

KORG

PERFORMANCE SIGNAL PROCESSOR

A4

GUITAR/BASS

SERVICE MANUAL

CONTENTS

| | |
|-----------------------------|----|
| 1. SPECIFICATIONS | 1 |
| 2. STRUCTURAL DIAGRAM | 3 |
| 3. BLOCK DIAGRAM | 5 |
| 4. CIRCUIT DIAGRAM | 6 |
| 5. P.C. BOARDS | 7 |
| 6. HOW TO DISASSEMBLY | 9 |
| 7. DIAGNOSTIC TEST | 11 |
| 8. REFERENCE DATA | 18 |
| 9. PARTS LIST | 26 |

1. SPECIFICATIONS

FOR A4GTR

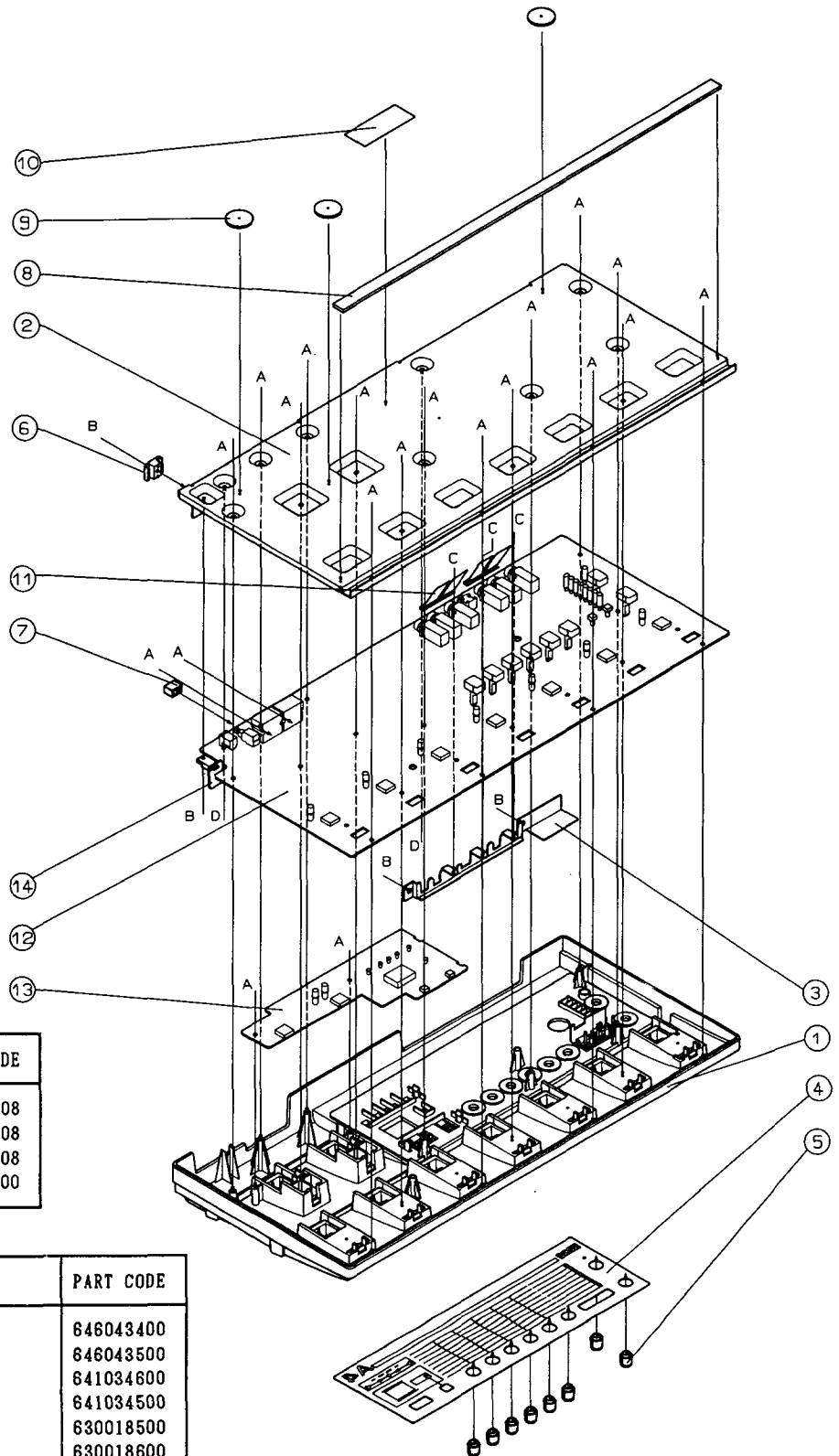
- Internal Effects : COMPRESSOR, DISTORTION/OVERDRIVE, 3 BAND EQ, PITCH/DELAY, CHORUS/FLANGER, REVERB, AMP SIMULATION, NOISE REDUCTION
- Programs : Preset; 30 programs
User programable; 30 programs
- Front panel : Volume; INPUT VOLUME, PARAMETER EDITORS, OUTPUT VOLUME
Keys/Switches; BANK UP SWITCH, WRITE KEY, USER/PRESET KEY, BYPASS/TUNE SWITCH, EFCT/PROG SWITCHES, PROG/EDIT SWITCH, MODE(Effect)SELECT KEYS(UP, DOWN)
Display; BANK/VALUE Display (8 segment LED x 2)
Dot type LEDs; EFCT/PROG LEDs, MODE LEDs, Peak indicator
- Rear panel : Power Switch, DC9V Jack, INPUT Terminal, OUTPUT Terminals (L/MONO, R), PHONE Jack, VOLUME PEDAL Jack, EXTERNAL CONTROL OUTPUT Terminals (1, 2), MIDI Terminals (MIDI IN, MIDI OUT)
- Sampling Frequency: 48 KHz
- Dynamic Range : 90dB or more(IHF-A, when bypassing)
- TUNER : Measurement Range; A0-C7
Measurement Accuracy; ± 0.5 cent.
- Power Supply : DC9V
- Power Consumption : 350mA
- Maximum Input
Level/Impedance : +7dBu/1M Ω
- Maximum Output
Level/Impedance : +7.5dBu/1k Ω
- Dimensions : 498(W) x 227.5(D) x 48.7(H)mm
- Weight : 2.2kg

FOR A4BASS

- Internal Effects : COMPRESSOR, DYNAMIC EXCITER, 6 BAND EQ, SYNTH BASS, DELAY, CHORUS/FLANGER, REVERB, NOISE REDUCTION
- Programs : Preset; 30 programs
User programable; 30 programs
- Front panel : Volume; INPUT VOLUME, PARAMETER EDITORS, OUTPUT VOLUME
Keys/Switches; BANK UP SWITCH, WRITE KEY, USER/PRESET KEY, BYPASS/TUNE SWITCH, EFCT/PROG SWITCHES, PROG/EDIT SWITCH, MODE(Effect)SELECT KEYS(UP, DOWN)
Display; BANK/VALUE Display (8 segment LED x 2)
Dot type LEDs; EFCT/PROG LEDs, MODE LEDs, Peak indicator
- Rear panel : Power Switch, DC9V Jack, INPUT Terminal, OUTPUT Terminals (L/MONO, R), PHONE Jack, VOLUME PEDAL Jack, EXTERNAL CONTROL OUTPUT Terminals (1, 2), MIDI Terminals (MIDI IN, MIDI OUT)
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Measurement Accuracy; ± 0.5 cent.
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- Power Consumption : 350mA
- Maximum Input
Level/Impedance : +7dBu/1M Ω
- Maximum Output
Level/Impedance : +7.5dBu/1k Ω
- Dimensions : 498(W) x 227.5(D) x 48.7(H)mm
- Weight : 2.2kg

* Specifications, operations and appearance are subject to change without notice.

2. STRUCTURAL DIAGRAM

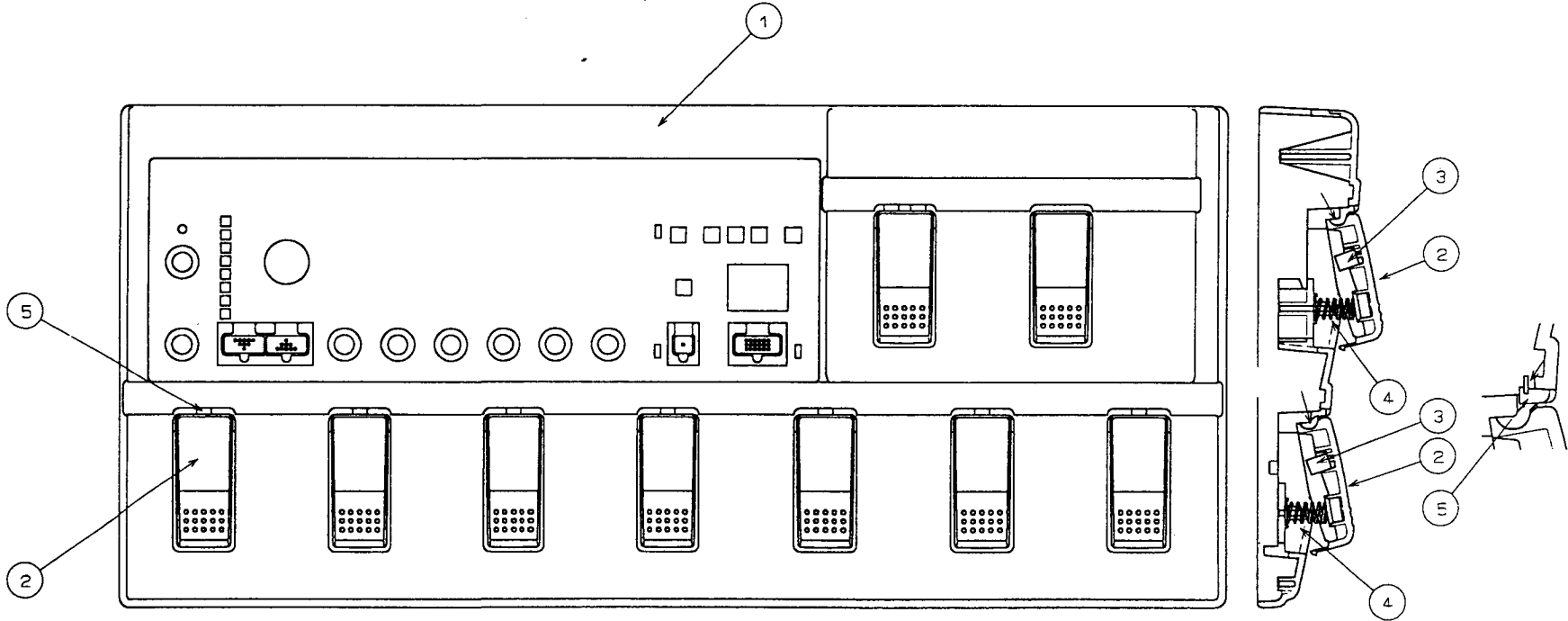


| PART NO | SCREWS | PART CODE |
|---------|-----------------|-----------|
| A | PLAX B BZMC 3X8 | 745060308 |
| B | CT B BZMC 3X8 | 715260308 |
| C | CT B ZMC 3X8 | 715230308 |
| D | PUSH RIVET | 540019600 |

| PART NO | PART NAME | PART CODE |
|---------|--|-----------|
| 1 | X-150G CASE ASSEMBLY (A4 GTR) | 646043400 |
| 1 | X-150B CASE ASSEMBLY (A4 B) | 646043500 |
| 2 | X-150 CHASSIS | 641034600 |
| 3 | X-150 PHONE JACK SUPPORT | 641034500 |
| 4 | X-150G PARAMETER SHEET (A4 GTR) | 630018500 |
| 4 | X-150B PARAMETER SHEET (A4 B) | 630018600 |
| 5 | ROTARY VR KNOB | 620022900 |
| 6 | X-150 CORD HOOK | 646043000 |
| 7 | POWER SW KNOB | 620018200 |
| 8 | RUBBER SPACER KOC-40577 | 500019600 |
| 9 | RUBBER FOOT 3x22x3 | 500018300 |
| 10 | NAME SEAL | ----- |
| 11 | X-507 GND SPRING | 644003000 |
| 12 | P.C.B.ASSEMBLY KLM-1597 (MAIN FOR A4G) | 001159700 |
| 12 | P.C.B.ASSEMBLY KLM-1597 (MAIN FOR A4B) | 001159701 |
| 13 | P.C.B.ASSEMBLY KLM-1598 (PANEL) | 001159800 |
| 14 | P.C.B.ASSEMBLY KLM-1599 (REGULATOR) | 001159700 |

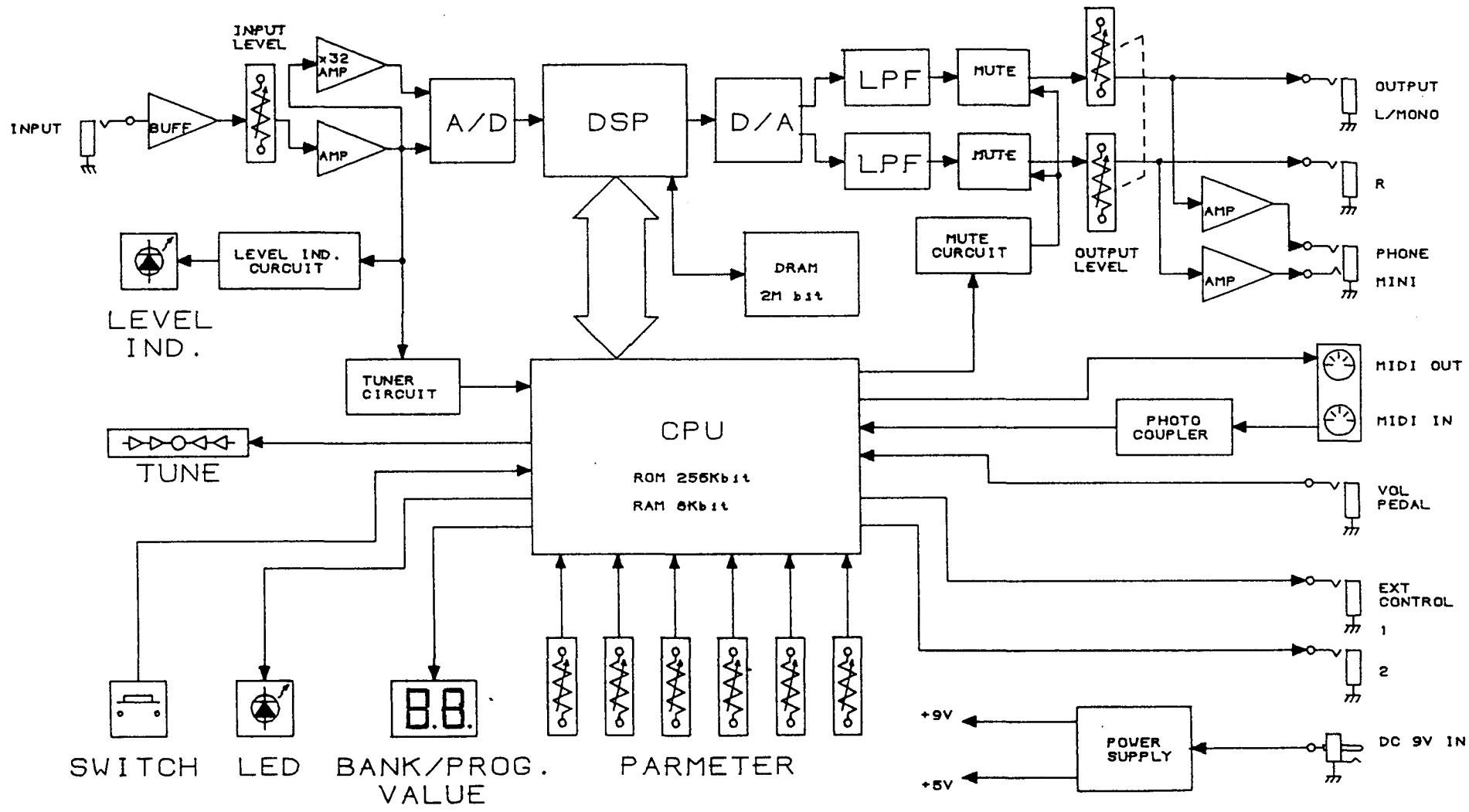
UPPER CASE ASSEMBLY

4



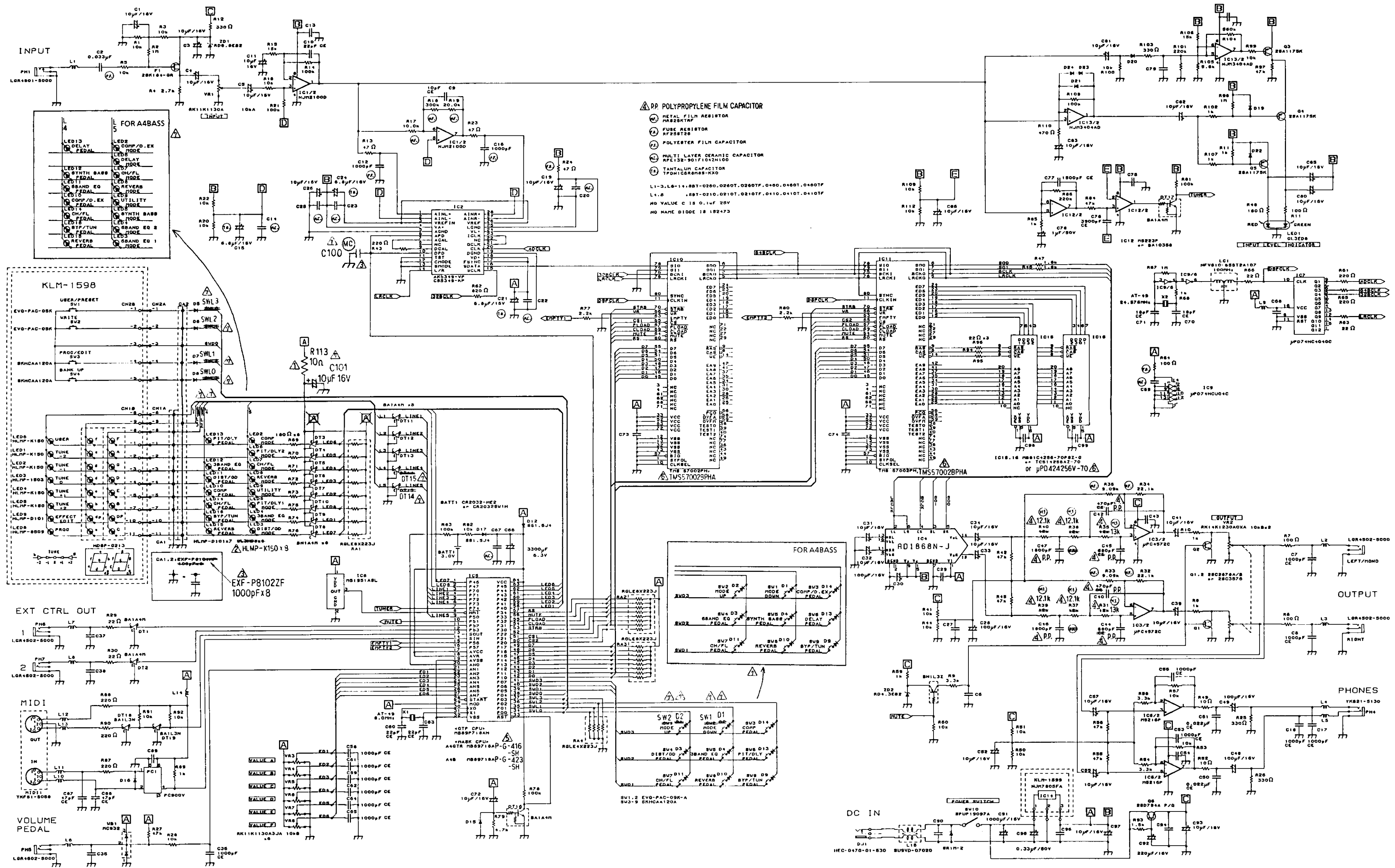
| PART NO | PART NAME | PART CODE |
|---------|-------------------------|-----------|
| 1 | X-150G CASE | 646042700 |
| 1 | X-150B CASE | 646043100 |
| 2 | X-150 PEDAL | 646042800 |
| 3 | SW CUSHION KOC-F40427 | 500013100 |
| 4 | PEDAL SPRING KOC-C40896 | 644006400 |
| 5 | X-150 REFLECTOR | 646042900 |

3. BLOCK DIAGRAM



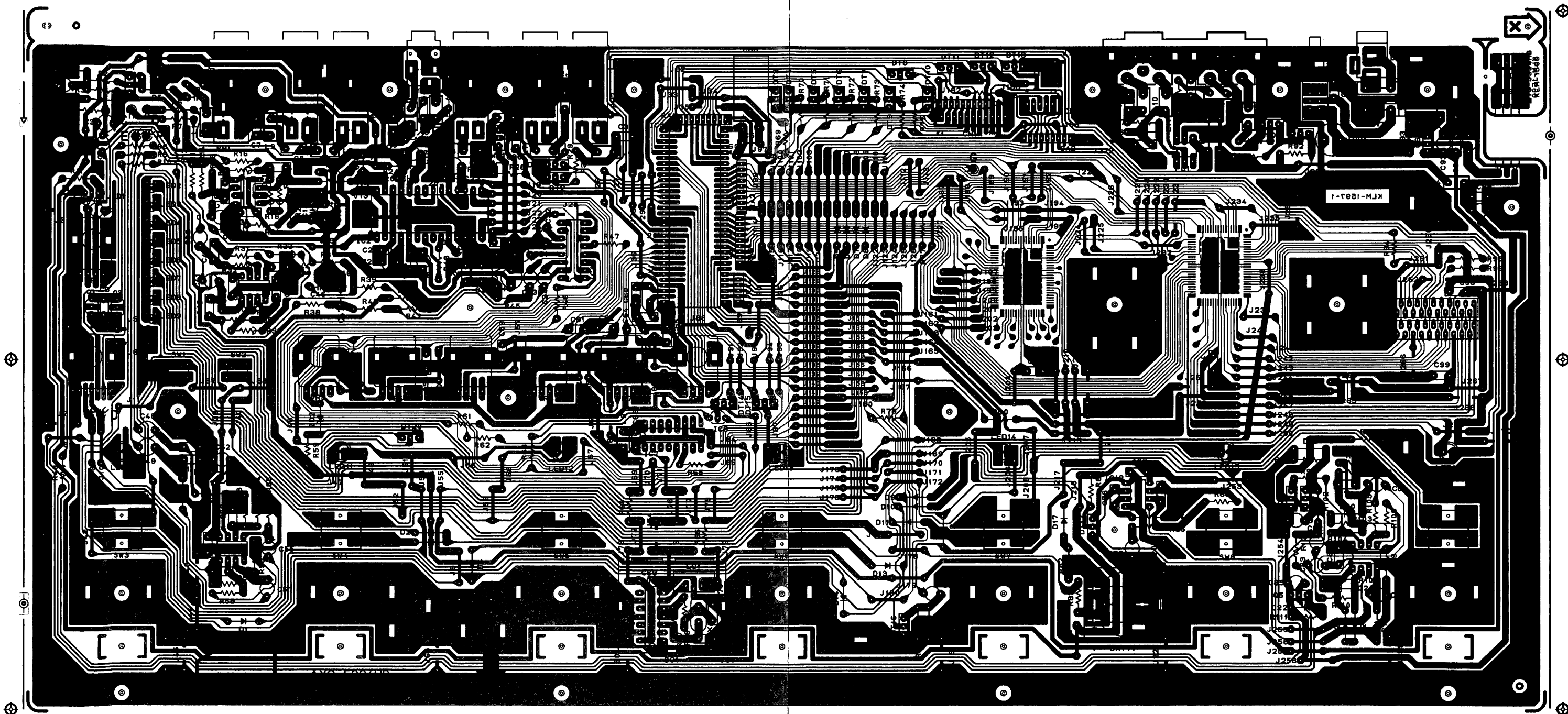
4. CIRCUIT DIAGRAM

KLM-1597/98/99



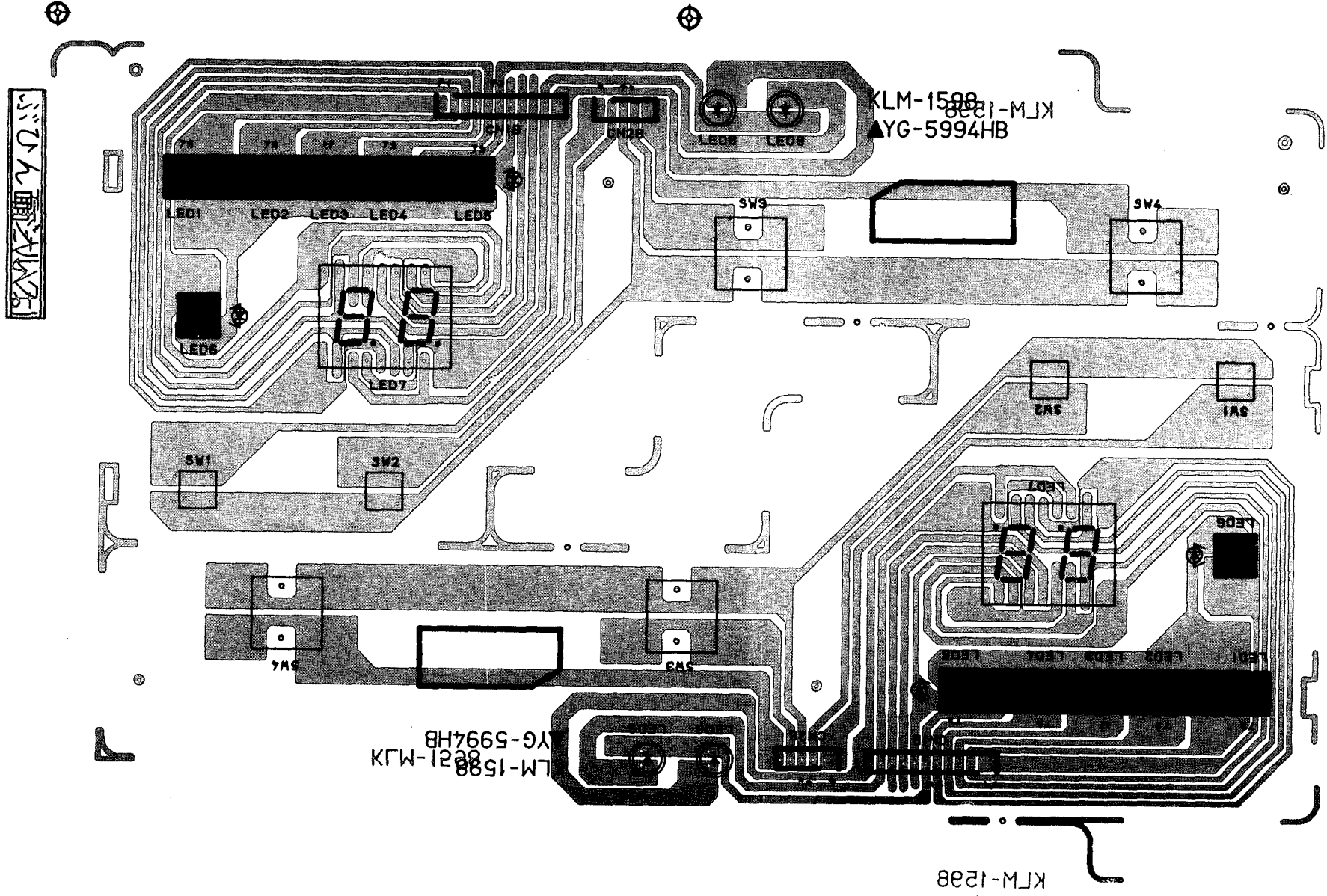
5. P.C. BOARDS

KLM-1597A/KLM-1599



右面はひび

KLM-1598



KLM-1598
8221-MJK
▲YG-5994HB

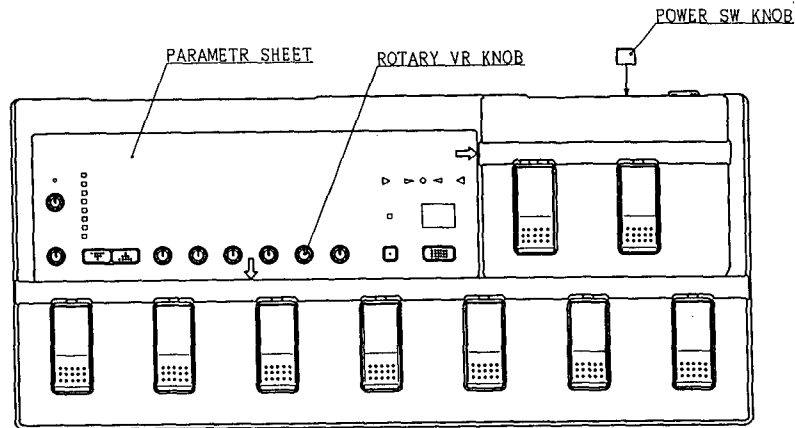
KLM-1598
8221-MJK
▲YG-5994HB

KLM-1298

6. HOW TO DISASSEMBLY

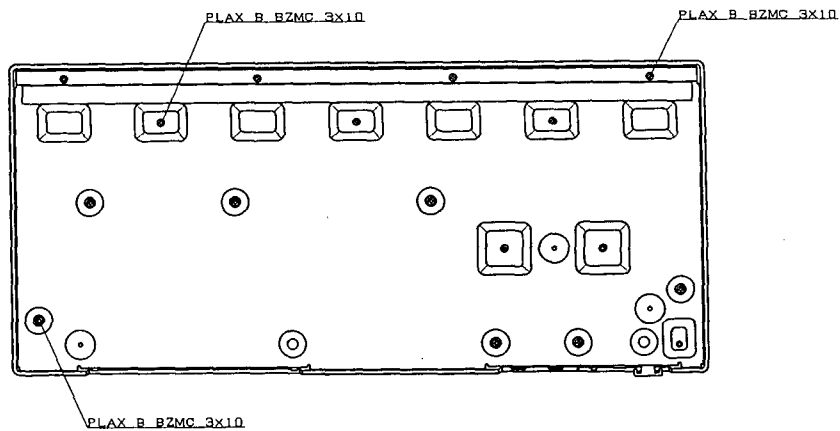
1. Remove the case assembly

- 1) Remove 8 pcs. of the rotary VR knobs on the upper case.

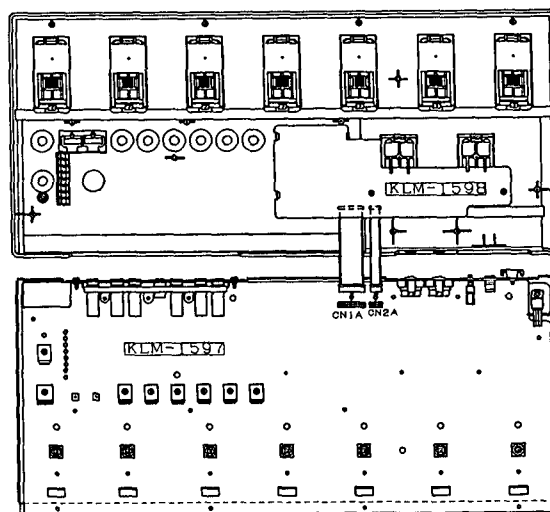


- 2) Remove 16 pcs. of the screws on the chassis.

[PLAX B BZMC 3 x 10] x 16



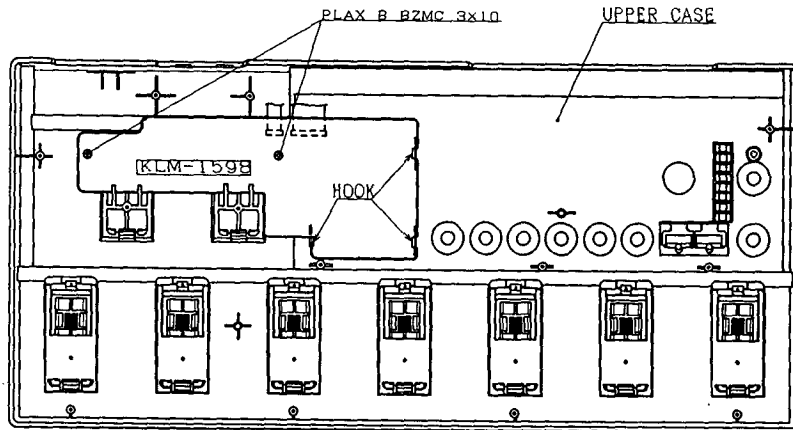
- 3) Remove 2 pcs. of the harnesses and remove the case assembly.



2. Remove the panel p.c.b.(KLM-1598)

- 1) Remove 2 pcs. of the screws on the panel p.c.b. and remove it.

[PLAX B BZMC 3 x 10] x 2



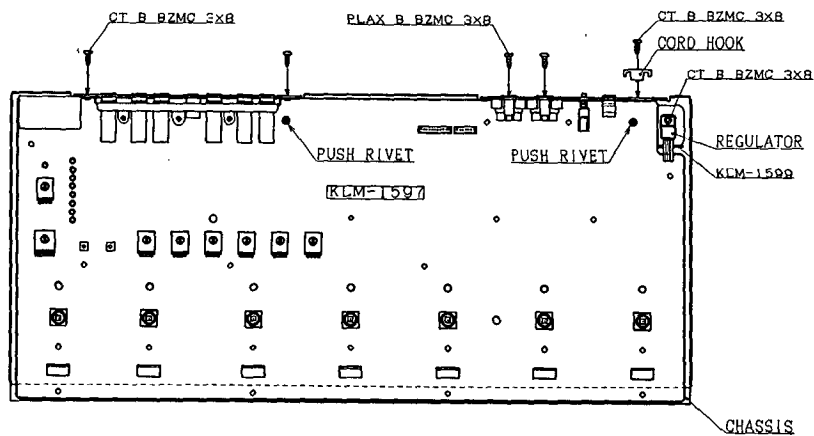
3. Remove the main p.c.b.(KLM-1597/99)

- 1) Remove a screw on the regulator.

[CT B BZMC 3 x 8] x 1

- 2) Remove 4 pcs. of the screws on the rear side of the chassis and remove the main p.c.b..

for PHONE JACK SUPPORT : [CT B BZMC 3 x 8] x 2
for MIDI JACK : [PLAX B BZMC 3 x 10] x 2



7. DIAGNOSTIC TEST

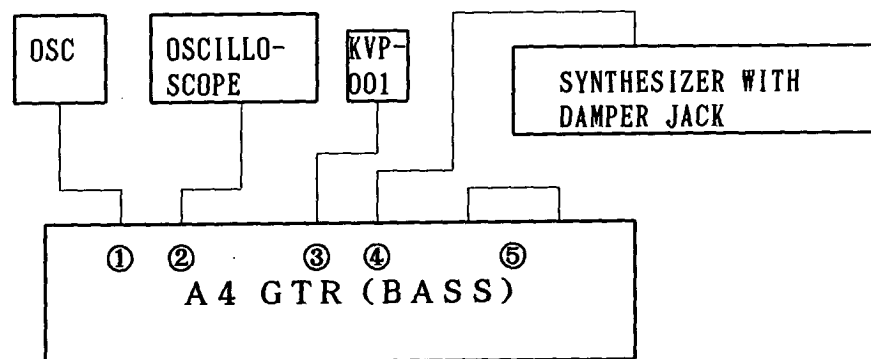
《 BEFORE ACTIVATING THE TEST MODE 》

The A4 GTR and BASS have a test mode for checking the unit's functions. When this test mode is activated, the data in the A4 is not initialized. Nevertheless, the data could be initialized by mistake, so it is advisable to save any user data to a MIDI data filer.

If necessary, the data in the A4 can be returned to the factory settings (preload data) by carrying out the operation for setting preload data after this test mode is activated.

The required equipment and settings for the test mode are pictured below.

《 SETUP FOR TEST 》



- ① INPUT
- ② OUTPUT L/MONO & R
- ③ VOLUME
- ④ EXT.CONTROL OUT 1 & 2
- ⑤ MIDI IN & MIDI OUT

《0. ACTIVATING THE TEST MODE 》

- (1) Switch the power on while at the same time pressing both the [USER/PRESET] and [WRITE] buttons on the front panel. The test mode will activate, and the internal battery voltage and MIDI circuitry will be checked automatically.
- (2) In this mode, the switches have the following functions:

[WRITE] : Press the [WRITE] button to start checking each item.

[MODE▲] : When [MODE▲] is pressed, the test moves ahead to the next item to be checked.

[MODE▼] : When [MODE▼] is pressed, the test moves back to the previous item to be checked.

《1. INTERNAL BATTERY CHECK 》

- (1) When the test mode is activated, the voltage of the internal battery is checked automatically.
- (2) When an error is found, all LEDs on the panel blink, except PEAK. The display will indicate the error details as below.

When the battery is low,

$b\Gamma$ and $L\Box$ will appear alternately.

When the battery voltage is high or no battery is loaded,

$b\Gamma$ and $H\mid$ will appear alternately.

- (3) When this check ends normally, the test function automatically moves on to the next item to be checked.

《2. MIDI CIRCUITRY CHECK 》

- (1) When the above check ends normally, the test function automatically checks the MIDI circuitry.
- (2) When an error is found, all LEDs on the panel blink, except PEAK. The display will indicate the error details as below.

Πd and $E\Gamma$ will appear alternately.

- (3) When this check ends normally, the test function automatically moves on to the next item to be checked.

《3. CPU CHECK 》

- (1) When all the above checks end normally, the display will indicate whether the CPU mounted on the main board is for GTR or BASS. Confirm which it is.

For A4GTR

$G\Gamma$

For A4BASS

bA

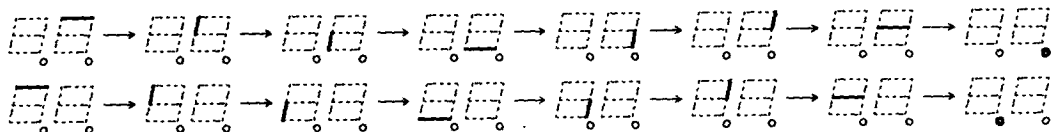
- (2) When the above display has appeared for 0.5 seconds, the test function moves on to the next check item.

«4. SWITCH AND LED CHECK »

- (1) This test item covers the switches and LEDs.
 (2) Press each of the switches in the order below to confirm that the corresponding LED lights up.

| DISPLAY | For A4 GTR | LED | For A4 BASS | LED |
|---------|--------------------|--------------------|--------------------|--------------------|
| | SW | | SW | |
| P1-1 | [1 COMPRESSOR] | <1 COMPRESSOR> | [1 COMP·DYNA EX] | <1 COMP·DYNA EX> |
| P1-2 | [2 DIST/OD] | <2 DIST/OD> | [2 6 BAND EQ] | <2 6 BAND EQ> |
| P1-3 | [3 3 BAND EQ] | <3 3 BAND EQ> | [3 SYNTH BASS] | <3 SYNTH BASS> |
| P1-4 | [4 PITCH·DELAY] | <4 PITCH·DELAY> | [4 DELAY] | <4 DELAY> |
| P1-5 | [5 CHORUS/FLANGER] | <5 CHORUS/FLANGER> | [5 CHORUS/FLANGER] | <5 CHORUS/FLANGER> |
| P1-6 | [6 REVERB] | <6 REVERB> | [6 REVERB] | <6 REVERB> |
| P1-7 | [BYPASS·TUNE] | <BYPASS·TUNE> | [BYPASS·TUNE] | <BYPASS·TUNE> |
| P1-8 | [MODE▼] | <[1]> | [MODE▼] | <[1]> |
| P1-9 | [MODE▼] | <[2]> | [MODE▼] | <[2]> |
| P1-10 | [MODE▼] | <[3]> | [MODE▼] | <[3]> |
| P1-11 | [MODE▼] | <[4]> | [MODE▼] | <[4]> |
| P1-12 | [MODE▲] | <[]> | [MODE▲] | <[]> |
| P1-13 | [MODE▲] | <[5]> | [MODE▲] | <[5]> |
| P1-14 | [MODE▲] | <[6]> | [MODE▲] | <[6]> |
| P1-15 | [MODE▲] | <[7]> | [MODE▲] | <[7]> |
| P1-16 | [USER/PRESET] | <USER> | [USER/PRESET] | <USER> |
| P1-17 | [WRITE] | <-50> | [WRITE] | <-50> |
| P1-18 | [WRITE] | <-50-0> | [WRITE] | <-50-0> |
| P1-19 | [WRITE] | <0> (Green) | [WRITE] | <0> (Green) |
| P1-20 | [WRITE] | <0-+50> | [WRITE] | <0-+50> |
| P1-21 | [WRITE] | <+50> | [WRITE] | <+50> |
| P1-22 | [PROG EDIT] | [PROG] | [PROG EDIT] | [PROG] |
| P1-23 | [BANK UP] | [EDIT] | [BANK UP] | [EDIT] |

- (3) When [WRITE] is pressed, the test function checks whether the panel display (7-segment LEDs) lights up in the sequence shown below.



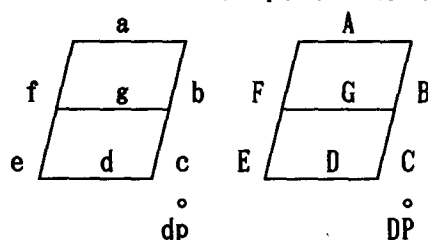
SWITCH MATRIX FOR A4 GTR

| | SWL0(P00) | SWL1(P01) | SWL2(P02) | SWL3(P03) |
|-----------|------------------|-------------------|----------------------|-----------|
| SWD0(P04) | USER /PRESET | WRITE | PROG/EDIT BYP/TUN | BANK UP |
| SWD1(P05) | CH/FL PEDAL | REVERB PEDAL | PEDAL PIT/DLY | _____ |
| SWD2(P06) | DIST/OD PEDAL | 3BAND EQ PEDAL | PEDAL COMP | _____ |
| SWD3(P07) | MODE UP | MODE DOWN | PEDAL | _____ |

LED MATRIX FOR A4 GTR

| | LINE1 (P70) | LINE2 (P71) | LINE3 (P72) | LINE4 (P73) | LINE5 (P50) |
|-----------|----------------|----------------|----------------|-------------------|------------------|
| LED1(P40) | EFFECT EDIT | dp | DP | BYP/TUN PEDAL | 3BAND EQ MODE |
| LED2(P41) | TUNE +1 | e | E | COMP PEDAL | UTILITY MODE |
| LED3(P42) | TUNE 0 | d | D | DIST/OD PEDAL | REVERB MODE |
| LED4(P43) | TUNE -1 | g | G | 3BAND EQ PEDAL | CH/FL MODE |
| LED5(P44) | TUNE -2 | a | A | — | PIT/DLY2 MODE |
| LED6(P45) | USER | f | F | PIT/DLY PEDAL | COMP MODE |
| LED7(P46) | PROG | c | C | REVERB PEDAL | DIST/OD MODE |
| LED8(P47) | TUNE +2 | b | B | CH/FL PEDAL | PIT/DLY1 MODE |

* LINE2 and LINE3 are the ports for the 7-segment LEDs.



(4) When this check ends, press [WRITE] to proceed to the next check.

《5. PARAMETER KNOB CHECK》

- (1) Here, the parameter knobs (A-F) on the panel and the volume pedal functions are checked.
- (2) First, when the knob is turned fully to the right (for the volume pedal, when the pedal is pressed back as far as possible), this check confirms whether the corresponding LED changes from a blinking state to a steady-lit state.
- (3) Next, when the knob is turned fully to the left (for the volume pedal, when the pedal is pressed forward as far as possible), this check confirms whether the corresponding LED goes out.
- (4) The check proceeds one by one, in sequence from knob A.
- (5) The table below shows the knobs and their corresponding LEDs.

| DISPLAY | VR | A4GTR | A4BASS | CPU PORT |
|----------|----------|--------------------|--------------------|----------|
| | | LED | LED | |
| P2-1,2 | (A) | <1 COMPRESSOR> | <1 COMP·DYNA EX> | AN2 |
| P2-3,4 | (B) | <2 DIST/OD> | <2 6 BAND EQ> | AN3 |
| P2-5,6 | (C) | <3 3 BAND EQ> | <3 SYNTH BASS> | AN4 |
| P2-7,8 | (D) | <4 PITCH·DELAY> | <4 DELAY> | AN5 |
| P2-9,10 | (E) | <5 CHORUS/FLANGER> | <5 CHORUS/FLANGER> | AN6 |
| P2-11,12 | (F) | <6 REVERB> | <6 REVERB> | AN7 |
| P2-13,14 | V. PEDAL | <BYPASS·TUNE> | <BYPASS·TUNE> | AN1 |

(6) When all knobs have been checked, press [WRITE] to proceed to the next check item.

«6. CHECK OF EXT.CTRL OUT JACKS »

- (1) This test item confirms whether the EXT.CTRL OUT 1 and 2 jacks are ON or OFF. The EXT.CTRL OUT 1 jack and the synthesizer's damper jack are connected by a patch cord. To check EXT.CTRL OUT 2, reconnect the patch cord.
- (2) Confirm that the damper effect appears in the connected synthesizer when EXT.CTRL OUT is ON. Also, confirm that the damper effect disappears in the connected synthesizer when the EXT.CTRL OUT is OFF.
NOTE: This result will appear in reverse with some synthesizers because of the setting of the damper polarity.
- (3) Press [WRITE] to check the jacks in the order shown below.

| DISPLAY | A4 GTR(B) | SYNTHESIZER |
|---------|-------------------|-------------|
| P3-1 | EXT.CTRL OUT1 ON | DAMPER ON |
| P3-2 | EXT.CTRL OUT1 OFF | DAMPER OFF |
| P3-3 | EXT.CTRL OUT2 ON | DAMPER ON |
| P3-4 | EXT.CTRL OUT2 OFF | DAMPER OFF |

- (3) When the checks are completed, press [WRITE] to proceed to the next item to be checked.

《7. DSP CHECK 》

- (1) Here, the main board's DSPs (IC10, IC11) and D_RAM (IC15, IC16) are checked.
- (2) Connect the oscilloscope to the rear panel OUTPUT, and turn the OUTPUT volume to MAX.
- (3) Press [WRITE], and the check will proceed as shown in the table below. Confirm that the waveform is the same as that shown in the figure.

| DISPLAY | A4 GTR(B) | OUTPUT | when no good |
|---------|-------------------------------|--------|--------------------------------|
| P4-1 | D S P(KLM-1597 IC11)test | OUT L | Check IC11 and analog circuit. |
| P4-2 | D S P(KLM-1597 IC11)test | OUT R | Check IC11 and analog circuit. |
| P4-3 | D R A M(KLM-1597 IC15,16)test | OUT L | Check IC11, IC15 and IC16. |
| P4-4 | D S P(KLM-1597 IC10)test | OUT L | Check IC10 and IC11. |
| P4-5 | D S P(KLM-1597 IC10)test | OUT R | Check IC10 and IC11. |

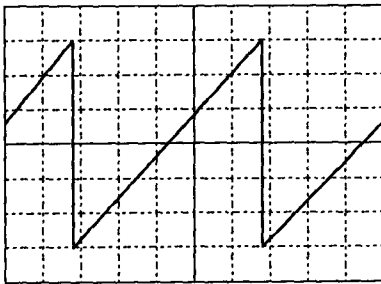


Figure 1

- (4) When the checks are completed, press [WRITE] to proceed to the next check item.

《8. TUNER FUNCTION CHECK 》

- (1) Here the TUNER function is checked.
Connect the rear panel INPUT jack to the oscillator.
- (2) Set the INPUT volume and OUTPUT volume on the panel to MAX.
- (3) Input a short wave 27.5Hz/10mVp-p to the INPUT jack and confirm that the TUNER LED 0 (green) on the panel lights up.
- (4) Input a short wave 2093.005003Hz/10mVp-p to the INPUT jack and confirm that the TUNER LED 0 (green) on the panel lights up.

| A4 GTR(B) | TUNER Function |
|-----------------------|----------------|
| 27.5Hz /10mVp-p | TUNER <0> lit |
| 2093.005003Hz/10mVp-p | TUNER <0> lit |

- (5) When this check is completed, press [MODE▲] to proceed to the next item to be checked.

《9. PEAK LED CHECK》

- (1) This test item checks the operation of the PEAK LED and its light-up status.
- (2) Set the A4's INPUT volume and OUTPUT volume to MAX.
- (3) Input a sine wave 1kHz/-10dBm to the INPUT jack and confirm that the PEAK LED lights red.
- (4) Input a sine wave 1kHz/-14dBm to the INPUT jack and confirm that the PEAK LED lights orange.
- (5) Input a sine wave 1kHz/-50dBm to the INPUT jack and confirm that the PEAK LED lights green.
- (6) Input a sine wave 1kHz/-70dBm to the INPUT jack and confirm that the PEAK LED goes out.

| INPUT SIGNAL | PEAK LED |
|--------------|----------------------|
| 1kHz/-10dBm | <PEAK> lights red |
| 1kHz/-14dBm | <PEAK> lights orange |
| 1kHz/-50dBm | <PEAK> lights green |
| 1kHz/-70dBm | <PEAK> goes out |

* The check items that follow the PEAK LED check are for tests carried out at the factory prior to shipment, and therefore are not covered here.

《10. TEST MODE COMPLETION AND DATA LOADING》

- (1) Note that there are two methods of ending the test mode.
One method ends the mode without initializing the A4's data.
The other method involves loading the preload data into the A4 and then ending the test.
- (2) Press [MODE▲] six times. As the check items move forward, confirm that all LEDs except PEAK blink.

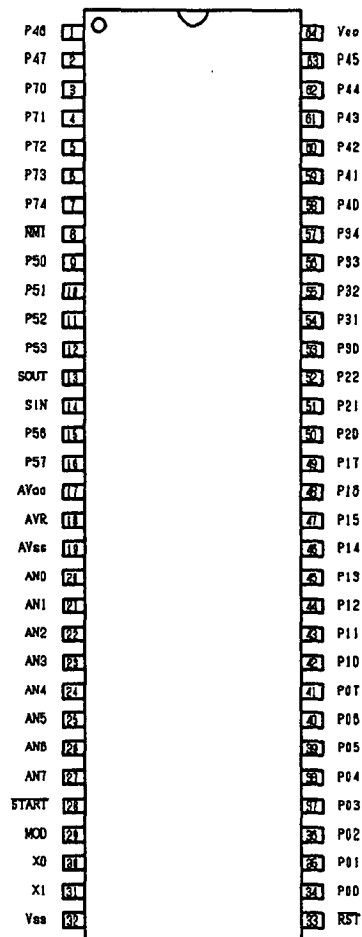
< Ending the test mode without initializing the A4's data >
(3a) Press [MODE▲]. The test mode will be ended without initializing the A4's data.

< Ending the test mode by loading the preload data >
(3b) Press [WRITE]. The Preload data will be loaded into the A4 and the test mode will end.
- (4) On returning to the normal mode, press [PROG EDIT] to confirm that the preloading has been performed correctly. Confirm that the A4 GTR LEDs [2: DIST/OD], [4: PITCH.DELAY] and [5: CHORUS/FLANGER] are lit, or that the A4 BASS LEDs [1: COMP.DYNA EX] and [2: 6 BAND EQ] are lit.

8. REFERENCE DATA

MB89710A (CPU)

PIN ASSIGNMENT



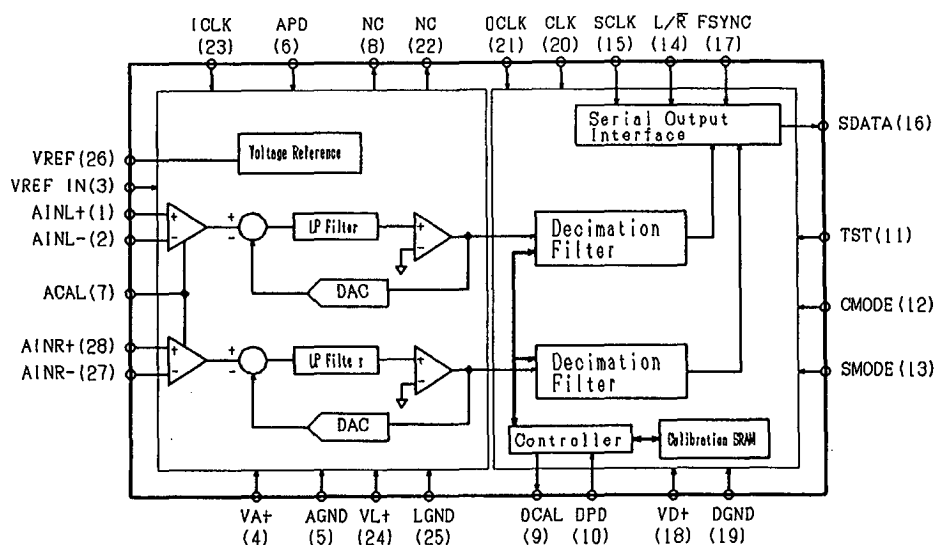
MB89710 (CPU)

PIN FUNCTION

| PIN NAME | I/O | FUNCTION |
|----------|-----|---|
| P00-P07 | I/O | I/O PORT 0 (SCAN FOR PANEL SWs) |
| P10-P17 | I/O | I/O PORT 1 (DATA BUS FOR DSP) |
| X0 | I | CRYSTAL OSC INPUT |
| X1 | O | CRYSTAL OSC OUTPUT |
| MOD | I | MODE SELECT INPUT |
| RES | I | RESET SIGNAL INPUT (LOW LEVEL ACTIVE) |
| START | I | START SIGNAL INPUT (LOW LEVEL ACTIVE) |
| NMI | I | NON MASKABLE INTERRUPT INPUT |
| P20-P22 | I/O | I/O PORT 2 (CHIP SELECT FOR DSPs) |
| P30-P37 | I/O | I/O PORT 3 (CONTROL PORT FOR DSPs) |
| P40-P47 | I/O | I/O PORT 4 (CONTROL PORT FOR LEDs) |
| VSS | --- | GROUND (0V) INPUT |

AK5349 (ADC)

INTERNAL BLOCK DIAGRAM



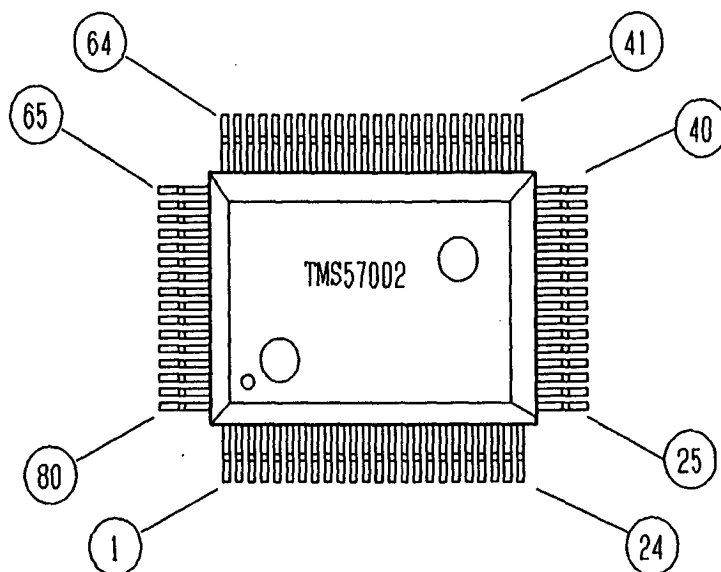
AK5349 (ADC)

PIN FUNCTION

| PIN NAME | I/O | FUNCTION |
|----------|-----|--|
| AINL+ | I | L CHANNEL ANALOG SIGNAL INPUT (+) |
| AINL- | I | L CHANNEL ANALOG SIGNAL INPUT (-) |
| VREFIN | I | REFERENCE VOLTAGE INPUT |
| VA+ | --- | POWER SUPPLY FOR ANALOG CIRCUIT (+5V) |
| AGND | --- | GROUND FOR ANALOG CIRCUIT |
| APD | I | ANALOG POWER DOWN ("H" LEVEL ACTIVE) |
| ACAL | I | ANALOG CALIBRATION |
| NC | I | NO CONNECTION |
| DCAL | O | DIGITAL CALIBRATION |
| DPD | I | DIGITAL POWER DOWN |
| TST | I | TEST |
| CMODE | I | CLOCK MODE "L": CLK=256fs (12.288MHz fs=48KHz) "H": CLK=384fs (18.432MHz fs=48KHz) |
| SMODE | I | INTERFACE CLOCK I/O SELECT "L": SLAVE MODE (L/R, SCLK & FSYNC: INPUT) "H": MASTER MODE (L/R, SCLK & FSYNC: OUTPUT) |
| L/R | I/O | L/R CLOCK SLAVE MODE: fs CLOCK INPUT MASTER MODE: fs CLOCK OUTPUT |
| SCLK | I/O | SERIAL DATA CLOCK SLAVE MODE: fs CLOCK INPUT MASTER MODE: fs CLOCK OUTPUT |
| SDATA | O | SERIAL DATA OUTPUT |
| FSYNC | I/O | FRAME SYNCHRONIZED CLOCK SLAVE MODE: CLOCK INPUT MASTER MODE: CLOCK OUTPUT |
| VD+ | --- | POWER SUPPLY FOR DIGITAL CIRCUIT (+5V) |
| DGND | --- | GROUND FOR DIGITAL CIRCUIT |
| CLK | I | MASTER CLOCK INPUT CMODE="H": 384fs CMODE="L": 256fs |
| OCLK | O | 128fs CLOCK OUTPUT |
| NC | --- | NO CONNECTION |
| ICLK | I | 128fs CLOCK INPUT |
| VL+ | --- | POWER SUPPLY FOR LOGIC CIRCUIT (+5V) |
| LGND | --- | GROUND FOR LOGIC CIRCUIT |
| VREF | O | REFERENCE VOLTAGE OUTPUT 2.56V (VA+ = +5V) |
| AINR+ | I | R CHANNEL ANALOG SIGNAL INPUT (-) R CHANNEL ANALOG SIGNAL INPUT (+) |

TMS57002 (DSP)

PIN ASSIGNMENT



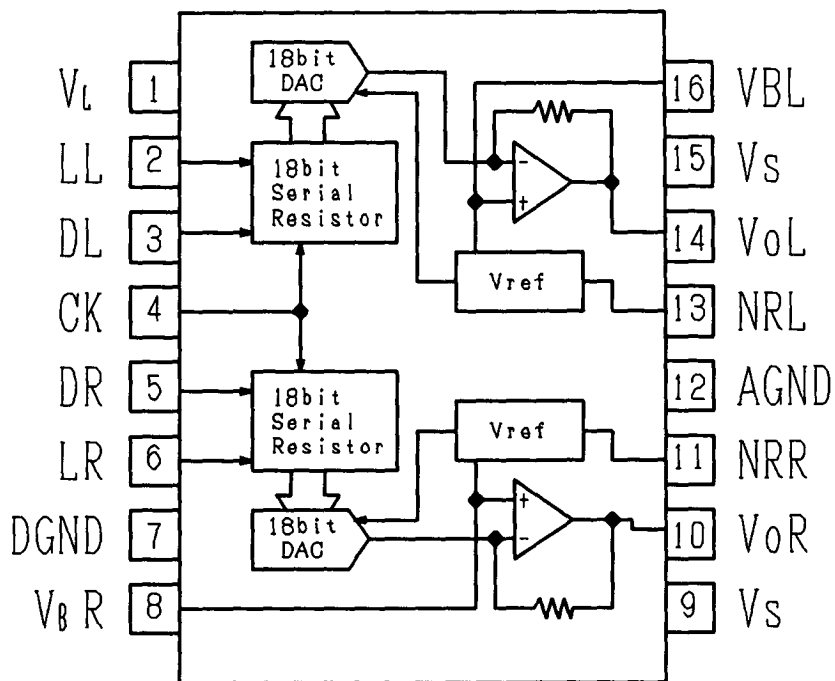
TMS57002 (DSP)

PIN FUNCTION

| PIN NAME | I/O | FUNCTION |
|------------|-----|--|
| VCC1, VCC2 | --- | +5V supply pins |
| VSS1, VSS2 | --- | Ground pins |
| CLKIN | I | System clock input |
| SYNC | I | System synchronization signal |
| SYPOL | I | Polarity select of SYNC active edge |
| SIO, S11 | I | S-port data receive input pins |
| SOO, SO1 | O | S-port data transmit output pins |
| BCKI | I | Bit clock for Input S-ports |
| BCKO | I | Bit clock for Output S-ports |
| LRCKI | I | L/R channel indication signal for Input S-ports |
| LRCKO | I | L/R channel indication signal for Output S-ports |
| D(7-0) | I/O | 8bit data input and output of P-port |
| STRB | I | Data Strobe input for P-port |
| WR | I | Write control signal input for P-port |
| EMPTY | O | Indicate P-port input buffer empty condition |
| CS | I | Chip select for P-port enable |
| PLOAD | I | Program data load control signal for P-port |
| CLOAD | I | Coefficient data background update request |
| BIO | I | Branch control signal |
| MUTE | I | Mute serial port signal |
| OVFM | O | Overflow detect signal on multiplier accumulator |
| OVFA | O | Overflow detect signal on ALU accumulator |
| RS | I | Hardware reset signal |
| PCO | O | Output Program Counter 0 state for sync clock |
| CLKSEL | I | Select signal of clock rate |
| TEST (0-4) | I | Device test control signals |
| RES | --- | Reserved for future external DRAM interface |

AD1868 (DAC)

INTERNAL BLOCK DIAGRAM



AD1868 (DAC)

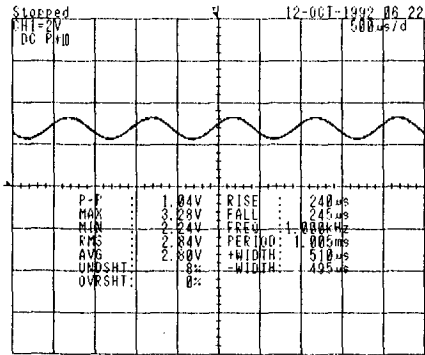
PIN FUNCTION

| PIN NAME | I/O | FUNCTION |
|----------|-----|--|
| VL | --- | POWER SUPPLY FOR DIGITAL CIRCUIT (+5V) |
| LL | I | L CHANNEL LATCH ENABLE INPUT |
| DL | I | L CHANNEL DATA INPUT |
| CK | I | CLOCK INPUT |
| DR | I | R CHANNEL DATA INPUT |
| LR | I | R CHANNEL LATCH ENABLE INPUT |
| DGND | --- | GROUND FOR DIGITAL CIRCUIT |
| VBR | I | BIAS FOR R CHANNEL |
| Vs | --- | POWER SUPPLY FOR ANALOG CIRCUIT |
| VOR | O | R CHANNEL SIGNAL OUTPUT |
| NRR | I | R CHANNEL NOISE REDUCTION |
| AGND | --- | GROUND FOR ANALOG CIRCUIT |
| NRL | I | L CHANNEL NOISE REDUCTION |
| VOL | O | L CHANNEL SIGNAL OUTPUT |
| Vs | --- | POWER SUPPLY FOR ANALOG CIRCUIT |
| VBL | I | BIAS FOR L CHANNEL |

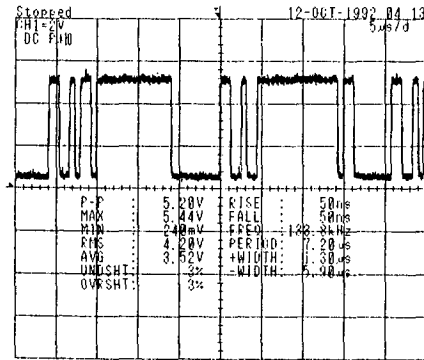
CHECK POINTS

AK5349-VP (IC2)

AINR- (27 PIN)

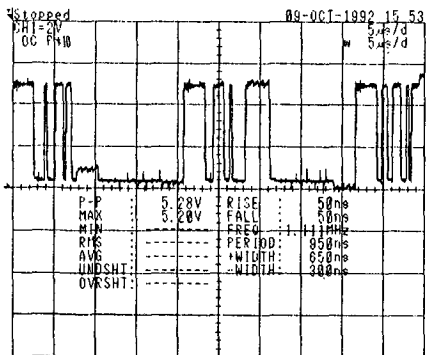


SDATA (16 PIN)



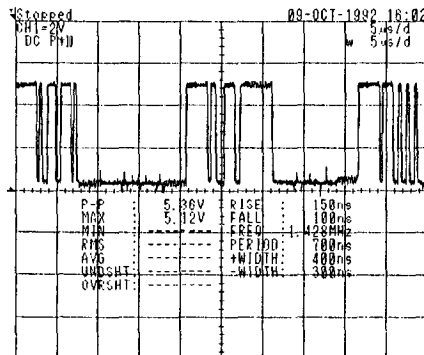
TMS57002PH (IC10, IC11)

S00 (6 PIN)



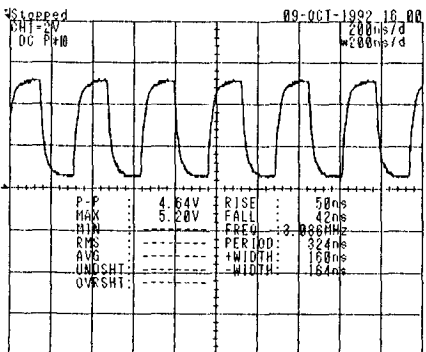
DSP TEST WAVEFORM

S01 (7 PIN)

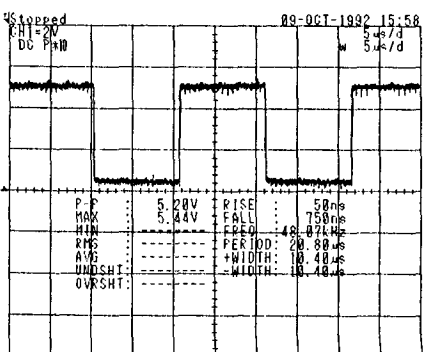


DSP TEST WAVEFORM

BCKO (2 PIN)

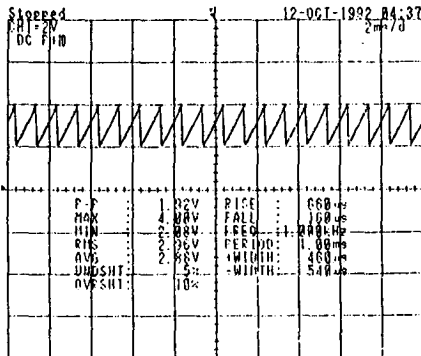


LRCKO (5 PIN)



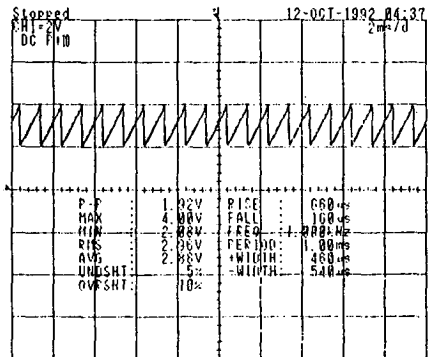
AD1868N-J (IC4)

VoL (14 PIN)



DSP TEST WAVEFORM

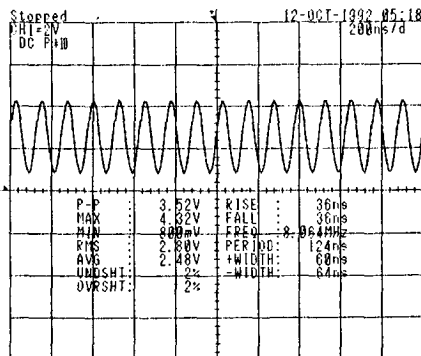
VoR (10 PIN)



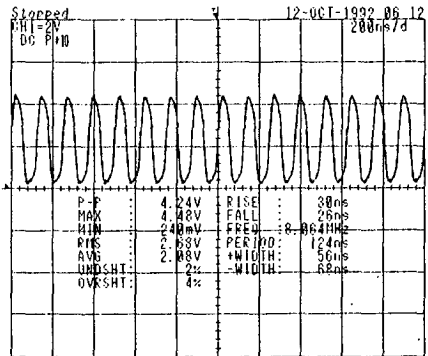
DSP TEST WAVEFORM

MB89718A (IC5)

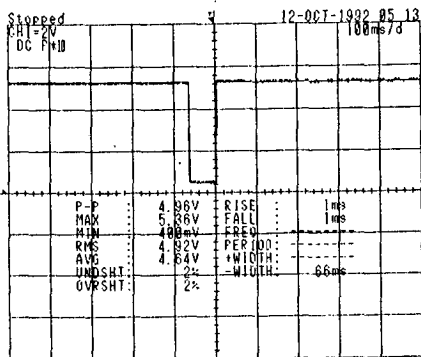
X0 (31 PIN)



X1 (32 PIN)

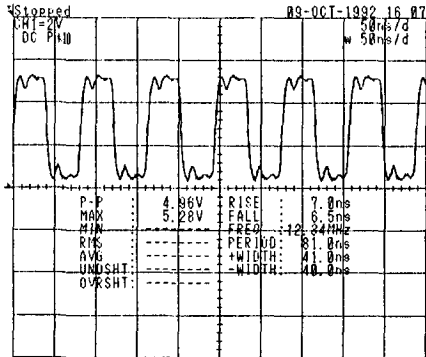


RST (33 PIN)

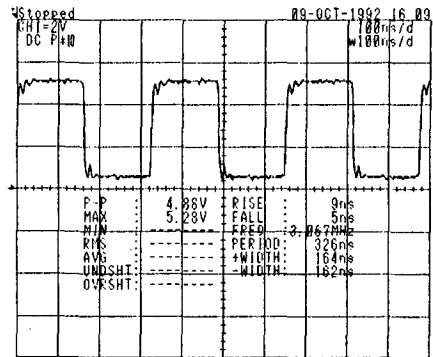


UPD74HC4040C (IC7)

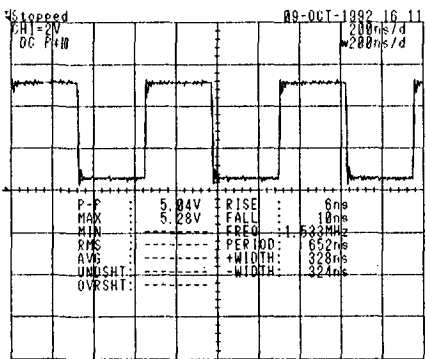
ADCLK (9 PIN)



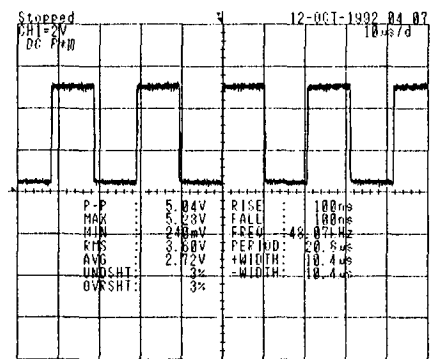
64BCLK (6 PIN)



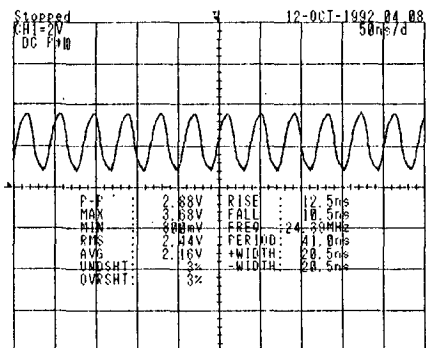
32BCLK (5 PIN)



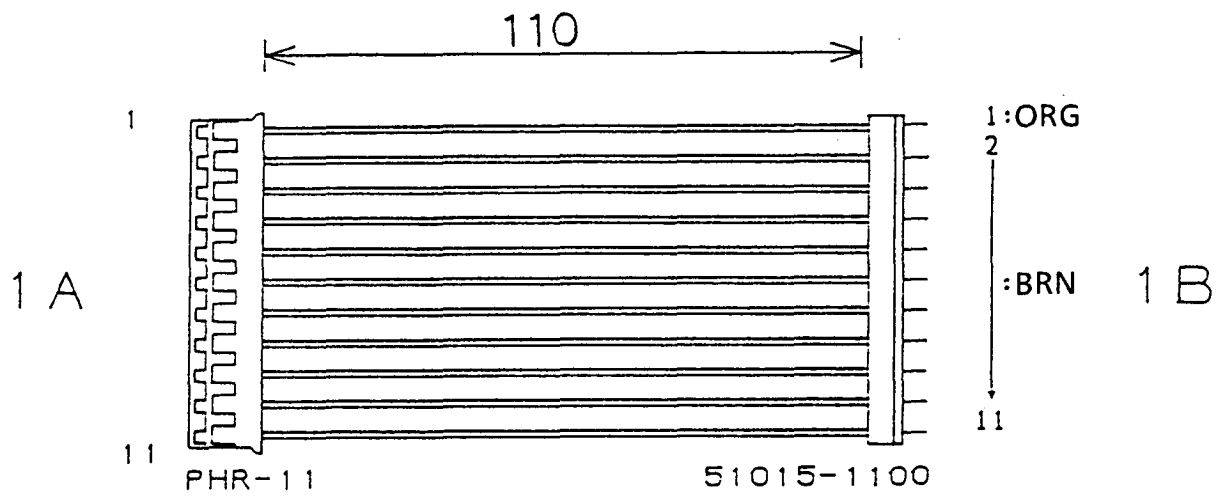
LRCLK (12 PIN)



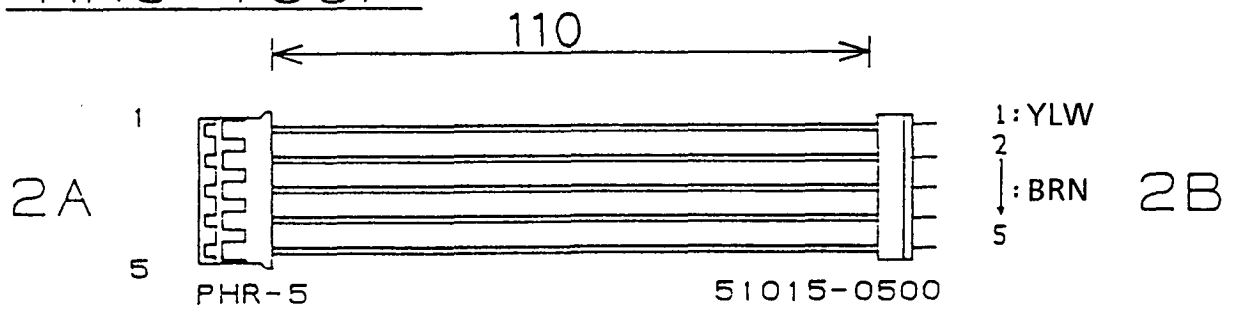
CLK (10 PIN)



FOR HARNESSSES



HNS-1837



HNS-1838

9. PARTS LIST

FOR A4GTR

| PART CODE | PART NAME/SPECIFICATION | P.C. BOARD | NOTE | Q'TY |
|-----------|---------------------------------|------------|-----------------|------|
| 001159700 | P.C. BOARD ASSEMBLY KLM-1597/99 | M.PART | MAIN(FOR A4GTR) | 1 |
| 001159800 | P.C. BOARD ASSEMBLY KLM-1598 | M.PART | PANEL | 1 |
| ----- | | | | |
| 303000528 | TR 2SD794A P/Q | 1597 | | 1 |
| 304000020 | TR 2SA1175 T K | 1597 | | 3 |
| 304020100 | TR BA1A4M-T | 1597 | | 9 |
| 304020110 | TR BN1A4M-T | 1597 | | 8 |
| 304020270 | TR 2SC3576-AC | 1597 | | 2 |
| 304030230 | TR BA1L3N-T | 1597 | | 2 |
| 304030240 | TR BN1L3Z-T | 1597 | | 1 |
| 304060060 | FET 2SK184-GR (TPE4) | 1597 | | 1 |
| ----- | | | | |
| 312009500 | LED HLMP-D101 (YHP) | 1597 | | 7 |
| | | 1598 | | 1 |
| 312010900 | LED GL3ED8 | 1597 | | 1 |
| 312011200 | LED HLMP-1503 (GREEN) | 1598 | | 1 |
| 312012300 | LED MODULE KDSP-213 | 1598 | | 1 |
| 312012400 | LED HLMP-K150 | 1598 | | 5 |
| | | 1597 | | 8 |
| 312012500 | LED HLMP-8509 | 1598 | | 1 |
| ----- | | | | |
| 314000300 | DIODE 1S-2473 T-77 | 1597 | | 21 |
| 314001700 | DIODE SS1.5J4 TPA | 1597 | | 2 |
| 314025700 | DIODE SR1M-2 TP-B | 1597 | | 1 |
| 314026700 | ZENER DIODE RD4.3EB2-T1 | 1597 | | 1 |
| 314026800 | ZENER DIODE RD6.8EB2-T1 | 1597 | | 1 |
| 315000400 | DOUBLE DIODE MC932-T12 | 1597 | | 1 |
| ----- | | | | |
| 320001068 | IC UPD74HCU04C | 1597 | HC_MOS | 1 |
| 320001314 | IC UPD74HC4040C | 1597 | HC_MOS | 1 |
| 320001315 | IC UPC4572C | 1597 | OP_AMP | 1 |
| 320003205 | IC TC514256AZ-70 | 1597 | D_RAM | 2 |
| 320009028 | IC NJM-3404AD | 1597 | OP_AMP | 1 |
| 320009057 | IC NJM7805FA | 1599 | REGULATOR | 1 |
| 320009083 | IC NJM-2100D | 1597 | OP_AMP | 1 |
| 320011024 | IC M-5223P | 1597 | OP_AMP | 1 |
| 320011110 | IC M5216P | 1597 | OP_AMP | 1 |
| 320011163 | IC M51951ASL | 1597 | RESET | 1 |
| 320012132 | IC MB89718AP-G-416-SH (SH-DIP) | 1597 | CPU(FOR A4GTR) | 1 |
| 320018004 | IC AK5349-VP | 1597 | A/D CONVERTER | 1 |
| 320021142 | IC TMS57002PH | 1597 | DSP | 2 |
| 320038001 | IC AD1868N-J | 1597 | D/A CONVERTER | 1 |
| ----- | | | | |
| 330000900 | PHOTO COUPLER PC-900 | 1597 | | 1 |
| ----- | | | | |
| 334000500 | SB COIL SBT-0260 TF | 1597 | | 12 |
| 334001200 | SB COIL SBT-0210 TF | 1597 | | 2 |
| ----- | | | | |

| PART CODE | PART NAME/SPECIFICATION | P. C. BOARD | NOTE | Q'TY |
|-----------|----------------------------------|-------------|------|------|
| 335006500 | CRYSTAL OSC. AT-49 24.576MHZ | 1597 | | 1 |
| 335007500 | CRYSTAL OSC AT-49 8.00MHZ | 1597 | | 1 |
| 360023300 | VR RK11K1130A3JA 10KB | 1597 | | 6 |
| 360023900 | VR RK11K1130A6RA 10KA | 1597 | | 1 |
| 362006200 | VR RK14K1230A0XA 10KBX2 | 1597 | | 1 |
| 375005000 | TACT SW SKHCAA120A | 1597 | | 7 |
| | | 1598 | | 2 |
| 375010500 | TOUCH SW EVQ-PAC09K-A | 1597 | | 2 |
| 375011400 | TOUCH SW EVQ-PAC-05K | 1598 | | 2 |
| 375013400 | PUSH SW SPUP19097A | 1597 | | 1 |
| 402004800 | SU COIL SU9UD-07020 | 1597 | | 1 |
| 450002300 | PHONE JACK LGR4502-5000 (STEREO) | 1597 | | 5 |
| 450002400 | PHONE JACK LGR4501-5000 (MONO) | 1597 | | 1 |
| 454006200 | JACK HEC-0470-01-630 | 1597 | | 1 |
| 454008300 | PHONE JACK YKB21-5130 | 1597 | | 1 |
| 454009100 | DIN JACK YKF51-5058 | 1597 | | 1 |
| 470192500 | HARNESS HNS-925 | 1597 | | 1 |
| 471070500 | CONNECTOR TOP B5B-PH | 1597 | | 1 |
| 471071100 | CONNECTOR TOP B11B-PH | 1597 | | 1 |
| 475001837 | HARNESS HNS-1837 (BOARD IN) | 1598 | | 1 |
| 475001838 | HARNESS HNS-1838 (BOARD IN) | 1598 | | 1 |
| 500013100 | SW CUSHION KOC-F40427 | M. PART | | 9 |
| 500018300 | RUBBER FOOT 3x22x3 | M. PART | | 4 |
| 500019600 | RUBBER SPACER KOC-40577 | M. PART | | 1 |
| 520001900 | LITHIUM BATTERY CR2032-HE2 | 1597 | | 1 |
| 575015000 | LED SPACER LS-15-6.5 L=6.5mm | 1597 | | 7 |
| | | 1598 | | 2 |
| 575016100 | LED SPACER LH-5-12 L=12mm | 1597 | | 9 |
| 575016200 | LED SPACER LH-5-3 L=3mm | 1598 | | 1 |
| 580032000 | X-150G MODE LIST SEAL KOC-F40593 | M. PART | | 1 |
| 620018200 | POWER SW KNOB | M. PART | | 1 |
| 620022900 | ROTARY VR KNOB | M. PART | | 8 |
| 630018500 | X-150G PARAMETER SHEET | M. PART | | 1 |
| 641034500 | X-150 PHONE JACK SUPPORT | M. PART | | 1 |

| PART CODE | PART NAME/SPECIFICATION | P. C. BOARD | NOTE | Q'TY |
|-----------|--------------------------|-------------|------|------|
| 641034600 | X-150 CHASSIS | M. PART | | 1 |
| 641034800 | X-150 SHIELD CASE | M. PART | | 1 |
| 644003000 | X-507 GND SPRING | M. PART | | 2 |
| 644006400 | PEDAL SPRING KOC-C40896 | M. PART | | 9 |
| 646042700 | X-150G CASE | M. PART | | 1 |
| 646042800 | X-150 PEDAL | M. PART | | 9 |
| 646042900 | X-150 REFLECTOR | M. PART | | 9 |
| 646043000 | X-150 CORD HOOK | M. PART | | 1 |
| 646043400 | X-150G CASE ASSEMBLY | M. PART | | 1 |
| 715230308 | SCREW CT B ZMC 3 x 8 | M. PART | | 3 |
| 715260308 | SCREW CT B BZMC 3 x 8 | M. PART | | 4 |
| 745060310 | SCREW PLAX B BZMC 3 x 10 | M. PART | | 20 |

FOR A4BASS

| PART CODE | PART NAME/SPECIFICATION | P.C. BOARD | NOTE | Q'TY |
|-----------|--------------------------------|------------|------------------|------|
| 001159701 | P.C.BOARD ASSEMBLY KLM-1597/99 | M.PART | MAIN(FOR A4BASS) | 1 |
| 001159800 | P.C.BOARD ASSEMBLY KLM-1598 | M.PART | PANEL | 1 |
| ----- | | | | |
| 303000528 | TR 2SD794A P/Q | 1597 | | 1 |
| 304000020 | TR 2SA1175 T K | 1597 | | 3 |
| 304020100 | TR BA1A4M-T | 1597 | | 9 |
| 304020110 | TR BN1A4M-T | 1597 | | 8 |
| 304020270 | TR 2SC3576-AC | 1597 | | 2 |
| 304030230 | TR BA1L3N-T | 1597 | | 2 |
| 304030240 | TR BN1L3Z-T | 1597 | | 1 |
| 304060060 | FET 2SK184-GR (TPE4) | 1597 | | 1 |
| ----- | | | | |
| 312009500 | LED HLMP-D101 (YHP) | 1597 | | 7 |
| | | 1598 | | 1 |
| 312010900 | LED GL3ED8 | 1597 | | 1 |
| 312011200 | LED HLMP-1503 (GREEN) | 1598 | | 1 |
| 312012300 | LED MODULE KDSP-213 | 1598 | | 1 |
| 312012400 | LED HLMP-K150 | 1598 | | 5 |
| | | 1597 | | 8 |
| 312012500 | LED HLMP-8509 | 1598 | | 1 |
| ----- | | | | |
| 314000300 | DIODE 1S-2473 T-77 | 1597 | | 21 |
| 314001700 | DIODE SS1.5J4 TPA | 1597 | | 2 |
| 314025700 | DIODE SR1M-2 TP-B | 1597 | | 1 |
| 314026700 | ZENER DIODE RD4.3EB2-T1 | 1597 | | 1 |
| 314026800 | ZENER DIODE RD6.8EB2-T1 | 1597 | | 1 |
| 315000400 | DOUBLE DIODE MC932-T12 | 1597 | | 1 |
| ----- | | | | |
| 320001068 | IC UPD74HCU04C | 1597 | HC_MOS | 1 |
| 320001314 | IC UPD74HC4040C | 1597 | HC_MOS | 1 |
| 320001315 | IC UPC4572C | 1597 | OP_AMP | 1 |
| 320009028 | IC NJM-3404AD | 1597 | OP_AMP | 1 |
| 320009057 | IC NJM7805FA | 1599 | REGULATOR | 1 |
| 320009083 | IC NJM-2100D | 1597 | OP_AMP | 1 |
| 320011024 | IC M-5223P | 1597 | OP_AMP | 1 |
| 320011110 | IC M5216P | 1597 | OP_AMP | 1 |
| 320011163 | IC M51951ASL | 1597 | RESET | 1 |
| 320012098 | IC MB81C4256-70PSZ-G | 1597 | D_RAM | 2 |
| 320012133 | IC MB89718AP-G-423-SH (SH-DIP) | 1597 | CPU(FOR A4BASS) | 1 |
| 320018004 | IC AK5349-VP | 1597 | A/D CONVERTER | 1 |
| 320021142 | IC TMS57002PH | 1597 | DSP | 2 |
| 320038001 | IC AD1868N-J | 1597 | D/A CONVERTER | 1 |
| ----- | | | | |
| 330000900 | PHOTO COUPLER PC-900 | 1597 | | 1 |
| ----- | | | | |
| 334000500 | SB COIL SBT-0260 TF | 1597 | | 12 |
| 334001200 | SB COIL SBT-0210 TF | 1597 | | 2 |
| ----- | | | | |

| PART CODE | PART NAME/SPECIFICATION | P.C. BOARD | NOTE | Q'TY |
|-----------|----------------------------------|------------|------|------|
| 335006500 | CRYSTAL OSC. AT-49 24.576MHZ | 1597 | | 1 |
| 335007500 | CRYSTAL OSC AT-49 8.00MHZ | 1597 | | 1 |
| 360023300 | VR RK11K1130A3JA 10KB | 1597 | | 6 |
| 360023900 | VR RK11K1130A6RA 10KA | 1597 | | 1 |
| 362006200 | VR RK14K1230A0XA 10KBX2 | 1597 | | 1 |
| 375005000 | TACT SW SKHCAA120A | 1597 | | 7 |
| | | 1598 | | 2 |
| 375010500 | TOUCH SW EVQ-PAC09K-A | 1597 | | 2 |
| 375011400 | TOUCH SW EVQ-PAC-05K | 1598 | | 2 |
| 375013400 | PUSH SW SPUP19097A | 1597 | | 1 |
| 402004800 | SU COIL SU9UD-07020 | 1597 | | 1 |
| 450002300 | PHONE JACK LGR4502-5000 (STEREO) | 1597 | | 5 |
| 450002400 | PHONE JACK LGR4501-5000 (MONO) | 1597 | | 1 |
| 454006200 | HEC-0470-01-630 | 1597 | | 1 |
| 454008300 | PHONE JACK YKB21-5130 | 1597 | | 1 |
| 454009100 | DIN JACK YKF51-5058 | 1597 | | 1 |
| 470192500 | HARNESS HNS-925 | 1597 | | 1 |
| 471070500 | CONNECTOR TOP B5B-PH | 1597 | | 1 |
| 471071100 | CONNECTOR TOP B11B-PH | 1597 | | 1 |
| 475001837 | HARNESS HNS-1837 (BOARD IN) | 1598 | | 1 |
| 475001838 | HARNESS HNS-1838 (BOARD IN) | 1598 | | 1 |
| 500013100 | SW CUSHION KOC-F40427 | M. PART | | 9 |
| 500018300 | RUBBER FOOT 3x22x3 | M. PART | | 4 |
| 500019600 | RUBBER SPACER KOC-40577 | M. PART | | 1 |
| 520001900 | LITHIUM BATTERY CR2032-HE2 | 1597 | | 1 |
| 575015000 | LED SPACER LS-15-6.5 L=6.5mm | 1597 | | 7 |
| | | 1598 | | 2 |
| 575016100 | LED SPACER LH-5-12 L=12mm | 1597 | | 9 |
| 575016200 | LED SPACER LH-5-3 L=3mm | 1598 | | 1 |
| 580032100 | X-150B MODE LIST SEAL | M. PART | | 1 |
| 620018200 | POWER SW KNOB | M. PART | | 1 |
| 620022900 | ROTARY VR KNOB | M. PART | | 8 |
| 630018600 | X-150B PARAMETER SHEET | M. PART | | 1 |
| 641034500 | X-150 PHONE JACK SUPPORT | M. PART | | 1 |

| PART CODE | PART NAME/SPECIFICATION | P.C. BOARD | NOTE | Q'TY |
|-----------|--------------------------|------------|------|------|
| 641034600 | X-150 CHASSIS KOC-C20262 | M.PART | | 1 |
| 641034800 | X-150 SHIELD CASE | M.PART | | 1 |
| 644003000 | X-507 GND SPRING | M.PART | | 2 |
| 644006400 | PEDAL SPRING KOC-C40896 | M.PART | | 9 |
| 646042800 | X-150 PEDAL | M.PART | | 9 |
| 646042900 | X-150 REFLECTOR | M.PART | | 9 |
| 646043000 | X-150 CORD HOOK | M.PART | | 1 |
| 646043100 | X-150B CASE | M.PART | | 1 |
| 646043500 | X-150B CASE ASSEMBLY | M.PART | | 1 |
| 715230308 | SCREW CT B ZMC 3 x 8 | M.PART | | 3 |
| 715260308 | SCREW CT B BZMC 3 x 8 | M.PART | | 4 |
| 745060310 | SCREW PLAX B BZMC 3 x 10 | M.PART | | 20 |

MEMO

KORG

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