MODEM GPS RECEIVER / MODEM GPS CONTROLLER

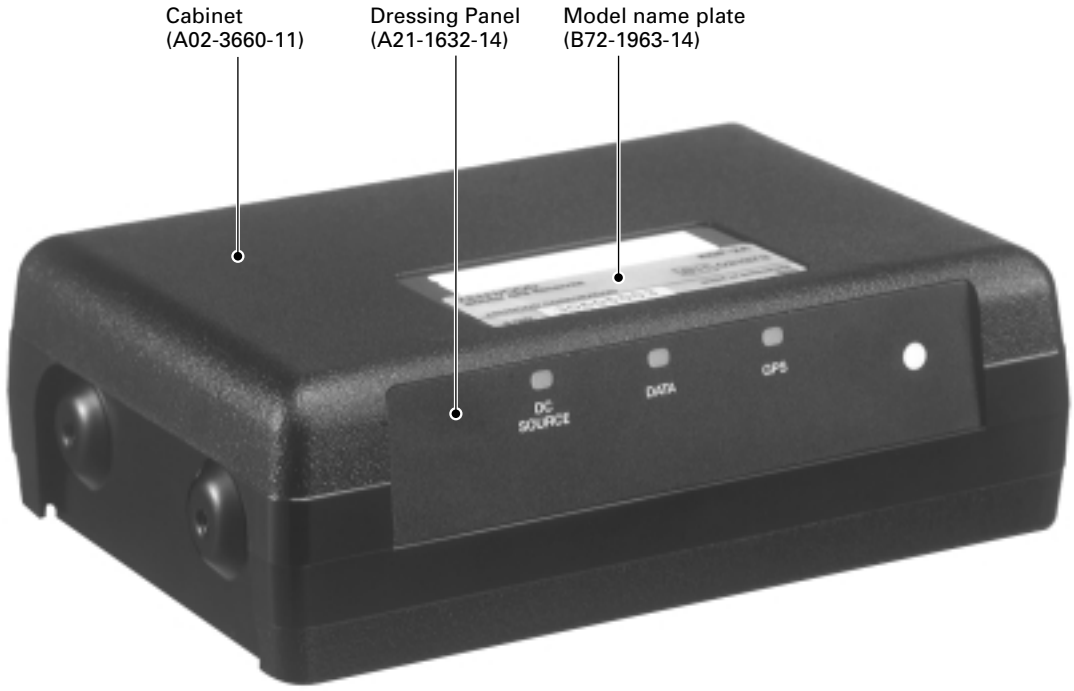
KGP-2A/2B

SERVICE MANUAL

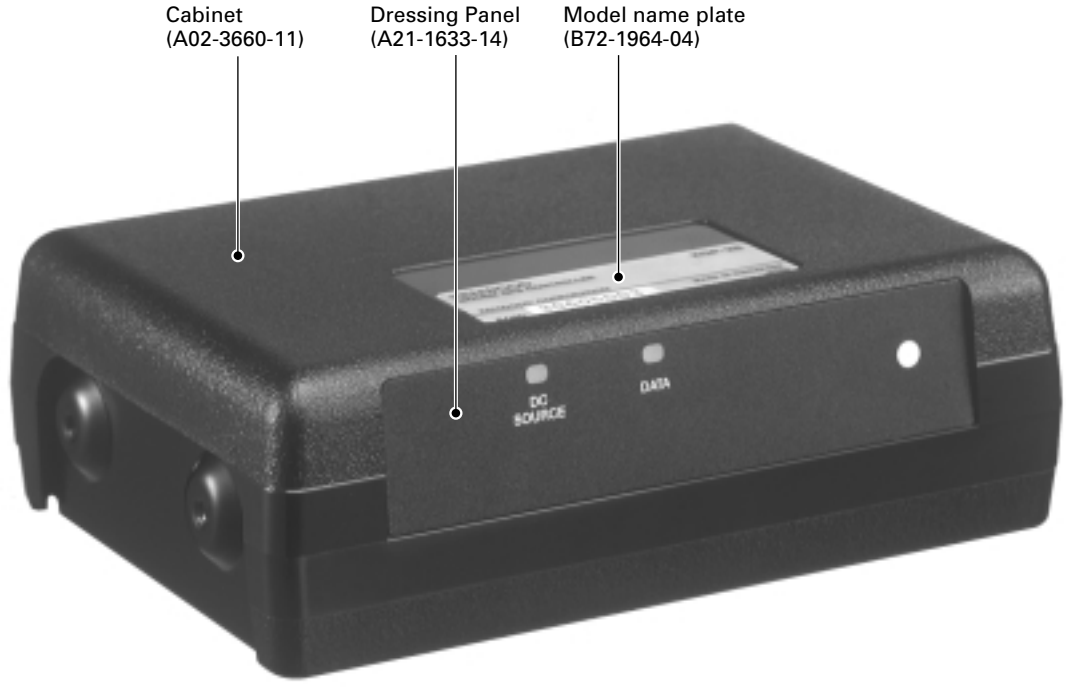
KENWOOD

B51-8596-00 (N) 1422

KGP-2A



KGP-2B



CONTENTS / INSTALLATION

CONTENTS

INSTALLATION

TK-780/880/980/981 Series (TK-∗80 Series)

■ Installing the KCT-34 in the Transceiver

1. Remove the upper cover from the transceiver.
2. Lift the DC cord bushing (❶) from the chassis.
3. Remove the pad as shown in the Figure 1 (❷).
4. Insert the KCT-34 cable (❸) into the chassis (❹). The wire harness band (❺) must be inside the chassis.
5. Replace the DC cord bushing (❻).
6. Connect the KCT-34 to the TX-RX unit (A/2) as shown in Figure 2 (❼).

Connector	Wire Color	Pin No.
A-1	Brown	4
A-2	NC	–
A-3	NC	–
A-4	Orange	5
A-5	Gray	10
A-6	NC	–
A-7	Yellow	6
A-8	Blue	8

Connector	Wire Color	Pin No.
B-1	NC	–
B-2	White	11
B-3	Green	7
C-1	Purple	9
C-2	Light blue	14
C-3	Light green	15
D-1	NC	–
D-2	Black	3
D-3	Red	1

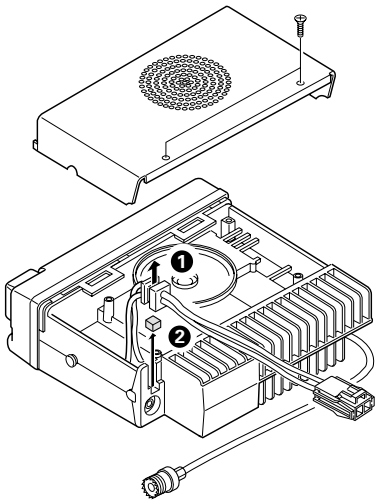


Fig. 1

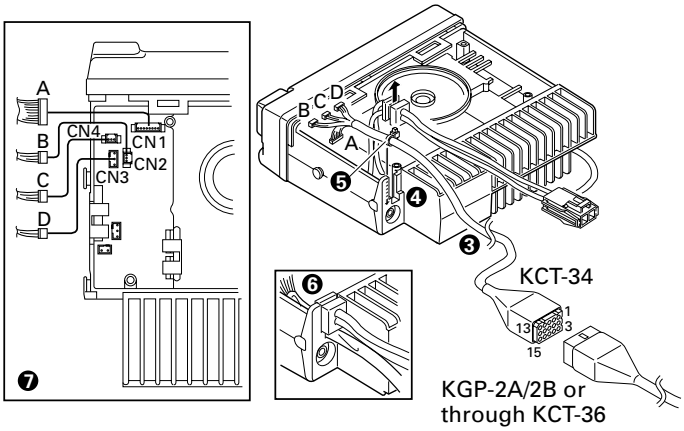


Fig. 2

INSTALLATION / REALIGNMENT

TK-760G/762G/860G/862G/768G/868G Series (TK-∗60G Series)

■ Installing the KCT-35 in the Transceiver

1. Remove the upper cover from the transceiver.
2. Lift the DC cord bushing (❶) from the chassis.
3. Remove the pad as shown in the Figure 3 (❷).
4. Insert the KCT-35 cable (❸) into the chassis (❹). The wire harness band (❺) must be inside the chassis.
5. Replace the DC cord bushing (❻).
6. Connect the KCT-35 to the TX-RX unit (A/2) as shown in Figure 4 (❼).

Connector	Wire Color	Pin No.
A-1	Brown	4
A-2	Green	7
A-3	NC	–
A-4	Orange	5
A-5	NC	–
A-6	NC	–
A-7	Yellow	6
A-8	Blue	8

Connector	Wire Color	Pin No.
B-1	Gray	10
B-2	White	11
B-3	Purple	9
C-1	NC	–
C-2	Black	3
C-3	Red	1

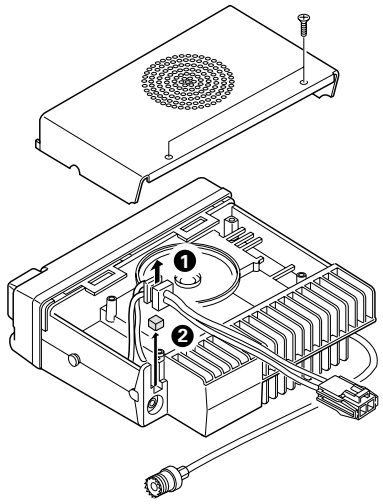


Fig. 3

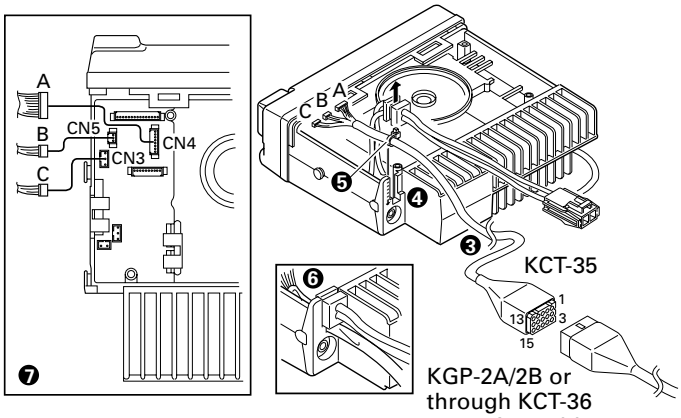


Fig. 4

REALIGNMENT

Transceiver Setting

When the KGP-2A/2B is connected to a transceiver, the transceiver functions must be set. The transceiver FPU is used to make this setting.

For a connection method, see Figure 1.

■ TK-∗80 Series Setting Method

1. Setting with KPG-49D (K and M markets FPU)

1) Select "Optional Features" from "Edit" on the menu bar and change Com2 (Internal Port) from "[None]" to "[AUX Hook/PTT]".

2. Setting with KPG-60D (E markets FPU)

1) Select "Extended Function" from "Edit" on the menu bar and change Com2 from "[None]" to "[AUX Hook/PTT]".

■ TK-∗60G Series Setting Method

Use the KPG-56D as the FPU.

1) Select "Key assignment" from "Edit" on the menu bar, and set "Foot Switch" to "[None]".
2) Select "Optional Features" from "Edit" on the menu bar and change "ACC Hook/DTC" from "[ACC Hook]" to "[DTC]".

Note :

Applicable only for S/No. 302XXXXX or later.

KGP-2A/2B Setting

After programming the transceiver, you need to configure the KGP-2A/2B. Using the FPU (KPG-73D), you can configure the KGP-2A/2B .

Using a cross-wired serial cable (KGP-2A/2B side : D-sub 9- pin female) as shown in Figure 2, plug one connector into the RS-232C (COM) port of your PC and the other end to the ACC1 connector on the rear panel of the KGP-2A/2B.

■ KGP-2A/2B Setting Method

1) Create a data file using the FPU (KPG-73D).
2) After configuring the KGP-2A/2B to the Programming Menu mode, upload the data file to the KGP-2A/2B.

❋ For detailed instructions, refer to the Help file included in the FPU.

❋ To set the KGP-2A/2B in the Programming Menu mode, refer to "Start the Programming Menu mode" on page 6.

REALIGNMENT

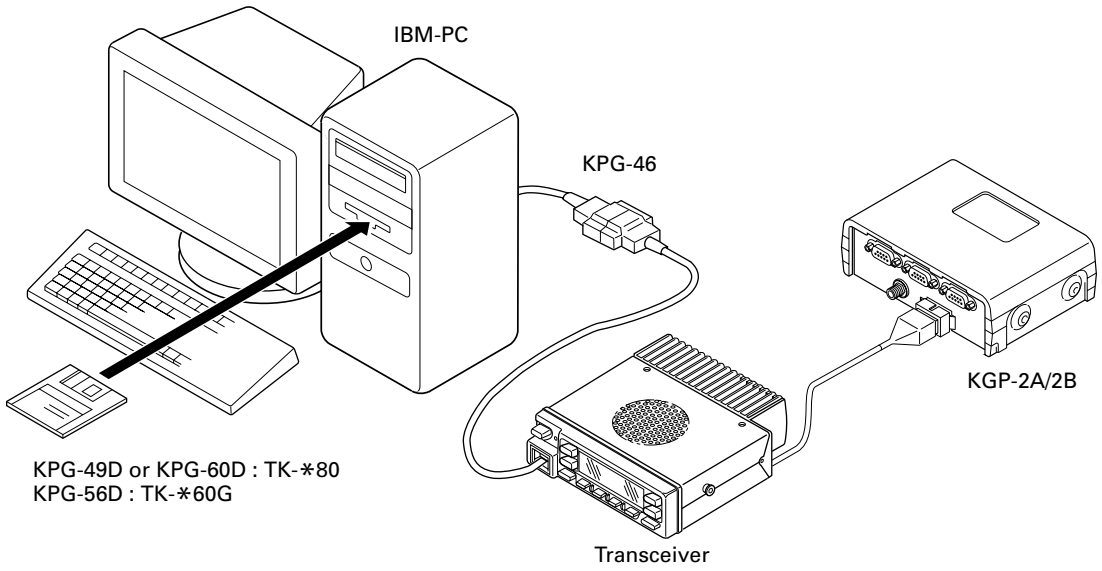


Fig. 1

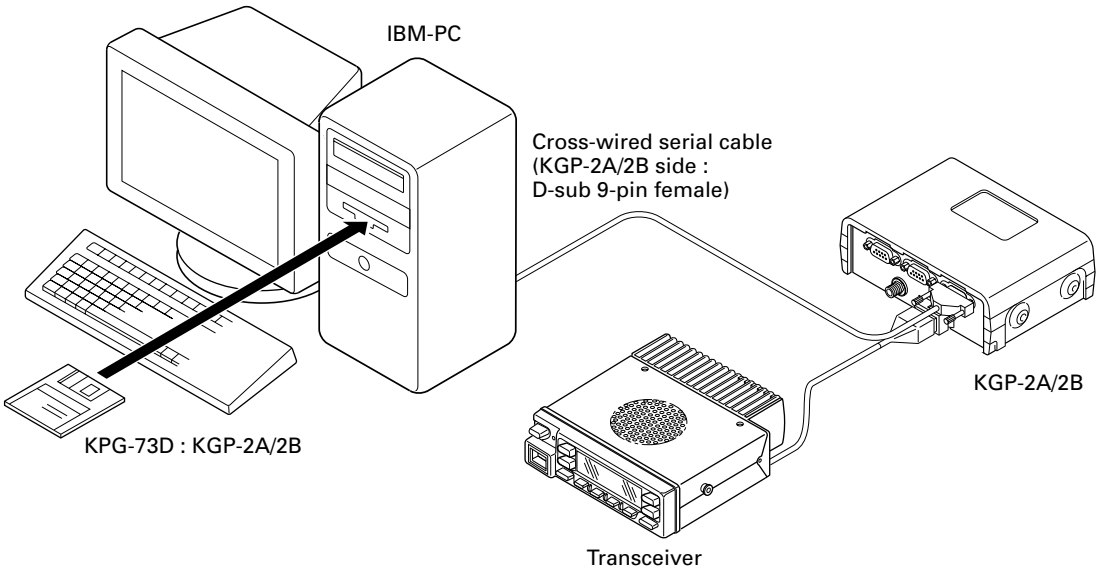


Fig. 2

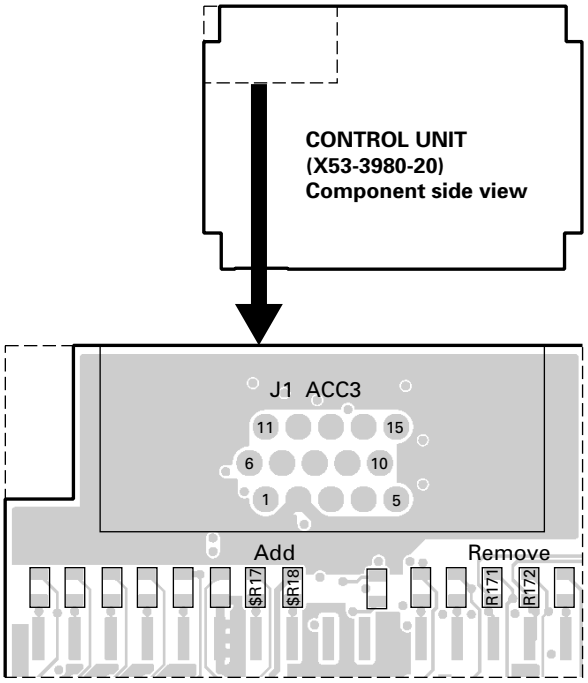
MODIFICATION

Connecting a Separate Microphone for Emergency Mode (KGP-2A only)

If you apply the modification as described below, you can connect a separate microphone to the KGP-2A in place of the transceiver's microphone for Emergency mode. The base station application software which can send out a corresponding command is required for the change of a microphone which operates in the time of emergency transmission.

■ Modification

1. Remove R171 (0Ω).
2. Remove R172 (0Ω).
3. Add 0Ω (R92-0670-05) to the $R17 location.
4. Add 0Ω (R92-0670-05) to the $R18 location.



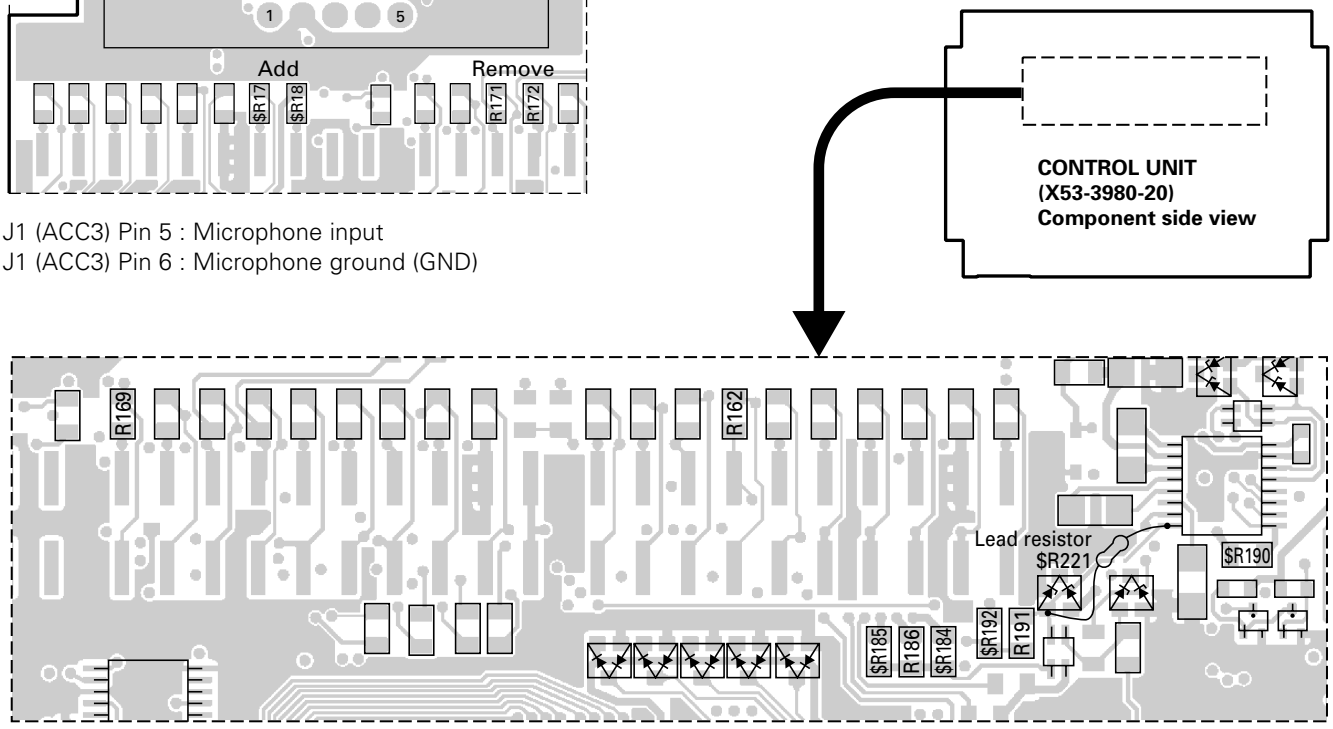
J1 (ACC3) Pin 5 : Microphone input
J1 (ACC3) Pin 6 : Microphone ground (GND)

Since 5V DC goes through R55 (56kΩ) and then it is supplied to the microphone input, an electric condenser-type microphone can be connected to this terminal.

You can also adjust the microphone sensitivity by changing the R206 (560Ω) constant between 330Ω and approximately 1kΩ. The microphone pre-emphasis and IDC are carried out by the DSP IC (IC29).

Modification Setting for DGPS (KGP-2A only)

Input method of DGPS signal	$R192 (0Ω)	R186 (0Ω)	$R184 (0Ω)	$R185 (0Ω)	R191 (0Ω)
5V input from ACC2	Yes	No	Yes	No	No
RS-232C level input from ACC2	Yes	No	Yes	No	Yes
5V input from ACC3	Yes	No	No	Yes	No
RS-232C level input from ACC3	Yes	No	No	Yes	Yes
Input method of DGPS signal	$R190 (0Ω)	$R221 (0Ω)	R162 (0Ω)	R169 (0Ω)	
5V input from ACC2	No	No	No	N/A	
RS-232C level input from ACC2	Yes	Yes	No	N/A	
5V input from ACC3	No	No	N/A	No	
RS-232C level input from ACC3	Yes	Yes	N/A	No	



DISASSEMBLY FOR REPAIR / ADJUSTMENT

Remove the Case from the Chassis

1. Remove 4 screws (❶).
2. Hold the KGP-2A/2B upside down as shown in Figure 2, then lift the chassis upward by pulling the tabs on its side (❷). Also, lift the chassis on the other side in same manner.
3. Grab the chassis from the top and lift it upward (❸), then slide and pull the chassis slightly (❹). Lift the chassis upward (❺) to remove it from the case.

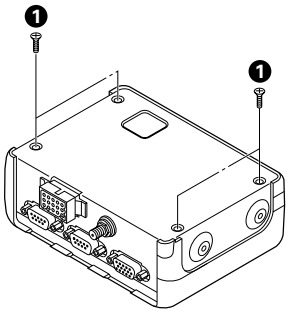


Fig. 1

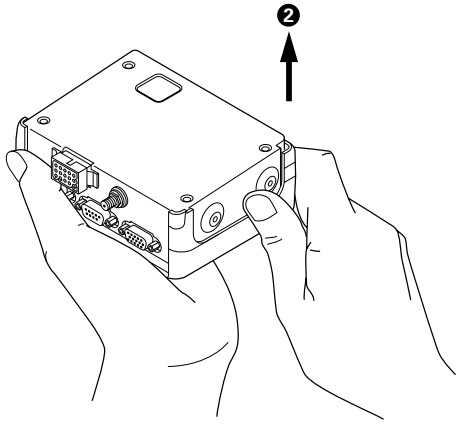


Fig. 2

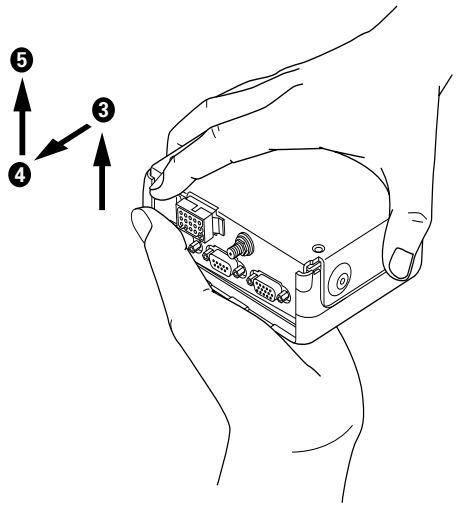
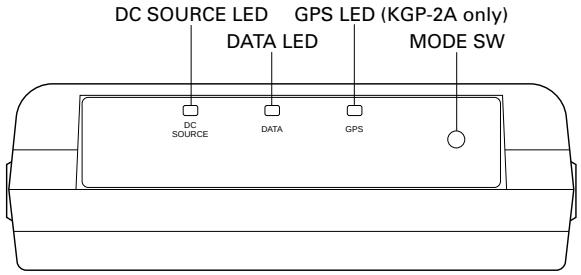


Fig. 3

ADJUSTMENT

Front Panel



Start the Programming Menu Mode

Press and hold the MODE SW key for more than 2 seconds. "DC SOURCE" LED blinks and then the KGP-2A/2B enters the programming menu mode.

Note : If the KGP-2A/2B does not receive any programming commands from a PC within 30 seconds after the "DC SOURCE" LED starts blinking. It returns normal operation (User mode). If you press MODE SW key while the "DC SOURCE" LED is blinking, the KGP-2A/2B returns to User mode.

Updating the Firmware

1) Connect the transceiver and KGP-2A/2B as shown in Figure 2 on page 4.
2) Double-click the "Fpro.exe" file (Ver. 3.01 or later) in the folder where the KPG-73D is installed.
3) After the program starts, click the "Open a file" icon [ ], then select the new firmware data file.
4) Configure the KPG-2A/2B to enter the Programming menu mode, then, click [Write] on the Fpro screen to start revising the firmware. (The Fpro program first erases the firmware file on the KGP-2A/2B, then writes the new firmware file.)
   - While erasing the firmware, the "DC SOURCE" LED blinks green and the "DATA" LED lights orange.
   - While writing the firmware, the "DC SOURCE" and "DATA" LEDs blink green.
   - When the firmware is successfully revised, only the "DC SOURCE" LED blinks green.
   - When an error occurrs, the "DC SOURCE" LED blinks green and the "DATA" LED blinks red. In this case, switch the KGP-2A/2B OFF, then turn it ON again. The "DC SOURCE" LED blinks green and the "DATA" LED lights orange. Click [Write] on the Fpro screen to restart revising the firmware.
5) Click "OK" when the confirmation dialog box appears. Select [Exit] to exit the program.
6) Turn the KGP-2A/2B OFF and then back ON to return to User mode.

ADJUSTMENT

MSK Modulation Adjustment

Adjust deviation as follows: Wide: 3kHz and Narrow: 1.5kHz.

1) Connect a transceiver and a PC to the KGP-2A/2B (Figure 2 on page 4). After configuring the KGP-2A/2B to enter the Programming menu mode, select "Test Mode" from "Program" on the FPU (KPG-73D) menu.
2) Adjust the "Output Level" DIGIT value on the "MSK" screen.
3) When you click on "OK" on the PC screen, the adjustment value is written into the KGP-2A/2B memories.

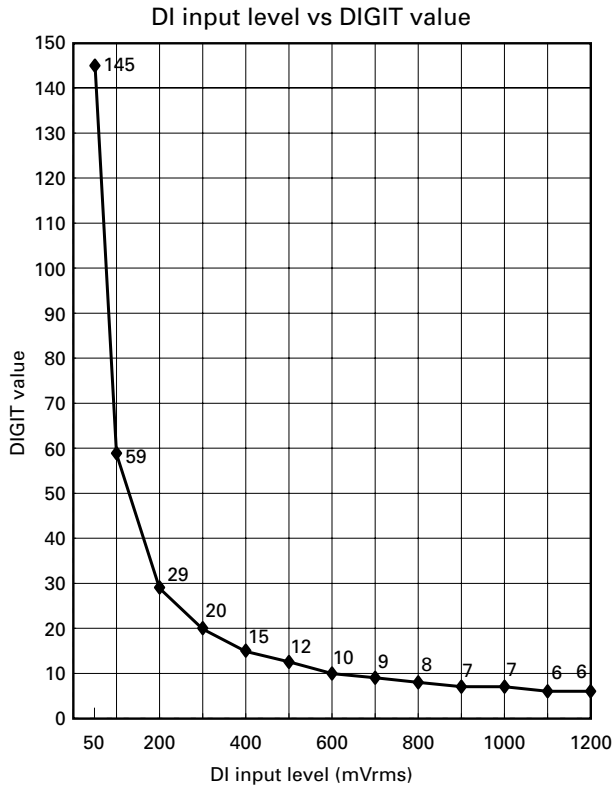
MSK Detection Input Level Adjustment

Set the input voltage at pin 2 of the CODEC IC (IC22) of the KGP-2A/2B to 1000mVp-p.

1) Adjust the SSG level as shown below. Then connect the output to the transceiver.
   Frequency : Same frequency that the transceiver is receiving.
   Modulation Frequency : 1200Hz (or 1000Hz)
   Frequency Deviation : 3kHz (Wide), 1.5kHz (Narrow)
   Output Level : –53dBm (60dBμ)
2) Measure the KGP-2A/2B DI voltage (DI: CN1 pin 3, transceiver detection output voltage) with a AF-VTVM.
3) Set the "Input Level" DIGIT value according to the following conversion table on the "MSK" screen in "Test Mode" so that the measured voltage (mVrms) is the CODEC IC input voltage (1000mVp-p).
4) When you click on "OK" on the PC screen, the adjustment value is written into the KGP-2A/2B memories.

DI input level (mVrms)	DIGIT value	CODEC IC (IC22) pin 2 input level (mVp-p)
50	145	1000
100	59	
200	29	
300	20	
400	15	
500	12	
600	10	
700	9	
800	8	
900	7	
1000	7	
1100	6	
1200	6	

Conversion table



CIRCUIT DESCRIPTION

1. Power Supply Circuit

The KGP-2A/2B power supply circuit uses a dedicated regulator IC for each circuit application so that the circuits do not interfere with each other. (Figure 1)

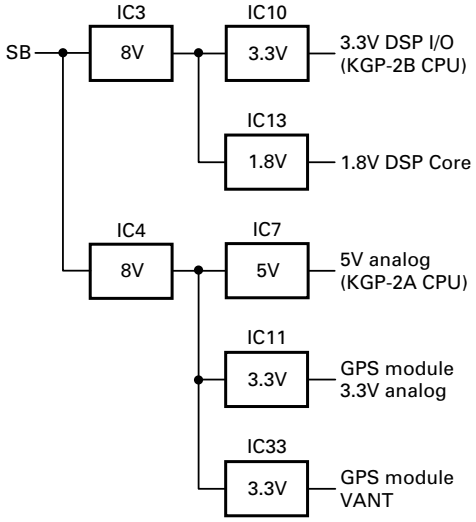


Fig. 1

2. LED Control Circuit

The LEDs of "DC SOURCE", "DATA" (TX/RX status), and "GPS" (KGP-2A only) are controlled by the CPU (IC17), using the shift register (IC12). (Figure 2)

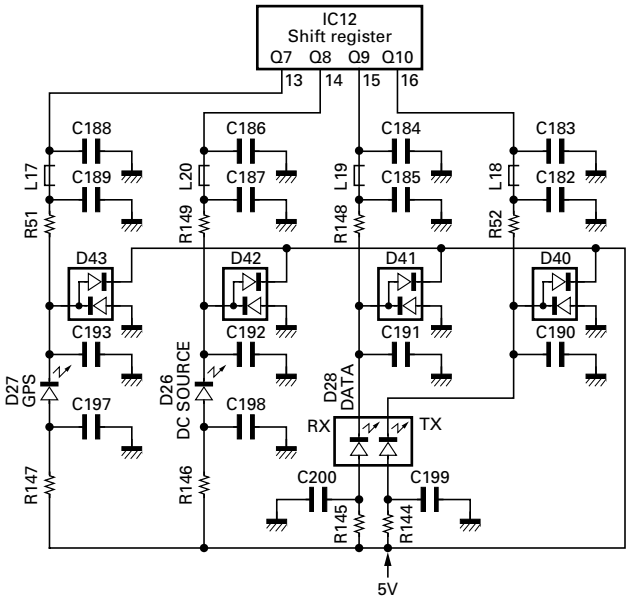


Fig. 2

3. Digital Control Circuit

■ Overview

The KGP-2A/2B control circuit consists of the CPU (IC17) and DSP IC (IC29).

The DSP functions as a MSK modem.

Figure 3 is a block diagram of a digital control circuit.

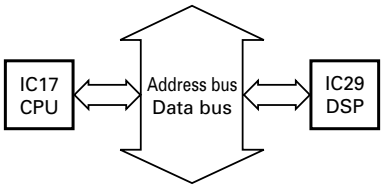


Fig. 3

■ Address control circuit

The CPU is running at "Single chip mode" that utilize the internal RAM and ROM. It exchanges data by using the external data bus to communicate with an external DSP IC. Although the CPU in the KGP-2A is running at 5V DC, the FLASH ROM (IC25) and DSP IC uses 3V DC. So, there are the 5V-3V level converter IC (IC19, IC20, IC21 and IC31) in the address bus and data bus to interface among these ICs. (Figure 4A)

Since the CPU in the KGP-2B is running at 3V DC, it does not require the voltage level conversion. So, the address bus and data bus of the CPU is connected to the FLASH ROM and DSP IC without using the 5V-3V level converter IC. (Figure 4B)

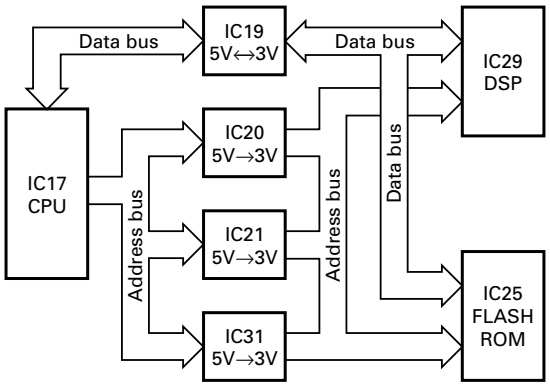


Fig. 4A

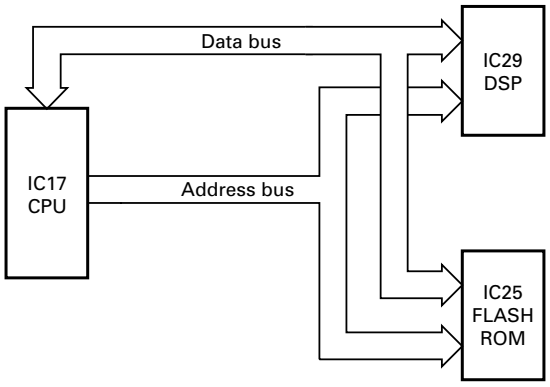


Fig. 4B

CIRCUIT DESCRIPTION

■ GPS module (KGP-2A only)

The location data is measured by the internal GPS module. When the KGP-2A is turned OFF, it enters the backup mode and the power is supplied by the internal rechargeable lithium battery. It takes approximately 45 seconds to calculate the location data when the KGP-2A is "cold" started (full initializing).

■ System reset

The reset IC (IC1) monitors the power supply voltage (SB : 13.6V). If the voltage drops, the IC outputs LOW-level on the OUT port. At the same time, PFINT port (CPU : IC17) becomes LOW-level and the program executes the backup routine. If the power supply voltage of the CPU (5V for the KGP-2A or 3 V for the KGP-2B) becomes lower than the specified value, the CPU stops working. When the power supply voltage of the CPU becomes normal (the above voltage), the reset IC (IC14) outputs the reset signal to the CPU RESET port. Then the CPU initializes the settings and starts working again.

■ Serial (COM) port

The KGP-2A/2B communicates to an external PC through the ACC1 connector on the rear panel. The KGP-2A/2B has an internal, bi-directional RS-232C/TTL voltage level converter (IC6) that converters the signal levels between the CPU and the ACC1 connector. (Figure 5)

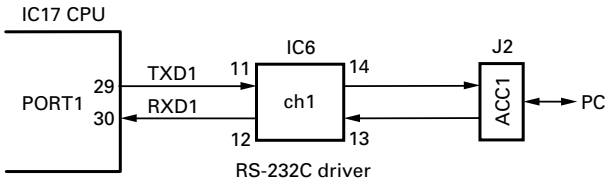


Fig. 5

4. Transmit/Receive Signal Flow

■ Receive Data Signal

The transceiver's detector output passes through CN1 pin 3 (DI) and amplifier (IC16), and the output level is adjusted by the D/A converter (IC18). The signal is amplified by the same amplifier (IC16) again, passes through the CODEC IC (IC22), and then it is converted to digital data.

The data is serially transferred from the CODEC IC to the DSP IC (IC29) and then further processed by the DSP IC. (Figure 6)

■ Transmit data signal

The digital data processed by the DSP IC, is serially transferred from the DSP IC to the CODEC IC. Then the signal is converted to analog signal. The signal is amplified by the amplifier (IC26) and then passes through the D/A converter (IC18) to adjust the voltage level. The signal is used as the transmitting data for the transceiver after passing through CN1 pin 5 (DO). (Figure 6)

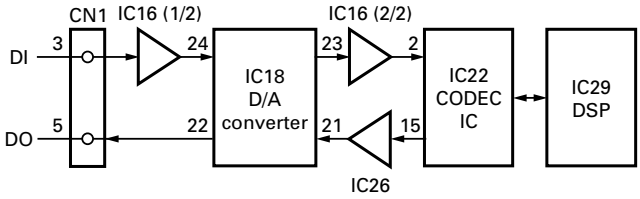


Fig. 6

DESCRIPTION OF COMPONENTS

Control Unit (X53-3980-XX)

Ref. No.	Use / Function	Operation / Condition
Q1,2	Switching	Level converter 3V→5V
Q4	Switching	Power switch of GPS module
Q5,6	Switching	Output terminal open-collector
Q10~14	Switching	Level converter 3V→5V
Q15	Switching	Logic inverter
Q16~26	Switching	Level converter 3V→5V
IC1	Reset IC	Monitor of SB power supply voltage
IC3,4	Regulator	8V (1A)
IC6	RS-232C driver	Level converter 5V⟷RS-232C
IC7	Regulator	5V (500mA)
IC9	Extended I/O	Radio control, Serial/parallel conversion
IC10,11	Regulator	3.3V
IC12	Shift register	LED (D26~28) control, Power switch of GPS module
IC13	Regulator	1.8V
IC14	Reset IC	Monitor of CPU power supply voltage
IC15	EEPROM	Memory backup
IC16	Amplifier	Input data
IC17	CPU	16 Bit
IC18	D/A converter	
IC19	Level converter	5V⟷3V
IC20,21	Level converter	5V→3V
IC22	CODEC IC	A/D,D/A conversion
IC23	Gate IC	IC19 direction control
IC24	Gate IC	A19 (IC17) Logic inverter
IC25	Memory IC	3.3V FLASH ROM
IC26	Ampifier	Output data
IC28	Clock demultiplier	for DSP
IC29	DSP IC	
IC31	Level converter	5V→3V
IC32	Amplifier	Microphone input signal
IC33	Regulator	3.3V
D1	Over current protection	0.75A
D2	Backward voltage protection	
D5	Reverse current protection	
D7~9	Surge absorption	
D12	Surge absorption	
D18	Reverse current protection	
D24	Surge absorption	
D26	LED	DC SOURCE (Power)
D27	LED	GPS
D28	LED	DATA (TX/RX)
D30	Reverse current protection	
D31~48	Surge absorption	
D50~62	Surge absorption	

Additional PCB

Ref. No.	Use / Function	Operation / Condition
Q7,8	Switching	Output terminal open-collector

SEMICONDUCTOR DATA

CPU : 30620M8A-2M6GP (Control unit IC17)

Pin No.	Pin Name	I/O	Function
1~5	SEN12~	I/O	KGP-2A Sensor 12~8
	SEN8	I	KGP-2B Not used
6	BYTE	I	Data bus width 8 bit
7	CNVSS	I	Memory extended mode select (GND)
8	MES	I	Microprocessor operation mode
9	FRBSY	I	FLASH ROM busy detect
10	RESET	I	Reset input
11	XOUT	O	Clock output
12	VSS	-	GND
13	XIN	I	Clock input
14	VCC	-	Power supply
15	NMI	I	Not used
16	SRCLK1	I	KGP-2A SWIPE READER CLOCK1 input
			KGP-2B Not used
17	SRCLK2	I	KGP-2A SWIPE READER CLOCK2 input
			KGP-2B Not used
18	PFINT	I	Power supply voltage monitor input
19	E2PSCL	O	E2PROM SK
20	VRLD	O	Electronic VR LD
21	-	I	Not used
22	SEN_ACC2/1	I	Not used
23	SEN_ACC2/2	I	Not used
24	SEN_ACC3	I	Not used
25	RADOE	O	IC9 OE (for RADIO)
26	RADST	O	IC9 ST (for RADIO)
27	RXD2	I	KGP-2A Radio data input
			KGP-2B Not used
28	TXD2	O	KGP-2A Radio data output
		I	KGP-2B Not used
29	TXD1	O	PC data output
30	RXD1	I	PC data input
31	CLK	O	Common CLOCK
32	DATA	O	Common DATA
33	TXD0	O	KGP-2A GPS receiver output (GPSTXD)
		I	KGP-2B Not used
34	RXD0	I	KGP-2A GPS receiver input (GPSRXD)
			KGP-2B Not used

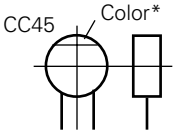
Pin No.	Pin Name	I/O	Function
35	RADSQ	I	Radio SQ input
36	RADTXS	I	Radio TXS input
37	RDY	I	Not used
38	ALE	O	Not used
39	HOLD	I	Not used
40	HLDA	O	Not used
41	BCLK	O	Not used
42	RD	O	Read signal
43	BHE	O	Not used
44	WR	O	Write signal
45	DSPCS	O	DSP chip select
46	E2PSDA	I	E2PROM DI
47	E2PWP	O	E2PROM DO
48	FROMCE	O	FLASH ROM CE
49~59	A19~A9	-	Address bus 19~9
60	VCC	-	Power supply
61	A8	-	Address bus 8
62	VSS	-	GND
63~70	A7~A0	-	Address bus 7~0
71	MODESW	O	Mode SW
72	DSPRINT	I	DSP RX interrupt
73	DSPTINT	I	DSP TX interrupt
74	DPSCLR	O	DSP reset output
75	SRSEL	I	KGP-2A SWIPE READER SELECT
			KGP-2B Not used
76	SRDAT1	I	KGP-2A SWIPE READER DATA1
			KGP-2B Not used
77	SRDAT2	I	KGP-2A SWIPE READER DATA2
			KGP-2B Not used
78	LEDLCK	O	IC12 LCK (for LED)
79~86	D7~D0	-	Data bus 7~0
87~93	SEN7~SEN1	I/O	KGP-2A Sensor 7~1
		I	KGP-2B Not used
94	AVSS	-	Analog power supply (GND)
95	SEN0	I/O	KGP-2A Sensor0
		I	KGP-2B Not used
96	VREF	-	Reference voltage
97	AVCC	-	Analog power supply
98~100	SEN13~	I/O	KGP-2A Sensor 13~15
	SEN15	I	KGP-2B Not used

PARTS LIST

CAPACITORS

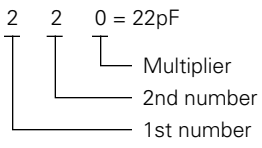
CC 45 TH 1H 220 J
1 2 3 4 5 6

1 = Type … ceramic, electrolytic, etc.
2 = Shape … round, square, ect.
3 = Temp. coefficient
4 = Voltage rating
5 = Value
6 = Tolerance



• Capacitor value

010 = 1pF
100 = 10pF
101 = 100pF
102 = 1000pF = 0.001μF
103 = 0.01μF



• Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	–80	–150	–220	–330	–470	–750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH = –470 ± 60ppm/°C

• Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 –20	+80 –20	+100 –0	More than 10μF – 10 ~ +50 Less than 4.7μF –10 ~ +75

(Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

• Voltage rating

2nd word / 1st word	A	B	C	D	E	F	G	H	J	K	V
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	–
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	–
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	–

• Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J
1 2 3 4 5 6 7
(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z
1 2 3 4 5 6 7
(Chip) (B, F)

Refer to the table above.
1 = Type
2 = Shape
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension (Chip capacitors)

Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0
H	1.0 ± 0.05	0.5 ± 0.05	0.5 ± 0.05

RESISTORS

• Chip resistor (Carbon)

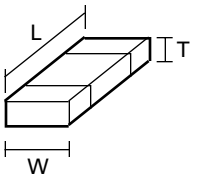
(EX) R D 7 3 E B 2 B 0 0 0 J
1 2 3 4 5 6 7
(Chip) (B,F)

• Carbon resistor (Normal type)

(EX) R D 1 4 B B 2 C 0 0 0 J
1 2 3 4 5 6 7

1 = Type … ceramic, electrolytic, etc.
2 = Shape … round, square, ect.
3 = Dimension
4 = Temp. coefficient
5 = Voltage rating
6 = Value
7 = Tolerance

Dimension



Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1
H	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05

Rating wattage

Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

PARTS LIST

✻ New Parts. ⚠ indicates safety critical components.
Parts without **Parts No.** are not supplied.
Les articles non mentionnes dans le **Parts No.** ne sont pas fournis.
Teile ohne **Parts No.** werden nicht geliefert.

L : Scandinavia **K**: USA **P** : Canada
Y : PX (Far East, Hawaii) **T** : England **E** : Europe
Y : AAFES (Europe) **X**: Australia **M**: Other Areas

KGP-2A
CONTROL UNIT (X53-3980-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination
KGP-2A					
1	2A	✻	A02-3660-11	CABINET	
2	2B	✻	A21-1632-14	DRESSING PANEL	
4	1A		B09-0355-05	CAP (D-SUB 9P)	
5	1A	✻	B09-0626-05	CAP (D-SUB 15P)	
6	1A		B42-3395-04	STANDARD LABEL	
7	2A	✻	B42-7033-04	STICKER (ID)	
8	1D	✻	B62-1481-00	INSTRUCTION MANUAL	
9	2A	✻	B72-1963-14	MODEL NAME PLATE	
11	2B	✻	E33-1987-05	PROCESSED WIRE KIT (ADDITIONAL PCB)	
12	1A	✻	E37-0982-05	LEAD WIRE WITH CONNECTOR (15P : RADIO)	
13	1A	✻	E37-0983-05	LEAD WIRE WITH CONNECTOR (ANT)	
14	1A	✻	E37-1001-05	LEAD WIRE WITH CONNECTOR (4P : CN19)	
16	1B	✻	F20-3339-04	INSULATING SHEET	
18	1B	✻	G10-1292-04	FIBROUS SHEET (CHASSIS:REAR-TOP)	
19	1B	✻	G10-1293-04	FIBROUS SHEET (CHASSIS:REAR-R&L)	
20	1B	✻	G10-1294-04	FIBROUS SHEET (CHASSIS:BOTTOM-R&L)	
21	1B	✻	G10-1295-04	FIBROUS SHEET (CHASSIS:BOTTOM-FRONT)	
22	2B		G10-0792-14	FIBROUS SHEET (ADDITIONAL PCB)	
23	2A	✻	G13-1882-04	CUSHION (15P CONNECTOR)	
24	1A	✻	G13-1888-04	CUSHION (CHASSIS BOTTOM)	
25	2A	✻	G13-1889-14	CUSHION (D-SUB)	
26	1A	✻	G13-1915-04	CUSHION (CHASSIS D-SUB)	
27	2B	✻	G13-1931-04	CUSHION (ADDITIONAL PCB)	
29	3E		H25-0796-04	PROTECTION BAG	
30	1E	✻	H52-1860-02	ITEM CARTON CASE	
32	2E		J29-0627-23	BRACKET ACCESSORY	
33	1A		J61-0307-05	BAND	
35	2B	✻	K29-9176-04	KEY TOP (MODE SW)	
A	1A	✻	N14-0596-05	HEXAGON NUT (ANT)	
B	1A		N15-1060-46	FLAT WASHER (ANT)	
C	1A	✻	N17-1060-46	TOOTHED LOCK WASHER (ANT)	
D	2A		N83-2610-45	PAN HEAD TAPTITE SCREW (D-SUB)	
E	2A,2B		N87-2605-46	BRAZIER HEAD TAPTITE SCREW (PCB)	
F	1A,1B		N88-3008-45	FLAT HEAD TAPTITE SCREW (CHASSIS)	
37	2E		N99-0395-05	SCREW SET ACCESSORY	
39	2D	✻	T90-1002-15	ANTENNA (GPS) ACCESSORY	
41	2A	✻	W02-3628-05	ELECTRIC CIRCUIT MODULE (GPS MODULE)	
CONTROL UNIT (X53-3980-20) : KGP-2A					
D26,27			B30-2056-05	LED	
D28			B30-2019-05	LED (RE/GR)	
C1-11			CC73GCH1H101J	CHIP C 100PF J	
C12			CK73GB1E103K	CHIP C 0.010UF K	
C13-17			CC73GCH1H101J	CHIP C 100PF J	
C18			CK73GB1E103K	CHIP C 0.010UF K	
C19-23			CC73GCH1H101J	CHIP C 100PF J	

Ref. No.	Address	New parts	Parts No.	Description	Destination
C24			C92-0720-05	ELECTRO 100UF 25WV	
C25			CK73GB1H471K	CHIP C 470PF K	
C26-28			CC73GCH1H101J	CHIP C 100PF J	
C30-35			CC73GCH1H101J	CHIP C 100PF J	
C37			CC73GCH1H101J	CHIP C 100PF J	
C38			CK73GB1E103K	CHIP C 0.010UF K	
C39,40			CC73GCH1H101J	CHIP C 100PF J	
C41-43			CK73GB1C104K	CHIP C 0.10UF K	
C44,45			CC73GCH1H101J	CHIP C 100PF J	
C47			CK73GB1E103K	CHIP C 0.010UF K	
C48			CK73GB1C104K	CHIP C 0.10UF K	
C49-51			CK73GB1C104K	CHIP C 0.10UF K	
C54			CK73GB1C104K	CHIP C 0.10UF K	
C55,56			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C57			CK73GB1C104K	CHIP C 0.10UF K	
C58			CK73GB1C104K	CHIP C 0.10UF K	
C59			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C61			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C62			CK73GB1C104K	CHIP C 0.10UF K	
C65			CK73GB1C104K	CHIP C 0.10UF K	
C66			CK73GB1E103K	CHIP C 0.010UF K	
C67-69			CK73GB1C104K	CHIP C 0.10UF K	
C70			CK73GB1E103K	CHIP C 0.010UF K	
C72			CK73GB1C104K	CHIP C 0.10UF K	
C74			CK73GB1E103K	CHIP C 0.010UF K	
C75			CK73GB1H471K	CHIP C 470PF K	
C76,77			C92-0628-05	CHIP-TAN 10UF 10WV	
C81			CC73GCH1H101J	CHIP C 100PF J	
C82,83			CK73GB1C104K	CHIP C 0.10UF K	
C87,88			C92-0628-05	CHIP-TAN 10UF 10WV	
C89			CK73GB1C104K	CHIP C 0.10UF K	
C91			CC73GCH1H101J	CHIP C 100PF J	
C94,95			CK73GB1E103K	CHIP C 0.010UF K	
C96,97			C92-0628-05	CHIP-TAN 10UF 10WV	
C98			CK73GB1E103K	CHIP C 0.010UF K	
C99			C92-0628-05	CHIP-TAN 10UF 10WV	
C101			C92-0628-05	CHIP-TAN 10UF 10WV	
C102,103			CK73GB1C104K	CHIP C 0.10UF K	
C104,105			C92-0628-05	CHIP-TAN 10UF 10WV	
C106			CK73GB1E103K	CHIP C 0.010UF K	
C107			CK73GB1C104K	CHIP C 0.10UF K	
C108,109			C92-0628-05	CHIP-TAN 10UF 10WV	
C110			CK73GB1E103K	CHIP C 0.010UF K	
C114			C92-0628-05	CHIP-TAN 10UF 10WV	
C115			CK73GB1E103K	CHIP C 0.010UF K	
C117			CK73GB1C104K	CHIP C 0.10UF K	
C118			CK73GB1H332K	CHIP C 3300PF K	
C119			C92-0628-05	CHIP-TAN 10UF 10WV	
C120			CC73GCH1H271J	CHIP C 270PF J	
C121			CK73GB1C104K	CHIP C 0.10UF K	
C122			C92-0628-05	CHIP-TAN 10UF 10WV	
C123,124			CK73GB1E103K	CHIP C 0.010UF K	
C125-127			C92-0628-05	CHIP-TAN 10UF 10WV	
C128,129			CK73GB1H471K	CHIP C 470PF K	
C130			C92-0628-05	CHIP-TAN 10UF 10WV	

PARTS LIST

CONTROL UNIT (X53-3980-20)

Ref. No.	Address	New parts	Parts No.	Description	Destination
C131-134			CK73GB1E103K	CHIP C 0.010UF K	
C135,136			CK73GB1H471K	CHIP C 470PF K	
C137,138			C92-0628-05	CHIP-TAN 10UF 10WV	
C139,140			CK73GB1H471K	CHIP C 470PF K	
C141-144			CK73GB1E103K	CHIP C 0.010UF K	
C145			CK73GB1H471K	CHIP C 470PF K	
C146			C92-0628-05	CHIP-TAN 10UF 10WV	
C147			CC73GCH1H270J	CHIP C 27PF J	
C148			CK73GB1H102K	CHIP C 1000PF K	
C149			CC73GCH1H270J	CHIP C 27PF J	
C151			CK73GB1E103K	CHIP C 0.010UF K	
C152			CK73GB1H471K	CHIP C 470PF K	
C153			C92-0628-05	CHIP-TAN 10UF 10WV	
C154,155			CK73GB1E103K	CHIP C 0.010UF K	
C156			CK73GB1H471K	CHIP C 470PF K	
C157,158			CK73GB1E103K	CHIP C 0.010UF K	
C159			CK73GB1H471K	CHIP C 470PF K	
C160,161			C92-0628-05	CHIP-TAN 10UF 10WV	
C162			CK73GB1H471K	CHIP C 470PF K	
C163			C92-0628-05	CHIP-TAN 10UF 10WV	
C165			CK73GB1H471K	CHIP C 470PF K	
C166			C92-0628-05	CHIP-TAN 10UF 10WV	
C175,176			CK73GB1E103K	CHIP C 0.010UF K	
C177			C92-0720-05	ELECTRO 100UF 25WV	
C178-195			CC73GCH1H101J	CHIP C 100PF J	
C196			C92-0628-05	CHIP-TAN 10UF 10WV	
C197-201			CC73GCH1H101J	CHIP C 100PF J	
C202			C92-0628-05	CHIP-TAN 10UF 10WV	
C203			CC73GCH1H101J	CHIP C 100PF J	
C204,205			CK73GB1E103K	CHIP C 0.010UF K	
C206			CC73GCH1H101J	CHIP C 100PF J	
C208			C92-0628-05	CHIP-TAN 10UF 10WV	
C209			CC73GCH1H101J	CHIP C 100PF J	
CN1			E40-6047-05	PIN ASSY (15P)	
J1		✻	E58-0489-05	SUB SOCKET (D) (D-SUB 15P : ACC3)	
J2		✻	E59-0413-05	SUB PLUG (D) (D-SUB 9P : ACC1)	
J3		✻	E59-0413-05	SUB PLUG (D) (D-SUB 9P : ACC2)	
-		✻	F20-3332-04	INSULATING SHEET (LITHIUM CELL)	
L1			L92-0140-05	FERRITE CHIP	
L8			L92-0140-05	FERRITE CHIP	
L10-13			L92-0140-05	FERRITE CHIP	
L15			L92-0140-05	FERRITE CHIP	
L17-20			L92-0140-05	FERRITE CHIP	
L23			L92-0140-05	FERRITE CHIP	
L24			L40-1011-14	SMALL FIXED INDUCTOR 100UH	
X1		✻	L78-1401-05	RESONATOR (7.373MHZ)	
X2			L77-1679-05	CRYSTAL RESONATOR (12.288MHZ)	
CP3,4			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP5		✻	RK75GA1J471J	CHIP-COM 470 J 1/16W	
CP22			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP23		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	
CP25			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP27			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP28		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	
CP29,30			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP31			RK75GB1J473J	CHIP-COM 47K J 1/16W	
CP32			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP34			RK75GB1J101J	CHIP-COM 100 J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
CP35			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP36		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	
CP37			RK75GB1J473J	CHIP-COM 47K J 1/16W	
CP38			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP39-43			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP46		✻	RK75GA1J473J	CHIP-COM 47K J 1/16W	
CP47,48		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP51		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP60		✻	RK75GA1J473J	CHIP-COM 47K J 1/16W	
CP67		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP70			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP71-74			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP75		✻	RK75GA1J473J	CHIP-COM 47K J 1/16W	
CP76		✻	RK75GA1J471J	CHIP-COM 470 J 1/16W	
CP79			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP81		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP82			RK75GB1J473J	CHIP-COM 47K J 1/16W	
R2			R92-1252-05	CHIP R 0 OHM J 1/16W	
R4			RK73GB1J273J	CHIP R 27K J 1/16W	
R5			RK73GB1J123J	CHIP R 12K J 1/16W	
R6			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R7			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R8			R92-0670-05	CHIP R 0 OHM	
R9			R92-3556-05	CHIP R 0 OHM J 1W	
R10			R92-0685-05	CHIP R 22 J 1/2W	
R11-16			R92-0670-05	CHIP R 0 OHM	
R33			RK73FB2A221J	CHIP R 220 J 1/10W	
R37			RK73FB2A221J	CHIP R 220 J 1/10W	
R51			RK73GB1J820J	CHIP R 82 J 1/16W	
R52			RK73GB1J681J	CHIP R 680 J 1/16W	
R55			RK73GB1J563J	CHIP R 56K J 1/16W	
R56			R92-1252-05	CHIP R 0 OHM J 1/16W	
R58			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R59			R92-1252-05	CHIP R 0 OHM J 1/16W	
R62			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R63			R92-1252-05	CHIP R 0 OHM J 1/16W	
R65-67			R92-1252-05	CHIP R 0 OHM J 1/16W	
R71,72			RK73GB1J473J	CHIP R 47K J 1/16W	
R73			R92-1252-05	CHIP R 0 OHM J 1/16W	
R75			R92-1252-05	CHIP R 0 OHM J 1/16W	
R77			R92-1252-05	CHIP R 0 OHM J 1/16W	
R80			RK73GB1J223J	CHIP R 22K J 1/16W	
R82			RK73GB1J473J	CHIP R 47K J 1/16W	
R84			RK73GB1J393J	CHIP R 39K J 1/16W	
R86			RK73GB1J473J	CHIP R 47K J 1/16W	
R90			RK73GB1J473J	CHIP R 47K J 1/16W	
R92,93			RK73GB1J473J	CHIP R 47K J 1/16W	
R95			RK73GB1J473J	CHIP R 47K J 1/16W	
R96			R92-1252-05	CHIP R 0 OHM J 1/16W	
R98			RK73GB1J223J	CHIP R 22K J 1/16W	
R99			RK73GB1J393J	CHIP R 39K J 1/16W	
R100			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R101			RK73GB1J333J	CHIP R 33K J 1/16W	
R102			RK73GB1J563J	CHIP R 56K J 1/16W	
R104			RK73GB1J223J	CHIP R 22K J 1/16W	
R105,106			RK73GB1J393J	CHIP R 39K J 1/16W	
R107-109			R92-1252-05	CHIP R 0 OHM J 1/16W	
R110			RK73GB1J473J	CHIP R 47K J 1/16W	
R111			R92-1252-05	CHIP R 0 OHM J 1/16W	
R112			RK73GB1J101J	CHIP R 100 J 1/16W	

PARTS LIST

CONTROL UNIT (X53-3980-20)
KGP-2B

Ref. No.	Address	New parts	Parts No.	Description	Destination
R113			R92-1252-05	CHIP R 0 OHM J 1/16W	
R114			RK73GB1J470J	CHIP R 47 J 1/16W	
R115			R92-1252-05	CHIP R 0 OHM J 1/16W	
R116			RK73GB1J473J	CHIP R 47K J 1/16W	
R117-119			R92-1252-05	CHIP R 0 OHM J 1/16W	
R120,121			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R122			RK73GB1J223J	CHIP R 22K J 1/16W	
R123			R92-1252-05	CHIP R 0 OHM J 1/16W	
R124			RK73GB1J473J	CHIP R 47K J 1/16W	
R125			R92-1252-05	CHIP R 0 OHM J 1/16W	
R129,130			R92-1252-05	CHIP R 0 OHM J 1/16W	
R132			RK73GB1J393J	CHIP R 39K J 1/16W	
R133			RK73GB1J563J	CHIP R 56K J 1/16W	
R134,135			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R136			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R137			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R138			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R139			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R140			RK73GB1J473J	CHIP R 47K J 1/16W	
R144-149			RK73GB1J820J	CHIP R 82 J 1/16W	
R152			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R154,155			R92-1252-05	CHIP R 0 OHM J 1/16W	
R157-177			R92-0670-05	CHIP R 0 OHM	
R179-183			R92-0670-05	CHIP R 0 OHM	
R186			R92-0670-05	CHIP R 0 OHM	
R189			R92-0670-05	CHIP R 0 OHM	
R191			R92-0670-05	CHIP R 0 OHM	
R194			R92-0670-05	CHIP R 0 OHM	
R199			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R200,201			RK73GB1J473J	CHIP R 47K J 1/16W	
R205			RK73GB1J184J	CHIP R 180K J 1/16W	
R206			RK73GB1J561J	CHIP R 560 J 1/16W	
R208			R92-1252-05	CHIP R 0 OHM J 1/16W	
R209			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R210			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R211			RK73GB1J223J	CHIP R 22K J 1/16W	
R212			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R213			RK73GB1J393J	CHIP R 39K J 1/16W	
R214			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R216,217			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R218			RK73GB1J473J	CHIP R 47K J 1/16W	
R219,220			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R222			RK73GB1J393J	CHIP R 39K J 1/16W	
R223			RK73GB1J563J	CHIP R 56K J 1/16W	
R224			RK73GB1J222J	CHIP R 2.2K J 1/16W	
S1			S70-0446-05	TACT SWITCH	
D1			1812L075PR	VARISTOR	
D2			DSM3MA1	DIODE	
D5			MA2S111	DIODE	
D7		✻	UMZ8.2T	ZENER DIODE	
D8			NNCD6.8G	ZENER DIODE	
D9		✻	UMZ8.2T	ZENER DIODE	
D12			NNCD6.8G	ZENER DIODE	
D18			MA2S111	DIODE	
D24			NNCD6.8G	ZENER DIODE	
D30			MA2S111	DIODE	
D31-35			NNCD6.8G	ZENER DIODE	
D36-45			DA204U	DIODE	
D46,47		✻	UMZ8.2T	ZENER DIODE	

Ref. No.	Address	New parts	Parts No.	Description	Destination
D48			DA204U	DIODE	
D50-58			DA204U	DIODE	
D59-61		✻	UMZ8.2T	ZENER DIODE	
D62			MTZJ6.8B	ZENER DIODE	
IC1			RN5VL30C	IC (RESET IC)	
IC3,4			TA7808F	IC (REGULATOR)	
IC6			ADM202EARU	IC (RS-232C DRIVER)	
IC6			ADM3202ARU	IC (RS-232C DRIVER)	
IC7			TA78L05F	IC (REGULATOR)	
IC9			TC74HC4094AF	IC (EXTENDED I/O)	
IC10,11			XC62FP3302P	IC (REGULATOR)	
IC12			BU2099FV	IC (SHIFT REGISTER)	
IC13			XC62FP1802P	IC (REGULATOR)	
IC14			RN5VL45C	IC (RESET IC)	
IC15			24LC08BT-ISN	IC (EEPROM)	
IC16			NJM4558M	IC (AMPLIFIER)	
IC17		✻	30620M8A-2M6GP	IC (CPU)	
IC18			M62364FP	IC (D/A CONVERTER)	
IC19			TC74LVX4245FS	IC (LEVEL CONVERTER)	
IC20,21			TC74LVX244FT	IC (LEVEL CONVERTER)	
IC22			AK4550VT	IC (CODEC IC)	
IC23			TC7S08F	IC (GATE IC)	
IC24			TC7S04F	IC (GATE IC)	
IC25		✻	MBM29LV800B90	IC (MEMORY IC)	
IC26			NJM4558M	IC (AMPLIFIER)	
IC28			TC74VHC4040FT	IC (CLOCK DEMULTIPLIER)	
IC29			320VC5402PGE	IC (DSP IC)	
IC31			TC74LVX244FT	IC (LEVEL CONVERTER)	
IC32			NJM4558M	IC (AMPLIFIER)	
IC33			XC62FP3302P	IC (REGULATOR)	
Q1,2			DTC114YE	DIGITAL TRANSISTOR	
Q4			2SB798(DL,DK)	TRANSISTOR	
Q5,6			DTC144EE	DIGITAL TRANSISTOR	
Q11			DTC114YE	DIGITAL TRANSISTOR	
Q12-14		✻	RN47A4	TRANSISTOR	
Q15			DTC114EUA	DIGITAL TRANSISTOR	
BA1		✻	W09-0985-05	LITHIUM CELL	

KGP-2B

1	2C	✻	A02-3660-11	CABINET	
3	2C	✻	A21-1633-14	DRESSING PANEL	
4	1B		B09-0355-05	CAP (D-SUB 9P)	
6	1C		B42-3395-04	STANDARD LABEL	
8	1D	✻	B62-1481-00	INSTRUCTION MANUAL	
10	2C	✻	B72-1964-04	MODEL NAME PLATE	
11	2C	✻	E33-1987-05	PROCESSED WIRE KIT (ADDITIONAL PCB)	
12	1B	✻	E37-0982-05	LEAD WIRE WITH CONNECTOR (15P : RADIO)	
15	1B	✻	F15-1003-04	SHIELDING PLATE (CHASSIS REAR)	
18	1C	✻	G10-1292-04	FIBROUS SHEET (CHASSIS:REAR-TOP)	
19	1C	✻	G10-1293-04	FIBROUS SHEET (CHASSIS:REAR-R&L)	
20	1C	✻	G10-1294-04	FIBROUS SHEET (CHASSIS:BOTTOM-R&L)	
21	1C	✻	G10-1295-04	FIBROUS SHEET (CHASSIS:BOTTOM-FRONT)	
22	2C		G10-0792-14	FIBROUS SHEET (ADDITIONAL PCB)	
23	2B	✻	G13-1882-04	CUSHION (15P CONNECTOR)	

PARTS LIST

KGP-2B
CONTROL UNIT (X53-3980-21)

Ref. No.	Address	New parts	Parts No.	Description	Destination
28	2B	✻	G13-1883-14	CUSHION (D-SUB)	
27	2C	✻	G13-1931-04	CUSHION (ADDITIONAL PCB)	
29	3E		H25-0796-04	PROTECTION BAG	
30	1E	✻	H52-1861-02	ITEM CARTON CASE	
35	2C	✻	K29-9176-04	KEY TOP (MODE SW)	
D	2C		N83-2610-45	PAN HEAD TAPTITE SCREW (D-SUB)	
E	2C		N87-2605-46	BRAZIER HEAD TAPTITE SCREW (PCB)	
F	1B,1C		N88-3008-45	FLAT HEAD TAPTITE SCREW (CHASSIS)	
CONTROL UNIT (X53-3980-21) : KGP-2B					
D26			B30-2056-05	LED	
D28			B30-2019-05	LED (RE/GR)	
C4,5			CC73GCH1H101J	CHIP C 100PF J	
C7			CC73GCH1H101J	CHIP C 100PF J	
C9			CC73GCH1H101J	CHIP C 100PF J	
C11			CC73GCH1H101J	CHIP C 100PF J	
C14			CC73GCH1H101J	CHIP C 100PF J	
C16,17			CC73GCH1H101J	CHIP C 100PF J	
C20			CC73GCH1H101J	CHIP C 100PF J	
C23			CC73GCH1H101J	CHIP C 100PF J	
C24			C92-0720-05	ELECTRO 100UF 25WV	
C25			CK73GB1H471K	CHIP C 470PF K	
C28			CC73GCH1H101J	CHIP C 100PF J	
C31			CC73GCH1H101J	CHIP C 100PF J	
C33			CC73GCH1H101J	CHIP C 100PF J	
C35			CC73GCH1H101J	CHIP C 100PF J	
C41-43			CK73GB1C104K	CHIP C 0.10UF K	
C47			CK73GB1E103K	CHIP C 0.010UF K	
C50,51			CK73GB1C104K	CHIP C 0.10UF K	
C54			CK73GB1C104K	CHIP C 0.10UF K	
C55,56			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C58			CK73GB1C104K	CHIP C 0.10UF K	
C59			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C61			C92-0519-05	CHIP-TAN 1.0UF 25WV	
C62,63			CK73GB1C104K	CHIP C 0.10UF K	
C66			CK73GB1E103K	CHIP C 0.010UF K	
C67-69			CK73GB1C104K	CHIP C 0.10UF K	
C70			CK73GB1E103K	CHIP C 0.010UF K	
C72			CK73GB1C104K	CHIP C 0.10UF K	
C74			CK73GB1E103K	CHIP C 0.010UF K	
C75			CK73GB1H471K	CHIP C 470PF K	
C76,77			C92-0628-05	CHIP-TAN 10UF 10WV	
C81			CC73GCH1H101J	CHIP C 100PF J	
C82,83			CK73GB1C104K	CHIP C 0.10UF K	
C87,88			C92-0628-05	CHIP-TAN 10UF 10WV	
C89			CK73GB1C104K	CHIP C 0.10UF K	
C91			CC73GCH1H101J	CHIP C 100PF J	
C95			CK73GB1E103K	CHIP C 0.010UF K	
C96			C92-0628-05	CHIP-TAN 10UF 10WV	
C99			C92-0628-05	CHIP-TAN 10UF 10WV	
C101			C92-0628-05	CHIP-TAN 10UF 10WV	
C102,103			CK73GB1C104K	CHIP C 0.10UF K	
C104,105			C92-0628-05	CHIP-TAN 10UF 10WV	
C106			CK73GB1E103K	CHIP C 0.010UF K	
C107			CK73GB1C104K	CHIP C 0.10UF K	
C108,109			C92-0628-05	CHIP-TAN 10UF 10WV	
C110			CK73GB1E103K	CHIP C 0.010UF K	
C114			C92-0628-05	CHIP-TAN 10UF 10WV	
C117			CK73GB1C104K	CHIP C 0.10UF K	
C118			CK73GB1H332K	CHIP C 3300PF K	
C119			C92-0628-05	CHIP-TAN 10UF 10WV	
C120			CC73GCH1H271J	CHIP C 270PF J	
C121			CK73GB1C104K	CHIP C 0.10UF K	
C122			C92-0628-05	CHIP-TAN 10UF 10WV	
C124			CK73GB1E103K	CHIP C 0.010UF K	
C125-127			C92-0628-05	CHIP-TAN 10UF 10WV	
C128,129			CK73GB1H471K	CHIP C 470PF K	
C130			C92-0628-05	CHIP-TAN 10UF 10WV	
C131-134			CK73GB1E103K	CHIP C 0.010UF K	
C135,136			CK73GB1H471K	CHIP C 470PF K	
C137,138			C92-0628-05	CHIP-TAN 10UF 10WV	
C139,140			CK73GB1H471K	CHIP C 470PF K	
C141-144			CK73GB1E103K	CHIP C 0.010UF K	
C145			CK73GB1H471K	CHIP C 470PF K	
C146			C92-0628-05	CHIP-TAN 10UF 10WV	
C147			CC73GCH1H270J	CHIP C 27PF J	
C148			CK73GB1H102K	CHIP C 1000PF K	
C149			CC73GCH1H270J	CHIP C 27PF J	
C151			CK73GB1E103K	CHIP C 0.010UF K	
C152			CK73GB1H471K	CHIP C 470PF K	
C153			C92-0628-05	CHIP-TAN 10UF 10WV	
C154,155			CK73GB1E103K	CHIP C 0.010UF K	
C156			CK73GB1H471K	CHIP C 470PF K	
C157,158			CK73GB1E103K	CHIP C 0.010UF K	
C159			CK73GB1H471K	CHIP C 470PF K	
C160,161			C92-0628-05	CHIP-TAN 10UF 10WV	
C162			CK73GB1H471K	CHIP C 470PF K	
C163			C92-0628-05	CHIP-TAN 10UF 10WV	
C165			CK73GB1H471K	CHIP C 470PF K	
C177			C92-0720-05	ELECTRO 100UF 25WV	
C178-187			CC73GCH1H101J	CHIP C 100PF J	
C190-192			CC73GCH1H101J	CHIP C 100PF J	
C194,195			CC73GCH1H101J	CHIP C 100PF J	
C196			C92-0628-05	CHIP-TAN 10UF 10WV	
C198-200			CC73GCH1H101J	CHIP C 100PF J	
C205			CK73GB1E103K	CHIP C 0.010UF K	
C206			CC73GCH1H101J	CHIP C 100PF J	
C209			CC73GCH1H101J	CHIP C 100PF J	
CN1			E40-6047-05	PIN ASSY (15P)	
J2		✻	E59-0413-05	SUB PLUG (D) (D-SUB 9P : ACC1)	
L1			L92-0140-05	FERRITE CHIP	
L8			L92-0140-05	FERRITE CHIP	
L10-13			L92-0140-05	FERRITE CHIP	
L15			L92-0140-05	FERRITE CHIP	
L18-21			L92-0140-05	FERRITE CHIP	
X1		✻	L78-1401-05	RESONATOR (7.373MHZ)	
X2			L77-1679-05	CRYSTAL RESONATOR (12.288MHZ)	
CP3,4			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP5		✻	RK73GA1J471J	CHIP-COM 470 J 1/16W	
CP22			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP23		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	
CP25			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP27			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP28		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	

PARTS LIST

CONTROL UNIT (X53-3980-21)

Ref. No.	Address	New parts	Parts No.	Description	Destination
CP29,30			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP31			RK75GB1J473J	CHIP-COM 47K J 1/16W	
CP32			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP34			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP35			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP36		✻	RK75GA1J102J	CHIP-COM 1.0K J 1/16W	
CP37			RK75GB1J473J	CHIP-COM 47K J 1/16W	
CP38			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP39-43			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP47,48		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP51		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP52-59			RK75GB1J101J	CHIP-COM 100 J 1/16W	
CP67		✻	RK75GA1J101J	CHIP-COM 100 J 1/16W	
CP75		✻	RK75GA1J473J	CHIP-COM 47K J 1/16W	
CP76		✻	RK75GA1J471J	CHIP-COM 470 J 1/16W	
CP77,78			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP80			RK75GB1J102J	CHIP-COM 1.0K J 1/16W	
CP82			RK75GB1J473J	CHIP-COM 47K J 1/16W	
R2			R92-1252-05	CHIP R 0 OHM J 1/16W	
R4			RK73GB1J273J	CHIP R 27K J 1/16W	
R5			RK73GB1J123J	CHIP R 12K J 1/16W	
R6			RK73FB2A102J	CHIP R 1.0K J 1/10W	
R7			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R8			R92-0670-05	CHIP R 0 OHM	
R9			R92-3556-05	CHIP R 0 OHM J 1W	
R10			R92-0685-05	CHIP R 22 J 1/2W	
R52			RK73GB1J681J	CHIP R 680 J 1/16W	
R56			R92-1252-05	CHIP R 0 OHM J 1/16W	
R58			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R62			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R63			R92-1252-05	CHIP R 0 OHM J 1/16W	
R64			RK73GB1J473J	CHIP R 47K J 1/16W	
R65-67			R92-1252-05	CHIP R 0 OHM J 1/16W	
R72			RK73GB1J473J	CHIP R 47K J 1/16W	
R73			R92-1252-05	CHIP R 0 OHM J 1/16W	
R75			R92-1252-05	CHIP R 0 OHM J 1/16W	
R77			R92-1252-05	CHIP R 0 OHM J 1/16W	
R80			RK73GB1J223J	CHIP R 22K J 1/16W	
R82			RK73GB1J473J	CHIP R 47K J 1/16W	
R84			RK73GB1J393J	CHIP R 39K J 1/16W	
R86			RK73GB1J473J	CHIP R 47K J 1/16W	
R90			RK73GB1J473J	CHIP R 47K J 1/16W	
R92,93			RK73GB1J473J	CHIP R 47K J 1/16W	
R95			RK73GB1J473J	CHIP R 47K J 1/16W	
R98			RK73GB1J223J	CHIP R 22K J 1/16W	
R99			RK73GB1J393J	CHIP R 39K J 1/16W	
R100			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R102			R92-1252-05	CHIP R 0 OHM J 1/16W	
R104			RK73GB1J223J	CHIP R 22K J 1/16W	
R105,106			RK73GB1J393J	CHIP R 39K J 1/16W	
R107-109			R92-1252-05	CHIP R 0 OHM J 1/16W	
R110			RK73GB1J473J	CHIP R 47K J 1/16W	
R111			R92-1252-05	CHIP R 0 OHM J 1/16W	
R112			RK73GB1J101J	CHIP R 100 J 1/16W	
R113			R92-1252-05	CHIP R 0 OHM J 1/16W	
R114			RK73GB1J470J	CHIP R 47 J 1/16W	
R115			R92-1252-05	CHIP R 0 OHM J 1/16W	
R116			RK73GB1J473J	CHIP R 47K J 1/16W	
R117-119			R92-1252-05	CHIP R 0 OHM J 1/16W	
R120,121			RK73GB1J274J	CHIP R 270K J 1/16W	

Ref. No.	Address	New parts	Parts No.	Description	Destination
R122			RK73GB1J223J	CHIP R 22K J 1/16W	
R123			R92-1252-05	CHIP R 0 OHM J 1/16W	
R124			RK73GB1J473J	CHIP R 47K J 1/16W	
R125-131			R92-1252-05	CHIP R 0 OHM J 1/16W	
R132			RK73GB1J393J	CHIP R 39K J 1/16W	
R133			RK73GB1J563J	CHIP R 56K J 1/16W	
R144-146			RK73GB1J820J	CHIP R 82 J 1/16W	
R148,149			RK73GB1J820J	CHIP R 82 J 1/16W	
R150,151			RK73GB1J474J	CHIP R 470K J 1/16W	
R152			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R154,155			R92-1252-05	CHIP R 0 OHM J 1/16W	
R157,158			R92-0670-05	CHIP R 0 OHM	
R186			R92-0670-05	CHIP R 0 OHM	
R189			R92-0670-05	CHIP R 0 OHM	
R191			R92-0670-05	CHIP R 0 OHM	
R194			R92-0670-05	CHIP R 0 OHM	
R201			RK73GB1J473J	CHIP R 47K J 1/16W	
R210			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R213			RK73GB1J393J	CHIP R 39K J 1/16W	
R214			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R216			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R218			RK73GB1J473J	CHIP R 47K J 1/16W	
R219,220			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R222			RK73GB1J393J	CHIP R 39K J 1/16W	
R223			RK73GB1J563J	CHIP R 56K J 1/16W	
R224			RK73GB1J222J	CHIP R 2.2K J 1/16W	
S1			S70-0446-05	TACT SWITCH	
D1			1812L075PR	VARISTOR	
D2			DSM3MA1	DIODE	
D5			MA2S111	DIODE	
D7		✻	UMZ8.2T	ZENER DIODE	
D8			NNCD6.8G	ZENER DIODE	
D9		✻	UMZ8.2T	ZENER DIODE	
D12			NNCD6.8G	ZENER DIODE	
D24			NNCD6.8G	ZENER DIODE	
D30			MA2S111	DIODE	
D36-42			DA204U	DIODE	
D44,45			DA204U	DIODE	
D46,47		✻	UMZ8.2T	ZENER DIODE	
D59		✻	UMZ8.2T	ZENER DIODE	
IC1			RN5VL30C	IC (RESET IC)	
IC3,4			TA7808F	IC (REGULATOR)	
IC6			ADM202EARU	IC (RS-232C DRIVER)	
IC6			ADM3202ARU	IC (RS-232C DRIVER)	
IC7			TA78L05F	IC (REGULATOR)	
IC9			TC74HC4094AF	IC (EXTENDED I/O)	
IC10,11			XC62FP3302P	IC (REGULATOR)	
IC12			BU2099FV	IC (SHIFT REGISTER)	
IC13			XC62FP1802P	IC (REGULATOR)	
IC14			RN5VL30C	IC (RESET IC)	
IC15			24LC08BT-ISN	IC (EEPROM)	
IC16			NJM4558M	IC (AMPLIFIER)	
IC17		✻	30620M8A-2M6GP	IC (CPU)	
IC18			M62364FP	IC (D/A CONVERTER)	
IC22			AK4550VT	IC (CODEC IC)	
IC24			TC7S04F	IC (GATE IC)	
IC25		✻	MBM29LV800B90	IC (MEMORY IC)	
IC26			NJM4558M	IC (AMPLIFIER)	

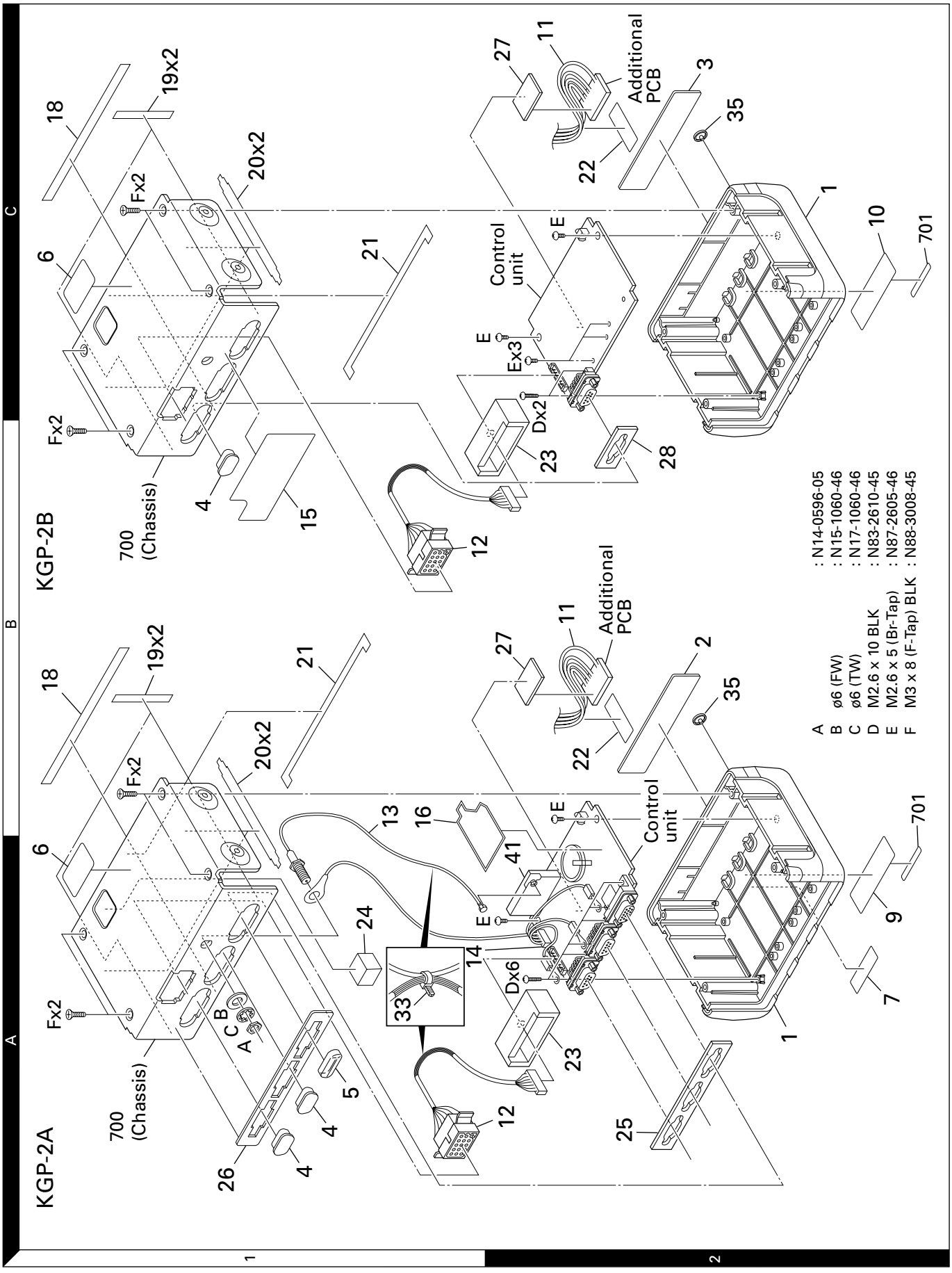
PARTS LIST

CONTROL UNIT (X53-3980-21)
ADDITIONAL PCB

Ref. No.	Address	New parts	Parts No.	Description	Destination
IC28			TC74VHC4040FT	IC (CLOCK DEMULTIPLIER)	
IC29			320VC5402PGE	IC (DSP IC)	
Q5,6			DTC144EE	DIGITAL TRANSISTOR	
Q10,11			DTC114YE	DIGITAL TRANSISTOR	
Q15			DTC114EUA	DIGITAL TRANSISTOR	
Q16-26			DTC114YE	DIGITAL TRANSISTOR	
ADDITIONAL PCB					
R202,203			RK73GB1J222J	CHIP R 2.2K J 1/16W	
Q7,8			DTC144EE	DIGITAL TRANSISTOR	

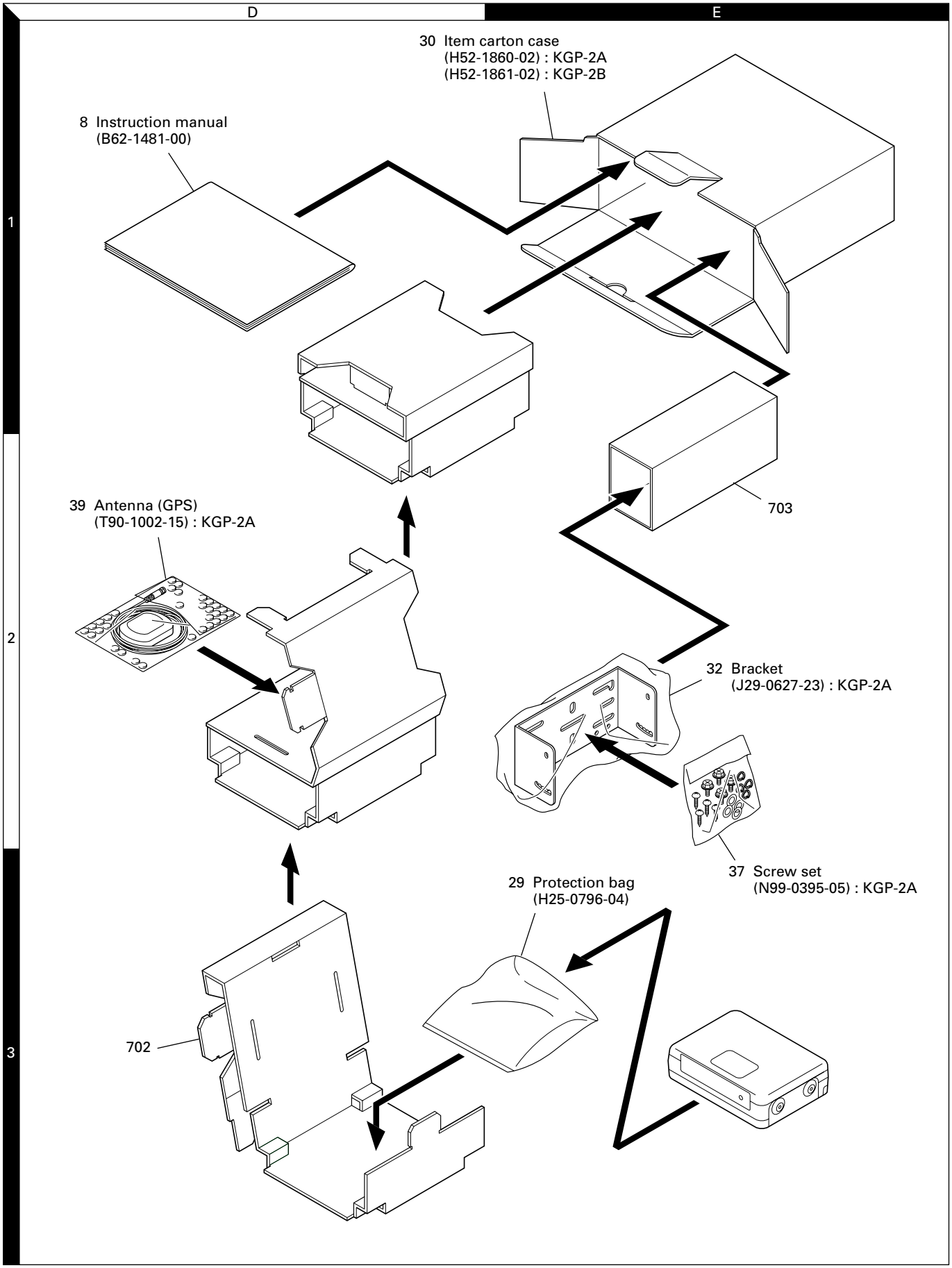
Ref. No.	Address	New parts	Parts No.	Description	Destination

EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

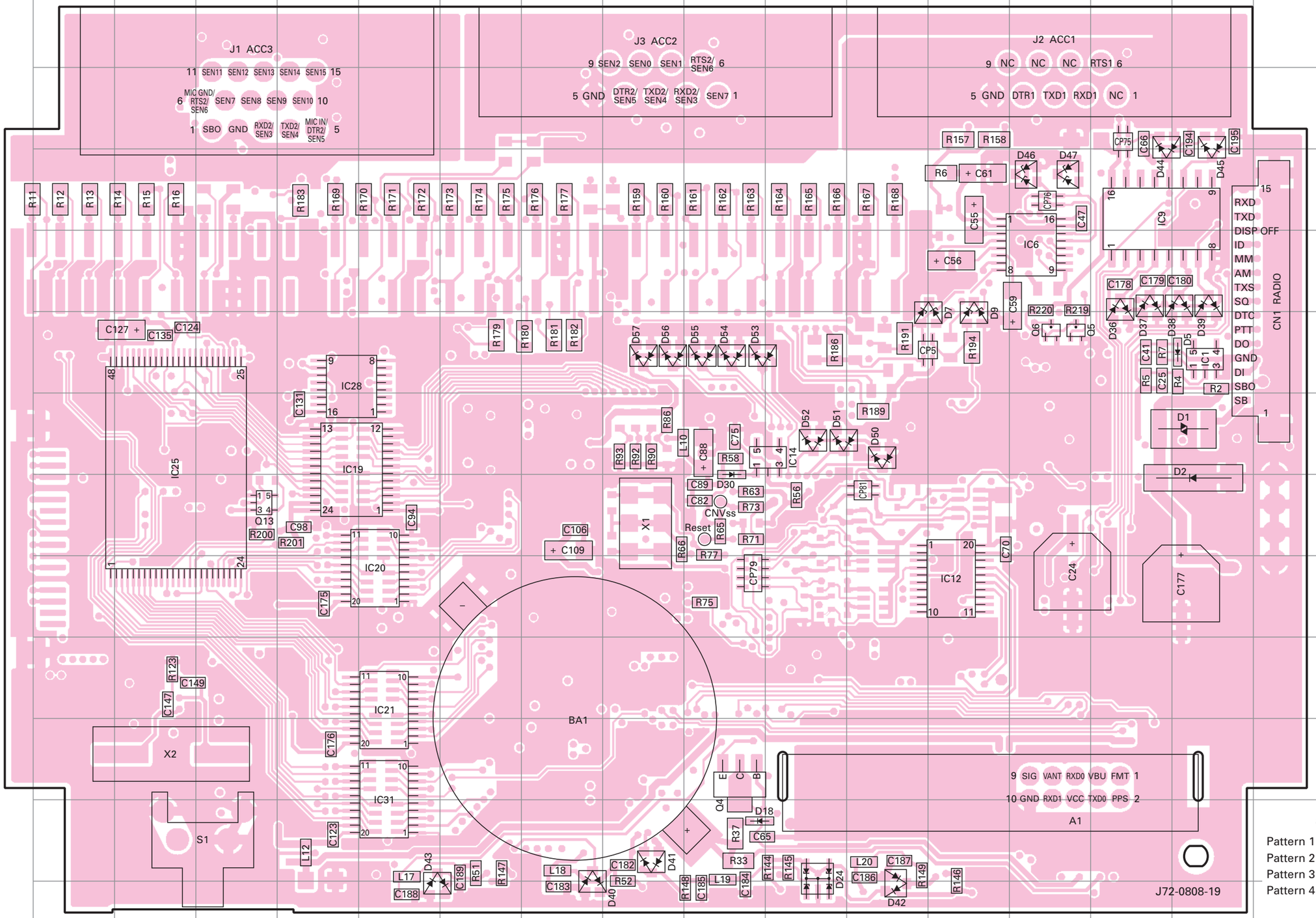
PACKING



Parts with the exploded numbers larger than 700 are not supplied.

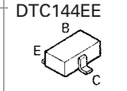
PC BOARD VIEW KGP-2A

CONTROL UNIT (X53-3980-20) Component side view

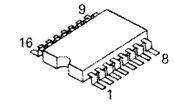


Ref No.	Address	Ref No.	Address	Ref No.	Address
IC1	6O	D1	7O	D43	12F
IC6	5M	D2	8O	D44	4N
IC9	4N	D5	6O	D45	4O
IC12	9L	D7	6L	D46	4M
IC14	7J	D9	6L	D47	4M
IC19	7D	D18	12I	D50	7K
IC20	9E	D24	12J	D51	7J
IC21	10E	D30	8I	D52	7J
IC25	7B	D36	6N	D53	6I
IC28	6D	D37	5N	D54	6I
IC31	12E	D38	5O	D55	6I
Q4	11I	D39	5O	D56	6H
Q5	6M	D40	13G	D57	6H
Q6	6M	D41	12H		
Q13	8C	D42	13K		

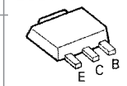
DTC114YE
DTC144EE



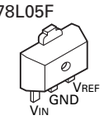
TC74HC4094AF



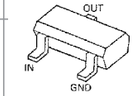
2SB798



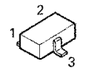
TA78L05F



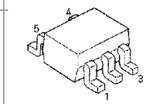
DTC114EUA



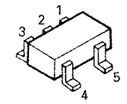
DA204U



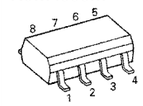
RN47A4



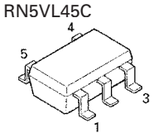
TC7S04F
TC7S08F



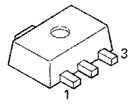
NJM4558M



RN5VL30C
RN5VL45C



XC62FP1802P
XC62FP3302P



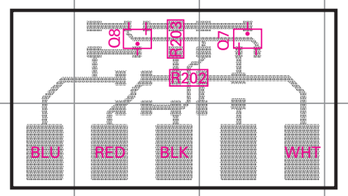
Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

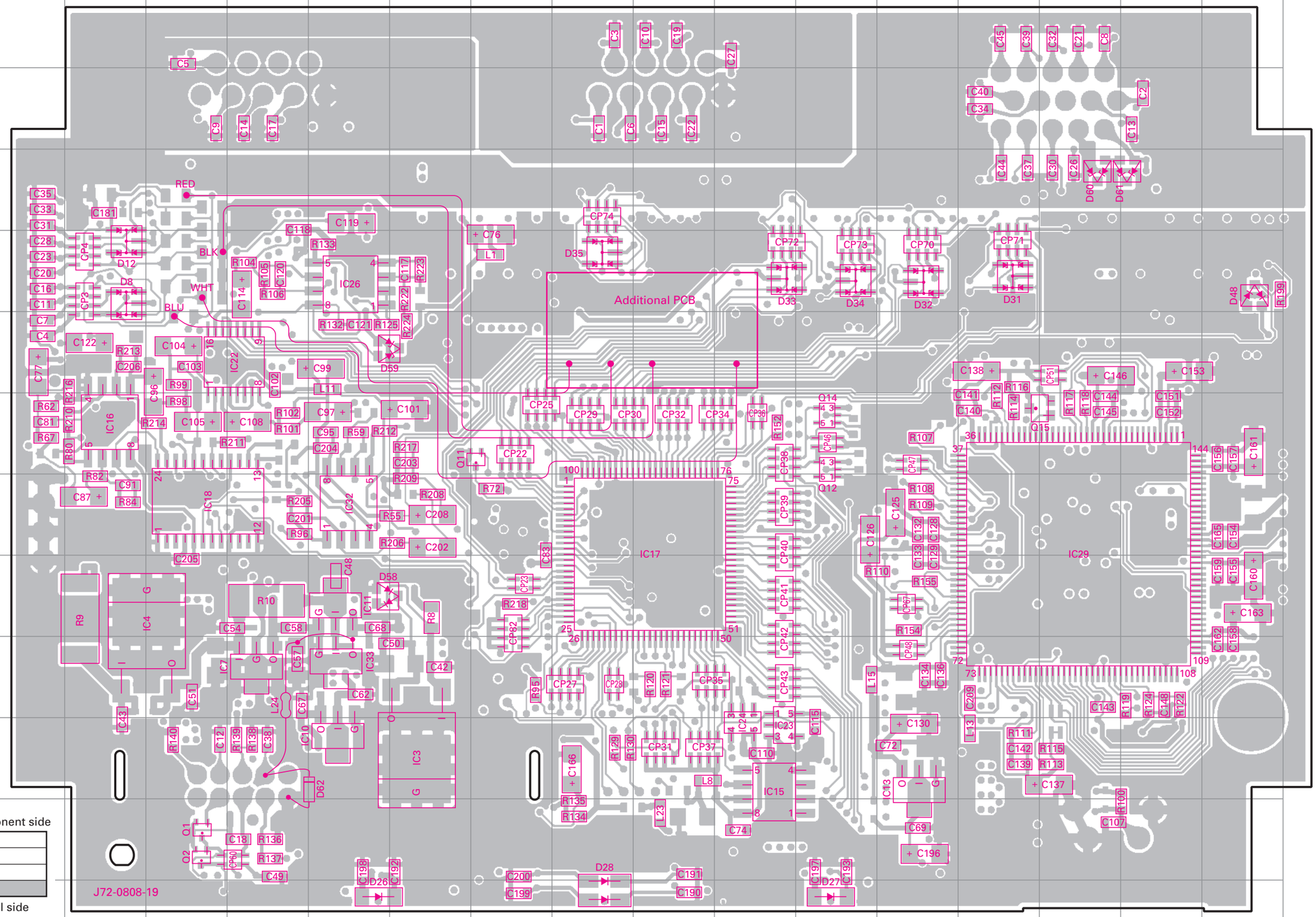
Foil side

KGP-2A PC BOARD VIEW

Additional PCB

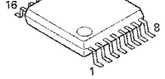


CONTROL UNIT (X53-3980-20) Foil side view

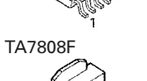


Ref No.	Address	Ref No.	Address	Ref No.	Address
IC3	11I	IC26	5H	D27	13N
IC4	9F	IC29	8Q	D28	13K
IC7	10G	IC32	8H	D31	5P
IC10	11H	IC33	10H	D32	5O
IC11	9H	Q1	12F	D33	5M
IC13	11O	Q2	12F	D34	5N
IC15	11M	Q11	7J	D35	5K
IC16	7E	Q12	7N	D48	5S
IC17	8L	Q14	7N	D58	9H
IC18	8F	Q15	7Q	D59	6H
IC22	6G	D8	5E	D60	4Q
IC23	11M	D12	5E	D61	4R
IC24	11M	D26	13H	D62	11H

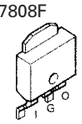
ADM202EARU
AK4550VT
TC74VHC4040FT



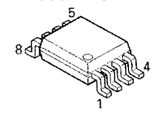
ADM3202ARU



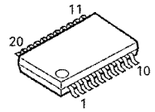
TA7808F



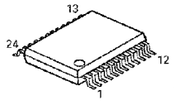
24LC08BT-ISN



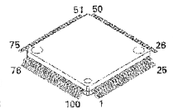
BU2099FV
TC74LVX244FT



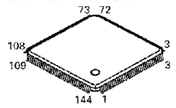
M62364FP
TC74LVX4245FS



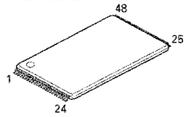
30620M8A-2M6GP



320VC5402PGE



MBM29LV800B90



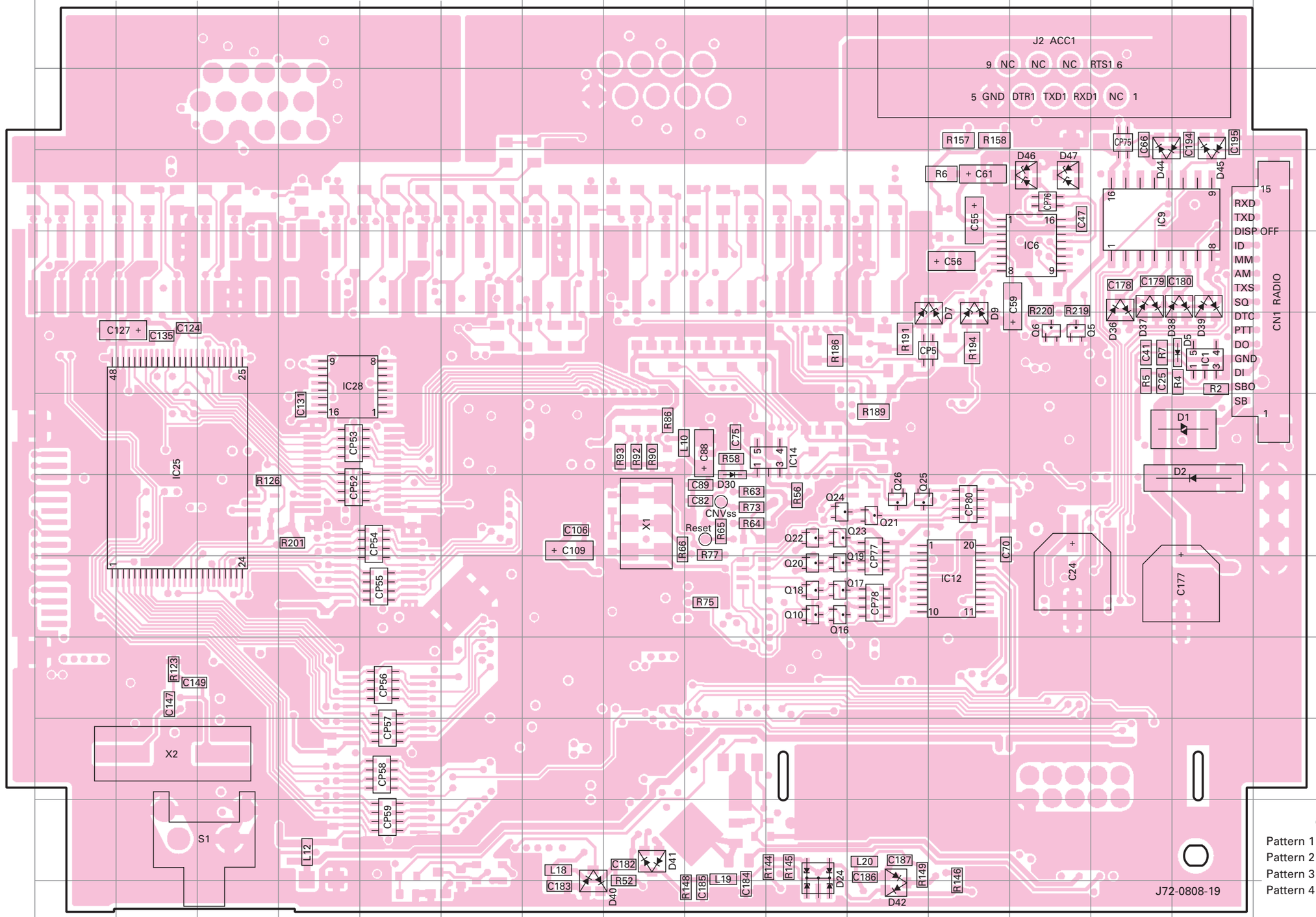
Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

PC BOARD VIEW KGP-2B

CONTROL UNIT (X53-3980-21) Component side view

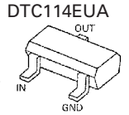


Ref No.	Address	Ref No.	Address	Ref No.	Address
IC1	6O	Q19	9J	D24	12J
IC6	5M	Q20	9J	D30	8I
IC9	4N	Q21	8K	D36	6N
IC12	9L	Q22	8J	D37	5N
IC14	7J	Q23	8J	D38	5O
IC25	7B	Q24	8J	D39	5O
IC28	6D	Q25	8K	D40	13G
Q5	6M	Q26	8K	D41	12H
Q6	6M	D1	7O	D42	13K
Q10	9J	D2	8O	D44	4N
Q16	9J	D5	6O	D45	4O
Q17	9J	D7	6L	D46	4M
Q18	9J	D9	6L	D47	4M

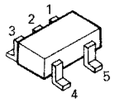
DTC114YE
DTC144EE

DA204U

DTC114EUA

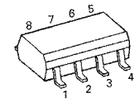


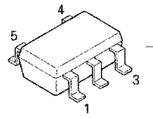
TC7S04F



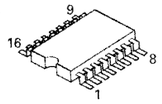
RN5VL30C

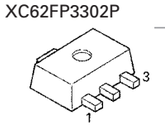
NJM4558M



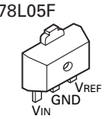


TC74HC4094AF
XC62FP1802P
XC62FP3302P





TA78L05F



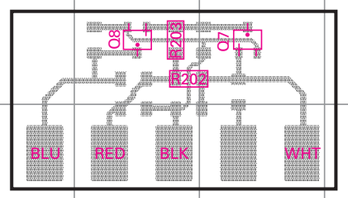
Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

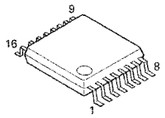
KGP-2B PC BOARD VIEW

Additional PCB

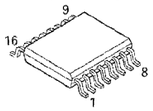


Ref No.	Address	Ref No.	Address	Ref No.	Address
IC3	11I	IC16	7E	Q11	7J
IC4	9F	IC17	8L	Q15	7Q
IC7	10G	IC18	8F	D8	5E
IC10	11H	IC22	6G	D12	5E
IC11	9H	IC24	11M	D26	13H
IC13	11O	IC26	5H	D28	13K
IC15	11M	IC29	8Q	D59	6H

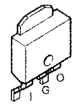
ADM202EARU
AK4550VT
TC74VHC4040FT



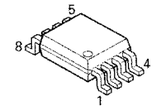
ADM3202ARU



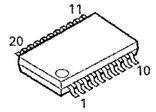
TA7808F



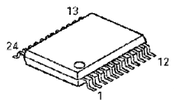
24LC08BT-ISN



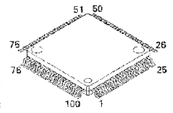
BU2099FV



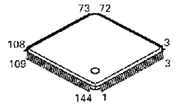
M62364FP



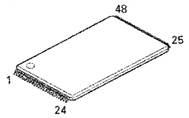
30620M8A-2M6GP



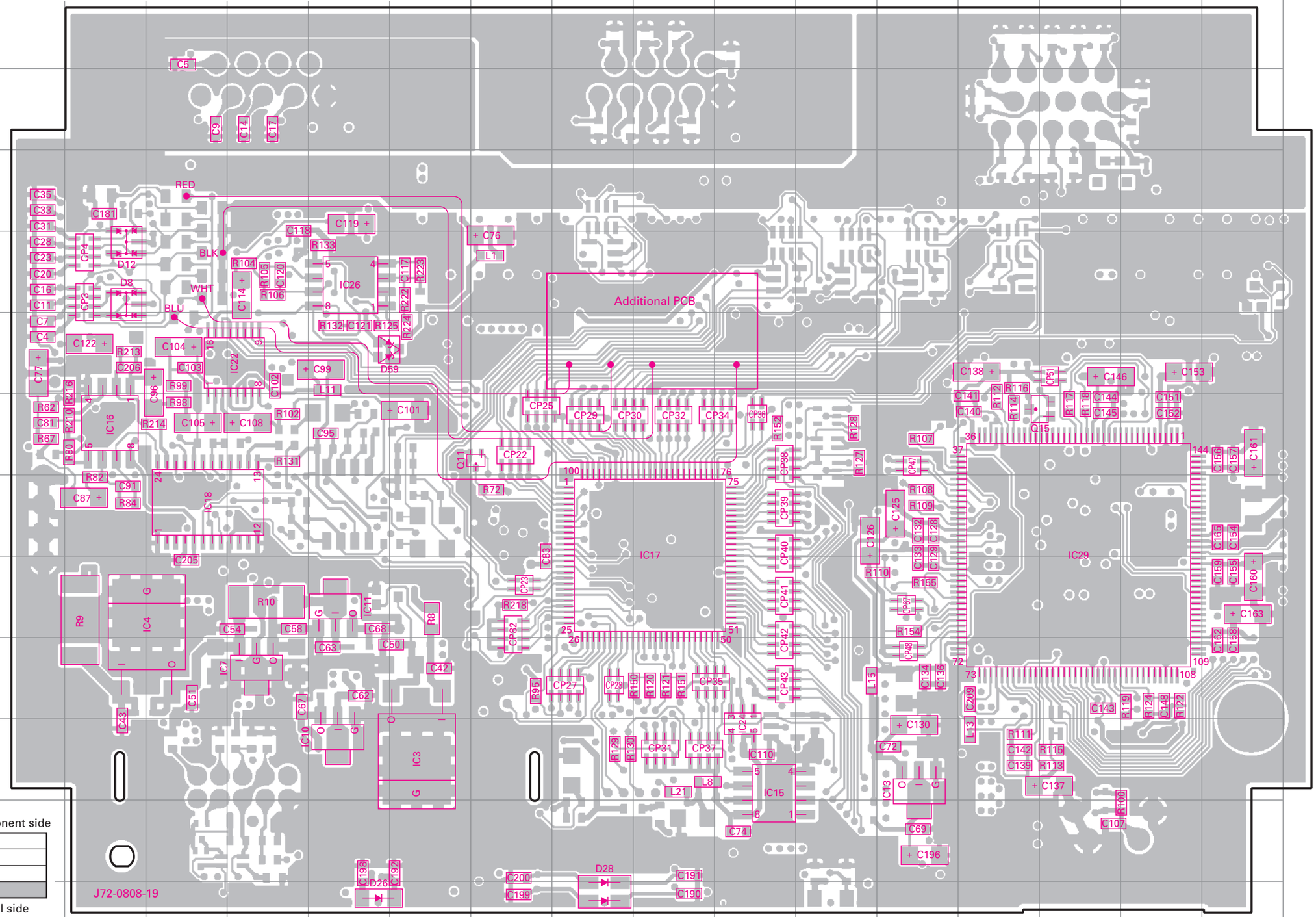
320VC5402PGE



MBM29LV800B90



CONTROL UNIT (X53-3980-21) Foil side view



Component side

Pattern 1
Pattern 2
Pattern 3
Pattern 4

Foil side

SCHEMATIC DIAGRAM KGP-2A/2B

Note : Components marked with a dot (·) are parts of pattern 1.

X53-3980-XX

D1 :1812L075PR
D2 :DSM3MA1
D5,18,30 :MA2S111
D7,9,46,47,59-61 :UMZ8.2T
D8,12,24,31-35 :NNCD6.8G
D26,27 :B30-2056-05
D28 :B30-2019-05
D36-45,48,50-58 :DA204U
D62 : MTZJ6.8B

Q1,2,10,11,16-26 :DTC114YE
Q4 :2SB798(DL,DK)
Q5,6 :DTC144EE
Q12-14 :RN47A4
Q15 :DTC114EUA

IC1 :RN5VL30C
IC3,4 :TA7808F
IC6 :ADM202EARU or ADM3202ARU
IC7 :TA78L05F
IC9 :TC74HC4094AF
IC10,11,33 :XC62FP3302P
IC12 :BU2099FV
IC13 :XC62FP1802P
IC14 :RN5VL30C,RN5VL45C
IC15 :24LC08BT-ISN
IC16,26,32 :NJM4558M
IC17 :30620M8A-2M6GP
IC18 :M62364FP
IC19 :TC74LVX4245FS
IC20,21,31 :TC74LVX244FT
IC22 :AK4550VT
IC23 :TC7S08F
IC24 :TC7S04F
IC25 :MBM29LV800B90
IC28 :74VHC4040FT
IC29 :320VC5402PGE

ADDITIONAL PCB

Q7,8 :DTC144EE

X53-3980-XX			A1	BA1	CP46	CP52	CP53	CP54	CP55	CP56	CP57	CP58	CP59	CP60	CP70	CP71	CP72	CP73	CP74	CP77	CP78	CP79	CP80	CP81
-20	KGP-2A	M	W02-3628-05	W09-0985-05	47k	NO	NO	NO	NO	NO	NO	NO	NO	47k	100	1k	1k	1k	1k	NO	NO	100	NO	100
-21	KGP-2B	M	NO	NO	NO	100	100	100	100	100	100	100	100	NO	NO	NO	NO	NO	NO	1k	1k	NO	1k	NO

X53-3980-XX			J1	J3	D18	D27	D31	D32	D33	D34	D35	D43	D48	IC14	IC19	IC20	IC21	IC23	IC31	IC32
-20	KGP-2A	M	E58-0489-05	E59-0413-05	MA2S111	B30-2056-05	NNCD6.8G	NNCD6.8G	NNCD6.8G	NNCD6.8G	NNCD6.8G	DA204U	DA204U	RN5VL45C	TC74LVX4245FS	TC74LVX244FT	TC74LVX244FT	TC7S08F	TC74LVX244FT	NJM4558M
-21	KGP-2B	M	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	RN5VL30C	NO	NO	NO	NO	NO	NO

X53-3980-XX			Q1	Q2	Q4	Q10	Q12	Q13	Q14	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	L17	L21	L23	CN19	R51	R168
-20	KGP-2A	M	DTC114YE	DTC114YE	2SB798(DL,DK)	NO	RN47A4	RN47A4	RN47A4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	L92-0140-05	NO	YES	E37-1001-05	82	0
-21	KGP-2B	M	NO	NO	NO	DTC114YE	NO	NO	NO	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	DTC114YE	NO	YES	NO	NO	NO	NO

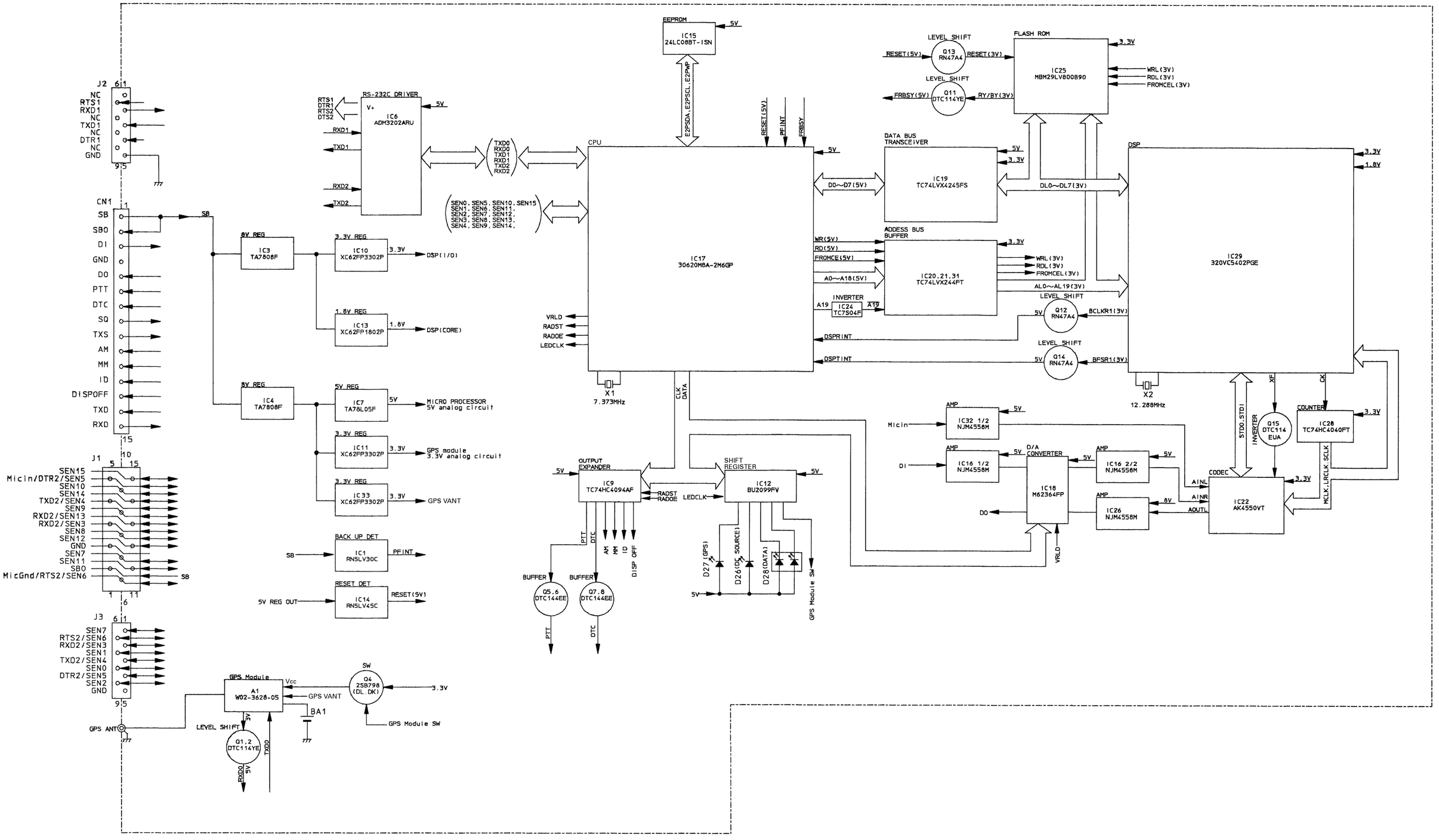
X53-3980-XX			R11	R12	R13	R14	R15	R16	R33	R37	R55	R59	R64	R71	R96	R101	R102	R120	R121	R126	R127	R128	R131	R134	R135	R136	R137	R138	R139	R140	R147	R150	R151
-20	KGP-2A	M	0	0	0	0	0	0	220	220	56k	0	NO	47k	0	33k	56k	1k	1k	NO	NO	NO	NO	1k	1k	5.6k	3.3k	5.6k	3.3k	47k	82	NO	NO
-21	KGP-2B	M	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	47k	NO	NO	NO	0	270k	270k	0	0	0	0	NO	NO	NO	NO	NO	NO	NO	NO	470k	470k

X53-3980-XX			R159	R160	R161	R162	R163	R164	R165	R166	R167	R169	R170	R171	R172	R173	R174	R175	R176	R177	R179	R180	R181	R182	R183	R199	R200	R205	R206	R208	R209	R211	R212	R217
-20	KGP-2A	M	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1k	47k	180k	560	0	1.2k	22k	2.2k	1.2k
-21	KGP-2B	M	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

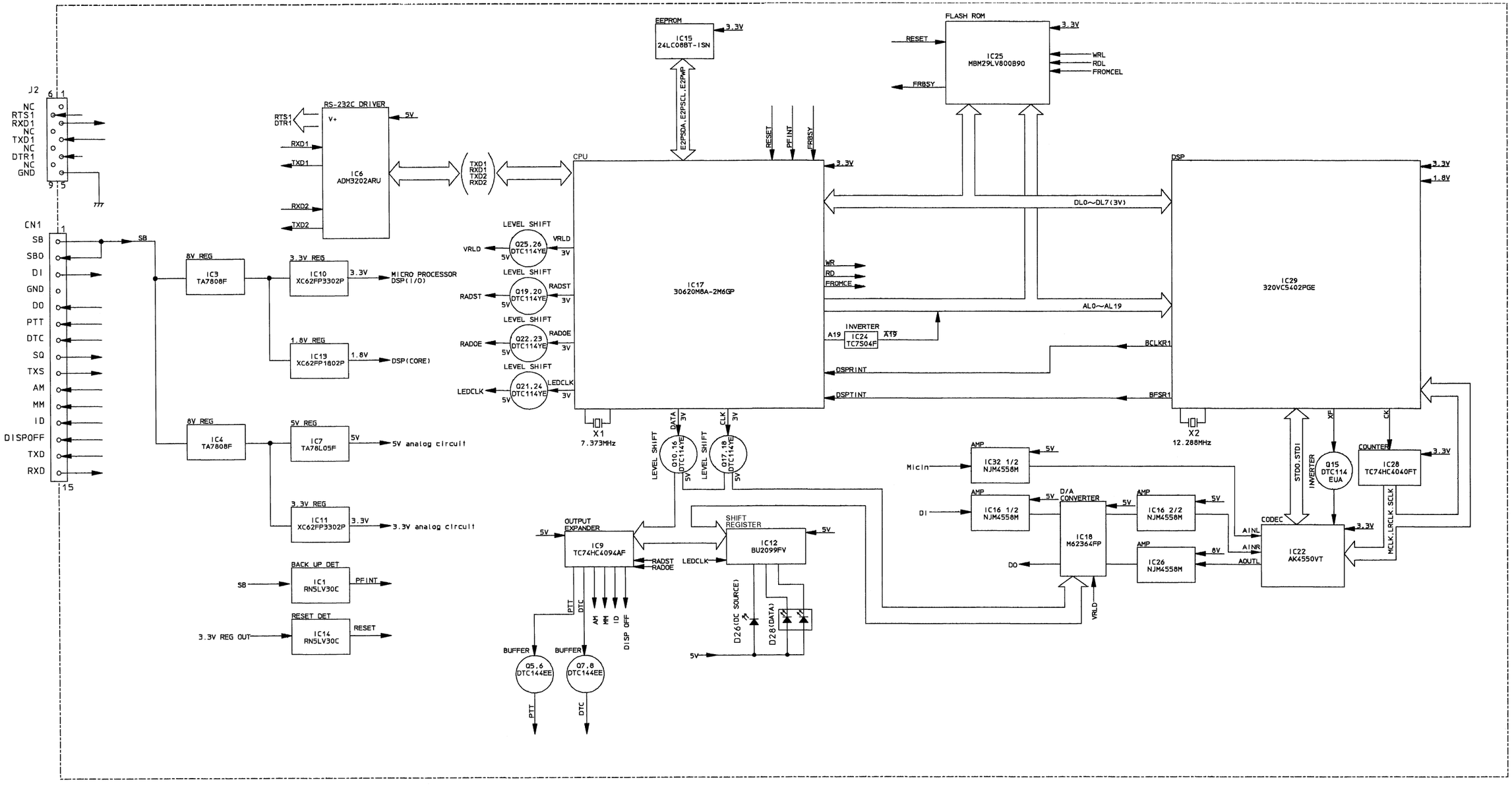
X53-3980-XX			C1	C2	C3	C6	C8	C10	C12	C13	C15	C18	C19	C21	C22	C26	C27	C30	C32	C34	C37	C38	C39	C40	C44	C45	C49	C65
-20	KGP-2A	M	100p	100p	100p	100p	100p	100p	0.01u	100p	100p	0.01u	100p	100p	100p	100p	100p	100p	100p	100p	100p	0.01u	100p	100p	100p	100p	0.1u	0.1u
-21	KGP-2B	M	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

X53-3980-XX			C94	C97	C98	C115	C123	C166	C175	C176	C188	C189	C193	C197	C201	C202	C203	C204	C208	IC33	D62	C48	C57	L24	D50-D58	D60,D61
-20	KGP-2A	M	0.01u	10u10	0.01u	0.01u	0.01u	10u10	0.01u	0.01u	100p	100p	100p	100p	100p	10u10	100p	0.01u	10u10	XC62FP3302P	MTZJ6.8B	0.1u	0.1u	L40-1011-14	DA204U	UMZ8.2T
-21	KGP-2B	M	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

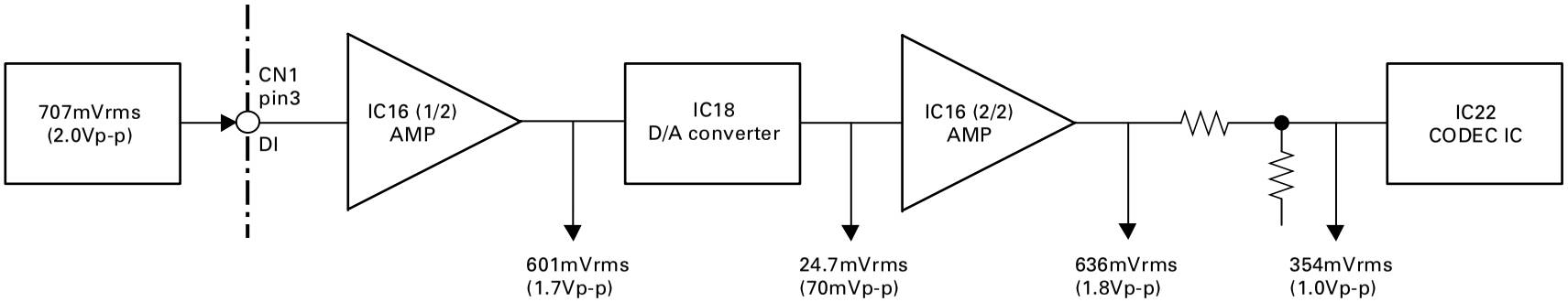
BLOCK DIAGRAM (KGP-2A)



BLOCK DIAGRAM (KGP-2B)

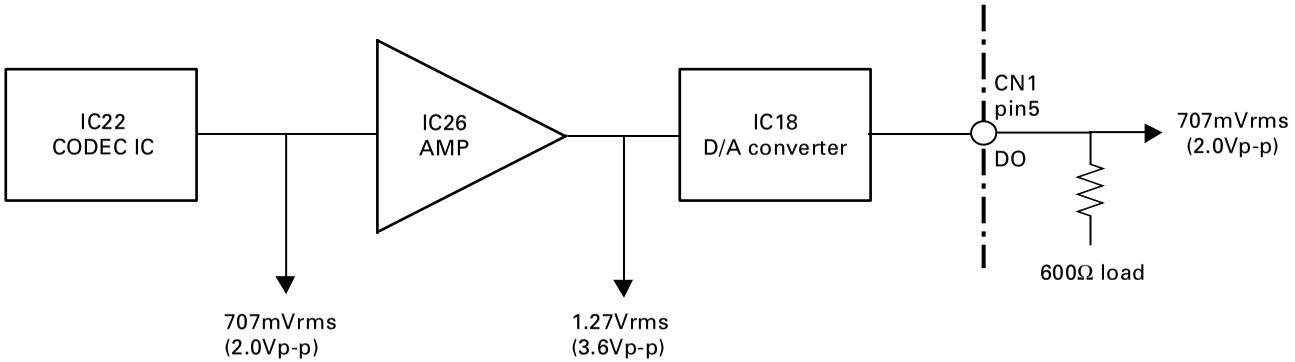


Receiver Secion



All voltage values are measured by using either an AF-VTVM or oscilloscope when 707mVrms (2.0Vp-p) is applied to the CN1 terminal pin 3 (DI).

Transmitter Section



All voltage values are measured by using either an AF-VTVM or oscilloscope when 707mVrms (2.0Vp-p) is appeared to the CN1 terminal pin 5 (DO).

TERMINAL FUNCTION

Connector No.	Pin No.	Pin Name	I/O	Function
CN1	1	SB	I	Main power supply input (13.6V)
	2	SBO	O	DC output (13.6V)
	3	DI	I	Modem input from radio DEO (Detector output)
	4	GND	–	Ground
	5	DO	O	Modem output to radio DI (Modulation input)
	6	PTT	O	PTT output
	7	DTC (DATA PTT)	O	Data TX control output (Data transmission output)
	8	SQ	I	Squelch input
	9	TXS	I	Radio TX detect input
	10	AM	O	Audio mute
	11	MM	O	Microphone mute
	12	ID	O	ID detect output (KGP protocol)
	13	DISP OFF	O	Controls radio LCD on/off
	14	TXD	O	Serial output (CMOS level)
	15	RXD	I	Serial input (CMOS level)
CN19 KGP-2A only	1~4	–	–	Ground
J2 (ACC1)	PC serial port (COM1)			
	1	NC	–	No connection
	2	RXD1	I	Serial 1 input (RS-232C level)
	3	TXD1	O	Serial 1 output (RS-232C level)
	4	DTR1	O	DTR1 output (RS-232C level)
	5	GND	–	Ground
	6	RTS1	O	RTS1 output (RS-232C level)
	7	NC	–	No connection
	8	NC	–	No connection
	9	NC	–	No connection
J3 (ACC2) KGP-2A only	Sensor I/O, Multi-purpose serial port (COM2)			
	1	SEN7*	I/O	Sensor 7 input/output
		NC	–	No connection
	2	SEN3*	I/O	Sensor 3 input/output
		RXD2	I	Serial 2 input (RS-232C level)
	3	SEN4*	I/O	Sensor 4 input/output
		TXD2	O	Serial 2 output (RS-232C level)
	4	SEN5*	I/O	Sensor 5 input/output
		DTR2	O	DTR2 output (RS-232C level)
	5	GND	–	Ground
	6	SEN6*	I/O	Sensor 6 input/output
		RTS2	O	RTS2 output (RS-232C level)
	7	SEN1*	I/O	Sensor 1 input/output
		NC	–	No connection
	8	SEN0*	I/O	Sensor 0 input/output
		NC	–	No connection
	9	SEN2*	I/O	Sensor 2 input/output
		NC	–	No connection
J1 (ACC3) KGP-2A only	Sensor I/O, Multi-purpose serial port (COM2)			
	1	SBO	O	DC output (13.6V)
	2	GND	–	Ground
	3	SEN3*	I/O	Sensor 3 input/output
		RXD2	I	Serial 2 input (RS-232C level)
	4	SEN4*	I/O	Sensor 4 input/output
		TXD2	O	Serial 2 output (RS-232C level)
	5	SEN5*	I/O	Sensor 5 input/output
		DTR2	O	DTR2 output (RS-232C level)
		MI	I	Microphone input
	6	SEN6*	I/O	Sensor 6 input/output
		RTS2	O	RTS2 output (RS-232C level)
		ME	–	Microphone earth
	7	SEN7	I/O	Sensor 7 input/output
	8	SEN8	I/O	Sensor 8 input/output
	9	SEN9	I/O	Sensor 9 input/output
	10	SEN10	I/O	Sensor 10 input/output
	11	SEN11	I/O	Sensor 11 input/output
	12	SEN12	I/O	Sensor 12 input/output
	13	SEN13	I/O	Sensor 13 input/output
	14	SEN14	I/O	Sensor 14 input/output
	15	SEN15	I/O	Sensor 15 input/output
RADIO	1	SB	I	Main power supply input (13.6V)
	2	SBO	O	DC output (13.6V)
	3	GND	–	Ground
	4	DI	I	Modem input from radio DEO (Detector output)
	5	DO	O	Modem output to radio DI (Modulation input)
	6	PTT	O	PTT output
	7	DTC	O	Data TX control output
	8	SQ	I	Squelch input
	9	TXS	I	Radio TX detect input
	10	AM	O	Audio mute
	11	MM	O	Microphone mute
	12	ID	O	ID detect output (KGP protocol)
	13	DISP OFF	O	Controls radio LCD on/off
	14	TXD	O	Serial output (CMOS level)
	15	RXD	I	Serial input (CMOS level)
ANT KGP-2A only	–	–	I	GPS antenna connector

* : Default

SPECIFICATIONS

General

Standard Input Voltage	13.6V DC negative ground (Suppling from connected Radio)
Current Drain	KGP-2A : Less than 300mA KGP-2B : Less than 240mA
Temperature Range	–30°C to +60°C (–22°F to +140°F)
Dimensions (W x H x D, Dimensions not including protrusions)	140 (5.5) x 46 (1.8) x 100 (4.0) mm (inch)
Weight	KGP-2A : 460g (1.01lbs) KGP-2B : 420g (0.93lbs)
Environment Standard	
Dust	MIL810C : 510.1/Procedure 1 MIL810D : 510.2/Procedure 1 MIL810E : 510.3/Procedure 1
Vibration	MIL810C : 514.2/Procedure 8,10 MIL810D : 514.3/Procedure 1 Cat, 8 MIL810E : 514.4/Procedure 1 Cat, 8
Shock	MIL810C : 516.2/Procedure 1,2,5 MIL810D : 516.3/Procedure 1,4 MIL810E : 516.4/Procedure 1,4

GPS Receiver Section (KGP-2A only)

Receiver Type	Parallel 9 channels
Receiver Frequency	1575.42MHz
Receiver Sensitivity (With supplied GPS antenna)	–130dBm or less
Supply Voltage to Antenna	DC 3.3V ± 0.2V

Modem Section

Modem Encode Level Range	100 to 1000mVrms
Modem Decode Level Range	100 to 1000mVrms
Modem Output Impedance	600Ω
Modem Input Impedance	600Ω
Modulation	MSK
Modulation Rate	1200bps or 2400bps

KENWOOD follows a policy of continuous advancement in development.
For this reason specifications may be changed without notice.

KGP-2A/2B

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