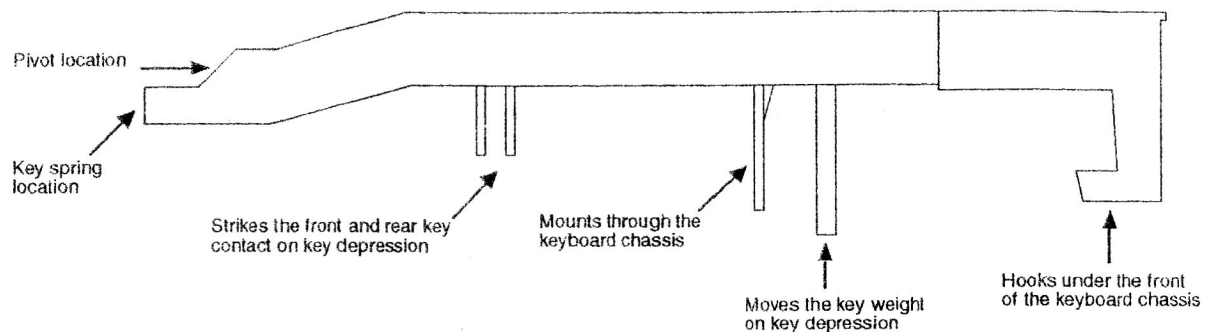
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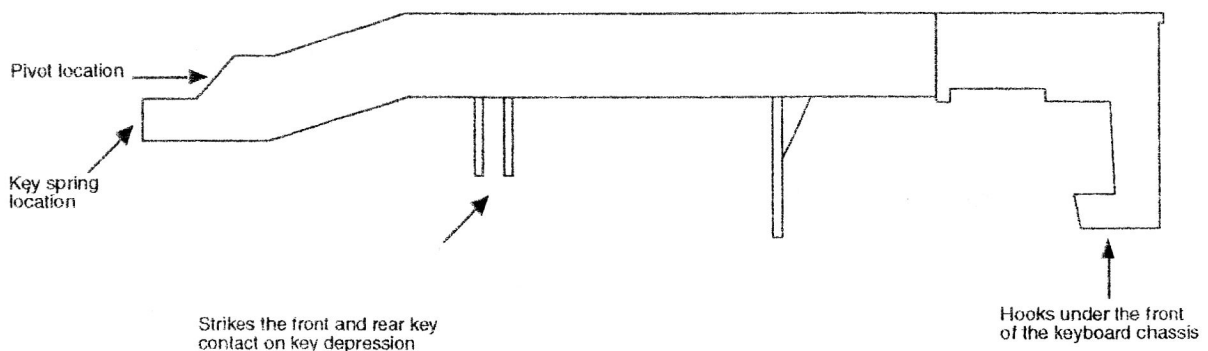
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DIFFERENCE BETWEEN FATAR MD & MDF KEYS



Natural/White Key, Keyboard MD



Natural/White Key, Keyboard MDF

- Generally you will find keyboards produced after April of 1998 to have the MDF style keys and weights.
- When ordering a key or keyweight from Kurzweil you should always have the serial number of the keyboard handy for verification.

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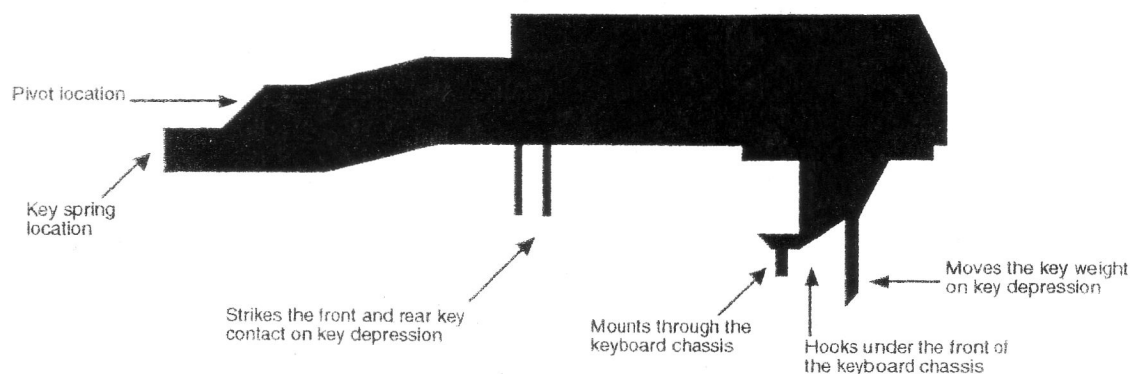
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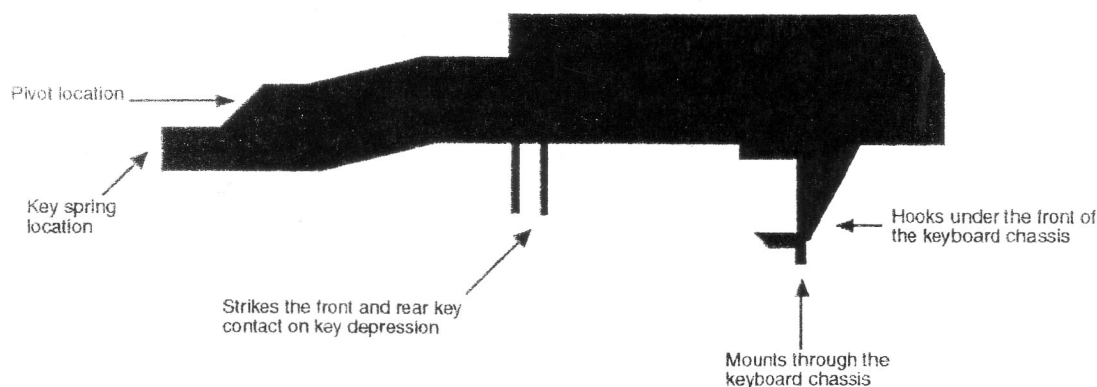
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DIFFERENCE BETWEEN FATAR MD & MDF SHARP KEYS

Sharp/Black Key



Sharp/Black Key, Keyboard MD



Sharp/Black Key, Keyboard MDF

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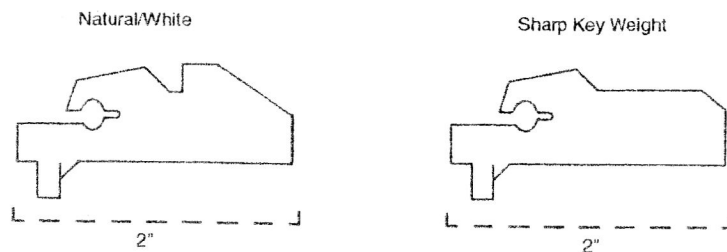
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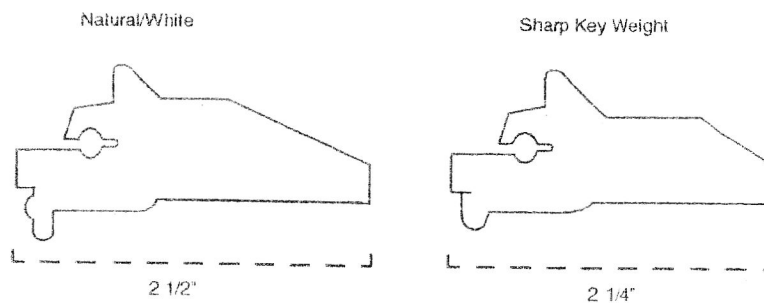
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DIFFERENCE BETWEEN FATAR MD & MDF KEYS WEIGHTS

Key Weights



Natural/White and Sharp/Black Key Weights, Keyboard MD



Natural/White and Sharp/Black Key Weights, Keyboard MDF

- Generally you will find keyboards produced after April of 1998 to have the MDF style keys and weights.
- When ordering a key or keyweight from Kurzweil you should always have the serial number of the keyboard handy for verification.

KURZWEIL SCSI DRIVE COMPATIBILITY

SPECIFICATIONS

- * ALL DRIVED MUST BE SCSI 1 OR SCSI 2 COMPATIBLE
- * (K2000 UNITS MUST HAVE OS VERSION 3.54 OR HIGHER)

EXTERNAL SCSI DRIVE

Fixed

- Any drive that sizes 2048Mb (2Gig), or less can be used with the K2000, K2VX or K2500

Removable

- Syquest – Any
- Magneto Optical – Most
- CDROM – Most External SCSI CDROM Drives will work.
 - Speed is NOT important
 - NEC brand drives are incompatible
- Imoega (Bemoulli.Zip, & Jaz) – Any
- Tape-Based Drives – Not Supported
- Writeable CDROM – Not Supported

INTERNAL SCSI DRIVES: (Hard Drive Install Kit Required)

- Any BARE drive that is 2048Mb (2Gig) or less, can be used with the K2000, K2VX, & K2500 PROVIDED the following additional specs are also met:

POWER CONSUMPTION: (Specs are the maximum allowed)

K2000 & K2VX Keyboards:

<u>+5VDC</u>	<u>+12VDC</u>
Start Up: < .625A	Start: < 1.0A
Read/Write: < .625A	Read/Write: < .75A
Seek: < .625A	Seek: < .75A
Idle: < .625A	Idle: < .75A

K2000R (Rack)

<u>+5VDC</u>	<u>+12VDC</u>
Start Up: < 1.0A	Start Up: < 1.5A
Read/Write: < 1.0A	Read/Write: < 1.0A
Seek: < 1.0A	Seek: < 1.0A
Idle: < 1.0A	Idle: < 1.0A

K2500 Rack & Keyboards:

<u>+5VDC</u>	<u>+12VDC</u>
Start Up: < 2.0A	Start Up: < 3.0A
Read/Write: < 1.0A	Read/Write: < 1.5A
Seek: < 1.0A	Seek: < 1.5A
Idle: < 1.0A	Idle: < 1.5A

Internal Drive Dimensions:

Height: 25.4mm (1")
Width: 101.6mm (4")
Length: 146mm (5.75")
Mounting: Industry Standard 3.5 x 1" Drive

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SIMM SPECIFICATIONS

K2000 SERIES, including VX & VP – 30 PIN SIMM

1. SIMMs are configured in Pairs.
2. There are a total of 4 SIMM sockets in all K2000 models
3. Unlike Pairs of SIMMs can be used.
4. The Pairs are installed in the 2 outer sockets and 2 inner sockets.
5. Only 1meg, 4meg & 16meg **non-composite** SIMM modules may be used.
6. 30 pin (8 bit non-parity) SIMMs @ 120ns or less, will function properly.
7. **Non-composite** SIMMs are required. This type of SIMM has no GAL or PAL chip.
8. A Composite SIMM that has a GAL or PAL IC in addition to memory ICs are not approved
9. Expandable to 64meg, i.e. (4) 16meg = 64 megabytes.

K2500 SERIES – 30 PIN OR 72 PIN

External Identification to identify 30 or 72 pin SIMMs.

- Early production models (8-30 pin SIMM Sockets) have an "O" in the 7th character position of the serial number.
- Late production (2 – 72 pin SIMM Sockets) have a "Z" in the 7th character position of the Serial number.
- Units starting with a "K" or an "S" will have 2 – 72 pin sockets.

K2500 30 PIN SIMMS

1. SIMMs are configured in pairs.
2. There are a total of 8 SIMM sockets in all 30 pin K2500 series.
3. Unlike Pairs of SIMMs may be used
4. The pairs are installed in adjacent sockets.
5. Only 1meg, 4meg & 16meg **non-composite** SIMM modules may be used.
6. 30 pin (8 bit non-parity or 9 bit parity) SIMMs @ 80ns or less, will function properly.
7. **Non-composite** SIMMs are required. This type of SIMM has no GAL or PAL chip.
8. A Composite SIMM that has a GAL or PAL IC in addition to memory ICs are not approved.
9. Expandable to 128meg, i.e. (8) 16meg = 128 megabytes.

K2500 & K2600 SERIES - 72 PIN SIMMS

1. SIMMS are configured in single module or in a pair.
2. There are a total of 2 SIMM sockets in all 72 pin K2500 series.
3. These models can use 4meg, 8meg, 16meg, 32meg, 64meg & 128meg SIMM modules.
4. 3 of the 6 sizes, 4's, 16's & 64's can be installed: alone, as matched pair or as mixed pair.
5. 3 of the 6 sizes, 8's, 32's & 128's: **only one size & one socket can be used.** One socket must be unused.
6. 72 pin (c32, non-parity or x36, parity) SIMMs @ 80ns or less will function properly.
7. **Non-composite** SIMMs are required. This type of SIMM has no GAL or PAL chip.
8. A Composite SIMM that has a GAL or PAL IC in addition to memory ICs are not approved.
9. Expandable to 128 meg, i.e. (2) 64meg or (1) 128 = 128 megabytes.
10. FPM (Fast Page Mode) or EDO (Extended Data Out) SIMMs may be used.

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The warranty time periods are as follows:

- All Pro Products are warranted for parts and labor for one year from the date of purchase. (*Pro Products include K2000s, K2500s, PC88s, KMP1s, and DMTIs*)
- All Reconditioned Pro Products shipped from the factory on or after June 23, 1999 will have a 90 day warranty on parts and labor.
- Home products bought between 1/1/96 and 12/31/96 only had a two year warranty on the parts and labor.
- Home products bought between 1/1/97 and present have a two year warranty on the labor, and a three year warranty on the parts.
(*Home Products include Marks and RGs*)

Whenever possible, obtain a copy of the proof of purchase for warranty repairs.
