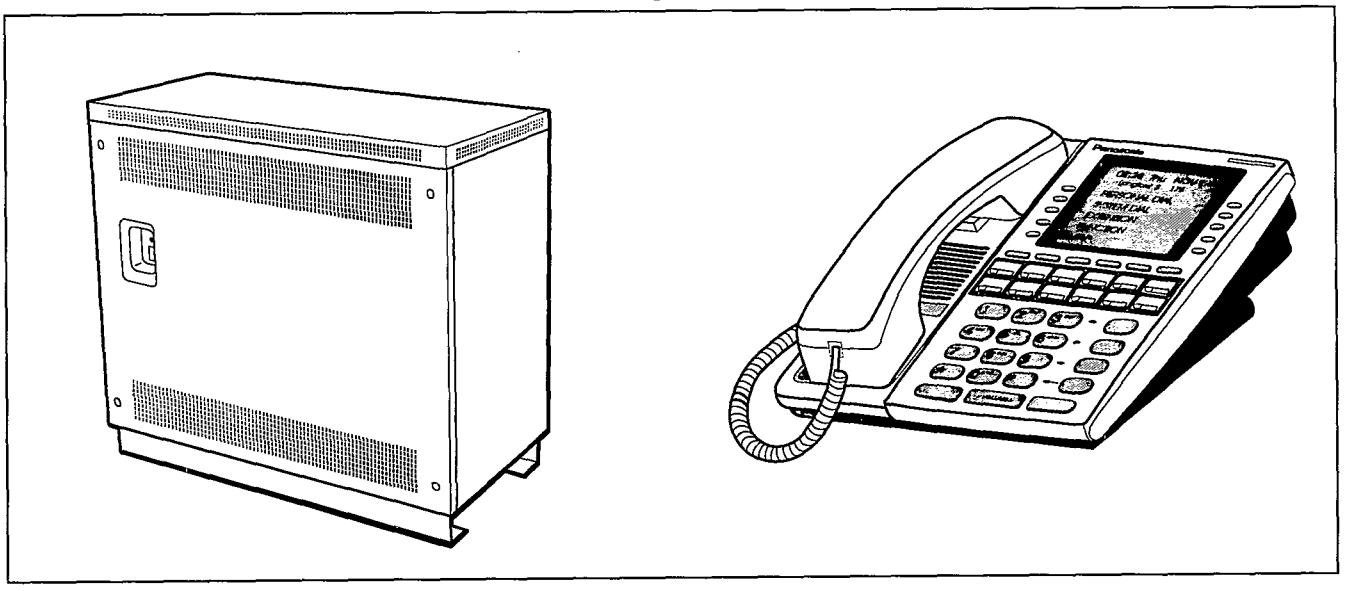
ORDER NO. CSD9706001C8

# Service Manual

Integrated Communication eXchange System



## Specifications

Maximum Ports(Exchange lines + Internal lines):
- VB-44010UK/HK(40 Ports)
- VB-44020UK/HK(96 Ports)
- Two VB-44010UK/HK(72 Ports)
- Six VB-44020UK/HK and VB-44021UK/HK (576 Ports)

Intercom speech path:
- Non blocking

Internal line resistance(loop):
- Digital TEL.(Less than 40 ohms)
- Digital DSS.(Less than 20 ohms)
- Analog Ext.(Less than 100 ohms)

Transmission loss:
- Less than 1.0 dB(at 1500Hz)

Crosstalk rejection:
- More than 72 dB(at 1500Hz)

Dimension(HxWxD):
- VB-44010UK/HK(495x405x260 mm)
- VB-44020UK/HK(515x680x260 mm)
- VB-44021UK/HK(455x680x260 mm)

Weight:
- VB-44010UK/HK(13Kg)
- VB-44020UK/HK(20Kg)
- VB-44021UK/HK(20Kg)

**⚠ WARNING**

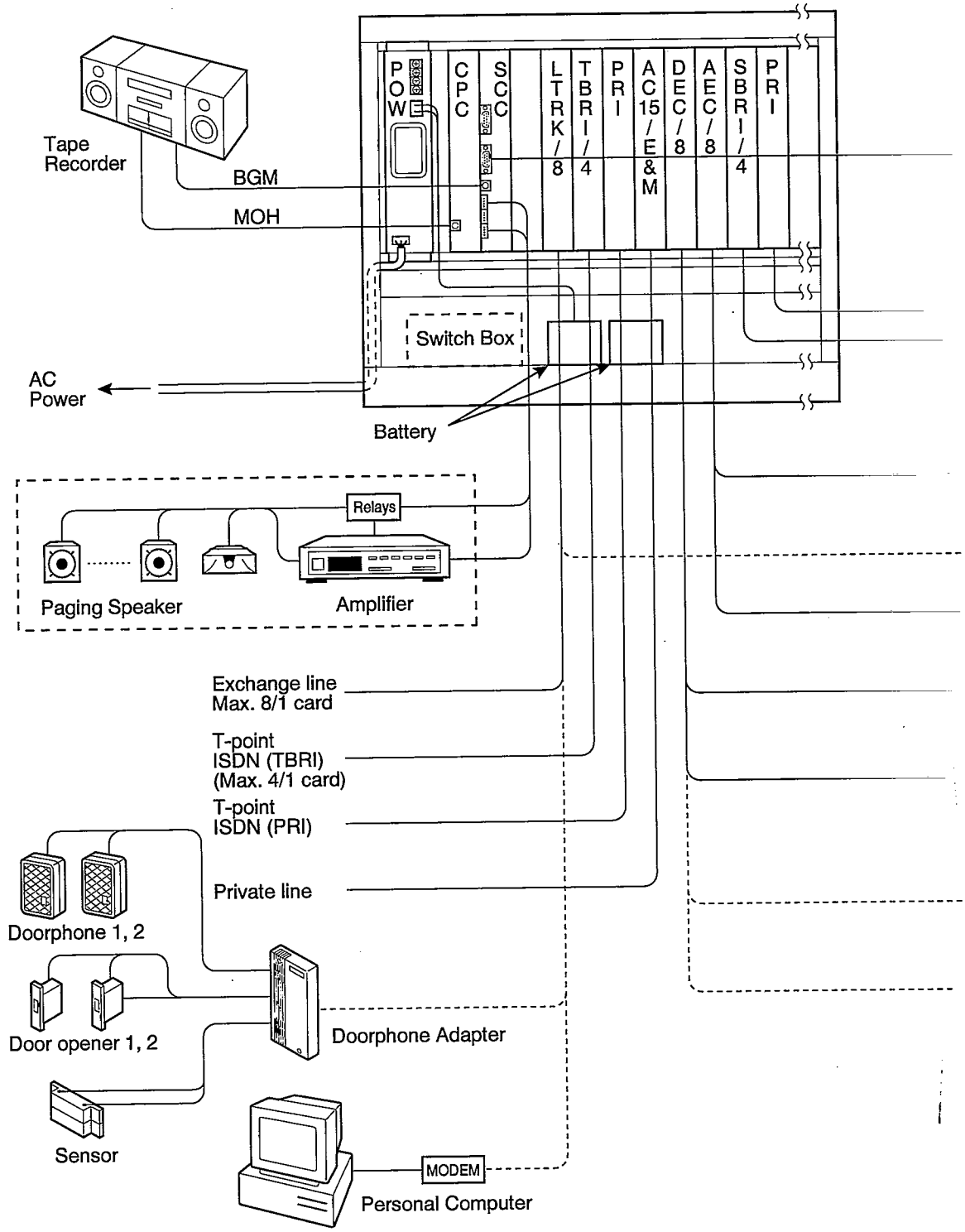
This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

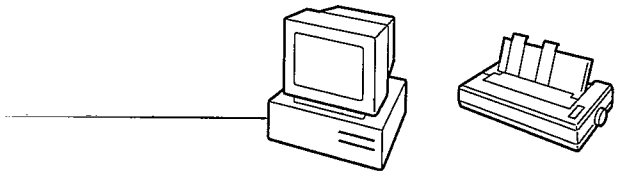
Panasonic

# CONTENTS

# ■GENERAL

## 1. System Connection Layout

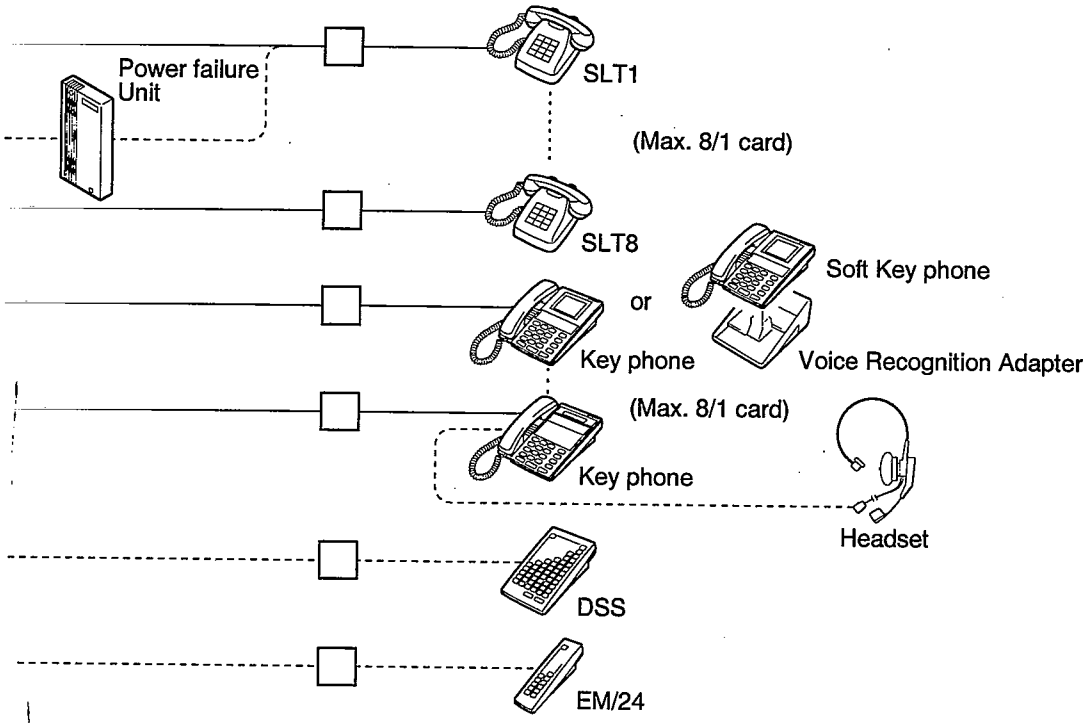




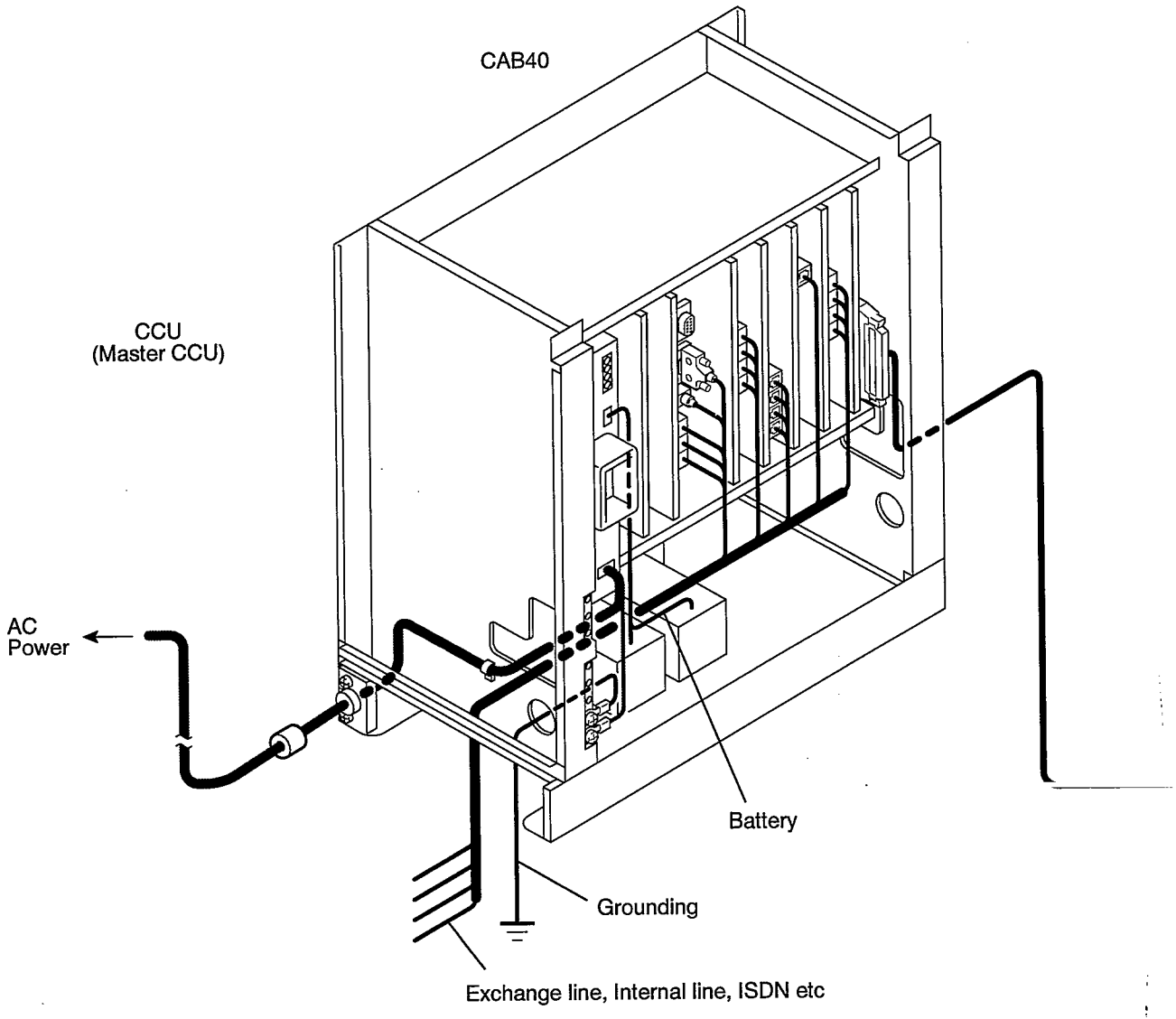
Personal Computer or Serial Printer

S-point ISDN (PRI)

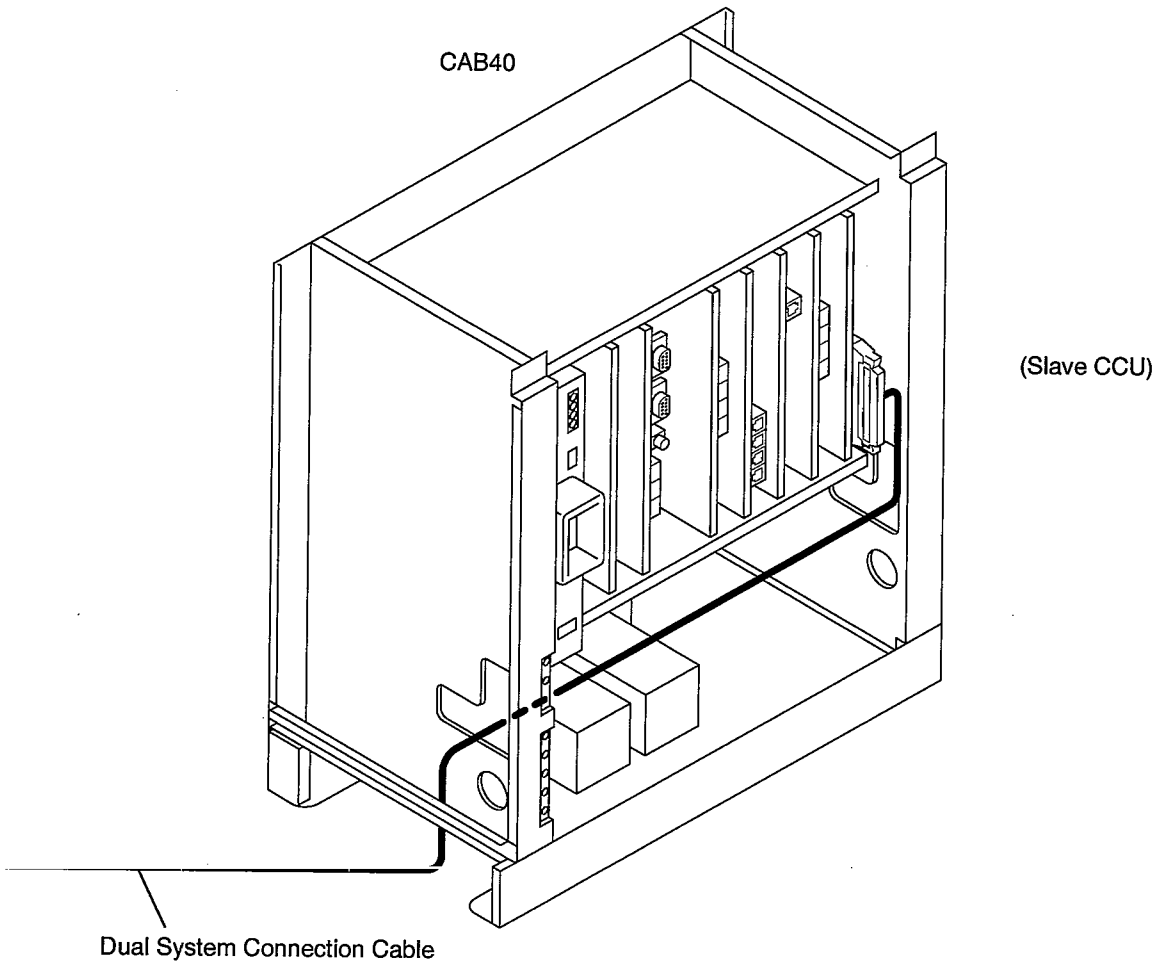
S-point ISDN (SBRI)



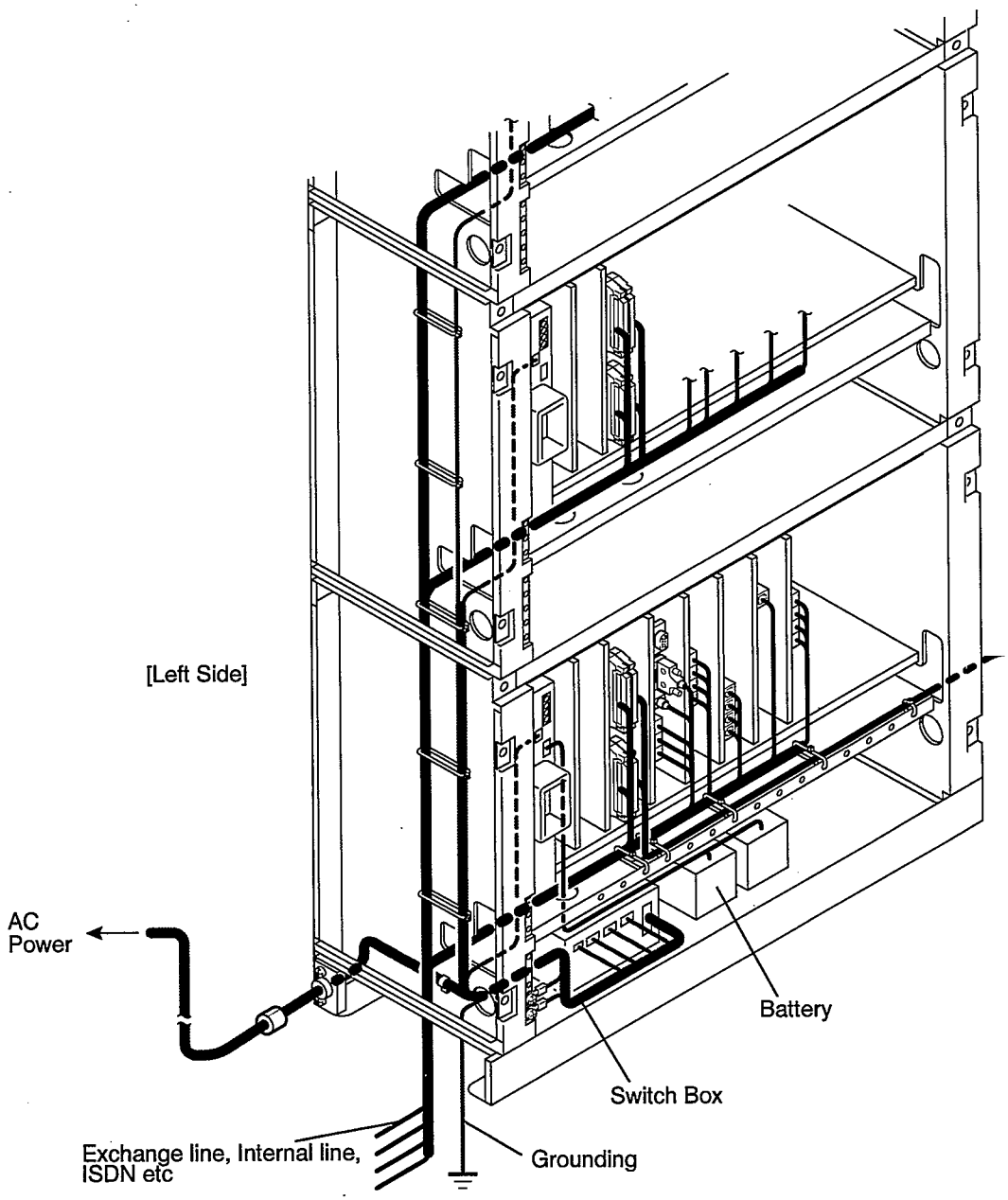
## 2. System Wiring
## (1)CAB40/CAB40+CAB40



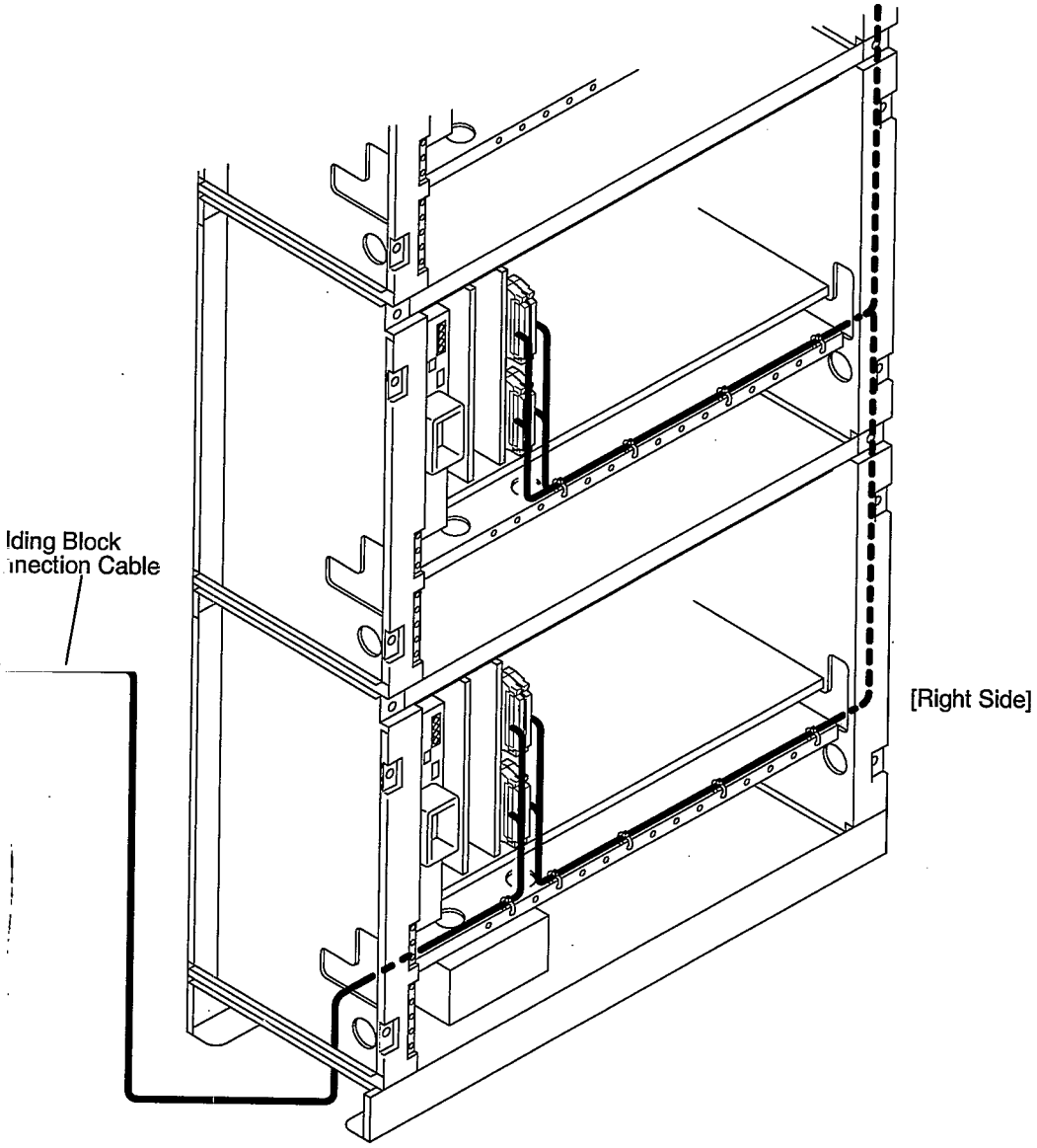

**Note:** The cable can be inserted at either the right or left side of the cabinet.
Arrange the cables according to the environment.


CAB40
(Slave CCU)
Dual System Connection Cable

## (2)CAB96/CAB96+CAB496B+...




**Note:** The cable can be inserted at either the right or left side of the cabinet.
Arrange the cables according to the environment.


lding Block
inection Cable
[Right Side]

# 3.Models and System Configuration

***Specifications (1/3)***

| Type | Item | Name (Abbreviated name) | Model No. | External dimensions (approximate mm) | | | Weight (approximate kg) | Supply voltage (V) | Maximum power dissipation (W) Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | W | H | D | | | |
| Central Control Unit | 40 ports CCU | CAB40 | VB-44010UK/HK | 405 | 495 | 260 | 13 | | |
| | 96 ports CCU | CAB96 | VB-44020UK/HK | 680 | 515 | 260 | 20 | | |
| | 96 ports Expand CCU | CAB96B | VB-44021UK/HK | 680 | 455 | 260 | 20 | | |
| Power supply | Switch Box | SWBOX | VB-44023UK | 163 | 66 | 121 | 0.8 | | |
| | -48V power supply | POW-48 | VB-44022 | 145 | 59 | 130 | | -48V | 1.0A |
| Control | CPC-96 Card | CPC96 | VB-44410UK/HK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 600mA<br>10mA |
| | CPC-288 Card | CPC288 | VB-444201UK/HK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 800mA<br>10mA |
| | CPC-576 Card | CPC576 | VB-444301UK/HK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 1500mA<br>10mA |
| | Connection Cable Card-M | CBLMST | VB-444501 | 26 | 250 | 178 | 0.5 | +5 | 100mA |
| | Connection Cable Card-S | CBLSLV | VB-444502 | 26 | 250 | 178 | 0.5 | +5 | 350mA |
| | Connection Cable Kit | CBLKIT | VB-44450 | | | | 0.5 | +5 | 350mA |
| | Building Block Card | CBL | VB-44451 | 26 | 250 | 178 | 0.5 | +5 | 350mA |
| | Connection Cable Card-DBS | CBLDBS | VB-44452 | 26 | 250 | 178 | 0.5 | +5 | 350mA |
| | Service Control Card | SCC | VB-44181UK/HK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 80mA<br>25mA |
| | Time Switch 288 Card | TSW288 | VB-444202UK/HK | 26 | 250 | 178 | 0.5 | +5 | 885mA |
| | Time Switch 576 Card | TSW576 | VB-444302UK/HK | 26 | 250 | 178 | 0.5 | +5 | 910mA |
| Exchange Lines | Loop Start Exchange Line Card | LTRK/8 | VB-44510UK/HK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 0.5W<br>2W |
| | BRI Card | TBRI/4 | VB-44530 | 26 | 250 | 178 | 0.5 | +5<br>+24 | 150mA<br>130mA |
| | PRI Card | PRI23/30 | VB-44540/UK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 100mA<br>120mA |
| | AC-15 card | AC15/4 | VB-44570UK | | | | | | |
| | DDI Trunk Card | DIDTR8 | VB-44520HK | 26 | 250 | 178 | | | |

***Specifications (2/3)***

| Type | Item | Name (Abbreviated name) | Model No. | External dimensions (approximate mm) | | | Weight (approximate kg) | Supply voltage (V) | Maximum power dissipation (W) Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | W | H | D | | | |
| Internal lines | Digital Extension Card | DEC/8 | VB-44610UK | 26 | 250 | 178 | 0.4 | +5<br>+24 | 100mA<br>1.6mA |
| | Analog Extension Card | AEC/8 | VB-44620UK/HK | 26 | 250 | 178 | | +5<br>+24 | 500W<br>12W |
| | BRI Unit (S-Point) | SBRI/4 | VB-44630 | 26 | 250 | 178 | 0.5 | +5<br>+24 | 150mA<br>130mA |
| | PRI Card | PRI23/30 | VB-44540/UK | 26 | 250 | 178 | 0.5 | +5<br>+24 | 100mA<br>120mA |
| Options | 8 DTMF Receiver Card | MFR/8 | VB-44110UK/HK | 26 | 250 | 178 | 0.5 | +5 | 110mA |
| | Conference Card | CONF | VB-44120UK/HK | 26 | 250 | 178 | 0.5 | +5 | 100mA |
| Audio applications | ACD Card | ACD | VB-44140/UK | 26 | 250 | 178 | 0.5 | +5 | 150mA |
| | 8 Voice Processing Card | VPU/8 | VB-44150/UK | 26 | 250 | 178 | 0.5 | +5 | 700mA |
| | 4 Voice Processing Card | VPU/4 | VB-44160/UK | 26 | 250 | 178 | 0.5 | +5 | 350mA |
| | Voice Storage Service Card | VSSC | VB-44170/UK | 47 | 250 | 178 | 1.0 | +5 | 2.2A |
| | HDD for replacement | VSSCHD | VB-44171 | 90 | 122 | 23 | 0.2 | +5 | 2.7W<br>1.3A |
| On-card packages | Sync Package/ Network Unit | SYNC | VB-44460UK | 70 | 70 | 1.6 | 0.1 | +5 | 50mA |
| | Remote Administration Unit | RAI | VB-44182UK/HK | 70 | 70 | 1.6 | 0.1 | +5 | 50mA |
| | PC Card | | VB-44431UK/HK | | | | | | |

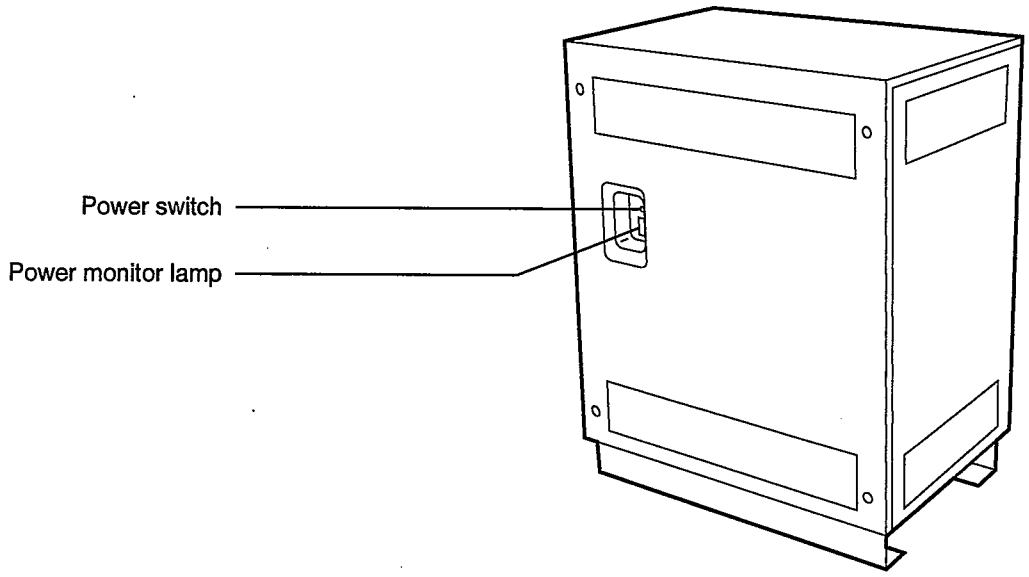
***Specifications (3/3)***

| Type | Item | Name (Abbreviated name) | Model No. | External dimensions (approximate mm) | | | Weight (approximate kg) | Supply voltage (V) | Maximum power dissipation (W) Current (A) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | W | H | D | | | |
| Phone systems | Key phone (12key) | 12CO/STD | VB-D411UK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (12key/SPU) | 12CO/SPU | VB-D44221HK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (12key-LCD/ SPU) | 12CO/D/ SPU | VB-D411DSUK VB-44223HK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (12key-LLCD/ SPU) | 12CO/LD/ SPU | VB-D411LDSUK VB-44225HK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (12key-LCD/ Soft key/Voice/ SLT/SPU) | 12CO/D/ SK/VR/ SLT/SPU | VB-D411DSVUK VB-44224HK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (24key-LCD) | 24CO/D | VB-D611DUK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | Key phone (24key-LCD/ SPU) | 24CO/D/ SPU | VB-D611DSUK VB-44233HK | 186 | 90 | 233 | 1 | +27 | 2.7W |
| | DSS | DSS | VB-D631UK VB-44320HK | 123 | 74 | 233 | 0.5 | +27 | 3.3W |
| | EM24 | EM24 | VB-D331UK VB-44310HK | 60 | 74 | 233 | 0.5 | +27 | 1.1W |
| | Voice Recognition Adaptor | VRADP | VB-44101UK/HK | 163 | 73 | 178 | 0.5 | +5 +27 | 3.6W 3.6W |
| External optional equipment | Doorphone Adaptor | DPH-ADP | VB-3473UK | | | | | | |
| | Doorphone | DPH | VL-568GPEX, VL-582APEX | | | | | | |
| | Power Failure Unit | PFU | VB-43703UK | 120 | 240 | 45 | 0.4 | +24 | |
| | TAPI Box | TAPI | VB-43720UK | 92 | 146 | 29 | 0.2 | | |
| Battery | Battery | BATT96 | VB-44025 | | | | | | |
| Miscellaneous | Connection Metal Kit | MTLKIT | VB-44024 | | | | | | |

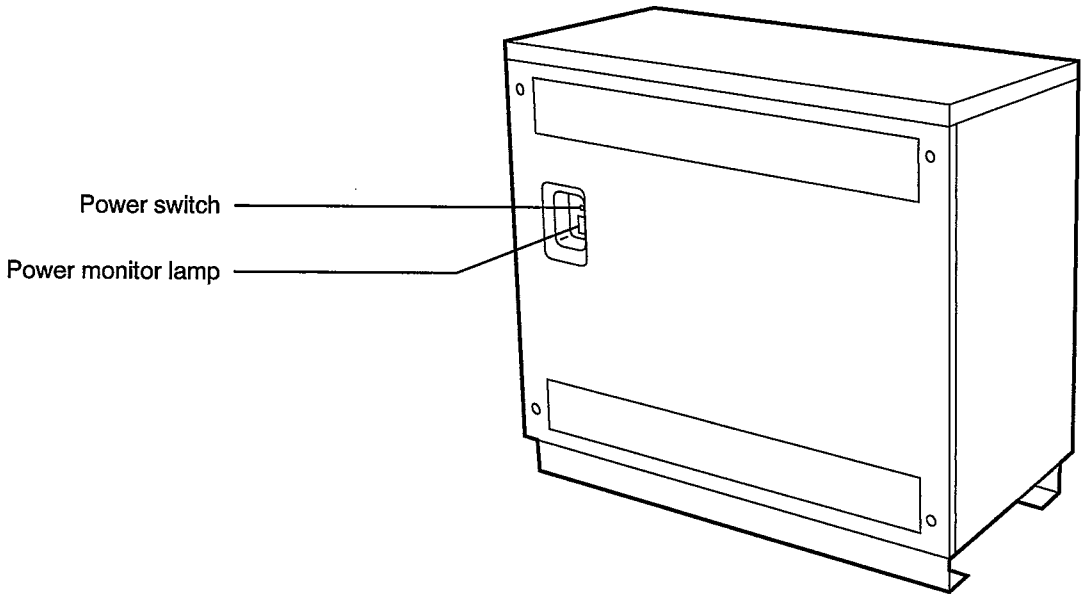
# ■EXTERNAL VIEW

## 1. CCU (Central Control Unit)

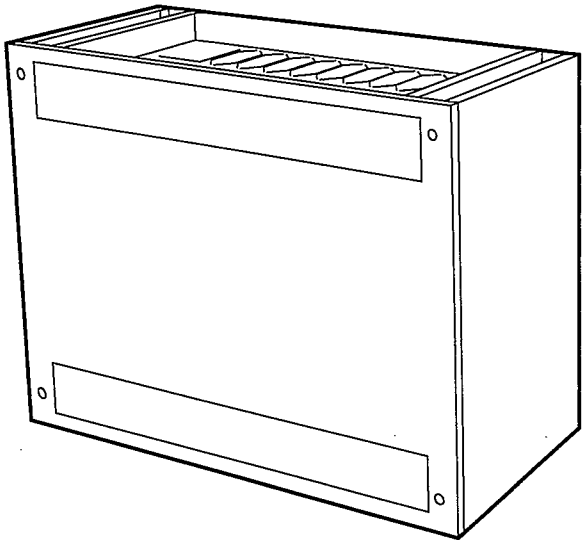
### (1)CAB40 (VB-44010UK/HK):40 port CCU




### (2)CAB96 (VB-44020UK/HK):96 port CCU

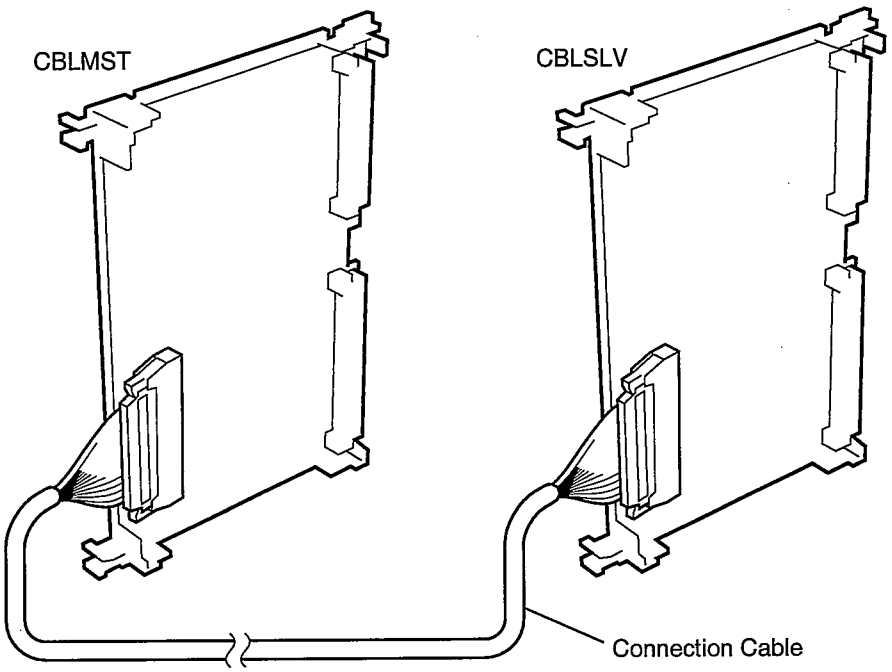


## (3)CAB96B (VB-44021UK/HK):96 expand port CCU

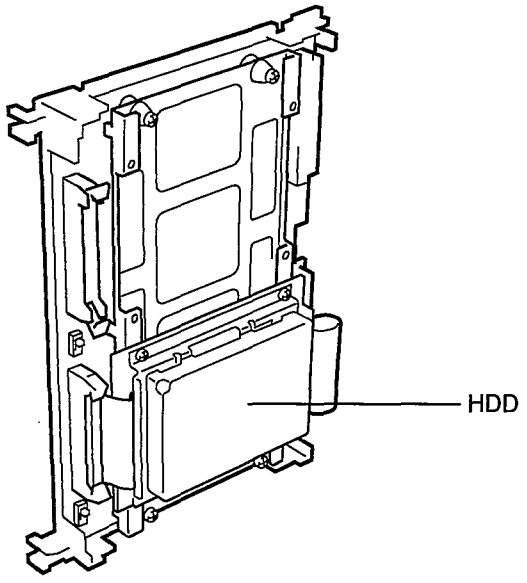


## 2. Cards

## (1)CBLKIT (VB-44450):Connection Cable Kit

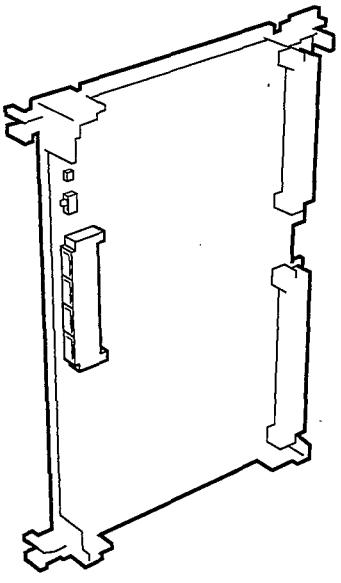


## (2)VSSC card (VB-44170UK/44170):Voice Storage Service Card



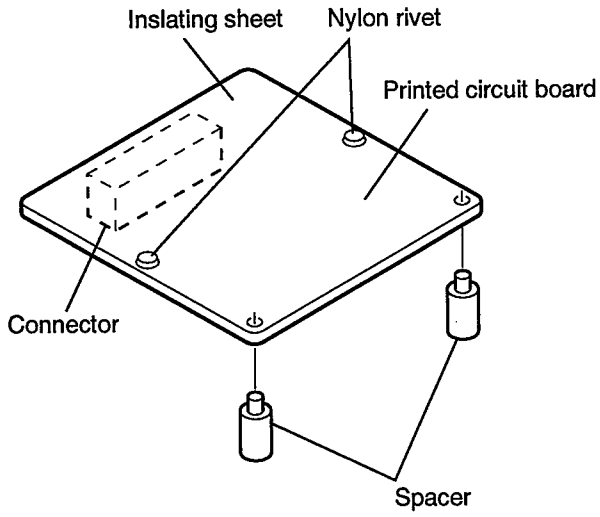

## (3)Others

CPC96 card (VB-44410UK/HK):CPC-96 Card
CPC288 card (VB-444201UK/HK):CPC-288 Card
CPC576 card (VB-444301UK/HK):CPC-576 Card
TSW288 card (VB-444202UK/HK):Time Switch 288 Card
TSW576 card (VB-444302UK/HK):Time Switch 576 Card
CBL card (VB-44451):Building Block Card
CBLDBC card (VB-44452):Connection Cable Card-DBS
SCC card (VB-44181UK/HK):Service Control Card
LTRK/8 card (VB-44510UK/HK):Loop Start Trunk Card
TBRI/4 card (VB-44530):BRI Card (T-point)
PRI/23 card (VB-44540):PRI Card (HK only)
PRI/30 card (VB-44540UK):PRI Card (UK only)
AC15/4 card (VB-44570UK):AC-15 Card (UK only)
DIDTR8 card (VB-44520HK):DID Trunk Card (HK only)
DEC/8 card (VB-44610UK):Digital Extension Card
AEC/8 card (VB-44620UK/HK):Analog Extension Card
SBRI/4 card (VB-44630):BRI Card (S-point)
MFR/8 card (VB-44110UK/HK):8 DTMF Receiver Card
CONF card (VB-44120UK/HK):Conference Card
ACD card (VB-44140UK/44140):ACD Card
VPU/8 card (VB-44150UK/44150):8 Voice Processing Card
VPU/4 card (VB-44160UK/44160):4 Voice Processing Card

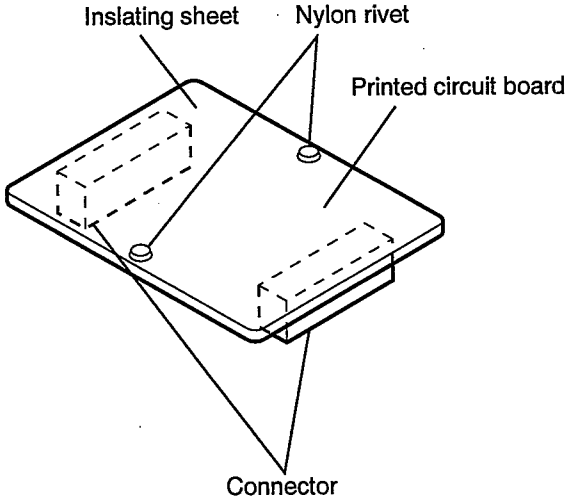


(Example:Loop Start Trunk Card)

## (4)SYNC Package (VB-44460UK)
## :Sync. Package/Network Unit

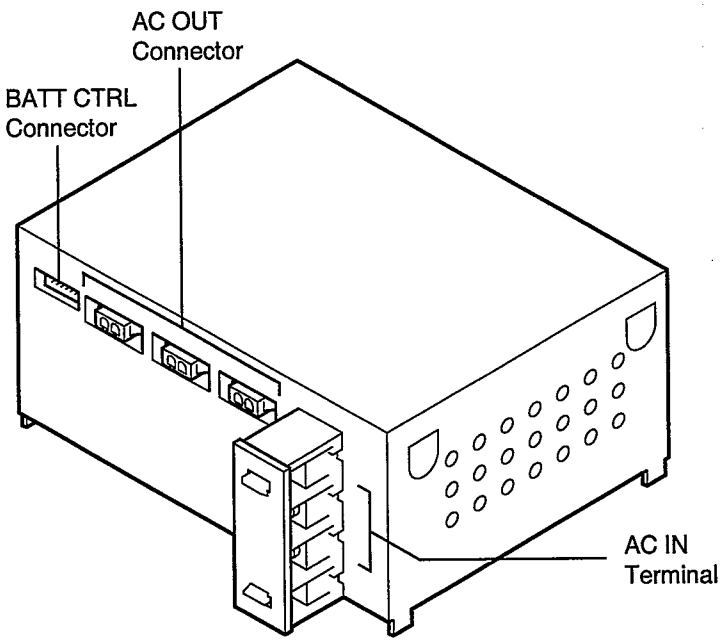



## (5)RAI Unit (VB-44182UK/HK)
## :Remote Administration Unit

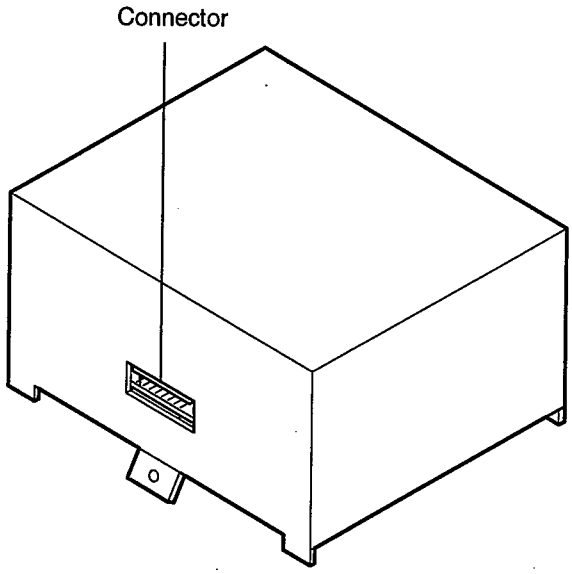



# 3. Power Supply & External Optional Equipment

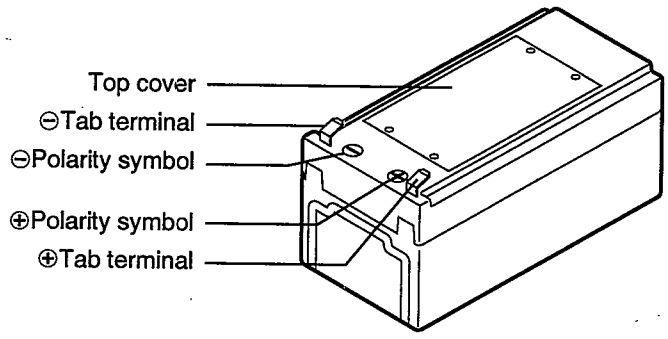
## (1)SWBOX (VB-44023UK/HK):Switch Box



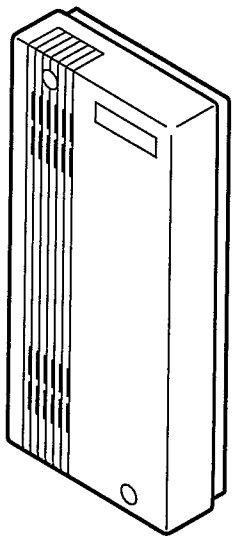
## (2)POW-48 (VB-44022):-48V Power Supply




## (3)BATT96 (VB-44025UK/44025) :Backup Battery

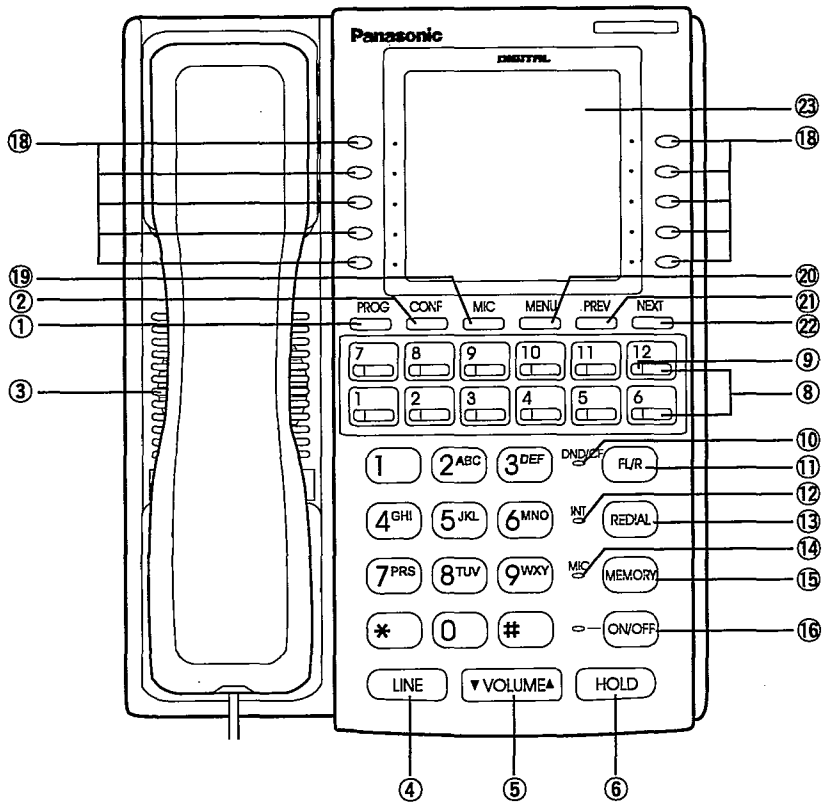



## (4)PFU (VB-43703UK) :Power Failure Unit



# 4. Key Phones

## 1)12 Key-LLCD/SPU (VB-D411LDSUK/VB-44225HK)




① PROG key ·····Used to program various functions and when transferring calls. It is also used for answering an outside call on call waiting (exchange line off-hook signal).

② CONF key·····Used for conference calls and for confirming entry of numbers for speed dialing, etc., in the one-touch speed dialling and FF key functions.

③ Speaker·····For ringing, tone, and voice.

④ LINE key ·····For making exchange line calls.

⑤ VOLUME key ·····Controls incoming call ring and handset volume, as well as LCD contrast.

⑥ HOLD key·····Places intercom and outside calls on hold. Releases intercom calls and hold.

⑦ One-touch key ·····These key can be programmed to contain telephone numbers, extension numbers and other functions for one-touch speed dialling.

⑧ FF key ·····These keys are used when making or talking exchange line calls. They can also be used to program extension and speed dialling codes.

⑨ FF LED ·····The LED associated with the key being used is green and either stays lit or flashes. The key LEDs used by other people are red and either stay lit or flash.

⑪ DND/CF LED ·····Lights up when the Do-Not-Disturb or Call Forward function has been set.

⑫ FL/R key ·····Used to terminate an outside call (without hanging up the handset) when it is desired to retain the current line to make another outside call. This key can be used to activate PBX features when the system is installed behind a PBX or Center lines.

⑬ INT LED ·····Lights when there is a conversation on the extension, flashes quickly when a call to the extension has been put on hold, and flash slowly at called extension.

⑭ REDIAL key ·····Redials the last number dialled.

⑮ MIC LED ·····Lights when the MIC key has been pressed, indicating that the built-in microphone is ON and Hands-Free Answer Back is available.

⑯ MEMORY key ·····Used when programming speed dialling numbers or using system speed dialling.

⑰ ON/OFF key ·····For on-hook dialling and programming speed dialling numbers. The LED lights when the ON/OFF key is pressed or when a line key is used to seize an exchange line and activate the monitor function.

⑱ Display ·····Shows the time and date if the telephone is not in use. When the telephone is in use, it shows the number dialled and the duration of the call.

⑲ Soft key ·····Use this key to choose the menu shown on the display.

⑳ MIC key ·····Turns the built-in microphone on and off. It can also be used when answering calls (Hands Free Answer Back function) or terminating a call.

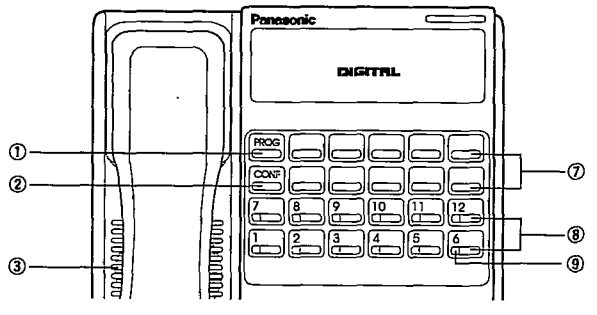
㉑ MENU key ·····Used to return the large display to the initial screen (i.e., the menu).

㉒ PREV key ·····Displays the previous screen.

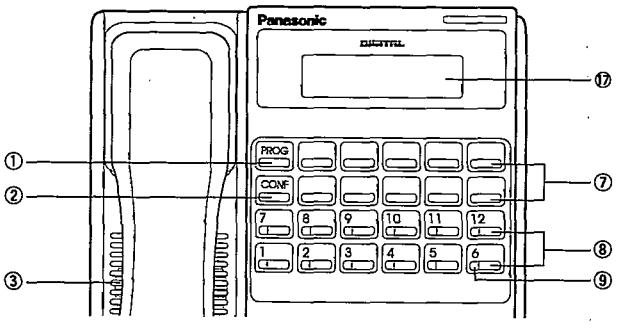
㉓ NEXT key ·····Displays the next screen.

㉔ Large display ·····This display has seven lines-six lines of 16 digits and one line of 15 digits.

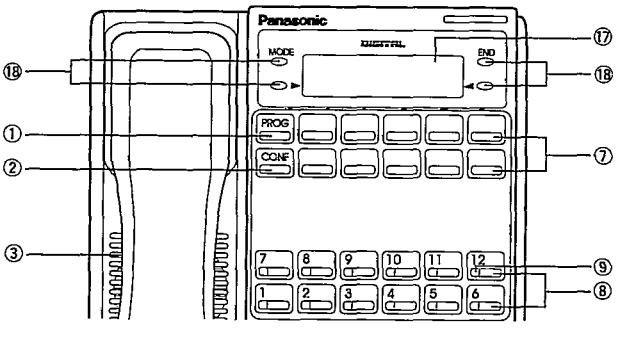
## (2)12Key(VB-D411UK) and 12 Key-SPU (VB-44221HK)



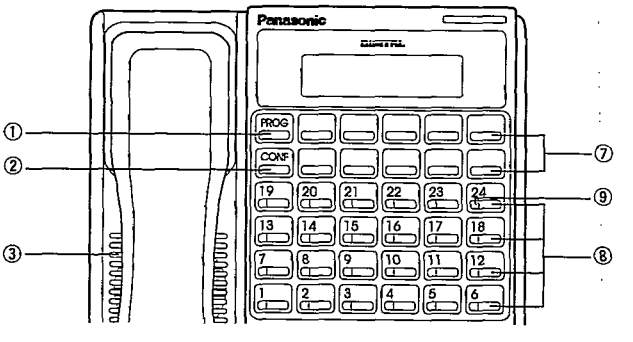

## (3)12Key-LCD/SPU(VB-D411DSUK/VB-44223HK)



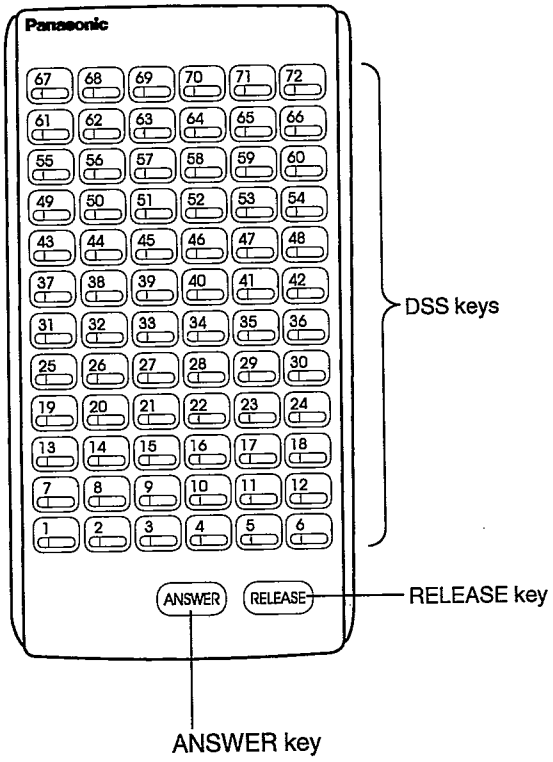

## (4)12 Key-LCD / Softkey / Voice /SLT/SPU (VB-D411DSVUK/VB-44224HK)



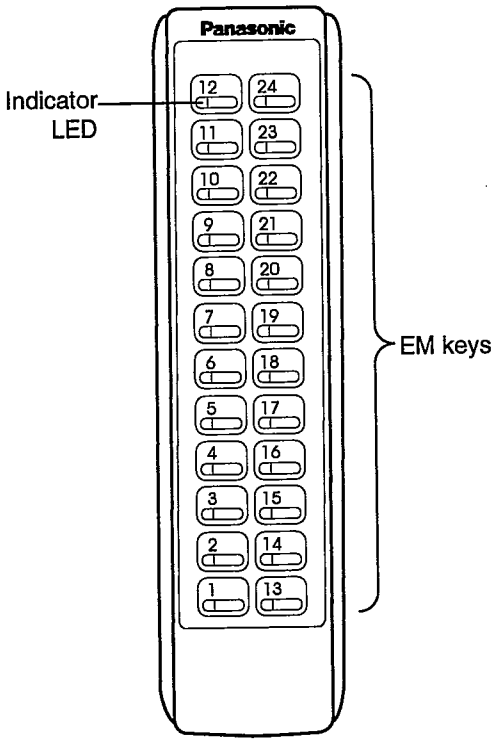

## (5)24 Key-LCD (VB-D611DUK) and 24 Key-LCD/SPU (VB-D611DSUK/VB-44233HK)



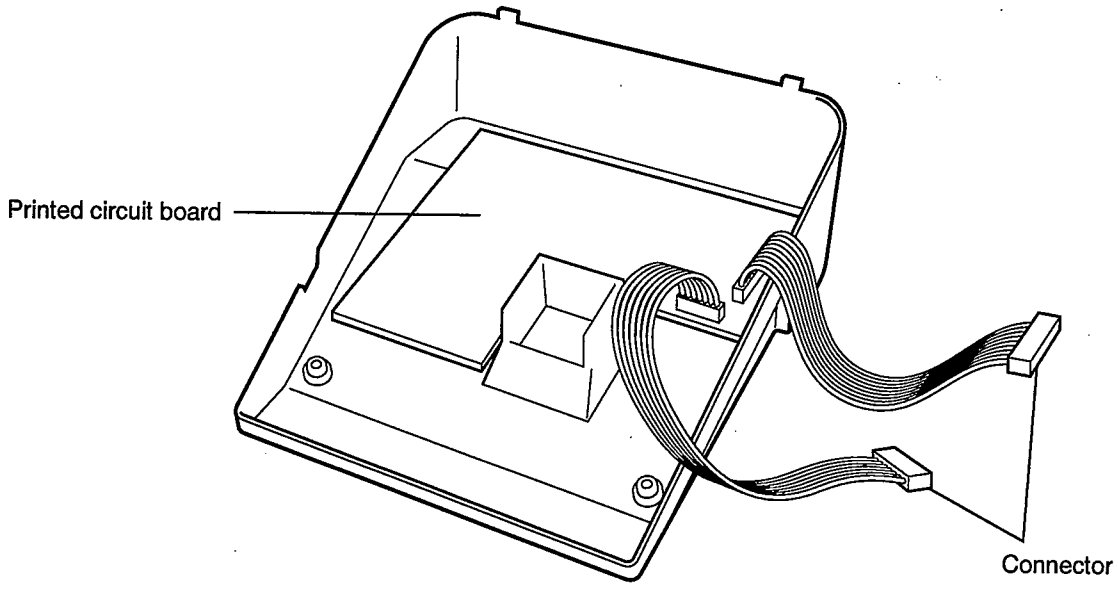
## (6)DSS (VB-D631UK/VB-44320HK)




## (7)EM24 (VB-D331UK/VB-44310HK)

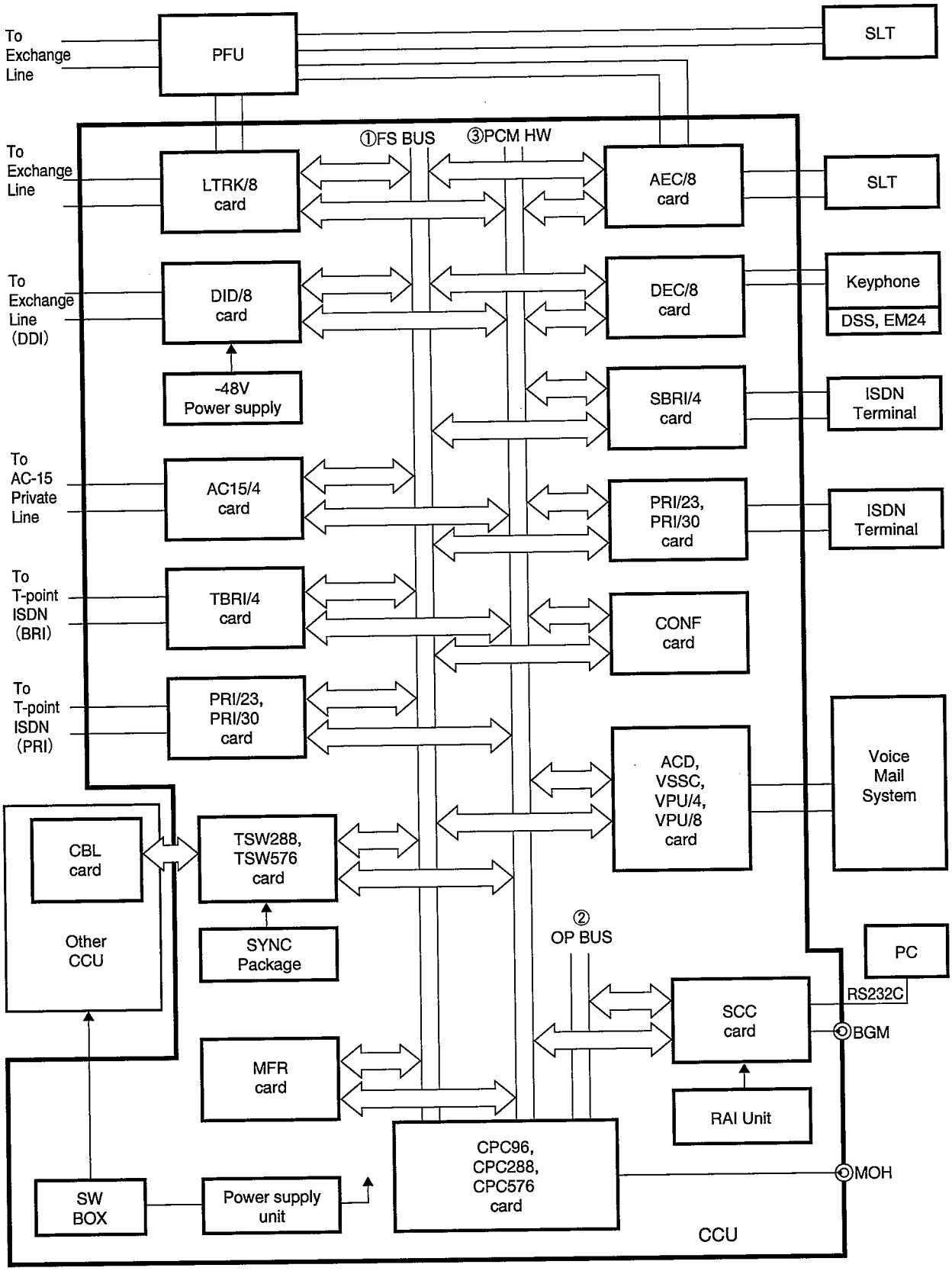


## (8)Voice Recognition Adaptor (VB-44101UK/HK)



# ■FEATURES AND TECHNICAL DESCRIPTIONS

## 1. Outline of ICX



Compared with conventional DBS systems, the ICX (Integrated Communication eXchange) system allows more exchange lines and more extension types to be accommodated. Also, up to 576 ports can be supported by adding on up to six CCUs.
Selecting the mounted card allows loop start exchange lines, DDI exchange lines (Hong Kong only) and AC-15 Private lines (UK only) and ISDN (PRI, BRI) to be accommodated as the exchange line. Also, digital extensions lines, analog extensions and ISDN terminals (PRI, BRI) can be accommodated as the extension.
The following describes the FS BUS, OP BUS and PCM HW in the block diagram. Cards and options in the block diagram are described on the following pages.

① FS BUS (Flexible Slot BUS)
The FS BUS comprises the address bus, data bus and control bus of the FPU (MPU that controls the terminal). The FS BUS carries out 8-bit data communications between the FPU and the CPU on the terminal. This controls all cards (excluding the power supply unit) that are mounted in option slots (OP) and flexible slots (FS).

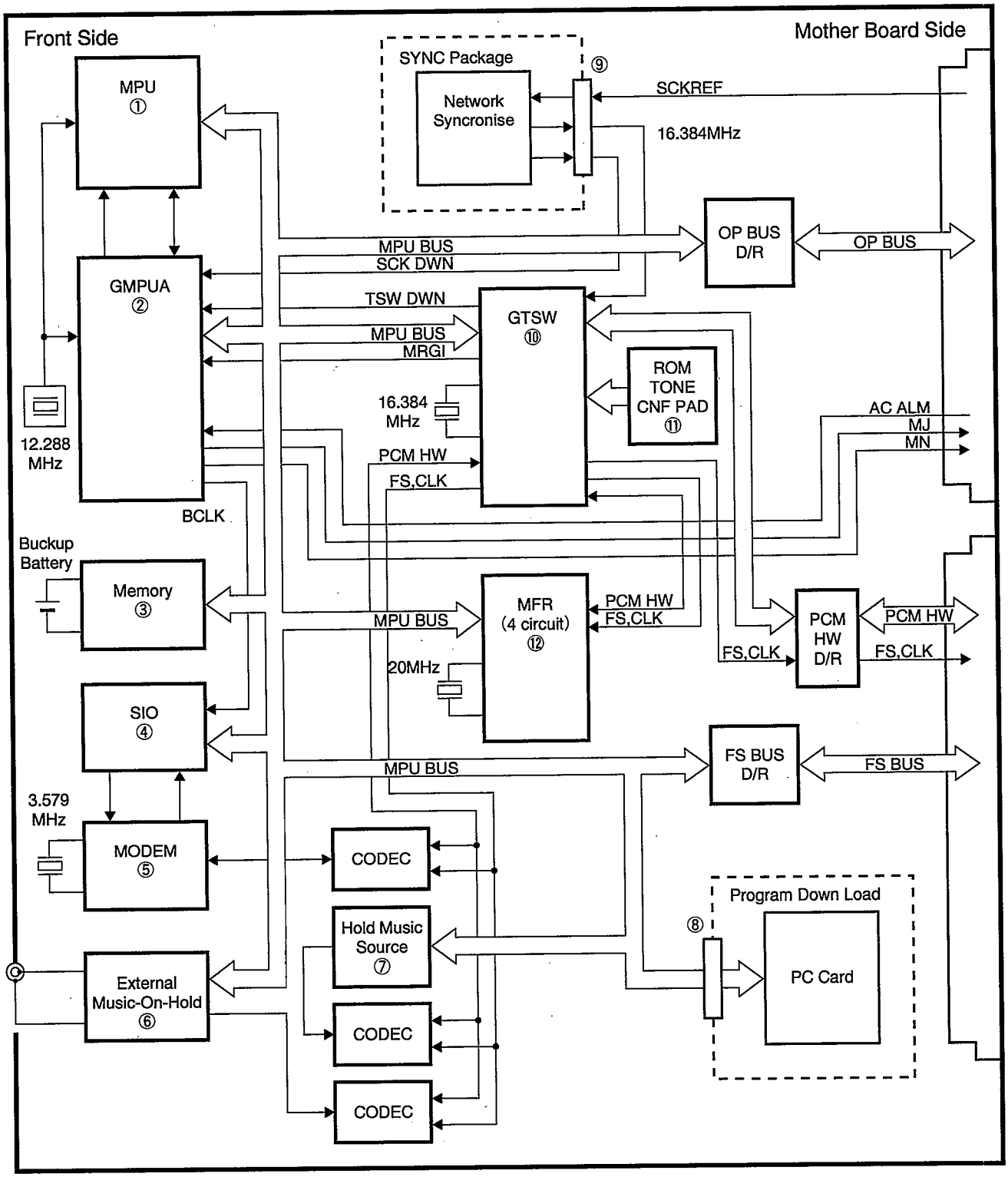
② OP BUS (Option Slot BUS)
The OP BUS comprises the address bus, data bus and control bus of the MPU (CPU that controls call processing). The OP BUS carries out 8-bit data communications between the MPU and the CPU on option units. This controls all cards mounted on the option slots (OP).

③ PCM HW (PCM Highway)
The PCM HW comprises the PCM data and PCM synchronising clock. Voice and DTMF signals are received and transmitted, and time-division exchange functions are executed by PCM data communications.

④ H BUS
H BUS connects ISDN card and CPU card.
This controls ISDN related features.

## 2. Cards

## (1) CPC96 card (VB-44410UK/HK) : CPC-96 card




MJ LED:Lights when a big problem occurs in the system e.g.) Breaking Network LSI.

MN LED:Lights when a small problem occurs in the system e.g.)・Problem writes error.

・problem which leads to the call disconnecting.

The CPC96 card is a CPU card for a 40 to 96 port system. A 16-bit CPU is used.
The CPU96 card provides a time switch (4 HW x 4 HW), a 4-circuit MFR (DTMF receiver circuit), conference circuits, service tone, a DTMF transmitter, an input terminal for external hold tone source (RCA jack), a connecting terminal for synchronisation package (VB-44460UK), an interface connector for external PC card and modem (300 bps) functions. The system control program is downloaded to the internal memory of the system through the PC card.

The following briefly describes the main blocks of the CPC96 card.

① MPU
The MPU is the CPU that controls the system up to 96 ports. This CPU uses a 12.288 MHz clock.

② GMPUA
The GMPUA is an MPU gate array IC that has functions for generating MPU control signals,address decode and controlling ports. The GMPUA uses the same 12.288 MHz clock as the MPU.

③ Memory
4M bytes of area is provided as program area (boot ROM and flash memory). 2M bytes each are provided as customizing area (SRAM) and work area (DRAM).
Customising memory is battery-backed up at all times.

④ SIO
The SIO has a parallel data serial data conversion function for modem communications and a modem control function.

⑤ MODEM
This is a 300 bps modem block for remote maintenance. This modem carries out serial data reception and transmission compliant with ITU-T V.21 protocol.

⑥ External Music-On-Hold
This is the input interface block for Music-On-Hold (MOH). The input level is adjusted by the digital PAD function in the GTSW block.

⑦ Hold Music Source (Hong Kong only)
A sound source (four tunes) is built in as the hold music. You can select the desired hold music by programming the MPU.

⑧ Program Down Load
This is the interface for connecting to the PC card for downloading the program. In the case of the CPC96 card, the PC card is mounted only when the program is downloaded, and is removed during regular use.

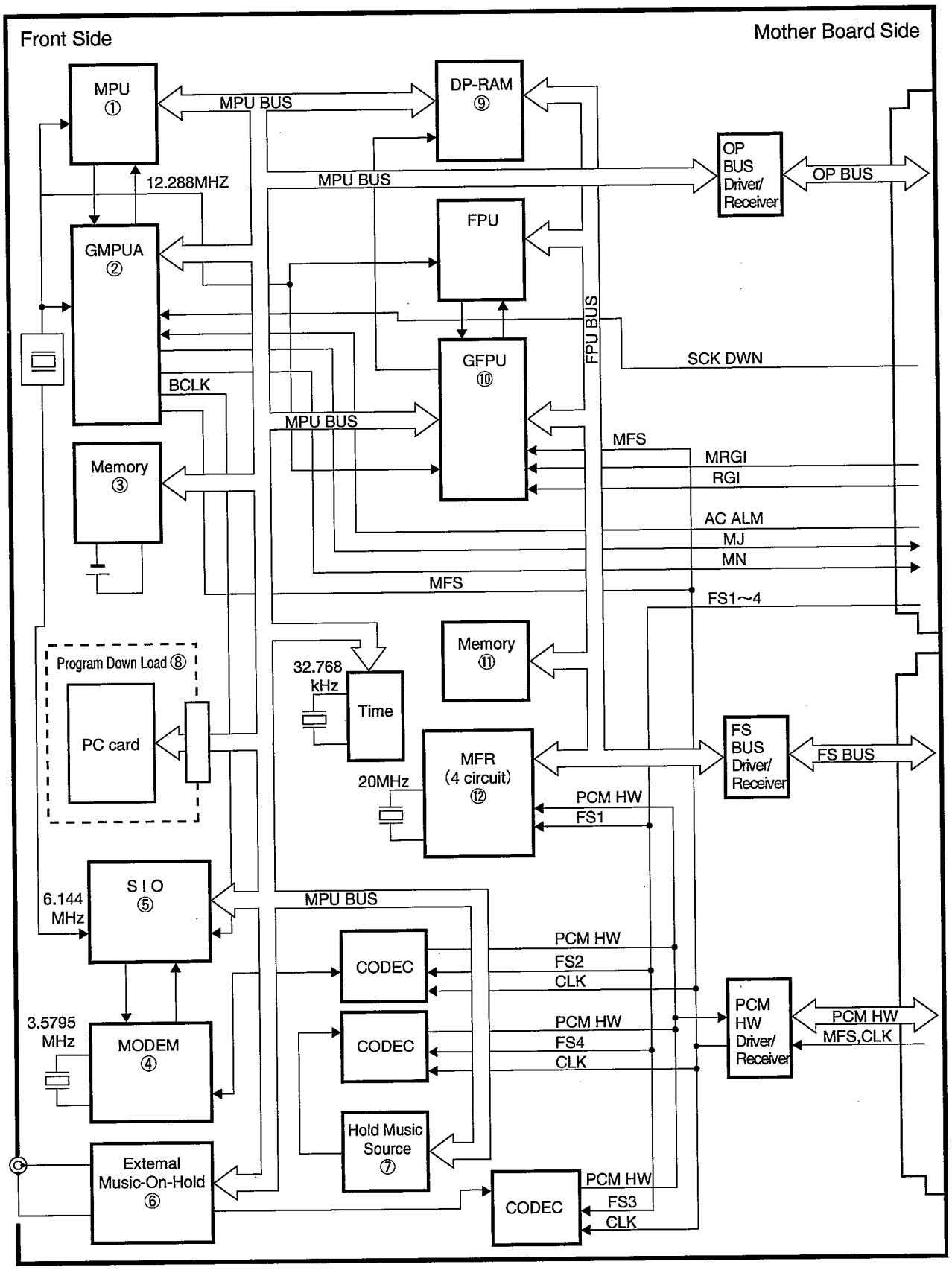
⑨ Network Synchronising Interface
This interface is for connecting to the synchronisation package (network synchronising circuit).
This is required when using ISDN.

⑩ GTSW
The GTSW is a gate array for carrying out time-division exchange of PCM data such as voice data. This gate array has a PAD control function, service tone generation function and a CONF control function.

⑪ Tone ROM
This ROM has built-in data for PAD, TONE and CONF, and has a capacity of 125k bytes. This ROM operates as I/O for GTSW.

⑫ MFR
The MFR is the gate array for receiving DTMF signals on the PCM highway. It has four built-in channels.

## (2) CPC288 card (VB-444201UK/HK) : CPC-288 card




The CPC288 card is a CPU card for a 96 to 288 port system. A 16-bit CPU is used.

The CPC288 card provides a 4-circuit MFR (DTMF receiver circuit), an input terminal for external hold tone source (RCA jack), an interface connector for external PC card and modem (ITU-T V.21/300 bps) functions.
The card is used with the TSW288 card (VB-444202UK/HK) for 96 to 288 port systems.
The system control program is downloaded to the internal memory of the system through the PC card.

The following briefly describes the main blocks of the CPC288 card.

① MPU
The MPU is the CPU that controls the system up to 288 ports. This CPU uses a 12.288 MHz clock.

② GMPUA
The GMPUA is an MPU gate array IC that has functions for generating MPU control signals, the address decode, and controlling ports. The GMPUA uses the same 12.288 MHz clock as the MPU.

③ Memory
4M bytes of area is provided as program area (boot ROM and flash memory). 2M bytes each are provided as customizing area (SRAM) and work area (DRAM).
Customising memory is battery-backed up at all times.

④ MODEM
This is a 300 bps modem block for remote maintenance. This modem carries out serial data reception and transmission compliant with ITU-T V.21 protocol.

⑤ SIO
The SIO has a parallel data/serial data conversion function for modem communications and a modem control function.

⑥ External Music-On-Hold
This is the input interface block for External Music-On-Hold. The input level is adjusted by the digital PAD function in the TSW288 card.

⑦ Hold Music Source (Hong Kong only)
A sound source (four tunes) is built in as the hold music. You can select the desired hold music by programming the MPU.

⑧ Program Down Load
This is the interface for connecting to the PC card for downloading the program. In the case of the CPC288 card, the PC card is mounted only when the program is downloaded, and is removed during regular use.

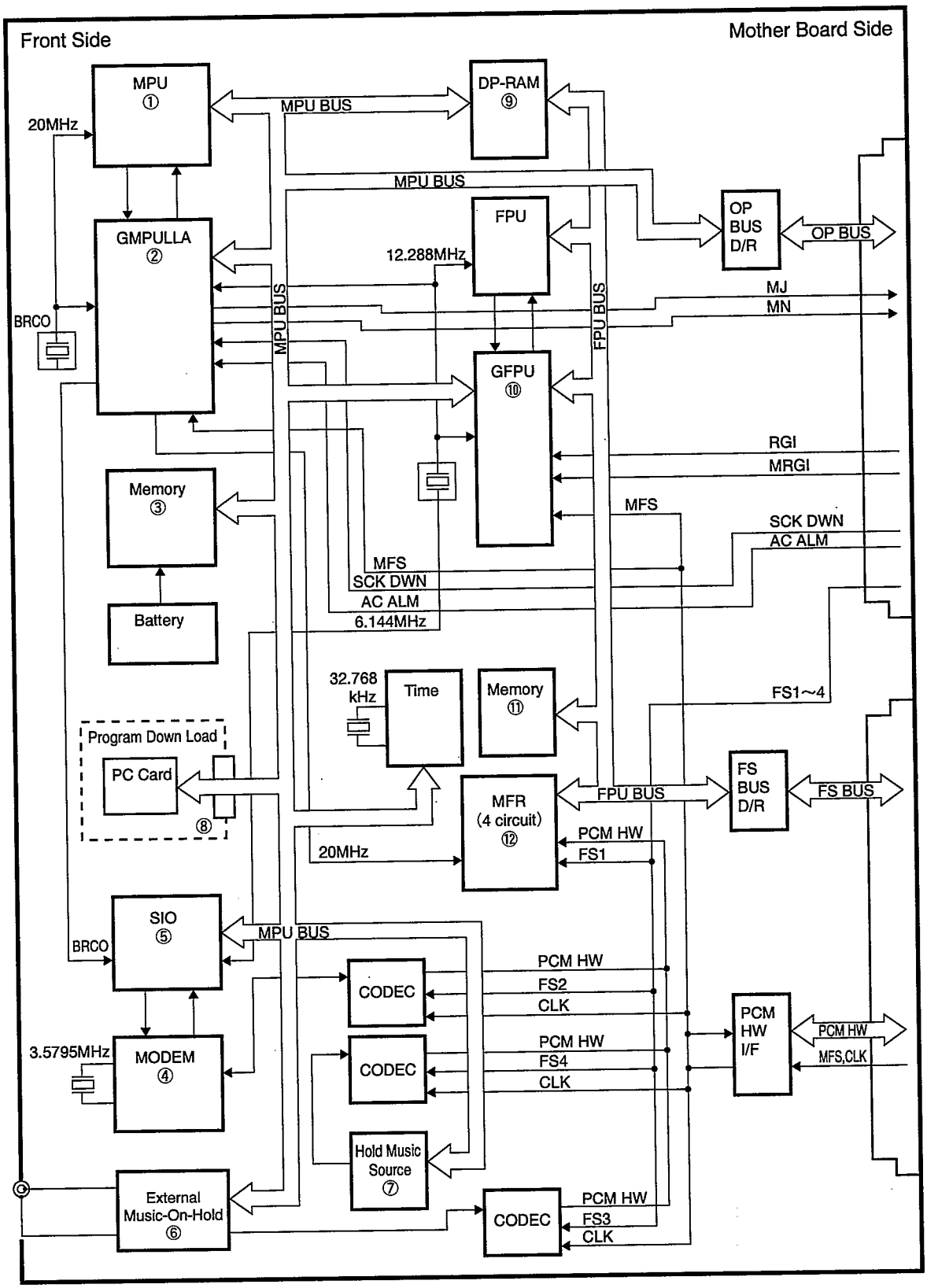
⑨ DP-RAM(Dual Port RAM)
DP-RAM carries out communications between the MPU and FPU. The capacity of this RAM is 32k bytes.

⑩ GFPU
This gate array has functions for generating the FPU control signals, address decode, and controlling interrupts. The GFPU carries out DP-RAM control between the MPU and FPU.

⑪ FPU Memory
A 128k byte memory area is provided as program area (ROM) and 64k byte memory area is provided as work area.

⑫ MFR
The MFR is the gate array for receiving DTMF signals on the PCM highway. It has four built-in channels.

# (3) CPC576 card (VB-444301UK/HK) : CPC-576 card




The CPC576 card is a CPU card for a 96 to 576 port system. A 32-bit CPU is used.
The CPC576 card provides a 4-circuit MFR (DTMF receiver circuit), an input terminal for external hold tone source (RCA jack), an interface connector for PCM-CIA (PC card interface connector) and modem (300 bps) functions.

The card is used with the TSW576 card (VB-444302UK/HK) for a 96 to 576 port system.
The system control program is downloaded to the internal memory of the system through the PC card. The PC card is also necessary during normal operating time (do not remove the PC card).

The following briefly describes the main blocks of the CPC576 card.

① MPU
The MPU is the CPU that controls the system up to 576 ports. This CPU uses a 20M Hz clock.

② GMPULLA
The GMPULLA is an MPU gate array IC that has functions for generating MPU control signals, the address decode, and controlling ports. The GMPULLA uses the same 20M Hz clock as the MPU.

③ MPU Memory
6M bytes of area is provided as program area (DRAM (SIMM)). 3M bytes are provided as customizing area (SRAM) and 4M bytes are provided as work area (DRAM (SIMM)). The program area includes 128k bytes of area as boot program area (ROM).
Customising memory is battery-backed up at all times.

④ MODEM
This is a 300 bps modem block for remote maintenance. This modem carries out serial data reception and transmission compliant with ITU-T V.21 protocol.

⑤ SIO
The SIO has a parallel data/serial data conversion function for modem communications and a modem control function.

⑥ External Music-On-Hold
This is the input interface block for External Music-On-Hold. The input level is adjusted by the digital PAD function in the TSW288 card or TSW576 card.

⑦ Hold Music Source (Hong Kong only)
A sound source (four tunes) is built in as the hold music. You can select the desired hold music by programming the MPU.

⑧ PC Card Interface
This is the interface for connecting to the PC card for downloading the program. In the case of the CPC576 card, regular operation is carried out even with the PC card mounted, after the program is downloaded.

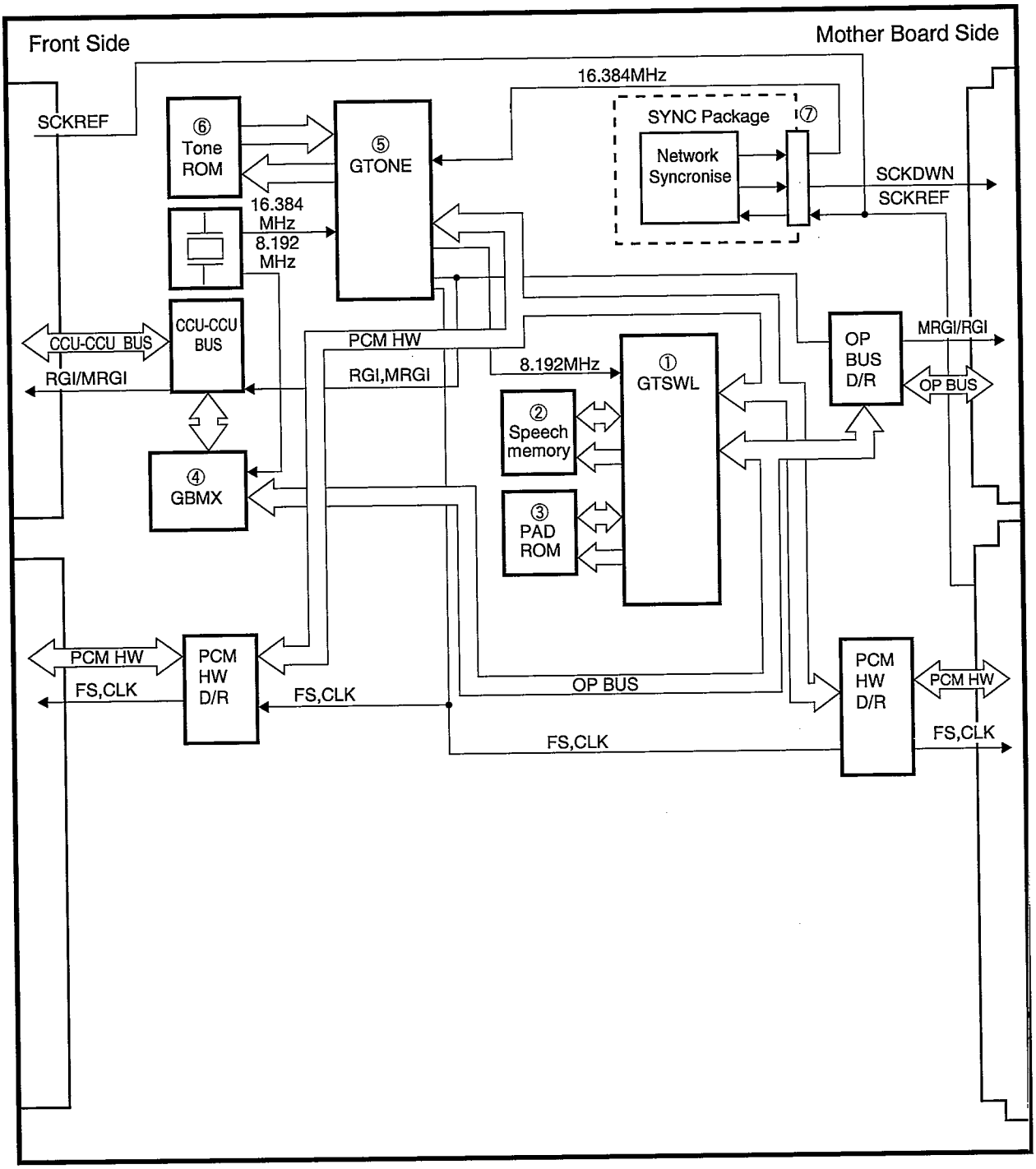
⑨ DP-RAM(Dual Port RAM)
DP-RAM carries out communications between the MPU and FPU. The capacity of this RAM is 32k bytes.

⑩ GFPU
This gate array has functions for generating the FPU control signals, address decode, and controlling interrupts. The GFPU carries out DP-RAM control between the MPU and FPU.

⑪ FPU Memory
A 128k byte memory area is provided as program area (ROM) and 64k byte memory area is provided as work area (SRAM).

⑫ MFR
The MFR is the gate array for receiving DTMF signals on the PCM highway. It has four built-in channels.

# (4) TSW288 card (VB-444202UK/HK) : Time Switch 288 card



The TSW288 card is the time switch card for the CPC288 card that is used for a 96 to 288 port system. This card is used paired with the CPC288 card. The TSW288 card is mounted on the option slot of the CAB96 main cabinet. Only one TSW288 card can be mounted for each system (maximum 288 ports).
The TSW288 card provides functions for a time switch (16 HW x 16 HW), service tone, a DTMF transmitter, a connecting terminal for a synchronisation package (VB-44460UK) and conference circuits.

The following briefly describes the main blocks of the TSW288 card.

① GTSWL
The GTSWL is a gate array for carrying out time-division exchange of PCM data such as voice data. This gate array also carries out PAD control.

② Speech memory
This speech memory is for time-division exchange. It also operates as the I/O for GTSWL.

③ PAD ROM
This ROM has a built-in digital PAD. It also operates as the I/O for GTSWL.

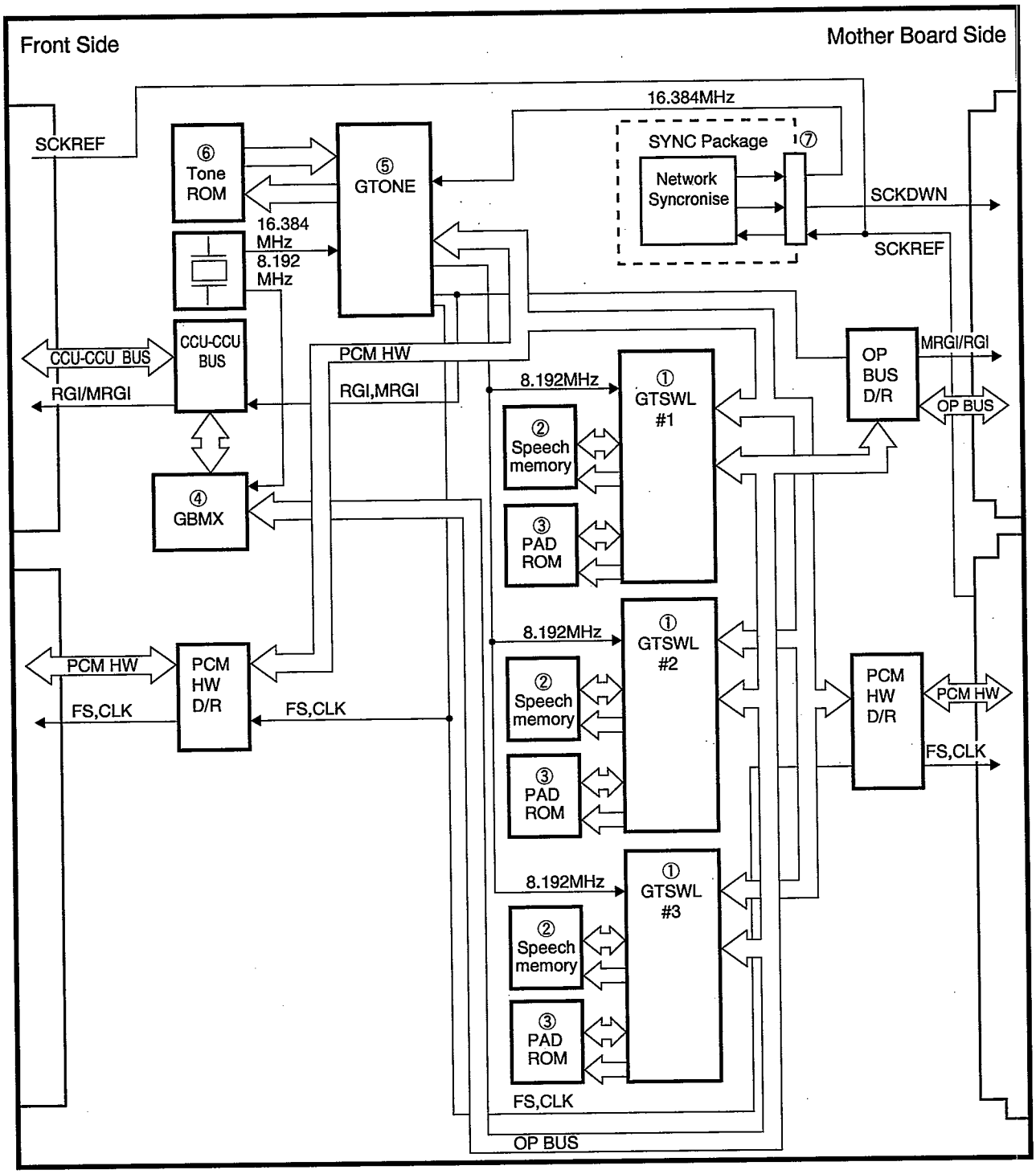
④ GBMX
The GBMX is the gate array IC for the bus interface which carry out conversion between CCU-CCU bus and OP bus.
The CCU-CCU bus is configured by multiplexing the address bus and the data bus on the OP bus. This gate array executes multiplexing and division of the address bus and the data bus on the OP bus.

⑤ GTONE
GTONE has a function for generating 64 service tone signals including DTMF signals and a conference conversation function.
It also has a multiplexing and division function for expansion CCU optional highways, and generates the operating clock for GTSWL and other units.

⑥ Tone ROM
This ROM operates as I/O for GTONE, and has built-in service tones (DT, BT, RBT and DTMF signals) and data for conference conversations.

⑦ Network Synchronising
This interface is for connecting to the synchronisation package, and has a 20-pin connector.

# (5) TSW576 card (VB-444302UK/HK) : Time Switch 576 card



The TSW576 card is the time switch card for the CPC-576 card that is used for a 96 to 576 port system. This card, used for a system with a maximum 576 ports, is paired with the CPC-576 card (VB-444301UK/HK) for a 576-port system.
The TSW576 card is mounted on the option slot of the CAB96 main cabinet.
Only one TSW576 card can be mounted for each system.
The TSW576 card provides the functions for a time switch (24 HW x 24 HW), service tone, a DTMF transmitter, a connecting terminal for synchronisation package (VB-44460UK), and conference circuits.

The following briefly describes the main blocks of the TSW576 card.

① GTSWL
The GTSWL is a gate array for carrying out time-division exchange of PCM data such as voice data. This gate array also carries out PAD control.

② Speech memory
This speech memory is for time-division exchange. It also operates as the I/O for GTSWL.

③ PAD ROM
This ROM has a built-in digital PAD. It also operates as the I/O for GTSWL.

④ GBMX
The GBMX is the gate array IC for the bus interface which carry out conversion between CCU-CCU bus and OP bus.
The CCU-CCU bus comprises multiplexing of OP bus addresses and the data bus. This gate array executes multiplexing and division of the address bus and the data bus on the OP bus.

⑤ GTONE
GTONE has a function for generating 64 service tone signals including DTMF signals and a conference conversation function.
It also has a multiplexing and division function for expansion CCU optional highways, and generates the operating clock for GTSWL and other units.

⑥ Tone ROM
This ROM operates as I/O for GTONE, and has built-in service tones (DT, BT, RBT and DTMF signals) and data for conference conversations.

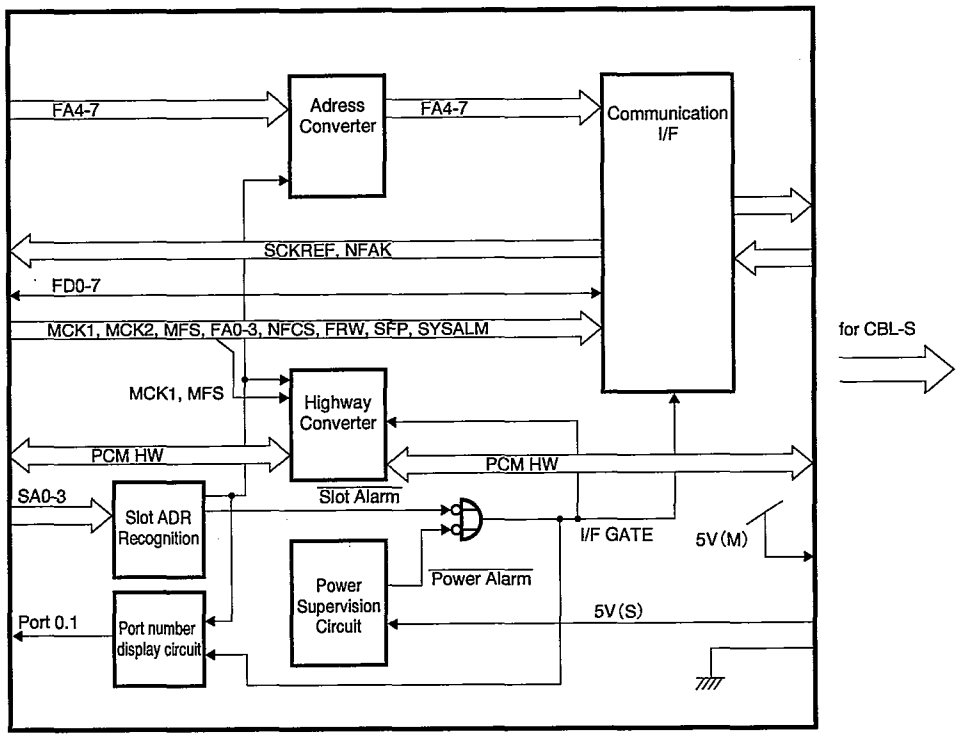
⑦ Network Synchronising
This option interface is for connecting to the synchronisation package, and has a 20-pin connector.

## (6) CBLMST card (VB-444501) : Connection Cable card-M/ CBLSLV card (VB-444502) : Connection Cable card-S

The CBLMST card (VB-444501) and the CBLSLV card (VB-444502) are required for connecting two CAB40s in a 2-cabinet connection (CAB40 + CAB40).
The CBLMST card is mounted on the FS5 slot of the master cabinet, and the CBLSLV card is mounted on the CPC slot of the slave cabinet. A dedicated cable, which connects the connector on each card, connects two CAB40 systems (2-cabinet connection).

The following briefly describes the main blocks of the CBLMST card and CBLSLV card.

● CBLMST Card




① Address Converter
This circuit converts addresses from the base CCU. FS1 to FS5 slots of slave cabinet is converted to FS5 to FS9 slots.

② Highway Converter
This circuit converts PCM highways HW4 and HW5 on the base CCU so that those highways can be connected to expansion CCUs.

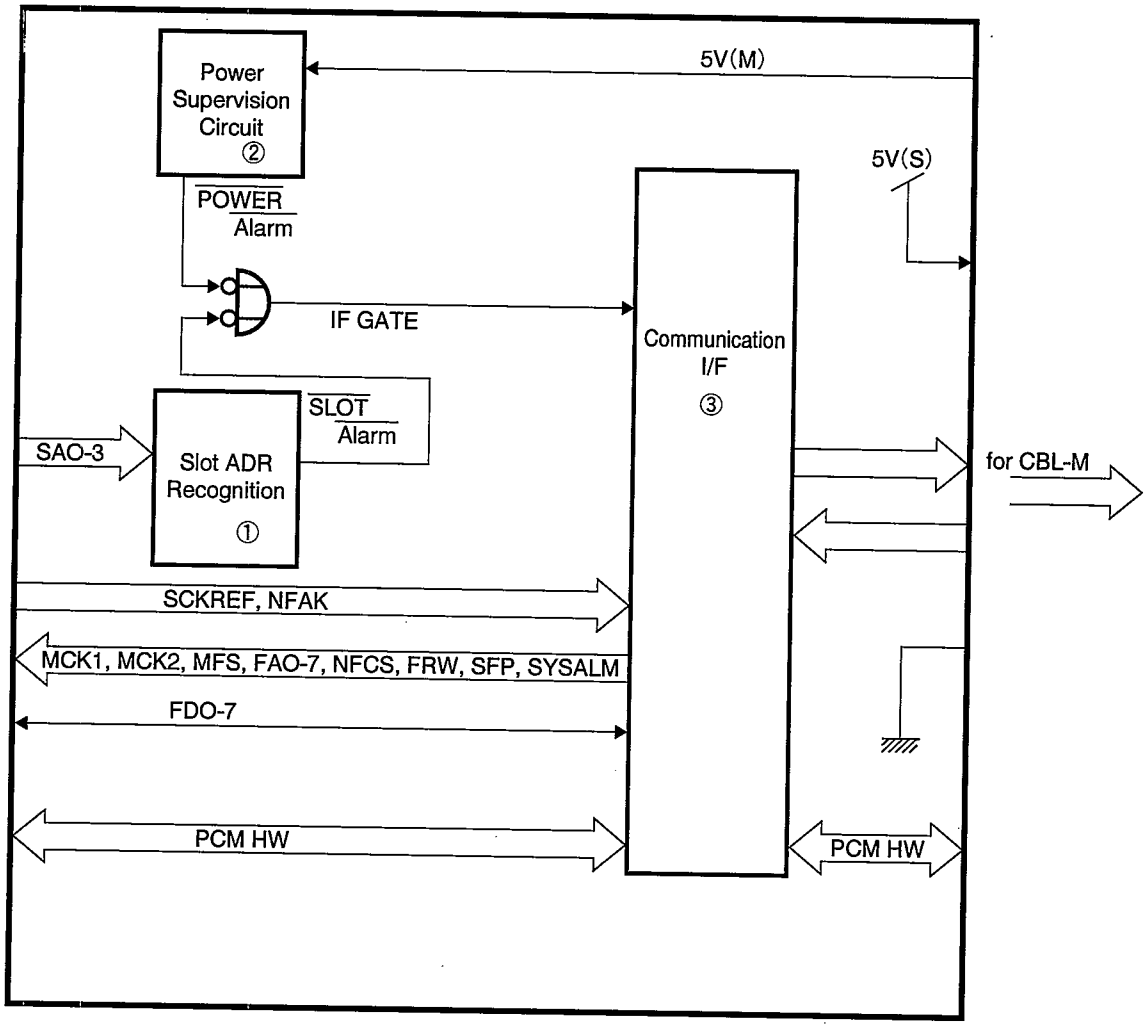
③ Slot Address Recognition
This block recognizes whether or not the CBLMST card is mounted at FS5. If the CBLMST card is mounted at a slot other than the FS5, this block operates to restrict connection to the CBLSLV card.

④ Power Supervision Circuit
This circuit supervises the +5V power supply on the CBLSLV card. If trouble such as a power failure occurs, this circuit restricts connection to the CBLSLV card.

⑤ Communication I/F
This interface comprises drivers and receivers of signal lines such as the FS-BUS or PCM highway.

⑥ Port Number Display Circuit
This circuit notifies the size of CCU to the MPU on the CPC card after CCU has been added.

● CBLSLV Card

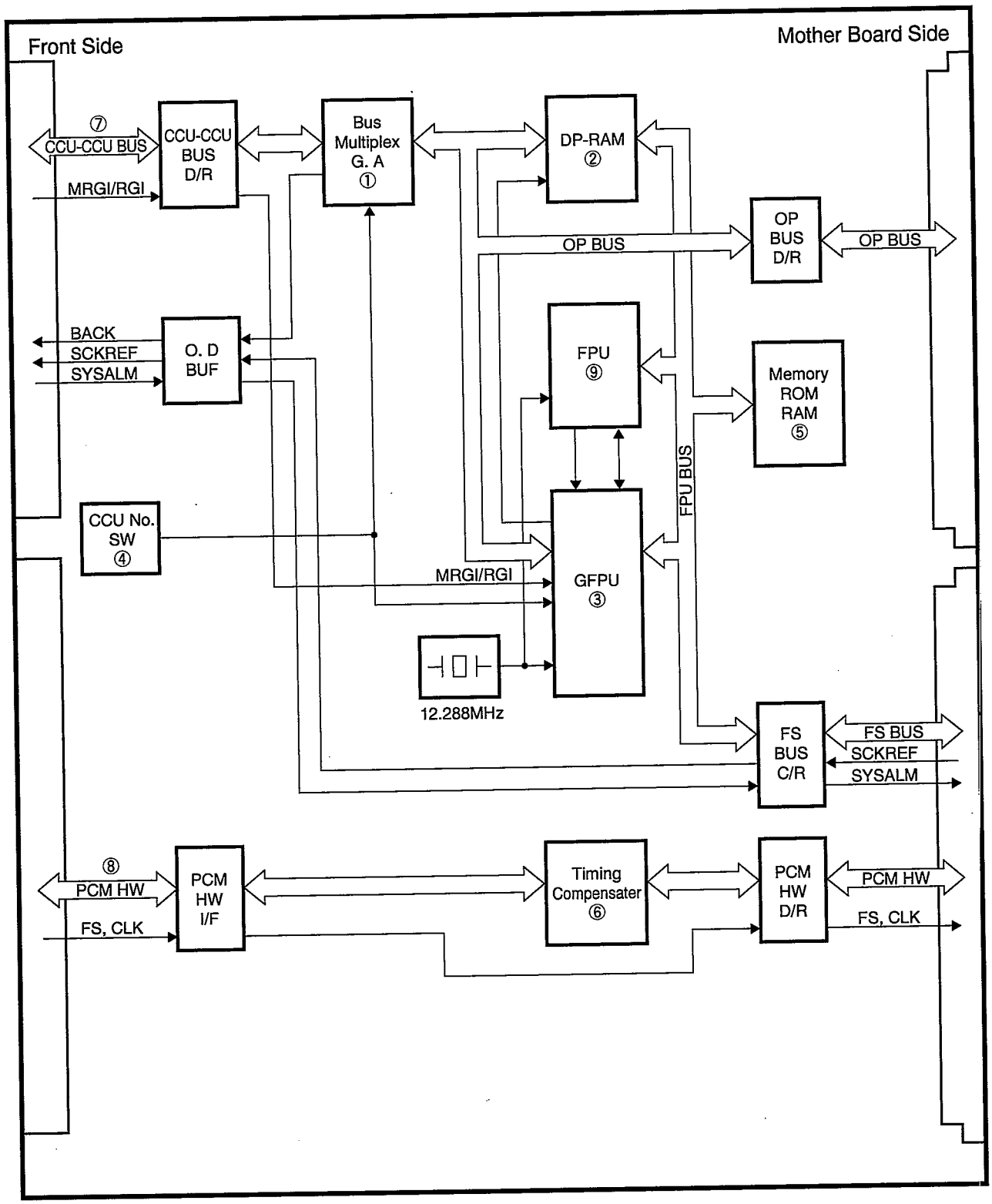



① Slot Address Recognition
This block recognizes whether or not the CBLSLV card is mounted at the CPC slot. If the CBLSLV card is mounted at a slot other than the CPC slot, this block operates to restrict connection to the CBLMST card.

② Power Supervision Circuit
This circuit supervises the +5V power supply on the CBLMST card. If trouble such as a power failure occurs, this circuit restricts connection to the CBLMST card.

③ Communication I/F
This interface comprises drivers and receivers of signal lines such as the FS-BUS or PCM Highway.

# (7)CBL Card (VB-44451) : Building Block card



The CBL card is required for the building block connection of CAB96 and CAB96B (CAB96 + CAB96B... + CAB96B). The TSW288/TSW576 card is also necessary for a building block connection.
The CBL card is mounted on the CPC slot of the Expand cabinet, and a dedicated cable connects the connector on this card and the connector on the TSW288/TSW576 card, which is mounted on the OP1 slot of the Base cabinet. This makes it possible to connect multiple (maximum 6) cabinets (building block connection).

The following briefly describes the main blocks of the CBL card.

① Bus Multiplex Gate Array
This gate array is for the bus interface which carry out the conversion between CCU-CCU bus and OP bus.
The CCU-CCU bus is configured by multiplexing the address bus and the data bus on the OP bus. This gate array executes multiplexing and division of the address bus and the data bus on the OP bus.

② DP-RAM
Communications between the MPU on the base cabinet and the FPU on expansion cabinets is carried out by DP-RAM configured memory. The capacity of this DP-RAM is 32k bytes.

③ GFPU
This FPU gate array has functions for generating the FPU control signals, for generating control signals for peripheral block, and for controlling interrupts. The GFPU also carries out DP-RAM control of communications between the MPU on the base cabinet and the FPU on expansion cabinets.

④ Cabinet number Switch
The number of expansion cabinets selected by setting this rotary switch. The number can be set within the range No.1 to No.5. Other settings are forbidden.

⑤ Memory
As FPU memory, 128k byte memory area is provided as program area (ROM) and 64k byte memory area is provided as work area (RAM).

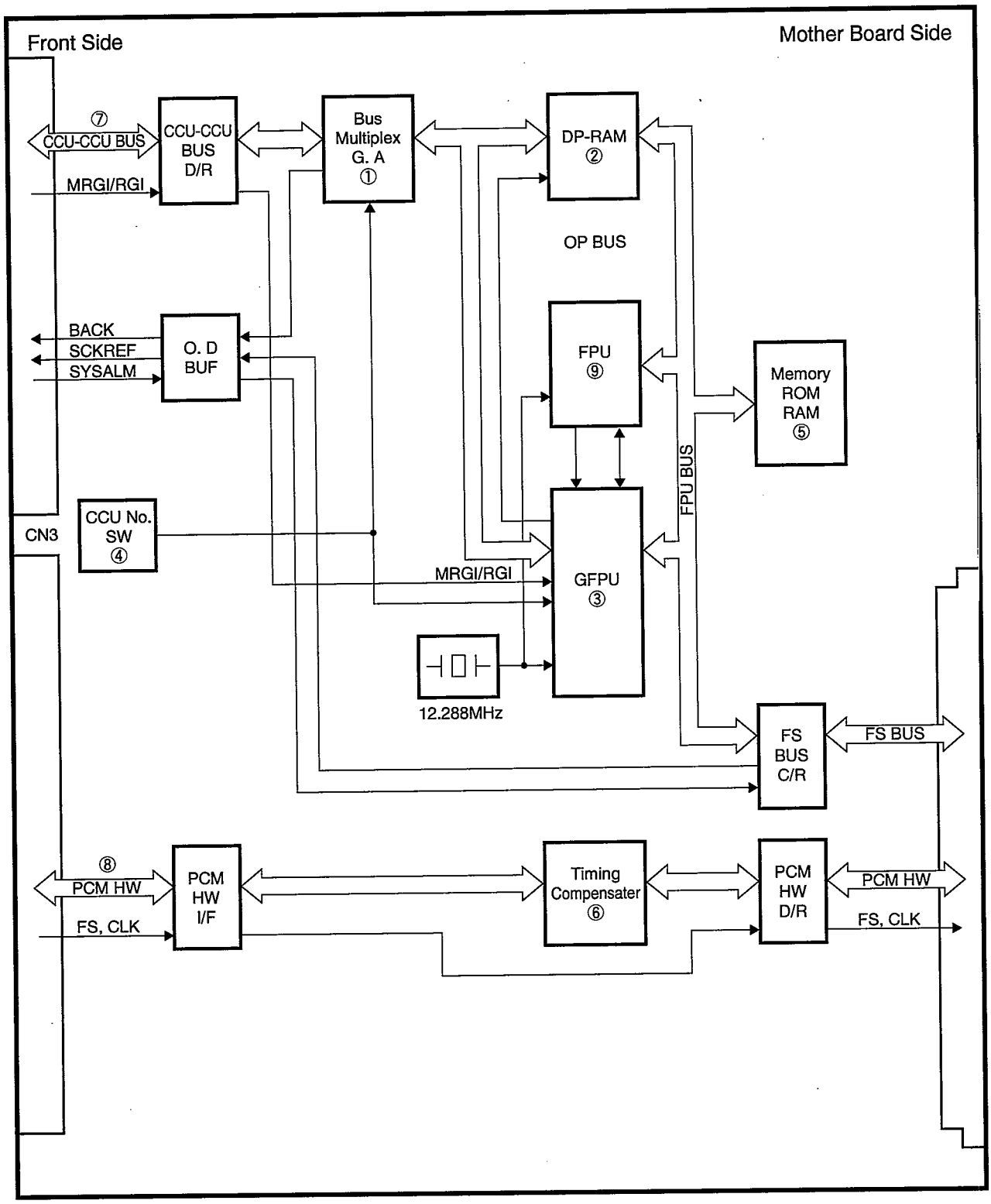
⑥ Timing Compensator
This block compensates the timing of the upward data (data to a base cabinet from an expansion cabinet) on the PCM highway.

⑦ CCU-CCU Bus
This is the control bus between the base cabinet and expansion cabinets, and between expansion cabinets, and expansion cabinets.
The CCU-CCU bus is configured by mulltiplexing the address bus and data bus on the OP bus.

⑧ CCU PCM-HW
This is the PCM highway between the base cabinet and expansion cabinets, and between expansion cabinets and expansion cabinets.

⑨ FPU
This is the CPU for controlling expansion cabinets. The FPU controls the extension cards and exchange line cards on expansion cabinets via the FPU bus.

# (8) CBLDBS card (VB-44452) : Connection Cable card-DBS



The CBLDBS card is required for connecting the CAB96 and DBS (VB-3657) systems. The TSW288/TSW576 card is also necessary to connect the CAB96 and DBS systems.
The CBLDBS card is mounted on the AUX1 slot of the DBS, and a dedicated cable connects the connector on this card and the connector on the TSW288/TSW576 card, which is mounted on the OP1 slot of the CAB96. This makes it possible to connect the CAB90 and DBS systems.

The following briefly describes the main blocks of the CBLDBS card.

① Bus Multiplex Gate Array
This gate array is for the bus interface which carry out the conversion between CCU-CCU bus and OP bus.
The CCU-CCU bus is configured by multiplexing the address bus and the data bus on the FS bus. This gate array executes multiplexing and division of the address bus and the data bus on the FS bus.

② DP-RAM
Communications between the MPU on the base cabinet and the FPU on expansion DBS90 cabinets is carried out DP-RAM configured memory. The capacity of this DP-RAM is 32k bytes.

③ GFPU
This FPU gate array has functions for generating the FPU control signals, for generating control signals for peripheral block, and for controlling interrupts. The GFPU also carries out DP-RAM control of communications between the MPU on the base cabinet and the FPU on expansion DBS90 cabinets.

④ Cabinet number Switch
The number of expansion DBS90 cabinets selected by setting this rotary switch. The number can be set within the range No.1 to No.5. Other settings are forbidden.

⑤ Memory
As FPU memory, 128k byte memory area is provided as program area (ROM) and 64k byte memory area is provided as work area (RAM).

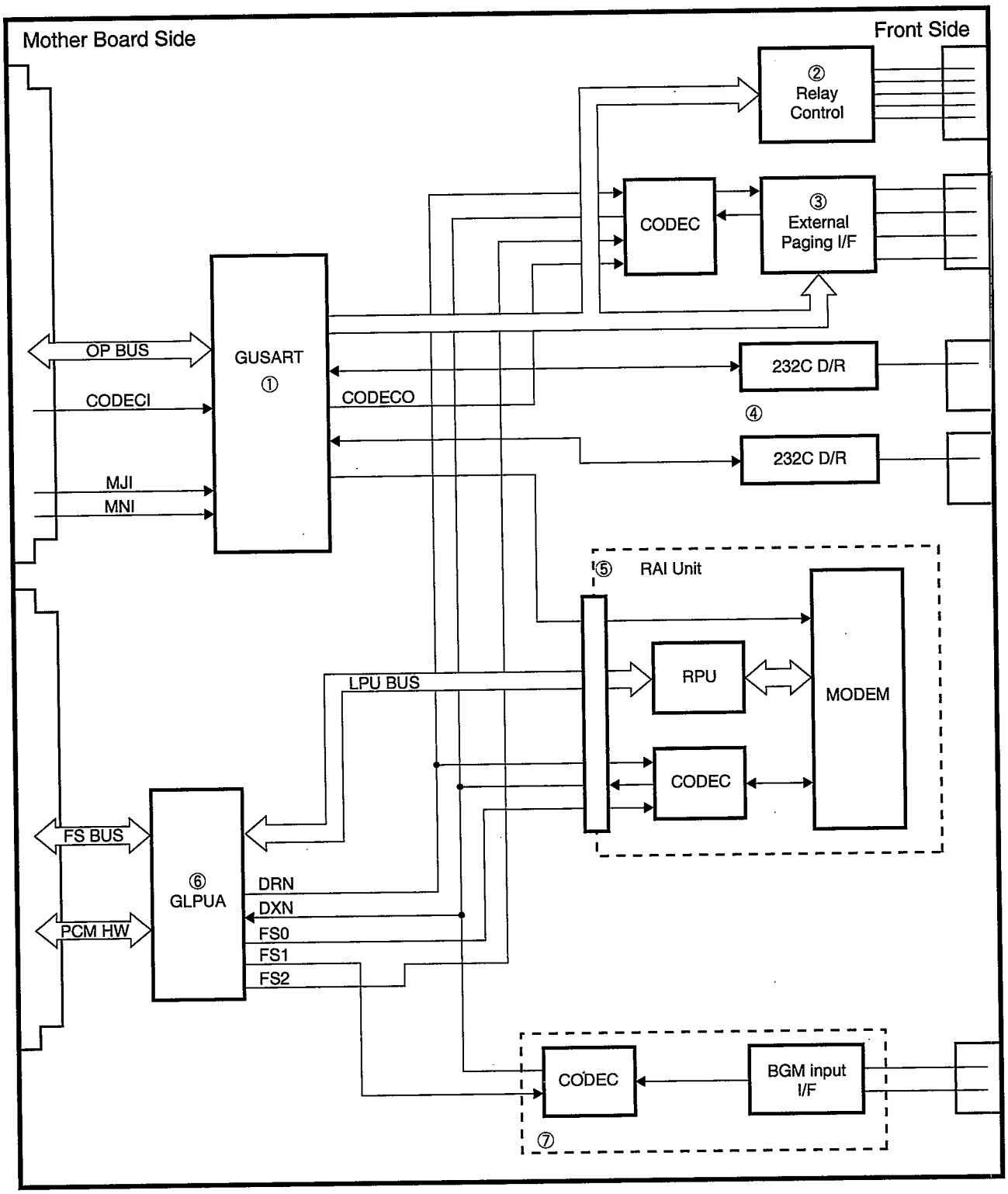
⑥ Timing Compensator
This block compensates the timing of the upward data (data to a base cabinet from an expansion DBS90 cabinet) on the PCM highway.

⑦ CCU-CCU Bus
This is the control bus between the base cabinet and expansion DBS90 cabinets, and between expansion DBS90 cabinets and expansion DBS90 cabinets.
The CCU-CCU bus is configured by mulltiplexing the address bus and data bus on the OP bus.

⑧ CCU PCM-HW
This is the PCM highway between the base cabinet and expansion DBS90 cabinets, and between expansion DBS90 cabinets and expansion DBS90 cabinets.

⑨ FPU
This is the CPU for controlling expansion DBS90 cabinets. The FPU controls the extension cards on expansion DBS90 cabinets via the FPU bus.

# (9) SCC card (VB-44181UK/HK) : Service Control Card



The SCC card is used to extend service functions. This card is mounted on the option slot to support RS-232C port control, background music (BGM) input and external paging (external paging with talkback) control.
Only one SCC card can be mounted for each system.

The following briefly describes the main blocks of the SCC card.

① GUSART
GUSART is a gate array that has functions such as the interface with the MPU on the CPC card, generation of the baud rate, sync/async serial communication control functions, and output ports for relay control.

② Relay Control
ON/OFF control of external equipment control relays is carried out by the control signals that are sent via GUSART from the MPU on the CPC card. Five ports are provided as relay driver outputs for controlling external equipments.

③ External Paging I/F
This output terminal for external paging has a talkback function. One port provides a relay loop make contact for controlling ON/OFF of external amplifiers.

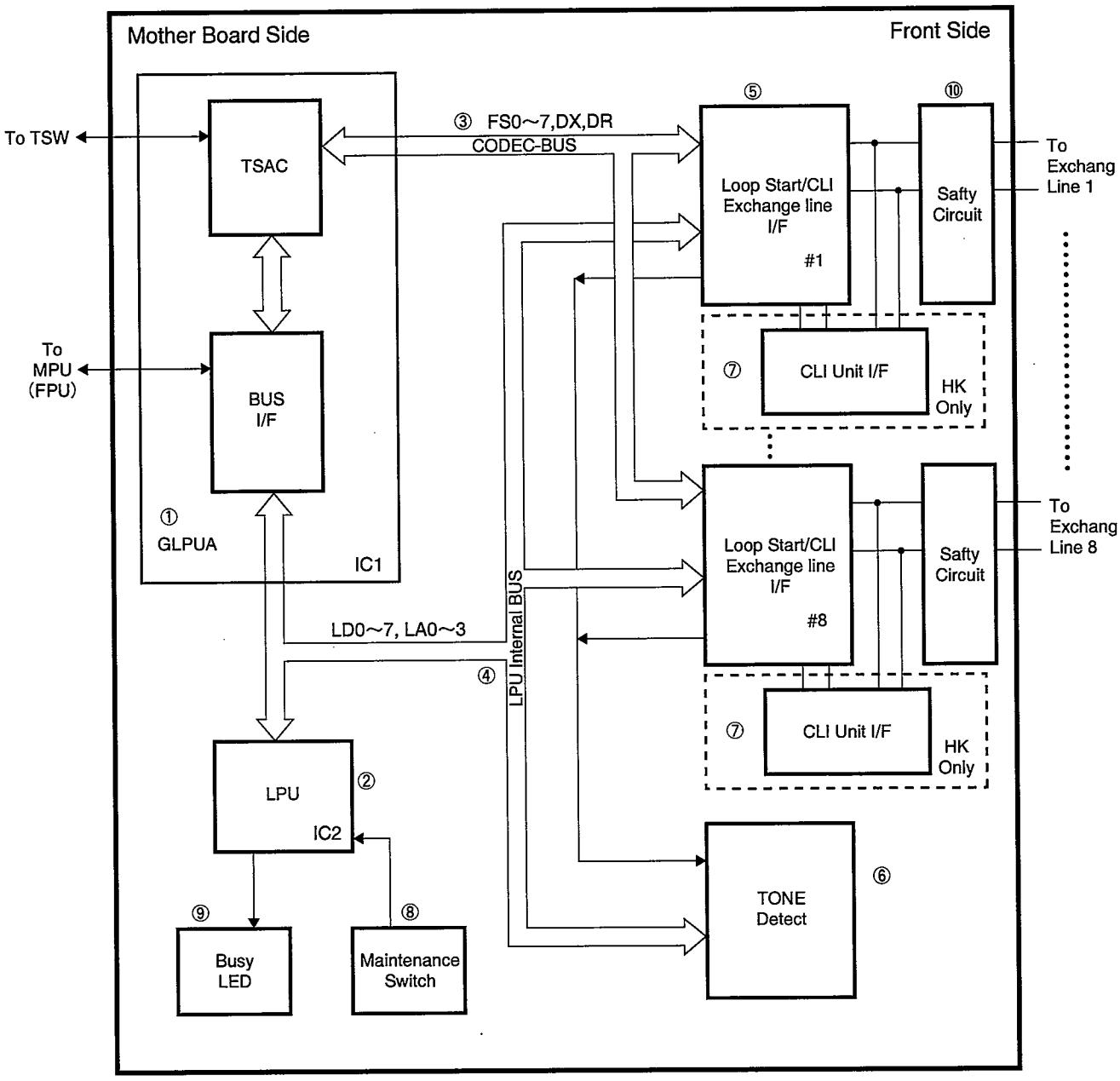
④ 232C Driver / Receiver
The 232C D/R converts the digital level (TTL level) with the RS-232C interface. Two ports are provided for connecting to the RS-232C interface.

⑤ RAI Unit
This interface is provided with connectors for interfacing the modem (RAI card) for remote maintenance.

⑥ GLPUA
GLPUA controls the timing of the system and various PCM data within SCC card. GLPUA operates when the RAI card is controlled.

⑦ BGM Input I/F
This interface has functions for inputting external BGM (one circuit).

# (10) LTRK/8 card (VB-44510UK/HK) : Loop Start Trunk Card



The LTRK/8 card is an interface that accommodates cards for a loop start type analog trunk. This card is mounted on a flexible slot to connect general analog telephone lines.
The LTRK/8 card provides an 8-circuit trunk interface and can serve the functions of detection and answering of callup signals from the trunk, sending callup signals to the trunk, dialing and speech.

The following briefly describes the main blocks of the LTRK/8 card.

① GLPUA
This is the interface gate array between the PCM highway and the FS-BUS.

② LPU
The LPU supervises and controls the line status. Communications with the CPU on the CPC card are carried out by reading and writing GLPUA registers.

③ CODEC-BUS
This bus is for communications between the CODEC and TSAC (Time Switch Assign Control). This bus handles up data (from expand cabinet to base cabinet), down data (from base cabinet to expand cabinet), CLK and FS.

④ LPU Internal Bus
This is a 8-bit parallel bus between the LPU, gate arrays and lines.
LD0 to LD7, KRD and KWR are handled on the data bus.

⑤ Loop Start/CLI Exchange Line I/F
This is a loop start type interface for connecting to 2-wire type exchange lines. The main functions of this line interface are as follows:

- Incoming call detection : Incoming callup signals detection from PTT exchange line.
- Loop detection : The loop current detection from PTT exchange line.
- Dial transmission : Dial pulses transmission to the exchange line.
- Conversation : Conversation function that is operated by 2-wire/4-wire conversion and analog-digital conversion
- Mute : Function for muting received calls

⑥ TONE Detect
This circuit detects the tone (DT or BT) from the exchange, and judges whether or not there is a tone.

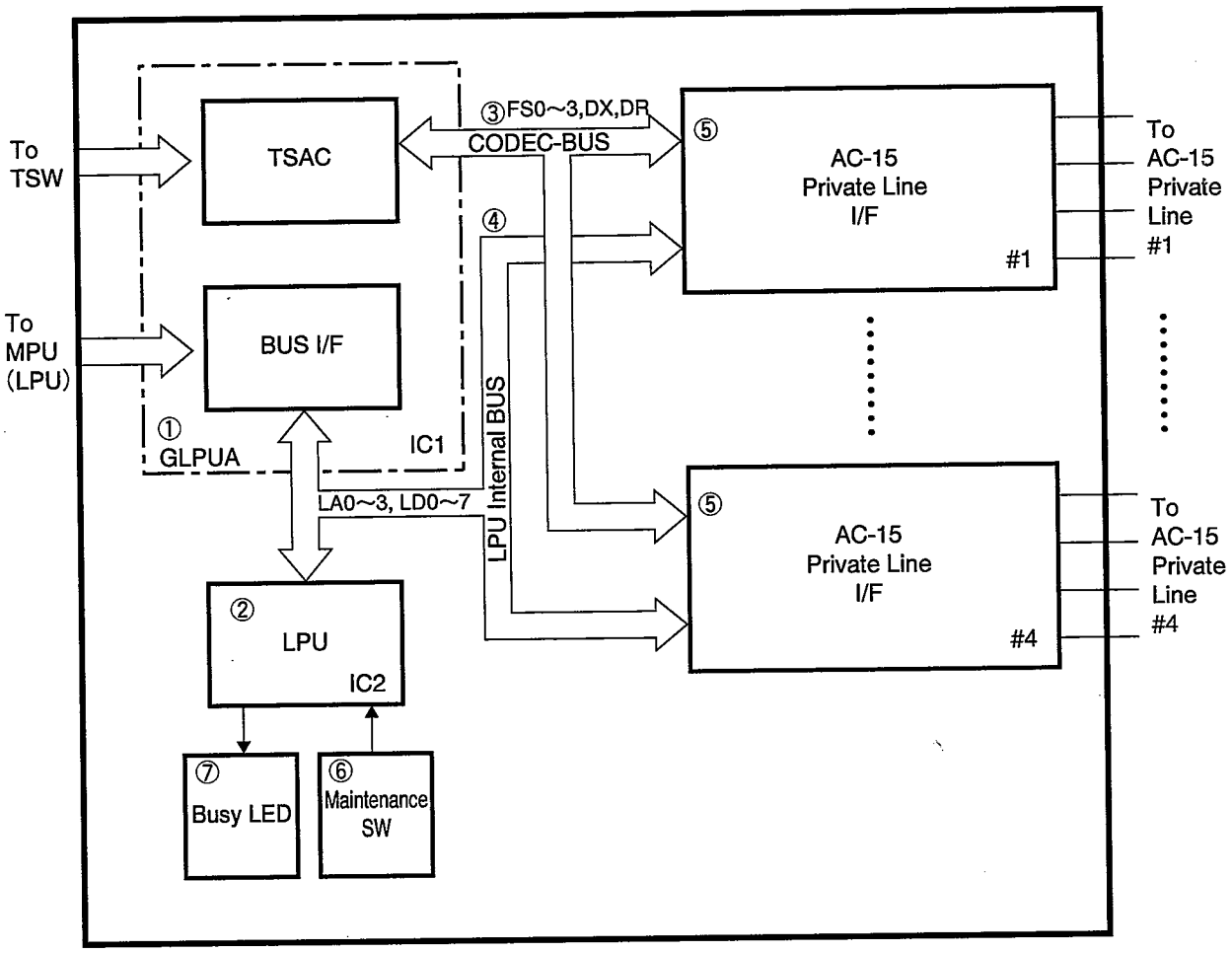
⑦ CLI Unit I/F (HK only)
This interface is for connecting the CLI (Caller ID) Unit (Hong Kong only) that will be introduced as an option.

⑧ Maintenance Switch
This switch enables removal or insertion of cards while the power is ON. When this switch is set to ON, the "no response to incoming calls," "restrict outgoing calls" and "disconnect after end of conversation" functions operate.

⑨ Busy LED
This LED lights when the line is busy.

⑩ Safety Circuit
This safety circuit protects against lightning surges.

# (11) AC15/4 card (VB-44570UK) : AC-15 Card (UK only)



The AC15/4 card is an AC-15 private line interface card. Other PBXs can be connected via the AC-15 private line by mounting the AC15/4 card in the flexible slot.
The AC15/4 card has four AC-15 private line interfaces. This card detects the callup signal from other PBXs, replies to these signals, transmits outgoing calls to the AC-15 private line, transmits the dial tone and handles conversations.

The following briefly describes the main blocks of the AC15/4 card.

① GLPUA
This is the interface gate array between the PCM highway and the FS-BUS.

② LPU
The LPU supervises and controls the line status. Communications with the CPU on the CPC card are carried out by reading and writing GLPUA registers.

③ CODEC-BUS
This bus is for communications between the CODEC and TSAC (Time Switch Assign Control). This bus handles up data (from expand cabinet to base cabinet), down data (from base cabinet to expand cabinet), CLK and FS.

④ LPU Internal Bus
This is a 8-bit parallel bus between the LPU, gate arrays and lines.
LD0 to LD7, KRD and KWR are handled on the data bus.

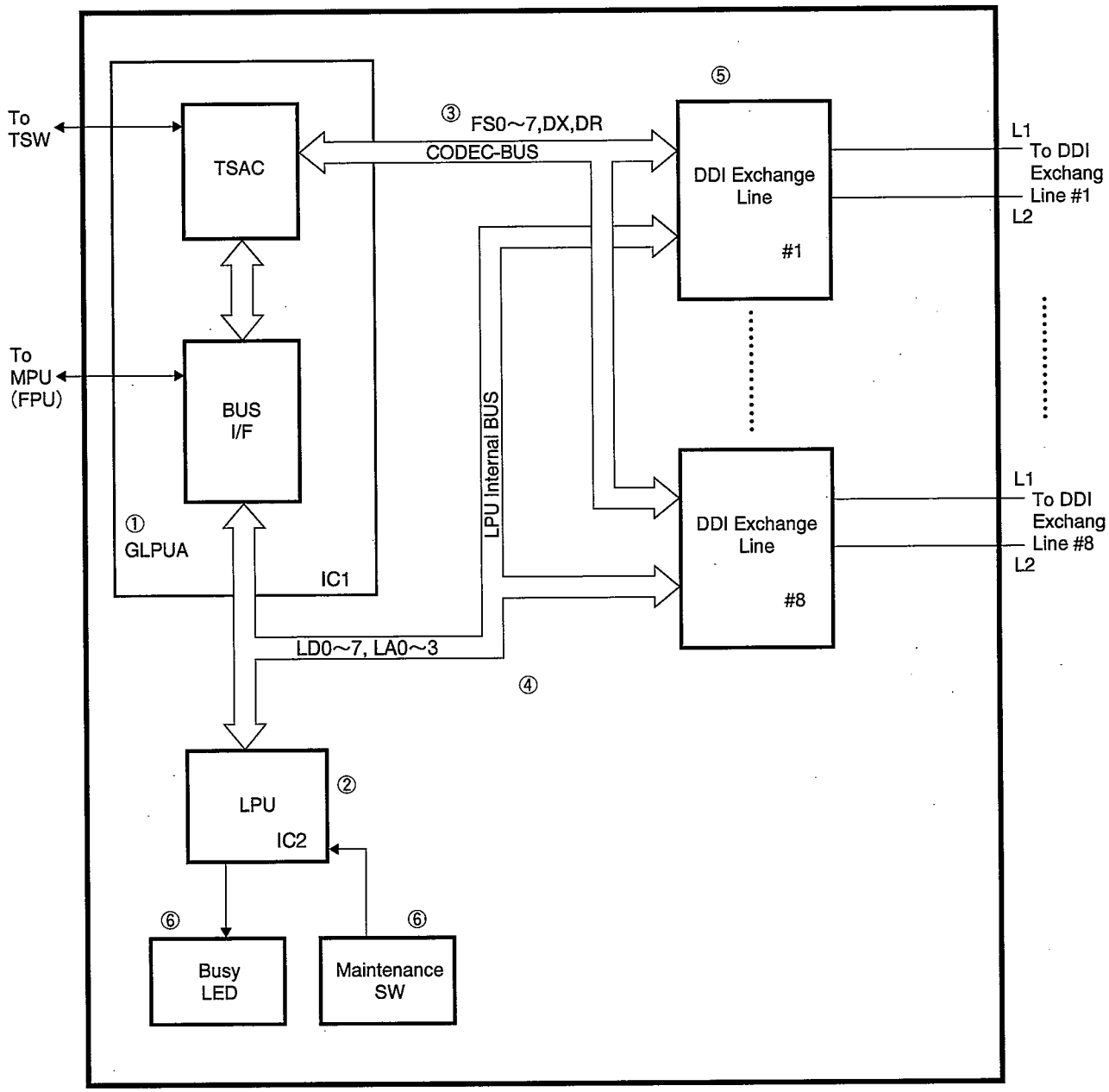
⑤ AC-15 Private Line I/F
This is an AC-15 type interface for connecting to AC-15 private lines. The main functions of this line interface are as follows:

- 2280 Hz detection : 2280Hz Signal detection from other PBXs.
- 2280 Hz transmission : 2280Hz Signal transmission to other PBXs. Signal levels can be switched to High or Low level.
- Dial transmission : Dial pulses transmission to the AC-15 private line made from 2280Hz signal.
- Conversation : Conversation function that is operated by analog-digital conversion

⑥ Maintenance Switch
This switch enables removal or insertion of cards while the power is ON. When this switch is set to ON, the "no response to incoming calls" and "restrict outgoing calls" functions operate.

⑦ Busy LED
This LED lights when the line is busy.

# (12) DIDTR8 card (VB-44520HK) : DID Trunk Card (Hong Kong only)



The DIDTR8 card is a trunk interface that accommodates cards for the DID dedicated incoming function.
The incoming call address receiving control is the immediate and wink method, and supports DP (10 PPS) and DTMF (only for wink) as incoming call address signals. However, an MFR/8 card is required when the wink method is selected.
The DIDTR8 card is mounted on a flexible slot to connect to a DID telephone line, making detection and answering of callup signals from the trunk and speech possible.
To use the DIDTR8 card, a built-in -48 V power supply is required in the system.

The following briefly describes the main blocks of the DIDTR8 card.

① GLPUA
This is the interface gate array among the PCM highway, the FS-BUS and LPU.

② LPU
The LPU supervises and controls the line status. Communications with the CPU on the CPC card are carried out by reading and writing GLPUA registers.

③ CODEC-BUS
This bus is for communications between the CODEC and TSAC (Time Slot Assign Control). This bus handles up data (from expand cabinet to base cabinet), down data (from base cabinet to expand cabinet), CLK and FS.

④ LPU Internal Bus
This is a 8-bit parallel bus between the LPU, gate arrays and lines.
LD0 to LD7, KRD and KWR are handled on the data bus.

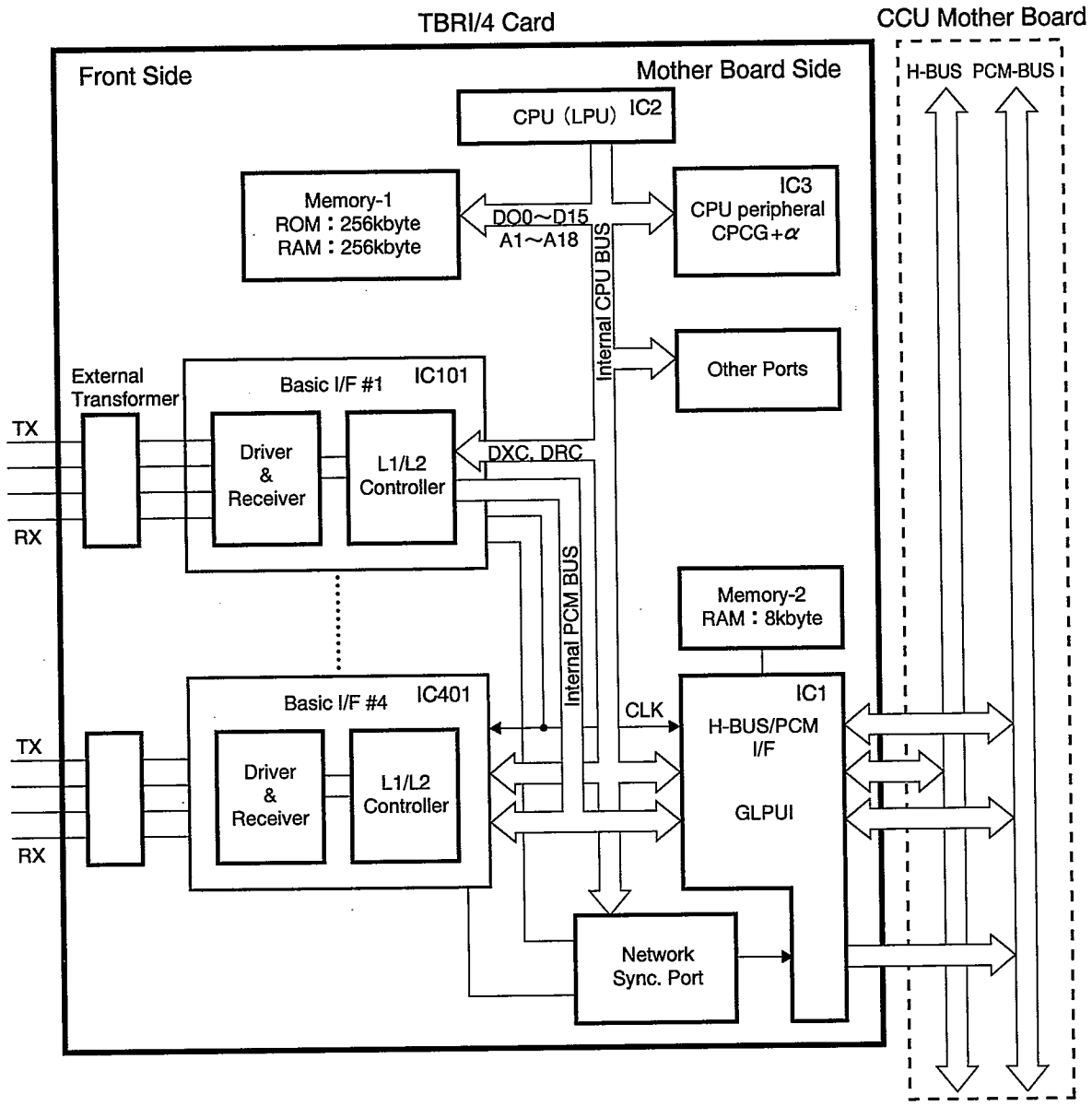
⑤ DDI Exchange Line I/F
This is a DDI-type interface for connecting to 2-wire type exchange lines. The main functions of this line interface are as follows:

- Loop detection (incoming call detection) : The loop current detection from the PTT exchange.
- Power supply : The power supplied to the PTT exchange.
- Polarity reverse transmission :Response signals during conversation and the disconnect signals at the end of the conversion are transmitted.
- Conversation :Conversation function that is operated by 2-wire/4-wire conversion and analog-digital conversion

⑥ Maintenance Switch
This switch enables removal or insertion of cards while the power is ON. When this switch is set to ON, the "no response to incoming calls," "restrict outgoing calls" and "disconnect after end of conversation" functions operate.

⑦ Busy LED
This LED lights when the line is busy.

# (13) TBRI/4 card (VB-44530) : BRI Card (T-point)



The TBRI/4 card is a T-point ISDN basic interface (2B + D: 144 kbps) accommodation card.
The TBRI/4 card is mounted on a flexible slot to control the basic user network interface of ISDN.
The TBRI card is connected through DSU to the ISDN trunk which supports the T-point ISDN basic interface.
This card has an on-board, 4-circuit T-point ISDN basic interface.

The following briefly describes the main blocks of the TBRI/4 card.

① CPU (LPU)
This CPU controls the TBRI/4 card. This CPU uses a 12.288 MHz clock.

② Memory-1
Memory-1 comprises 256k byte ROM (EPROM) and 256k byte RAM (SRAM).

③ CPU periphery
The CPU periphery comprises a CPU periphery decoder, Program Timer and interrupt encoder. This block uses a CPCG gate array.

④ H-BUS/PCM I/F
This interface controls H-BUS communications and re-routes B channel data onto the PCM highway. This block uses a GLPUI gate array.

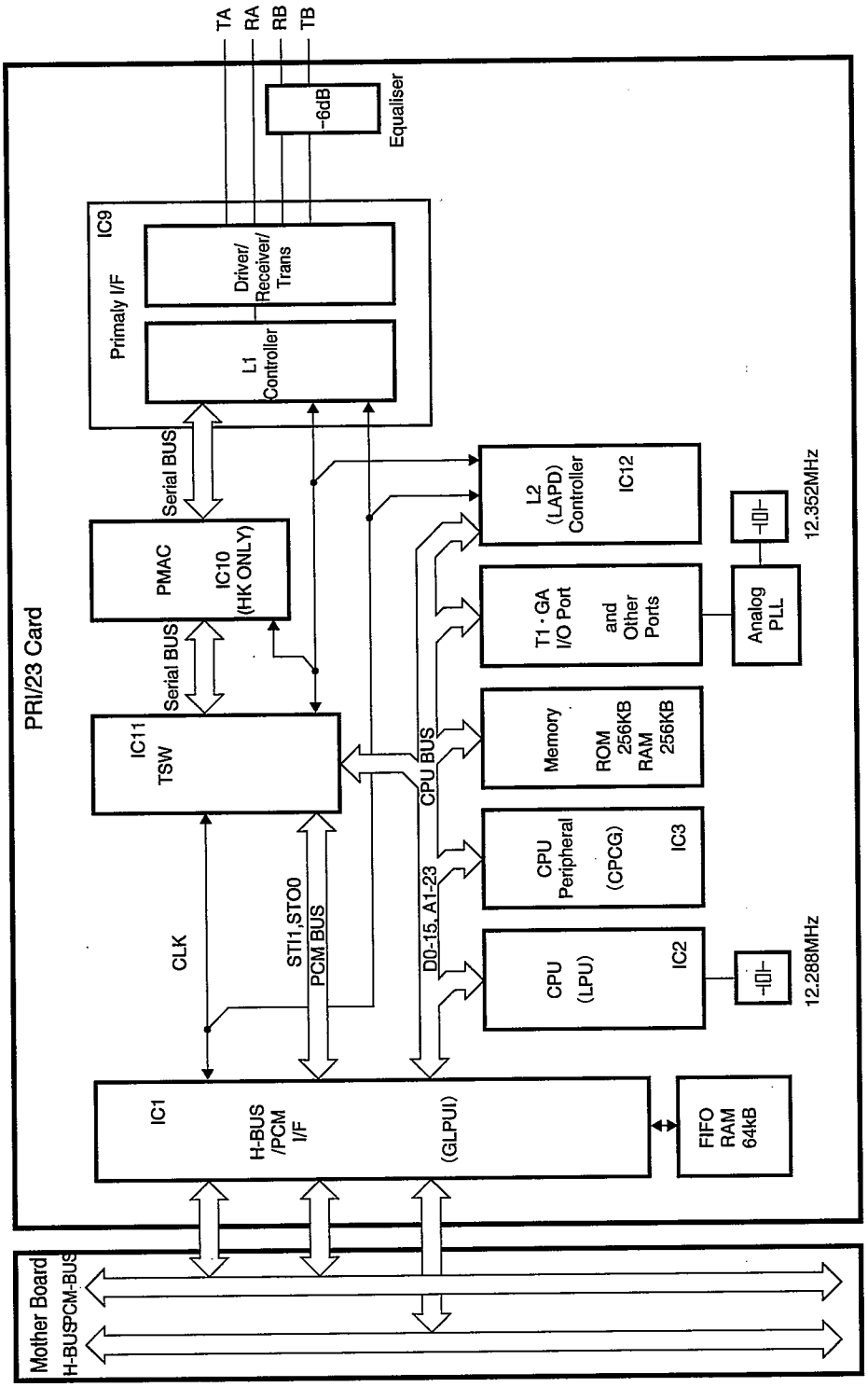
⑤ Memory-2
Memory-2 is external memory for the H-BUS/PCM interface. FIFO 8k byte SRAM is used as the H-BUS command buffer.

⑥ LSI for ISDN Basic I/F
This interface handles the breakdown and reconstruction of ISDN layer 1 frames, control of D channel, and the breakdown and reconstruction of ISDN layer 2 frames.
This card has a 4-circuit LSIs for ISDN basic interface.

⑦ Network Sync. Port
This port is for selecting one of the four (maximum) network sync clocks that are output by the LSI for the basic ISDN interface, and for outputting the selected clock to the GLPUI gate array.
It also has a function for lighting the network sync established lamp when the network sync clock is being transmitted from the TBRI/4 card.

⑧ Other Ports
The following ports are provided:
- Line busy lamp control port:
  This port controls ON/OFF switching of the busy LED. The busy LED indicates the line status.
- Maintenance port:
  This port indicates the status of the maintenance switch that is linked with the pre-closure function.
- Line selection/line No. recognition port:
  This port indicates the status the of the switch (line select switch) for selecting the ISDN line whose status is to be displayed.

# (14) PRI/23 card (VB-44540) : PRI Card (Hong Kong only)



The PRI/23 card is a T-point ISDN primary rate interface (23B + D/24B: 1544 kbps) and also an S-point ISDN primary rate interface accommodation card. The PRI/23 card is mounted on a flexible slot to connect the system to ISDN (to access ISDN services). It is possible to use either the T- or S-point ISDN primary rate interface by setting a switch on the card, 8/16/24 channel modes can be selected, however, there are restrictions to the position of the slot to which the card is mounted. This depends on the number of accommodating channels.

The following briefly describes the main blocks of the PRI/23 card.

① CPU (LPU)
This CPU controls the PRI/23 card. This CPU uses a 12.288 MHz clock.

② Memory-1
Memory-1 comprises 256k byte ROM (EPROM) and 256k byte RAM (SRAM).

③ CPU periphery
The CPU periphery comprises a CPU periphery decoder, Program Timer and interrupt encoder. This block uses a CPCG gate array.

④ H-BUS/PCM I/F
This interface controls H-BUS communications and re-routes B channel data onto the PCM highway. This block uses a GLPUI gate array.

⑤ Memory-2
Memory-2 is external memory for the H-BUS/PCM interface. FIFO 8k byte SRAM is used as the H-BUS command buffer.

⑥ L2 (LAPD) Controller
This controller breaks down and reconstructs ISDN layer 2 frames using the LAPD controller LSI.

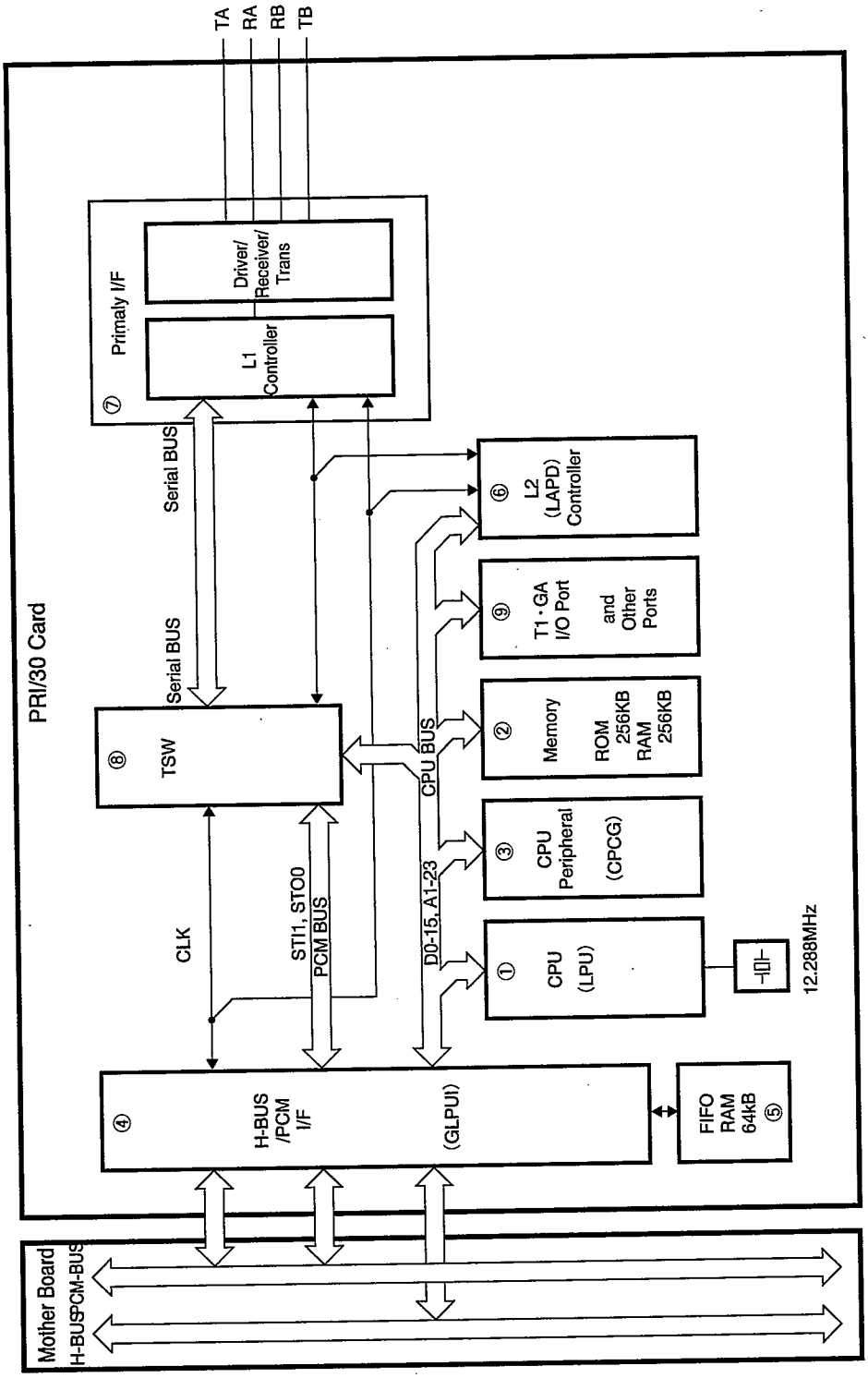
⑦ Primary rate I/F
This interface breaks down and reconstructs ISDN layer 1 frames using the ISDN primary rate interface LSI.

⑧ TSW (Time switch)
This switch compensates the timing of the ISDN primary rate interface LSI, LAPD controller LSI and PCM interface LSI.
The ISDN primary rate interface LSI is accessed from the CPU via this switch.

⑨ Other Ports
The following five ports are provided:

- Busy lamp control port:
  This port controls ON/OFF switching of the busy LED. The busy LED indicates the line status.
- Trouble monitor display port
  This ports controls ON/OFF switching of the trouble lamp. In the case of sending network synchronisation clock from PRI/23 card, it can light the network synchronisation established lamp.
- Make busy port:
  This port indicates the status of the make busy switch.

# (15) PRI/30 card (VB-44540UK) : PRI card (UK only)



The PRI/30 card is a T-point ISDN primary rate interface (30B + D: 1984 kbps) and also an S-point ISDN primary rate interface accommodation card. The PRI/30 card is mounted on a flexible slot to connect the system to ISDN (to access ISDN services). It is possible to use either the T- or S-point ISDN primary rate interface by setting a switch on the card, 8/16/24/30 channel modes can be selected, however, there are restrictions to the position of the slot to which the card is mounted. This depends on the number of accommodating channels.

The following briefly describes the main blocks of the PRI/30 card.

① CPU (LPU)
This CPU controls the PRI/30 card. This CPU uses a 12.288 MHz clock.

② Memory-1
Memory-1 comprises 256k byte ROM (EPROM) and 256k byte RAM (SRAM).

③ CPU periphery
The CPU periphery comprises a CPU periphery decoder, Program Timer and interrupt encoder. This block uses a CPCG gate array.

④ H-BUS/PCM I/F
This interface controls H-BUS communications and re-routes B channel data onto the PCM highway. This block uses a GLPUI gate array.

⑤ Memory-2
Memory-2 is external memory for the H-BUS/PCM interface. FIFO 8k byte SRAM is used as the H-BUS command buffer.

⑥ L2 (LAPD) Controller
This controller breaks down and reconstructs ISDN layer 2 frames using the LAPD controller LSI.

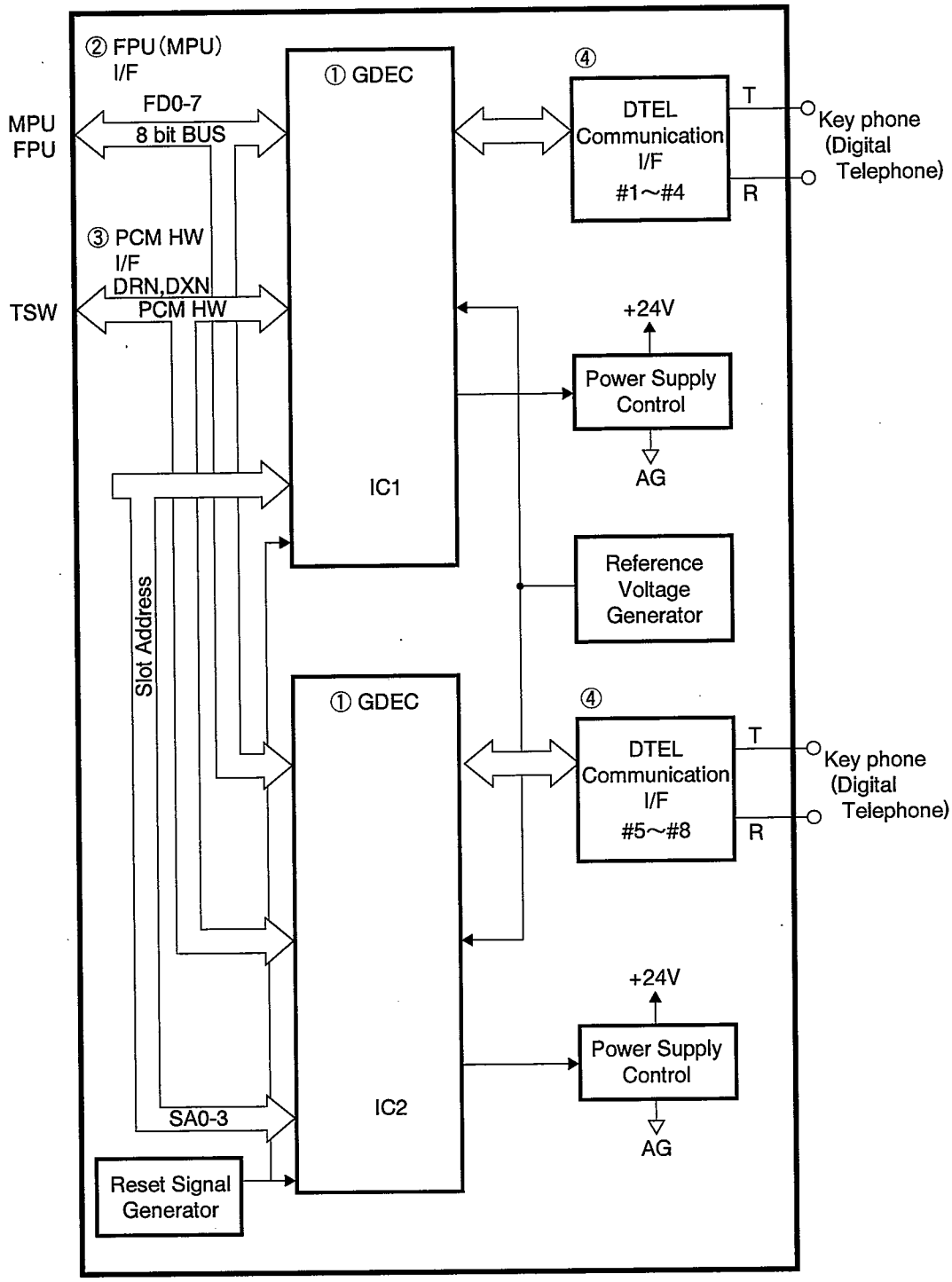
⑦ Primary rate I/F
This interface breaks down and reconstructs ISDN layer 1 frames using the ISDN primary rate interface LSI.

⑧ TSW (Time switch)
This switch compensates the timing of the ISDN primary rate interface LSI, LAPD controller LSI and PCM interface LSI.
The ISDN primary rate interface LSI is accessed from the CPU via this switch.

⑨ Other Ports
The following four ports are provided:

- Busy lamp control port:
  This port controls ON/OFF switching of the busy LED. The busy LED indicates the line status.
- Trouble monitor display port
  This ports controls ON/OFF switching of the trouble lamp.
  It also has a function for lighting the network sync rate lamp when the network sync clock is being transmitted from the PRI/30 card.
- Make busy port:
  This port indicates the status of the make busy switch.

# (16) DEC/8 card (VB-44610UK) : Digital Extension Card



The DEC/8 card is an interface accommodating card for digital key telephones (1B + D: 64 kbps + 16 kbps). The DEC/8 card is mounted on a flexible slot to connect digital extensions (1B + D: digital key telephones and DSS). This card accommodates an on-board 8-circuit extension interface. The connection format is 2-wire nonpolarized star wiring.

The following briefly describes the main blocks of the DEC/8 card.

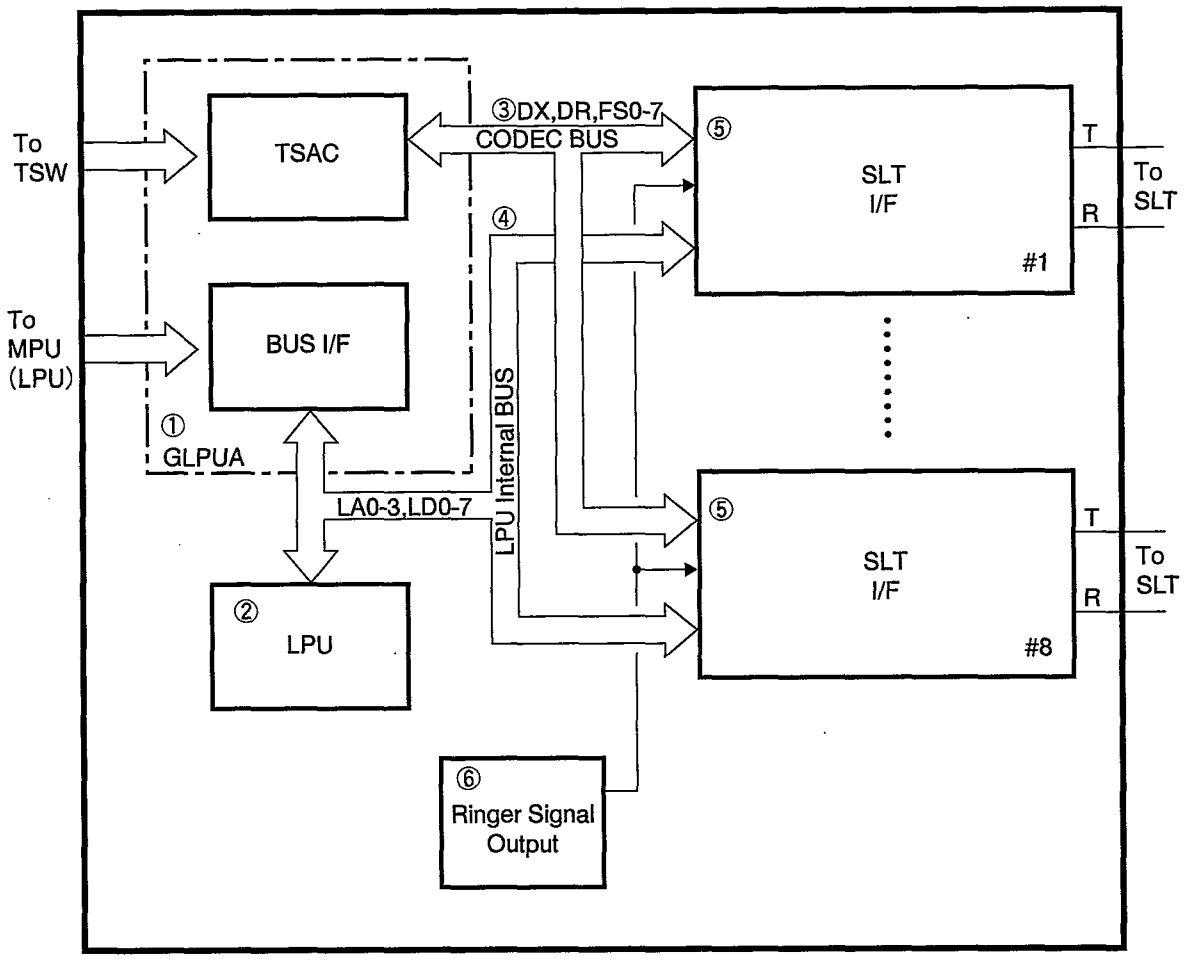
① GDEC
The GDEC is a communications bypass for forming the interface with the CCU on a digital 2-wire type extension line interface. A maximum of four digital extensions (e.g. key phone) can be connected to a single GDEC.

② FPU (MPU) I/F
This interface forms the interface between the GDEC and CCU control. Signals input from the FPU to GDEC are created by MCLK1 and MCLK2, sampled by the 4.096 MHz clock, and synchronised with the GDEC internal circuit.

③ PCM HW I/F
This is the interface with the PCM highway. The frame + clock synchronisation (frame: 8k Hz, clock : 2.048M Hz) is used.

④ DTEL Communication I/F
This interface forms the 2-wire type digital communications interface between CCU and extensions. Transfer is carried out by 256k Hz ping-pong.
Transmission and reception frames consist of 12 bits respectively. Each of these frames comprises an information channel (B channel: 64 kbps) of eight bits, a control channel (D channel: 16 kbps) of two bits, and a frame sync bit (F bit) and control channel sync bit (S bit) of one bit each.
Non-polarity wiring is allowed between DEC/8 and extensions.

# (17) AEC/8 card (VB-44620UK/HK) : Analog Extension Card




The AEC/8 card is an extension interface accommodating card for single line telephones (SLT). The AEC/8 card is mounted on a flexible slot to connect a single line telephone (SLT) to the system.

The AEC/8 card has an 8-circuit analog extension interface, and provides such functions as callup signals to SLT, detection of dialing (10 pps/DTMF) and speech.

The supply voltage to a SLT is +24 V, and a ringer circuit is built-in. The duration of one callup signal from the built-in ringer circuit is a maximum one second. Control is in three phases when eight extensions are simultaneously called up: the first phase timing for the first to thirdt extensions, the second phase timing for the fourth to sixtht extensions, and the third phase timing for the seventh and eightht extensions.

The following briefly describes the main blocks of the AEC/8 card.

① GLPUA
This is the interface gate array between the PCM highway and the FS-BUS.

② LPU
The LPU supervises and controls the line status. Communications with the upper CPU are carried out by reading and writing GLPUA registers.

③ CODEC-BUS
This bus is for communications between the CODEC and TSAC (Time Switch Assign Control). This bus handles up data, down data, CLK and FS.

④ LPU Internal Bus
This is a 8-bit parallel bus between the LPU, gate arrays and lines.
LD0 to LD8, KRD and KWR are handled on the data bus.

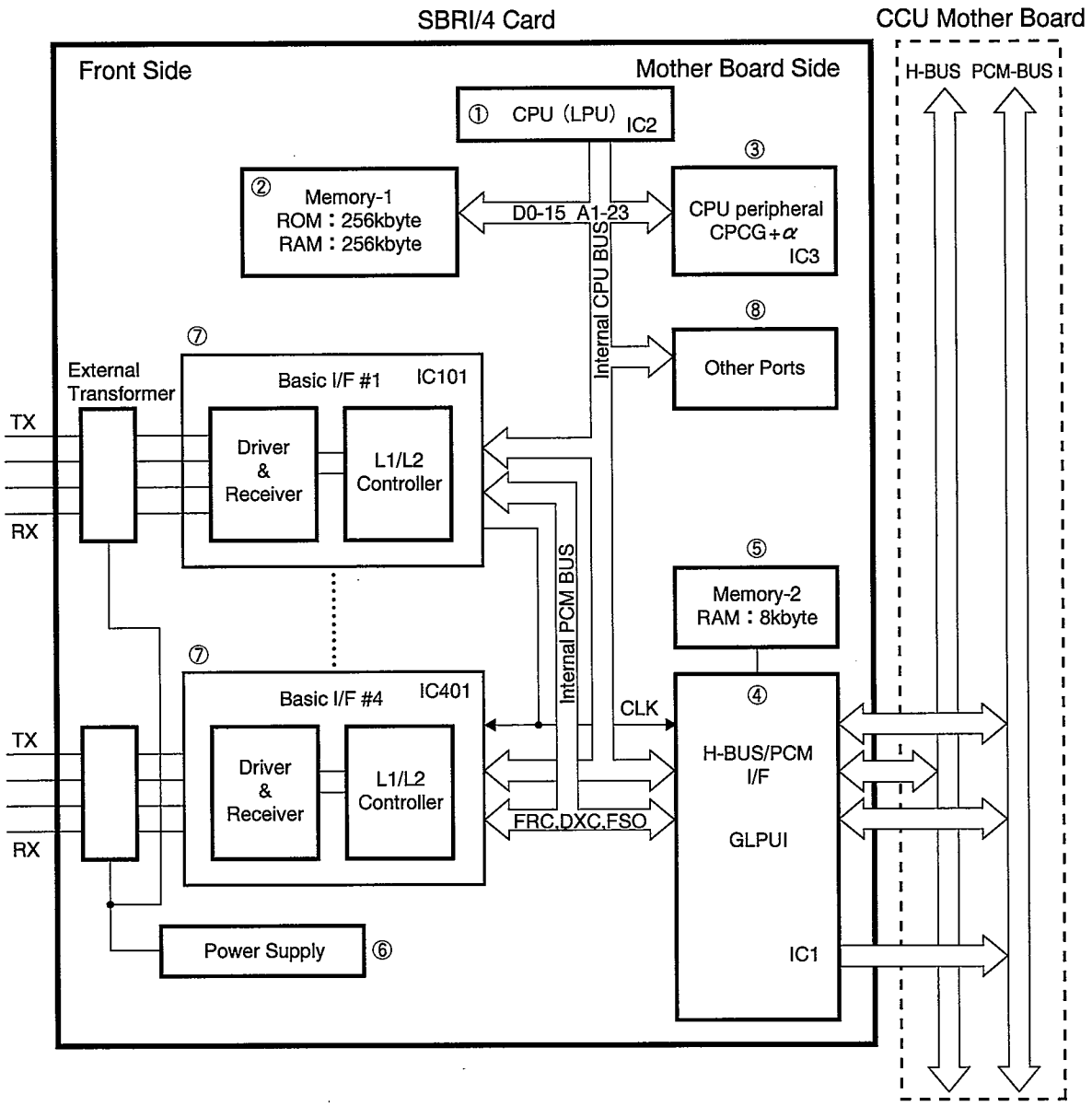
⑤ SLT I/F
This is an extension interface with a single line telephone (SLT). The main functions of this interface are as follows:

- Power supply : DC power (fixed current) is supplied to the telephone.
- Loop detection : The loop current detection and the dial detection
- Ringer transmission : The ringer signal is transmitted to the telephone.
- Ringer trip detection : Off-hook during transmission of the ringing signal is detected.
- Conversation : Conversation function that is operated by 2-wire/4-wire conversion and analog-digital conversion
- Telephone on/off-hook : The telephone status is detected by loop detection.
- DP dial detection : The number of pulses of the DP dial is detected by loop detection.

(6) Ringer Signal Output
This circuit transmits the ringer tone to a single line telephone (SLT). The main functions of the ringer signal output circuit are as follows:

- Ringer interval pattern : The interval pattern is generated by LPU control.
- Phase control of ringer sounding : The phases by which the number of simultaneously ringing telephones is controlled to disperse the load of the ringer circuit.
- Ringer zero-cross control : ON/OFF control is carried out at zero level matched to the ringer pattern.

# (18) SBRI/4 card (VB-44630) : BRI card (S-point)



The SBRI/4 card is a S-point ISDN basic interface (2B + D: 144kbps) accommodating card for S-point ISDN.
The SBRI/4 card is mounted on a flexible slot to accommodate ISDN terminals. The system supplies -40 V to the ISDN terminals.
The SBRI/4 card has an on-board, 4-circuit S-point ISDN basic interface.

The following briefly describes the main blocks of the SBRI/4 card.

① CPU (LPU)
This CPU controls the SBRI/4 card. This CPU uses a 12.288 MHz clock.

② Memory-1
Memory-1 comprises 256k byte ROM (EPROM) and 256k byte RAM (SRAM).

③ CPU periphery
The CPU periphery comprises a CPU periphery decoder, Program Timer and interrupt encoder. This block uses a CPCG gate array.

④ H-BUS/PCM I/F
This interface controls H-BUS communications and re-routes B channel data onto the PCM highway. This block uses a GLPUI gate array.

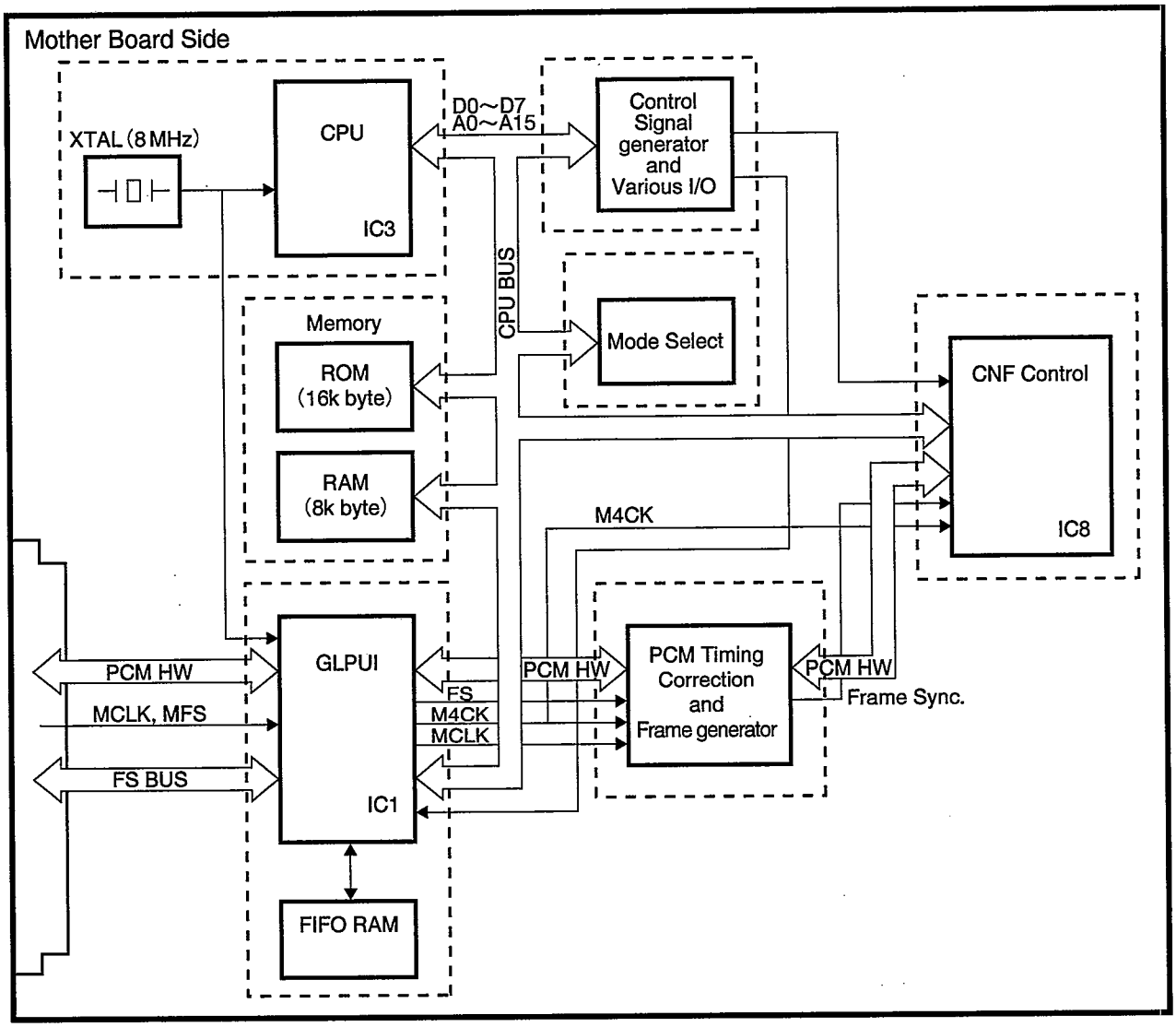
⑤ Memory-2
Memory-2 is external memory for the H-BUS/PCM interface. FIFO 8k byte SRAM is used as the H-BUS command buffer.

⑥ Power Supply
-40 V which is made by phantom power supply with restricted power is supplied to the terminal (TE). The maximum power that can be transmitted over a single line is 420 mW.
The power supply unit used a DC-DC converter circuit to generate 42 VDC from 24 VDC.

⑦ LSI for ISDN Basic rate I/F
This interface handles the breakdown and reconstruction of ISDN layer 1 frames, control of D channel contention, and the breakdown and reconstruction of ISDN layer 2 frames.
Four ISDN basic interface LSIs are mounted on the SBRI/4 card.

⑧ Other Ports
The following port is provided:
- Line selection/line No. recognition port:
  This port indicates the status the of the switch (line select switch) for selecting the ISDN line whose status is to be displayed.

# (19) CONF card (VB-44120UK/HK) : Conference Card



The CONF card is a conference speech card.
The CONF card is mounted on a flexible slot to support a group of a maximum 8-party conference.

The following briefly describes the main blocks of the CONF card.

① CPU
This CPU controls the CONF card. This CPU uses an 8 MHz clock.

② CPU periphery
The CPU periphery has functions for generating control signals and address decode signals to the various I/Os from the CPU.

③ Memory
16k byte ROM and 8k byte RAM memory areas are provided as external memory.

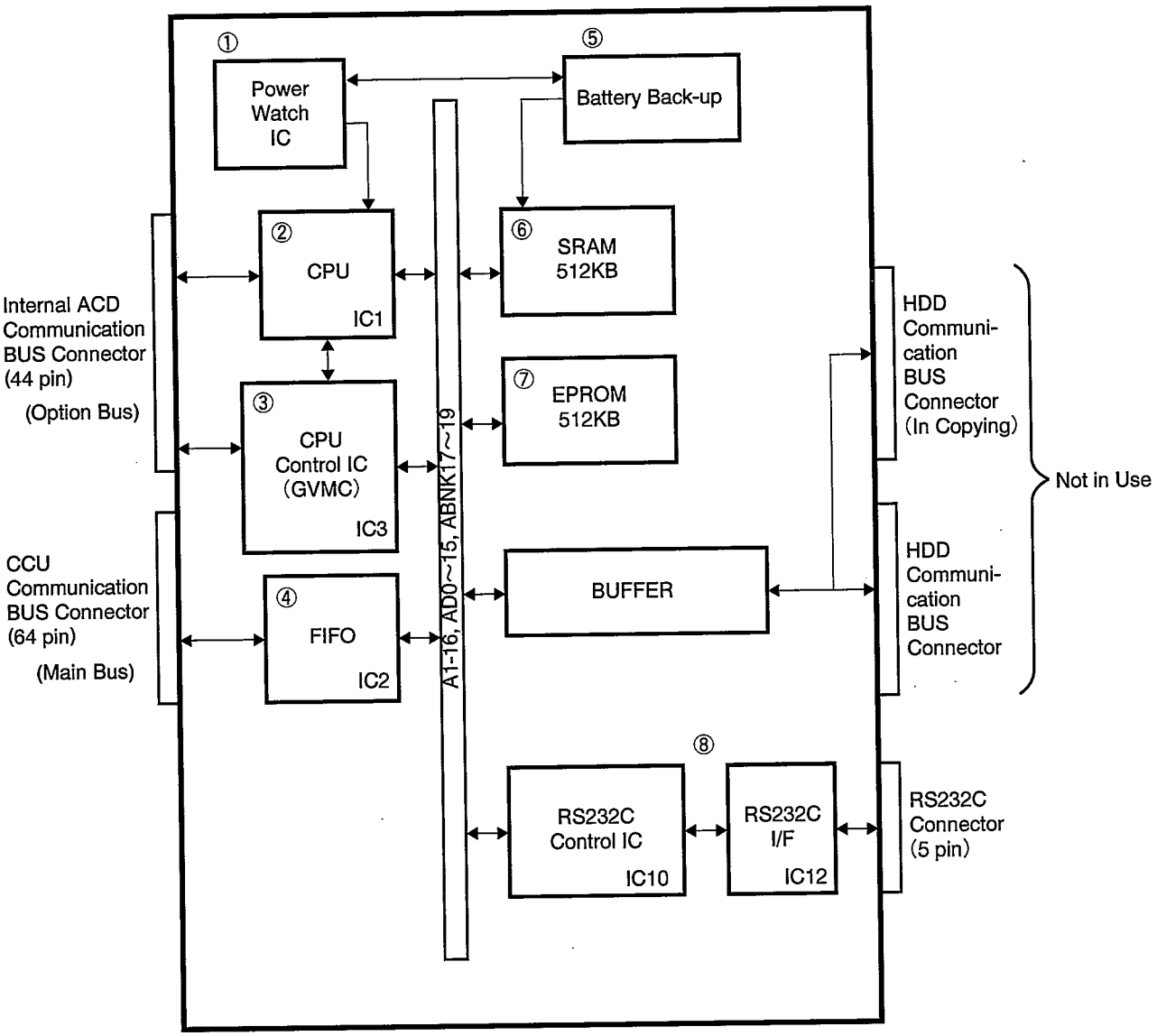
④ CNF Control LSI
This LSI has a function for supporting a conference conversation.

⑤ PCM Timing Correction
This circuit generates the frame signal to the CNF control LSI and the timing correction of the PCM highway.

⑥ GLPUI
The GLPUI is the gate array for the PCM interface and FS bus interfaces.

⑦ Mode Select
This is for the mode of conference call.At this moment,you do not have any choices.This is the future use.

# (20) ACD card (VB-44140/UK) : ACD card



The ACD card is an Automatic Call Distribution (ACD) card which is mounted in the main cabinet.
By using the ACD card with the VPU/4 card (VB-44160), ACD functions such as the incoming call distributing function and work unit count code for each agent can be supported. The result of total calls can be output from a personal computer which is connected through an RS-232C port. This port is mounted in the ACD unit. The result can be printed out by connecting a printer to the same RS-232C port. However, the PC and printer cannot be connected at the same time, and only a dedicated RS-232C cable can be used for the connection.
Only one ACD card can be mounted for each Main Cabinet.
For a multiple-cabinet configuration (maximum 6-cabinet configuration) based on a building block connection, a maximum of two cards can be mounted. The ACD card and VSSC card (VB-44170) cannot be used together on the same cabinet.

The following briefly describes the main blocks of the ACD card.

① Power Watch IC
This IC resets the CPU when the power is interrupted or down.

② CPU
It controls the peripheral circuits of CPU.

③ CPU Control IC (GVMC)
This handles the data transfer circuit and the signal processing circuit (VPU/4 card). As DSP write signals differ from regular write signals, narrower width (3T) write signals are generated in the GVMC gate array.

④ FIFO
Signals which is transmitted in PCM highway are input to the voice processing circuit (VPU/4 card) via the FIFO IC. And it communicates with main CPU of the CCU.

⑤ Battery Backup/RAM Backup Switch
A backup battery and RAM backup switch are provided to hold or clear data in RAM.
To hold data in RAM, set the RAM backup switch to BACK UP. To clear data, set the RAM backup switch to INITIAL. The CPU checks the setting of this switch only when the system is started up, and determines whether or not to clear the data.

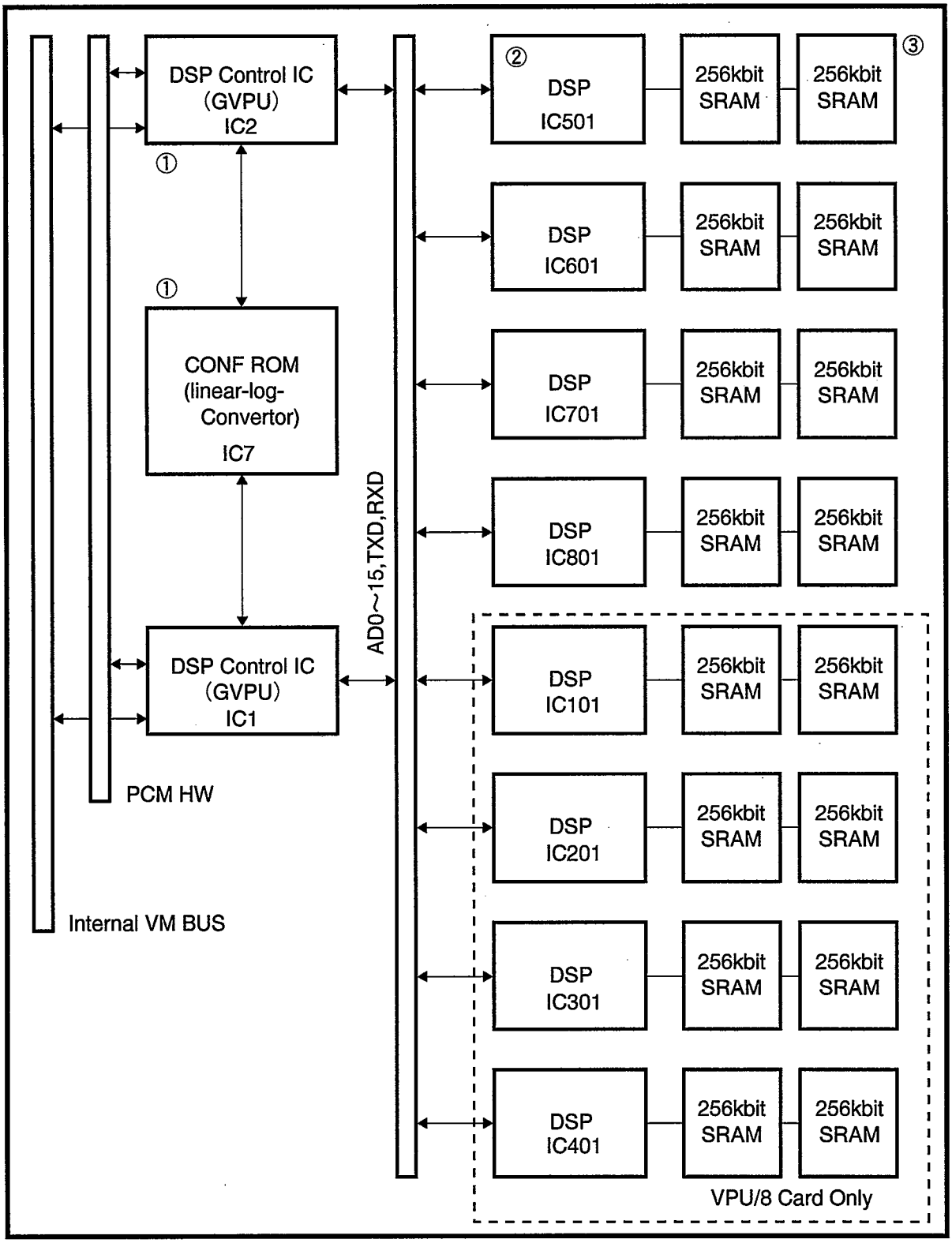
⑥ RAM
RAM comprises two 1-Mbit SRAMs, and holds the voice data for user guidance. Data is held in RAM by the battery backup circuit.

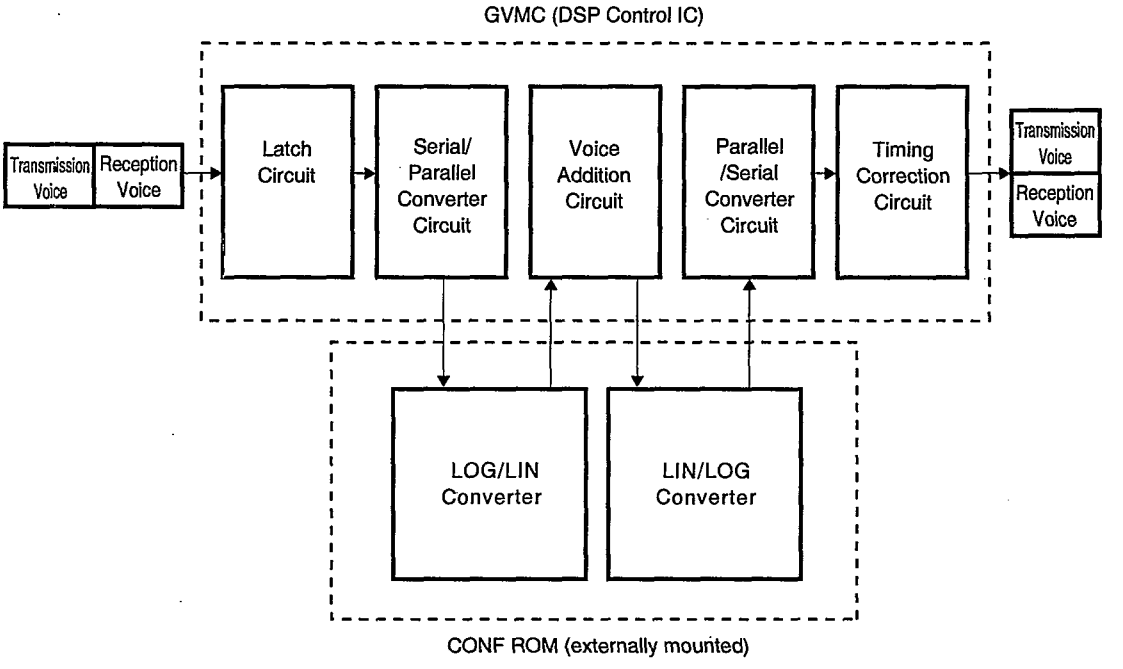
⑦ ROM
ROM comprises two 4-Mbit EPROMs.

⑧ RS-232C I/F
One RS232C port is provided by mounting an RS-232C control IC and line driver/receiver IC. The baud rate is programmable, and can be set within the range 150 to 19200 bps. TxDATA, *RTS, RxDATA, *CTS and SG are supported as serial communications signals. Note, however, that a small 5-pin connector is used as the output connector. Therefore please use a dedicated cable when you connect PC or printer.

# (21) VPU/8 card (VB-44150/UK) : 8-voice Processing Card
# VPU/4 card (VB-44160/UK) : 4-voice Processing Card

The following shows an overall block diagram of the VPU/8 and VPU/4 card, and a detailed block diagram of the DSP Control IC and CONF ROM.






The VPU/8 card and VPU/4 card are voice processing cards for voice mail, and are mounted in the main cabinet. The VPU/8 card and VPU/4 card can support voice mail functions by using these cards with the VSSC card (VB-44170).
The VPU/8 card and ACD card (VB-44140) cannot be used together.

The following briefly describes the main blocks of the VPU/8 card and VPU/4 card.

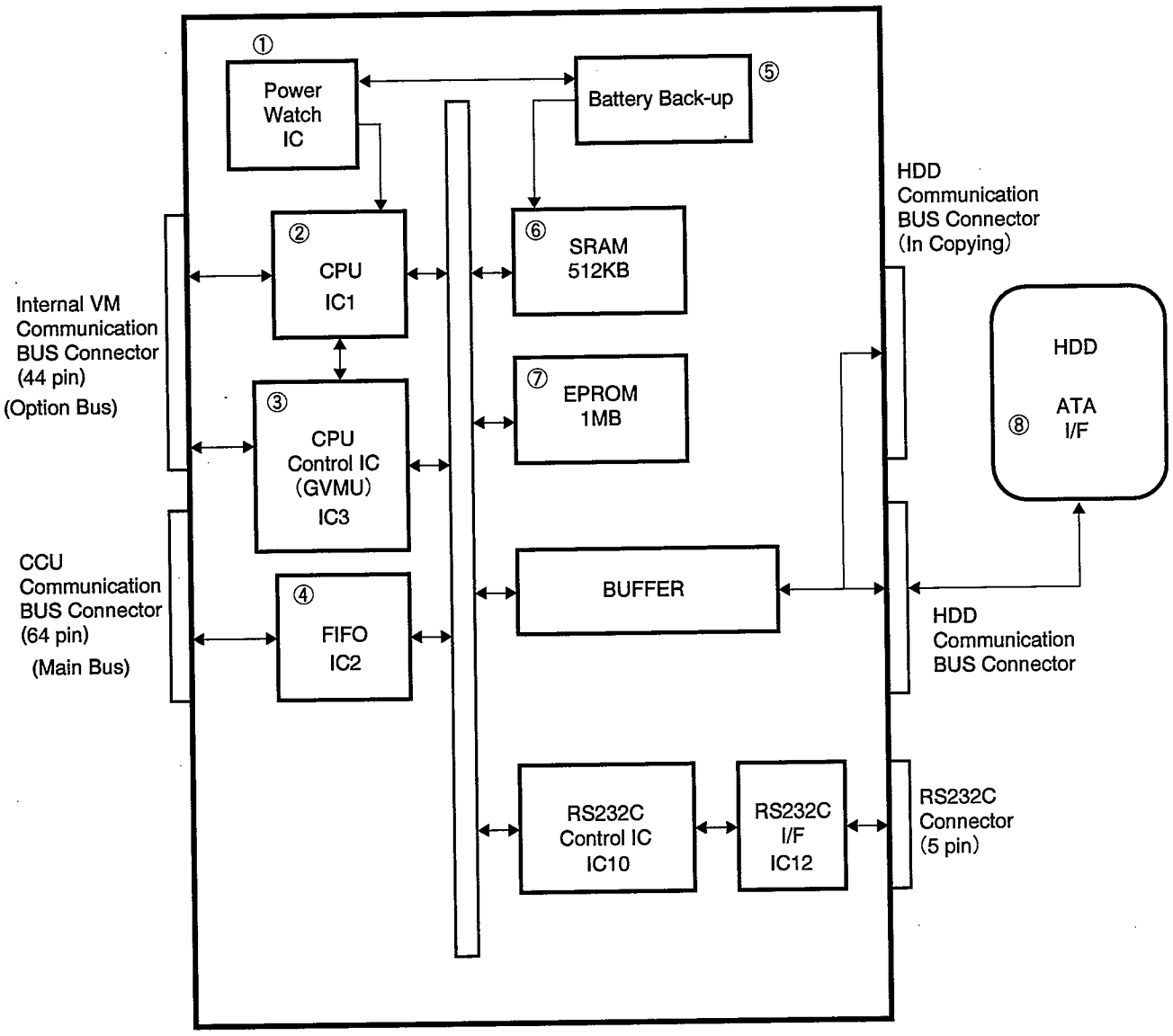
① DSP Control IC (GVPU)/CONF ROM (Linear-log conversion)
When conversations are recorded, signals of the call reception time slots and transmission time slots are added and recorded. In order to add voice data, a process for conversion of restoring compressed CODEC data to linear data is required. These operations are carried out on the DSP Control IC (GVPU) and CONF ROM (Linear-log conversion).
The following briefly describes operations when voice data is added.

1) Conversation receive and transmit signals are captured by the latch circuit.
2) The PCM serial data is converted to parallel data by the serial/parallel conversion circuit.
3) The CODEC log data is converted to linear data by the LOG-LINEAR conversion circuit.
4) The conversation receive and transmit signals are added by the voice addition circuit.
5) The added data is converted again to log data by the LINEAR/LOG conversion circuit.
6) Parallel data is converted to serial data by the parallel-serial conversion circuit. For this operation, the PCM clock rate is stepped down to 512k Hz.
7) The timing is compensated, and the recording signals are transmitted to the DSP.

② DSP
Recording signals sent from the DSP Control IC (GVPU) are encoded on the DSP and transmitted to CPU-bus. And then, playing signals sent from the CPU bus are decoded on the DSP and sent to the DSP Control IC (GVPU).

③ RAM
RAM comprises two 256k bit SRAMs.

# (22) VSSC card (VB-44170/UK) : Voice Storage Service Card



The VSSC card is a voice storage card for voice mail, and is mounted in the main cabinet.
The VSSC card provides a hard disc to store voice data of voice mail, and can support voice mail functions by using this card with the VPU/8 card (VB-44150/UK) or the VPU/4 card(VB-44160/UK).
The VSSC card and ACD card (VB-44140/UK) cannot be used on the same eabinet.

The following briefly describes the main blocks of the VSSC card.

① Power Watch IC
This IC resets the CPU when the power is interrupted or down.

② CPU
This CPU controls the VSSC card.

③ CPU Control IC (GVMC)
GVMC controls the peripheral circuits of CPU.

④ FIFO
Signals which is transmitted in the PCM highway are input to the voice processing circuit (VPU/4, VPU/8 cards) via the FIFO IC. And it communicates with main CPU of the CCU.

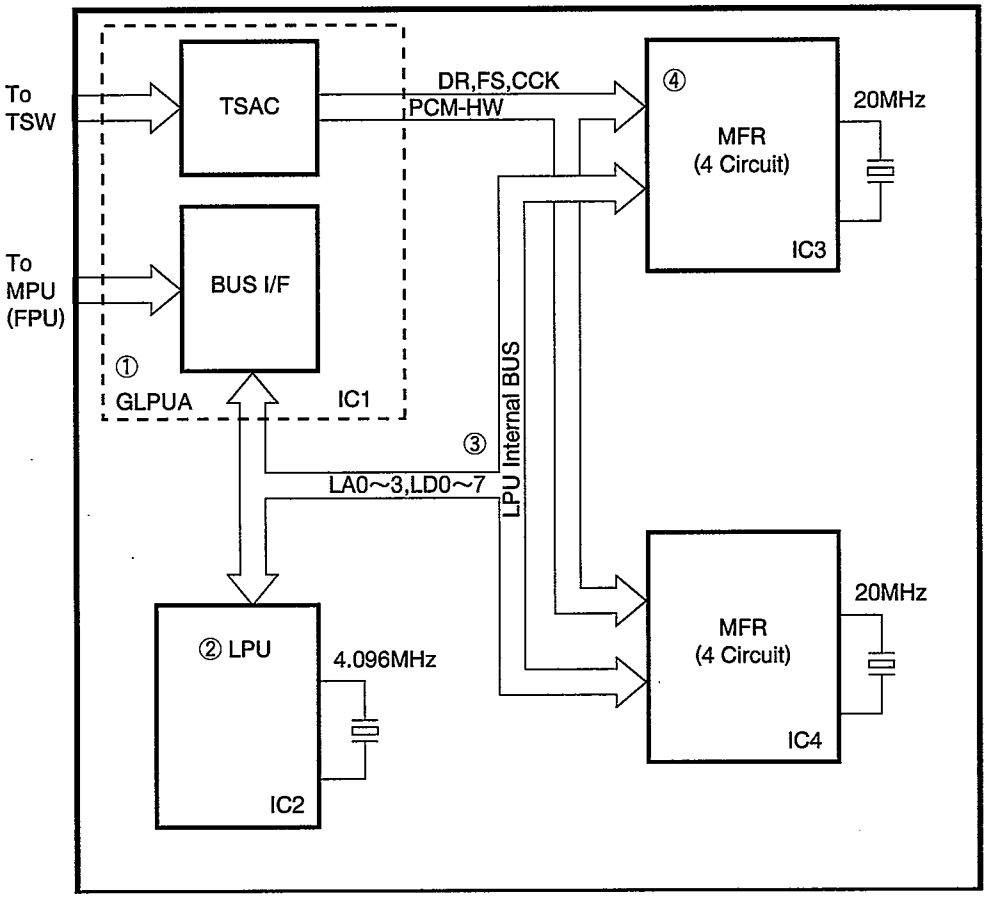
⑤ Battery Backup/RAM Backup Switch
A backup battery and RAM backup switch are provided to hold or clear data in RAM.
To hold data in RAM, set the RAM backup switch to BACK UP. To clear data, set the RAM backup switch to INITIAL. The CPU checks the setting of this switch only when the system is started up, and determines whether or not to clear the data.

⑥ RAM
RAM comprises four 1-Mbit SRAMs. Data is held in RAM by the battery backup circuit.

⑦ ROM
ROM comprises two 4-Mbit EPROMs.

⑧ ATA I/F
This circuit is for transferring (CPU voice data buffer to harddisk) data by ATA I/F. Regular programme transfer is used when transferring data on the ATA interface.

# (23) MFR/8 card (VB-44110UK/HK) : 8 DTMF Receiver Card




The MFR/8 card is DTMF receiver circuits.
MFR/8 card is mounted on the option slot or the flexible slot and can be received DTMF signal coming from SLT extension or from outside line.
The MFR/8 card has eight built-in DTMF receiver circuits, and only one card can be mounted for one main cabinet.

The following briefly describes the main blocks of the MFR/8 card.

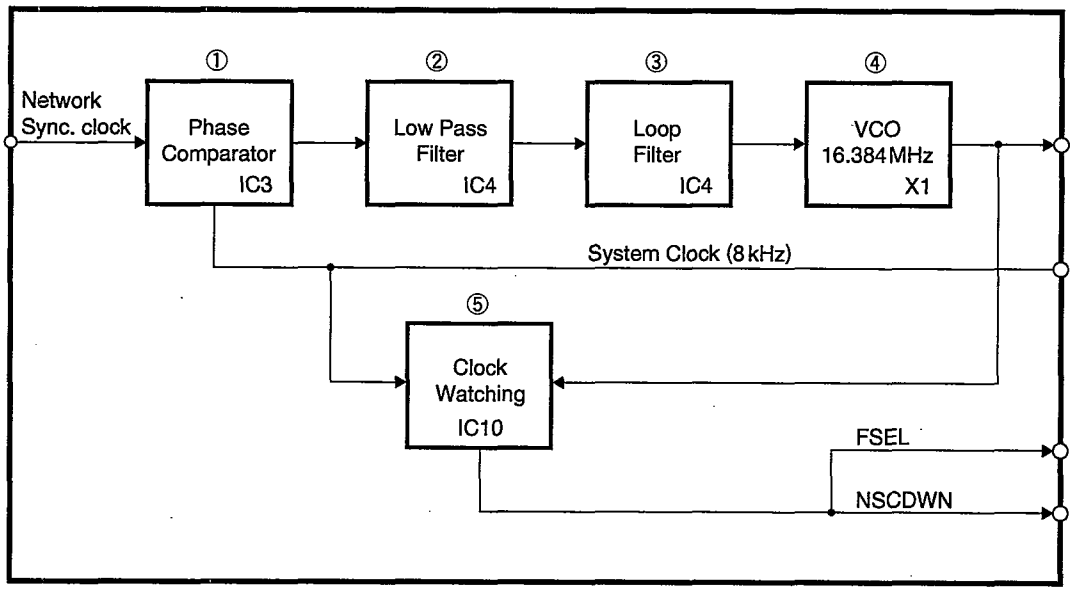
① GLPUA
This is the interface gate array between the PCM highway and the FS-BUS.

② LPU
The LPU controls the MFR by communicating with the upper CPU (MPU or FPU) by reading and writing the GLPUA registers.

③ LPU Internal Bus
This is a 8-bit parallel bus between the LPU, GLPUA, and MFR.

④ MFR
The MFR accommodates, 4-circuit in a single chip.

# (24) Synchronisation package (VB-44460UK) : Synchronisation Package/Network Unit




The synchronisation package is required when a digital circuit, such as ISDN, is mounted.
The synchronisation package generates a PCM clock that is synchronised with a digital network by the PLL circuit, supplying the PCM clock to the CPC96/TSW288/TSW576 card.
The synchronisation package is mounted on either the CPU96 card or the TSW288/TSW576 card.

The following briefly describes the main blocks of the synchronisation package.

① Phase Comparator
The phase comparator compares the reference clock signal (network extracted clock) and the sync clock signal (main unit system clock) to detect phase difference.

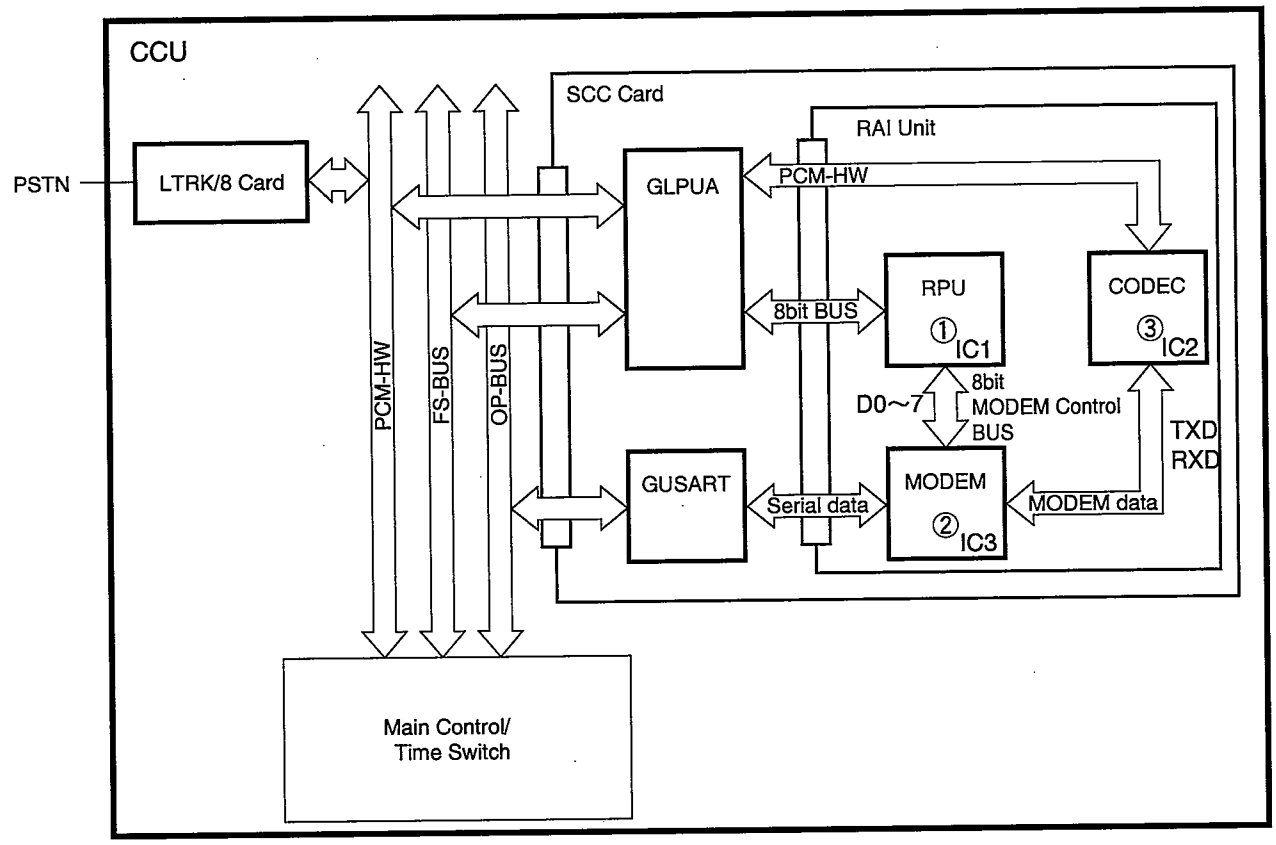
② Low Pass Filter
This filter removes unnecessary high-frequency from the VCO output clock signal, reference clock signal and sync clock signal.

③ Loop Filter
This filter is for determining the response characteristics of the PLL circuit.

④ VCO
The VCO crystal oscillator can control output frequency according to the level of the voltage applied to the CNT pin.
The VCO output clock signal is synchronised with the reference clock signal by converting the phase difference between the reference and sync clock signals to a voltage level, and inputting this voltage level to the CNT pin on the VCO.

⑤ Clock Watching
This circuit watches for the output of clock signals. Outputs the NSCDWN or FSEL signals when an error is detected.

# (25) RAI Unit (VB-44182UK/HK) : Remote Administration Unit




By mounting the RAI unit on the SCC card, RS-232C (port 1) can be used as a maximum 2400 bps modem interface. The RAI unit provides such remote maintenance as programming by connecting a personal computer to the Exchange line port through the modem.
The RAI unit supports the following ITU-T protocols: V.21, V.22 and V.22 bis.

The following briefly describes the main blocks of the RAI unit.

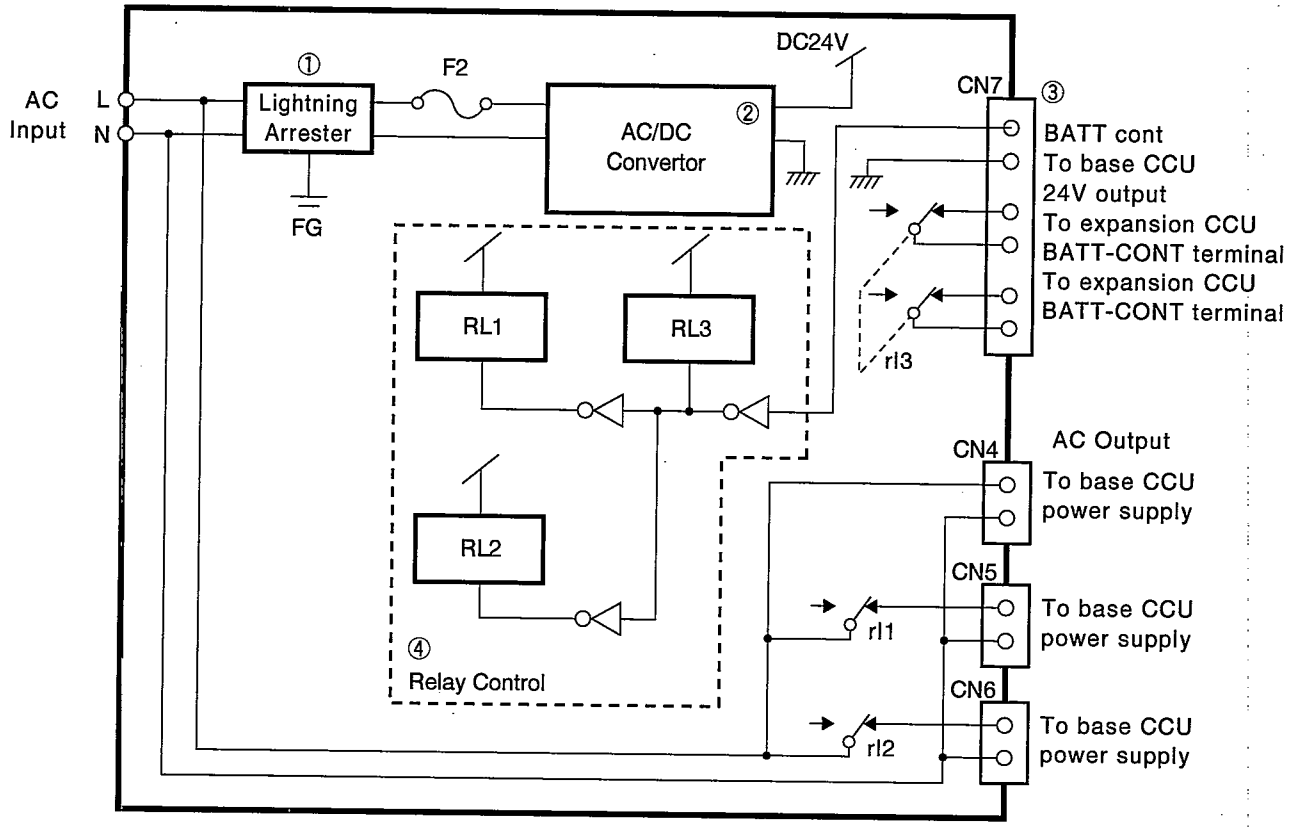
① RPU
The RPU controls the modem, and handles communications with the upper CPU. It also has built-in ROM (6144 bytes) and SRAM (512 x 4 bits).

② MODEM
The modem modulates and demodulates serial data to modem (analog) data. It also supervises connection sequences and the carrier.

③ CODEC
The CODEC forms the interface between analog signals and the PCM highway.

# 3. Power Supply & External Optional Equipment

## (1) SWBOX (VB-44023UK) : Switch Box




The SWBOX is installed when the building block is being configured, and batch controls the power supplies for the base CCU and expansion CCUs according to the power switch on the base CCU.

① Lightning Arrester Circuit

This circuit protects the AC/DC converter (auxiliary power supply) from lightning surge by using a ZNR, discharge tube and fuses.

② AC/DC converter (auxiliary power supply)

This generates the 24 VDC relay power supply for controlling AC power supply output from expansion CCUs and for controlling the BATT control signal.

③ BATT Control Terminal

This terminal controls the backup battery disconnection on expansion CCUs. Actual operation is linked with the power switch on the base CCU.

④ Relay Control

This supervises the 24 V voltage of the base CCU and controls the expansion CCU AC power supply relays (RL1, RL2) and the backup battery disconnect control relay (RL3).

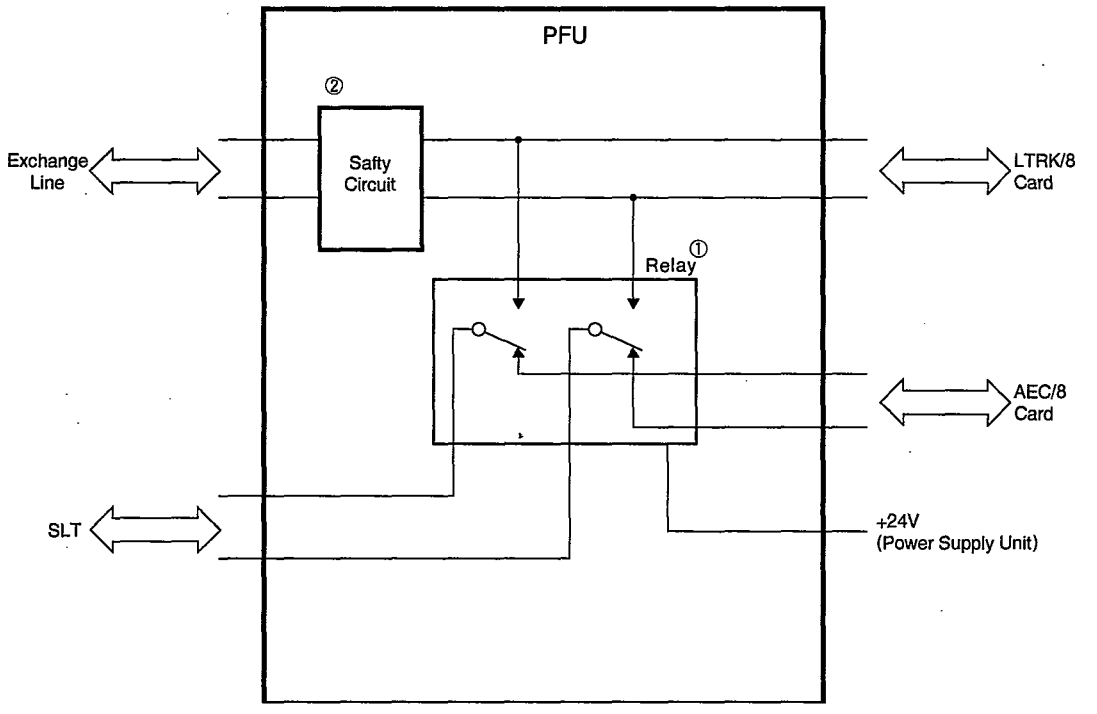
## (2) BATT96 (VB-44025/UK) : Battery

BATT96 is a sealed lead battery. The following are the main specifications of BATT96.

- Nominal voltage :12 V
- Rated capacity :3.4 Ah (20-hours rate)
- Weight :Approx.1200 g
- Initial charging current :Max. 0.51 A

Two of these batteries are inserted for use at installation. These batteries supply +24 VDC voltage to the CCUs when the power is interrupted.

## (3) PFU (VB-43703UK) : Power Failure Unit




The PFU is a box type external adapter.
Normally, the analog exchange line interface card (LTRK/8 card) is connected to the analog exchange line, and the analog extension interface card (AEC/8 card) is connected to the single telephone (SLT). When power failure happens, the relay in the PFU is switched so that the analog exchange line and SLT are directly connected.
The PFU is provided with circuits for four exchange lines.

The following briefly describes the main blocks of the PFU.

① Switching Relay
Normally, the analog exchange line interface card (LTRK/8 card) is connected to the analog exchange line, and the analog extension interface card (AEC/8 card) is connected to the single line telephone (SLT).
When power failure happens, this relay is switched so that the analog exchange line and SLT are directly connected.

② Safety Circuit
This safety circuit protects against lightning surges.

## 4. Key Phones

### (1) Key Phone

12 Key (VB-D411UK)

12 Key-SPU (VB-44221HK)

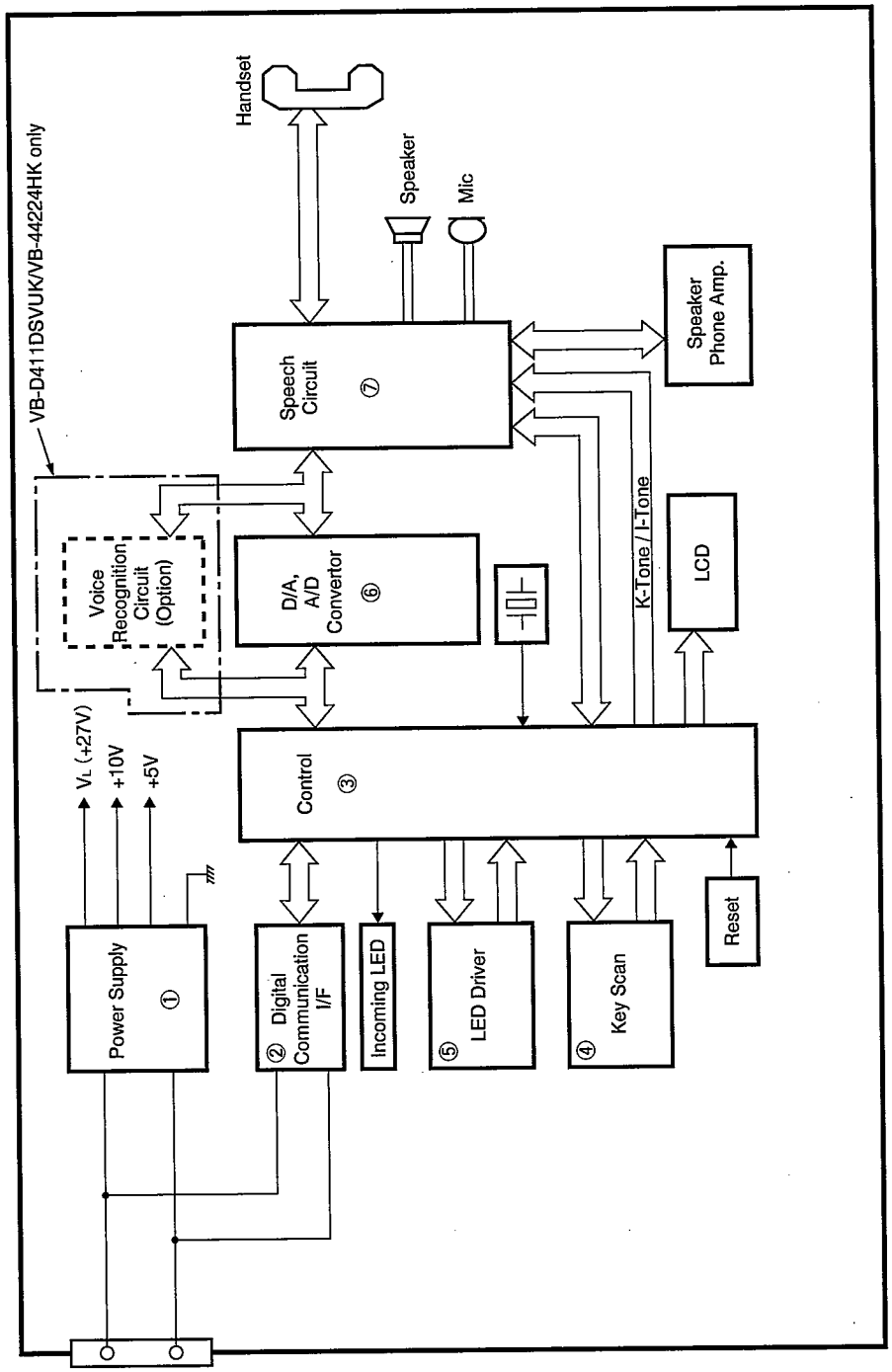
12 Key-LCD/SPU (VB-D411DSUK/VB-44223HK)

12 Key-LLCD/SPU (VB-D411LDSUK/VB-44225HK)

12 Key-LCD/Soft key/Voice/SLT/SPU (VB-D411DSVUK/VB-44224HK)

24 Key-LCD (VB-D611DUK)

24 Key-LCD/SPU (VB-D611DSUK/VB-44233HK)



Though key phones differ in numbers of FF keys and in size of LCD, the basic configuration of the circuits is the same. The following summarises the descriptions of the key phones.

The following briefly describes the main blocks of a key phone.

① Power Supply
The VL (+27V), +10V and +5V DC power supplies are generated based upon the power that is supplied from the CCU extension cards (DEC/8 card) via the modular connector.

② Digital Communication I/F
This interface is for receiving and transmitting digital communications data to and from the CCU extension card (DEC/8 cards).

③ Control Section
This controls digital communications data, key scan data, LED drive data, communication circuit and LCD display.

④ Key Scan
When you press the required key from the key matrix, the Key Scan signal of the key that is pressed is sent to the Control Section.

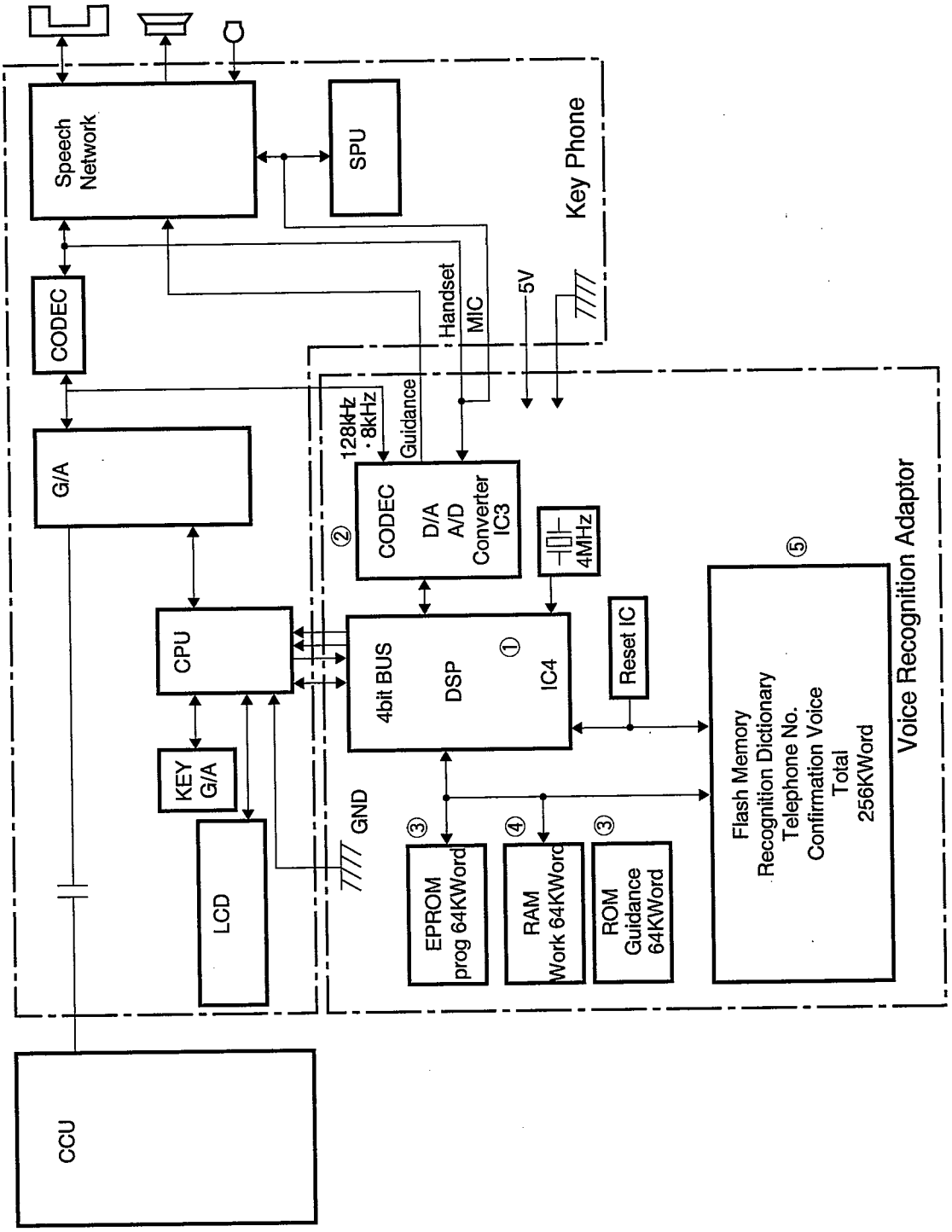
⑤ LED Drive
The LED drive lights the required LED from the LED matrix according to the LED drive signal from the Control Section.

⑥ D/A, A/D Converter
The A/D converter converts analog voice data that is sent from the handset or microphone via the speech circuit to digital data. The D/A converter converts digital voice data that is sent from the CCU via the digital communications interface to analog voice data, and transmits the analog voice data to the handset or speaker.

⑦ Speech Circuit
This circuit adjusts analog voice signals from the handset and analog voice signals that have been converted by the D/A converter to an appropriate signal level by an amplifier circuit.

⑧ Speakerphone Circuit (only for speakerphone telephone)
This circuit receives and transmits voice signals to and from the speech circuit. It is provided with a microphone amplifier and speaker amplifier so that conversations can be carried out without the using the handset.

## (2) VRADP (VB-44101UK/HK) : Voice Recognition Adapter




Voice recognition operation are possible if VRADP is incorporated in telephones (VB-D411DSVUK/VB-44224HK) that support voice recognition. When you enter the voice recognition mode, guidance is output from the adapter. The following operations are possible when the VRADP is used.

1) Voice Dial Function

- Dial transmission:
  A voice that is input on the telephone is recognized from a pre-registered directory of voices to enable transmission from exchange lines and extensions.
- Execution of Fixed Feature code:
  Functions which is assigned in fixed feature code can be executed by voice-inputting the previously registered name of a function when the internal dial tone is heard.

2) Voice Recognition Function
   This function recognizes voices that are input to the adapter on the telephone, and notifies the recognition result to VRADP control.
   The voice recognition function comprises DSP, memory and respective control software. The voice of the caller can be recognized by standard voice element patterns pre-registered to the adapter.

3) Learning function
   This adapter is intended for a specific user. Voice dialing can be registered, and voice commands for control can be registered again by the user's voice. This enables voices to be reliably recognized. (Default is voice recognition by an unspecified user and sometimes voice cannot be recognized good enough.)

4) Voice directory functions
- Voice registration:
  The voice directory is intended for use by individuals. Up to 100 destinations per person can be registered to the directory.
- Directory confirmation:
  The details registered to the telephone directory can be confirmed by caller's voice.
- Editing:
  Telephone numbers of destinations pre-registered to the directory can be changed and modified, and the voice for a registered item can be changed.

5) Soft Key Function
   If voice input is no longer possible due to the operating environment, the same operations as the caller's voice recognition can be carried out on the soft keys.

The following briefly describes the main blocks of the VRADP.

① DSP
The DSP carries out data communications with the CPU on the key telephone based upon voice digital data and control data from CODEC, ROM/RAM, and flash memory, and controls the voice recognition telephone functions.

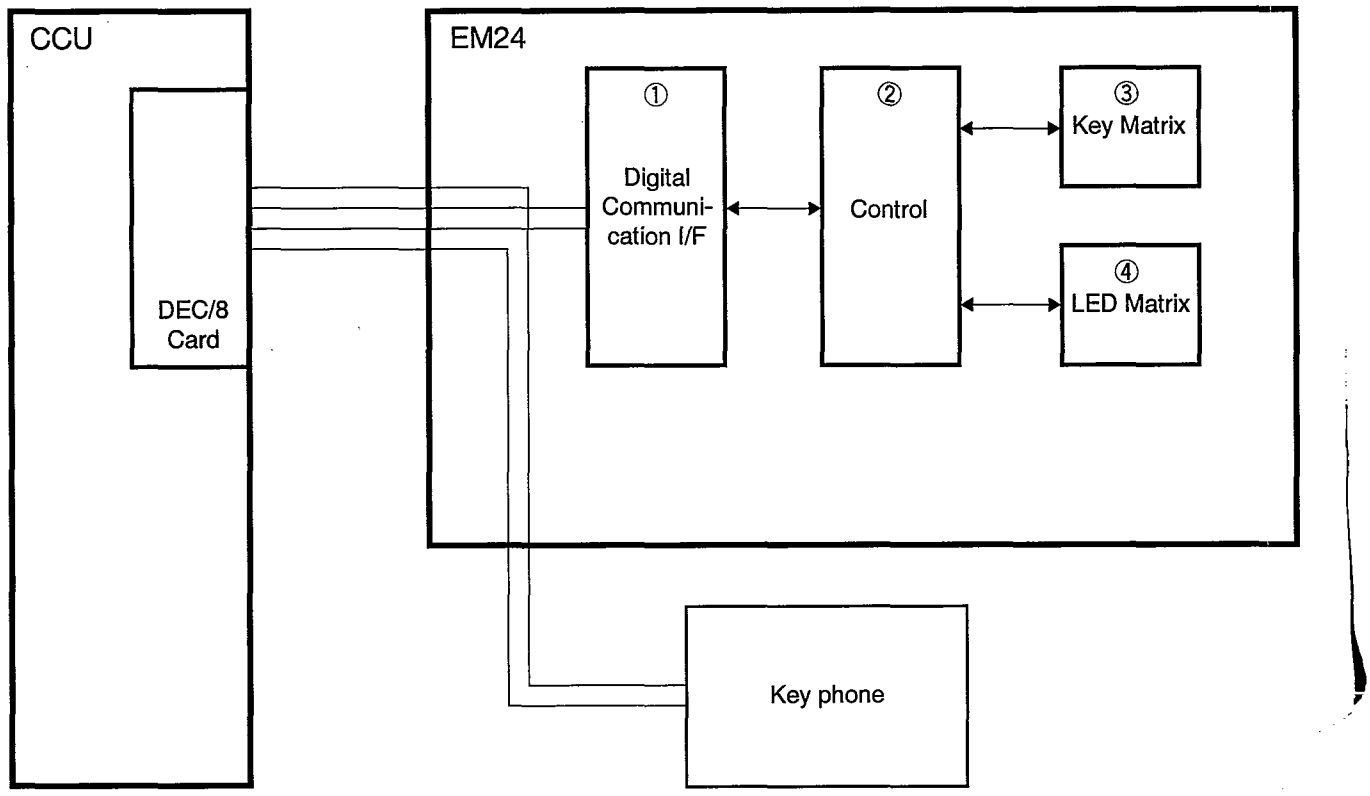
② CODEC (D/A, A/D Converter)
The CODEC converts analog voice data input on the handset or microphone to digital data. It also converts digital voice data (e.g. guidance) to analog voice data, and transmits this analog voice data to the handset or speaker.
128k Hz and 8k Hz signals are sent to the adapter from the key telephone as the CODEC clock signal.

③ ROM
ROM comprises a 64k word(Kilo Word) ROM as program area and a 64k Word ROM as guidance area.

④ RAM
RAM consists of a 64k Word area as the work area.

⑤ Memory
A total of 256k Word flash memory is used as the memory. The recognition dictionary, telephone numbers and resistered voices are stored to this memory.

## (3) DSS (VB-D631UK/VB-44320HK) : Direct Station Selector Console
## EM24(VB-D331UK/VB-44310HK) : 24key Expansion Module




Up to 24(EM24)/72(DSS) FF keys can be added on by connecting the DSS unit to the DEC card on a CCU in combination with a key phone.

① Digital Communication I/F
This interface is for receiving and transmitting digital communications data to and from the DEC/8 card on a CCU.

② Control Section
This controls digital communications data, key scan data and LED drive data.

③ Key Matrix
This matrix corresponds to entry by the 24/72 keys so that the signal of the key that was pressed is sent to the Control section.

④ LED Matrix
This matrix corresponds to LED display of the 24/72 keys in response to signals from the Control and the drive circuit so that the LED of the key that was pressed lights.

# ■SETTING OF SWITCHES

The following shows the settings of switches on each card.

## 1. Maintenance Switch

Some cards are providing a maintenance switch. When this switch is set to ON, cards can be removed and inserted while the power is ON.

**CAUTION:**

- Check that the line busy lamp is off before removing the card. If the lamp is on, the line will be disconnected when the card is removed.
- Check that the maintenance switch is off. After replacing the card in its slot on completion of the maintenance work.
- Never attempt to remove any of the following cards while the system is operating: (If you do so, ICs might be damaged.)
  - CPC96 card
  - CPC288 card
  - CPC576 card
  - TSW288 card
  - TSW576 card
  - CBLMST card
  - CBLSLV card
  - CBLDBS card
  - CBL card
  - SCC card
  - ACD card
  - VPU/8 card
  - VPU/4 card
  - VSSC card

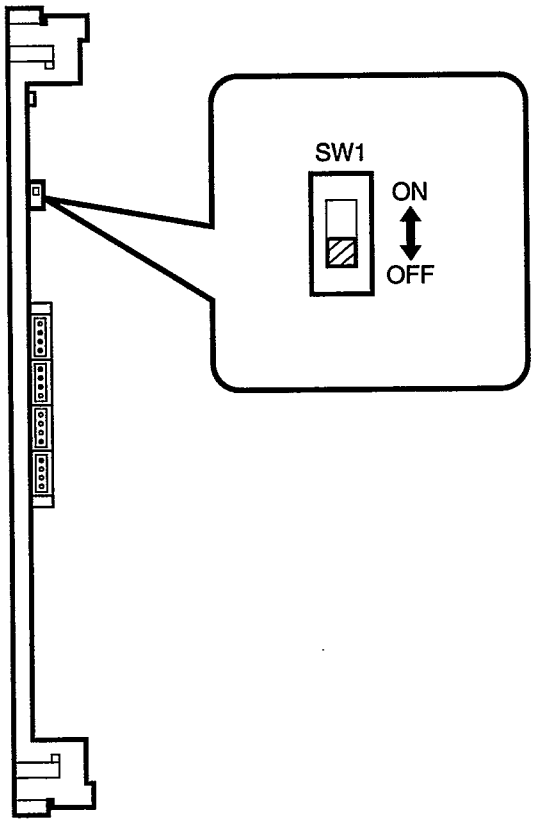
- The following 6 cards can be removed from and replaced in their slots even when the system is operating (power is on) provided the maintenance switch is set to ON (up).
  - LTRK/8 card
  - AC15/4 card (VB-44570UK)
  - DIDTR8 card (VB-44620HK)
  - TBRI/4 card
  - PRI/23 card (VB-44540)
  - PRI/30 card (VB-44540UK)

When the maintence switch is on, the cards are in the following state:

- Incoming calls are ignored;
- Outgoing calls are prevented;
- The line is diconnected on completion of any current call.

The cards can be removed as soon as all circuits on the card are idle and the busy lamps are off.

Note that the extension cards (DEC/8, AEC/8, SBRI/4, MFR/8, and CONF Card) can be removed and replaced while the system is operating. However, because there are no busy lamps for calls on extension lines, you cannnot check the status of there lines. We recommend using paging, etc., before removing the cards, to warn users that the extension lines will be disconnected.

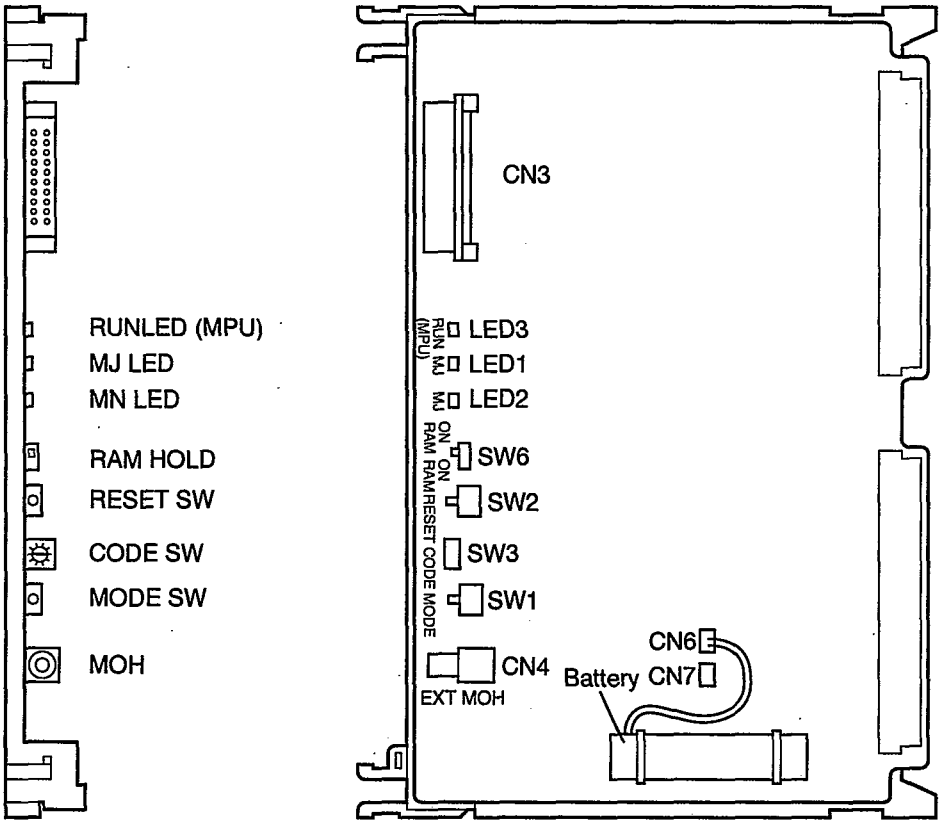



<LTRK/8 Card>

# 2. Cards

## (1) CPC96 card (VB-44410UK/HK):CPC-96 card

The following shows the locations and settings of switches on the CPC96 card.

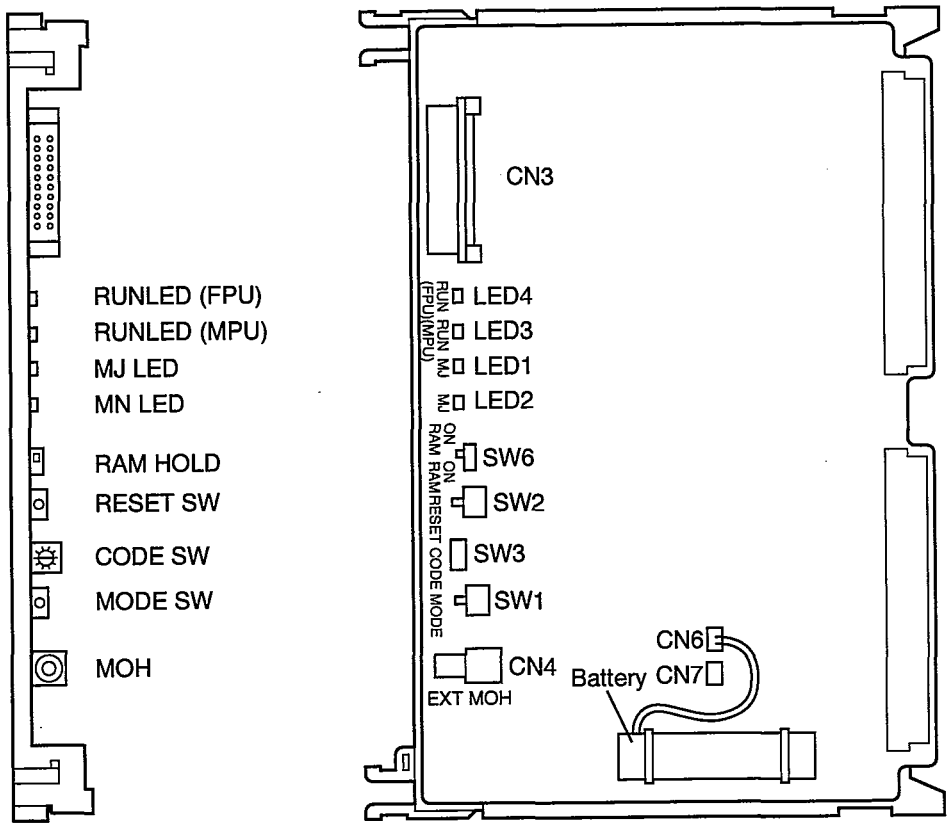



***Switch settings of CPC96 card***

| SW No. | Description |
|---|---|
| SW1 : Black (MODE) | Push switch for setting modes of system. |
| SW2 : Red (RESET) | Push switch for resetting. |
| SW3 (CODE) | Rotary switch for setting startup mode of system. |
| SW6 (RAM HOLD) | Switch for selecting battery backup of memory. |

## (2) CPC288 card (VB-444201UK/HK):CPC-288 card

The following shows the locations and settings of switches on the CPC288 card.

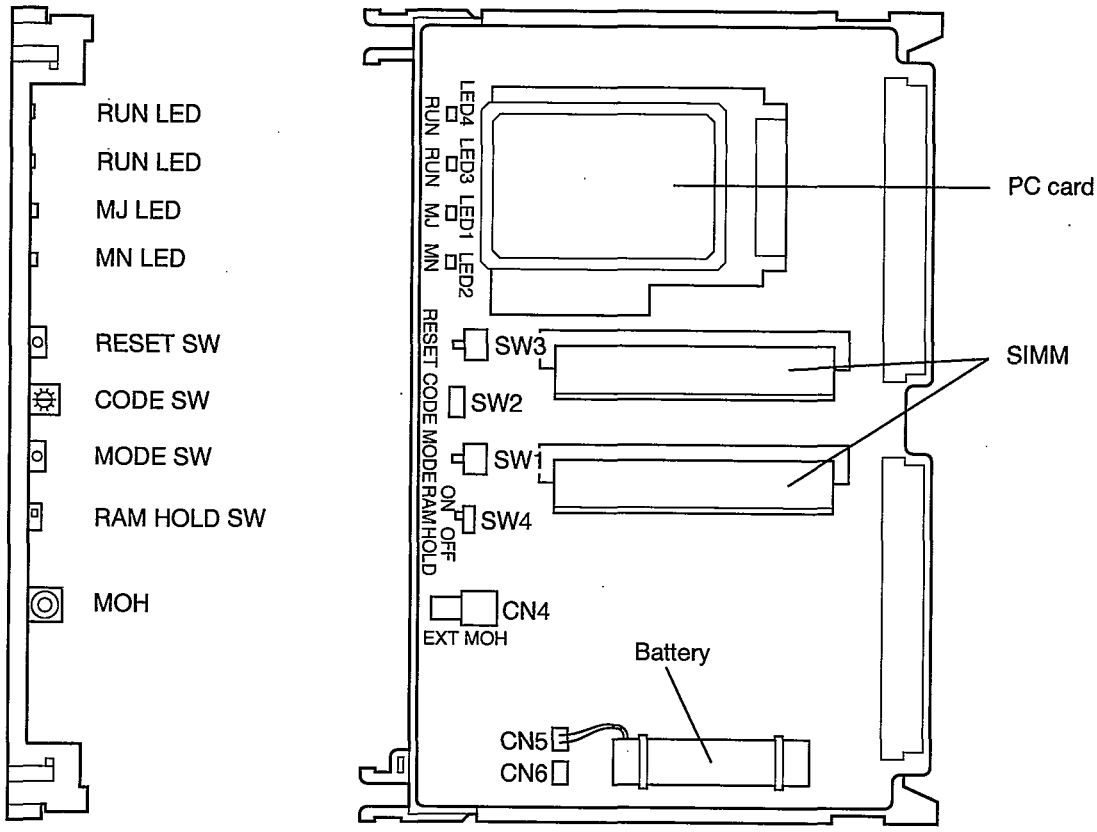



***Switch settings of CPC288 card***

| SW No. | Description |
|---|---|
| SW1 : Black (MODE) | Push switch for setting modes of system. |
| SW2 : Red (RESET) | Push switch for resetting. |
| SW3 (CODE) | Rotary switch for setting startup mode of system. |
| SW6 (RAM HOLD) | Switch for selecting battery backup of memory. |

## (3) CPC576 card (VB-444301UK/HK):CPC-576 card

The following shows the locations and settings of switches on the CPC576 card.




***Switch settings of CPC576 card***

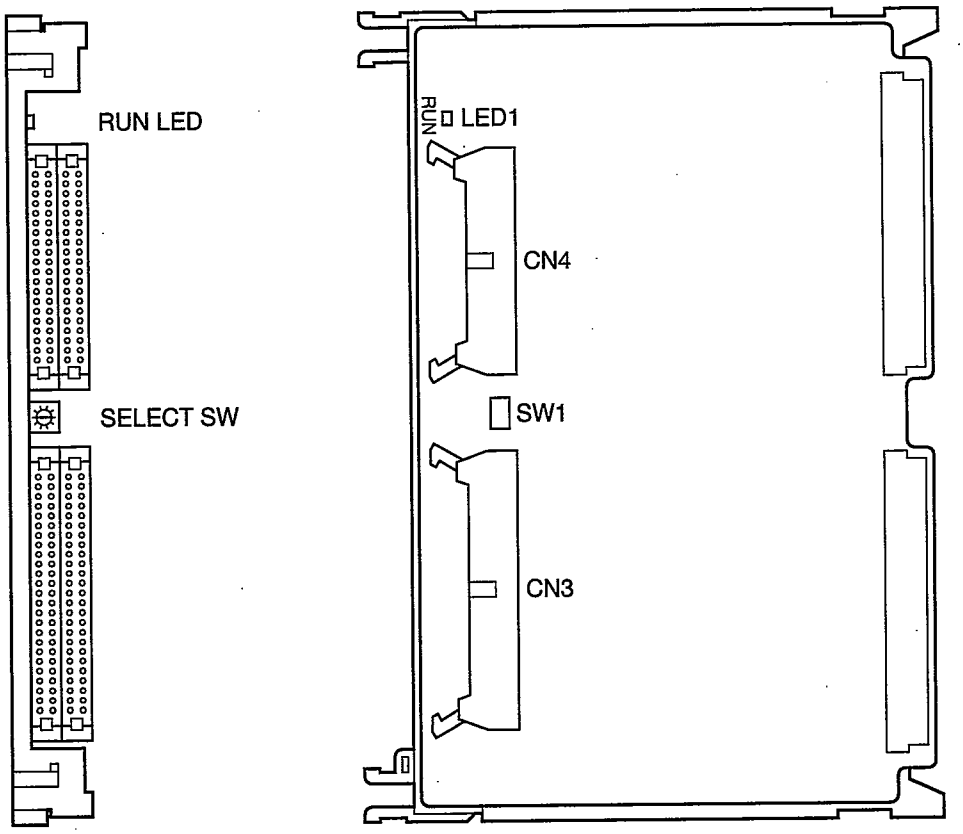
| SW No. | Description |
|---|---|
| SW1 : Black (MODE) | Push switch for setting modes of system. |
| SW2 : Red (CODE) | Rotary switch for setting startup mode of system. |
| SW3 (RESET) | Push switch for resetting. |
| SW4 (RAM HOLD) | Switch for selecting battery backup of memory. |

## (4) CBL card (VB-44451):Building Block card
## CBLDBS card (VB-44452):Connection Cable card-DBS

The following shows the locations and settings of switches on the CBL card.

Use the rotary switch (SW1) on the CBL and CBLDBS cards to set the expansion CCU No.

Refer to the following table, which shows the relationship between rotary switch position and expansion CCU ID No. when setting the ID No.

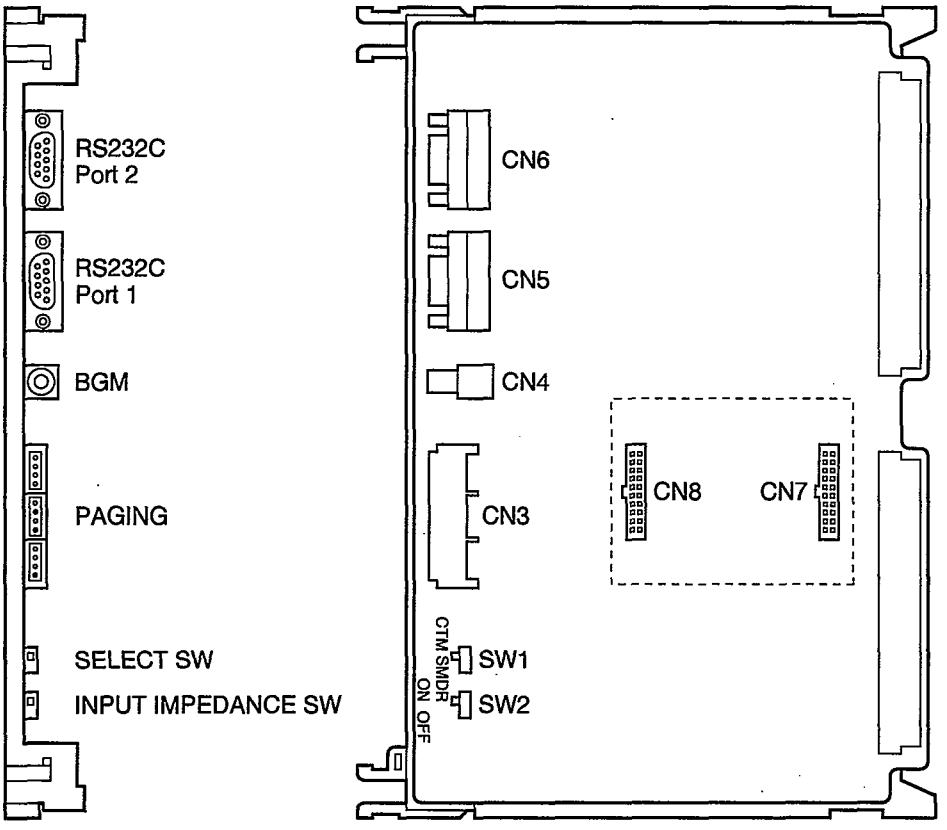



***Settings of rotary swich (SW1) of CBL and CBLDBS cards***

| Rotary switch position | Expansion CCU ID No. |
|---|---|
| 1 | Expansion CCU-1 |
| 2 | Expansion CCU-2 |
| 3 | Expansion CCU-3 |
| 4 | Expansion CCU-4 |
| 5 | Expansion CCU-5 |
| 0,6 to 9 | Not available |

## (5) SCC card (VB-44181UK/HK):Service Control Card

The following shows the locations and settings of switches on the SCC card.

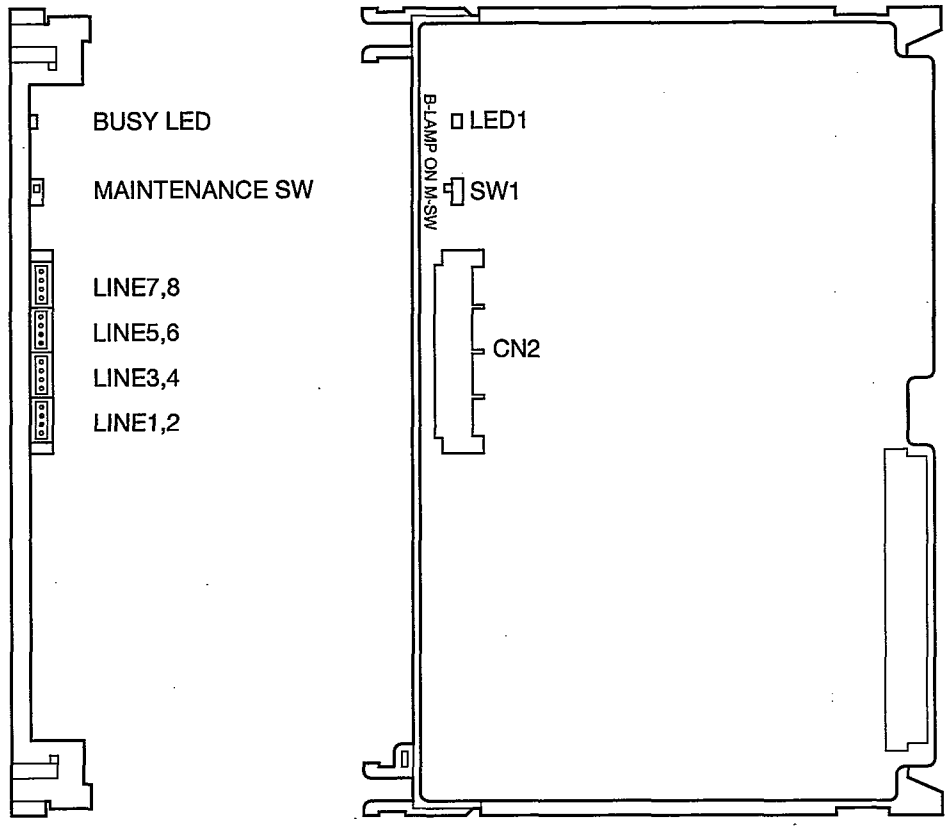



***SCC card switch settings.***

| Switch No. | Setting | Description |
|---|---|---|
| SW1 | CTM | Connects customised tool to RS-232C port (CN5). |
| | SMDR | Connects call logging device to RS-232C port (CN5). (default setting) |
| SW2 | ON | Sets input impedance of external paging device to 600ohm. |
| | OFF | Sets input impedance of external paging device to high impedance. (default setting) |

## (6) LTRK/8 card (VB-44510UK/HK):Loop Start Trunk Card

The following shows the locations and settings of switches on the LTRK/8 card.

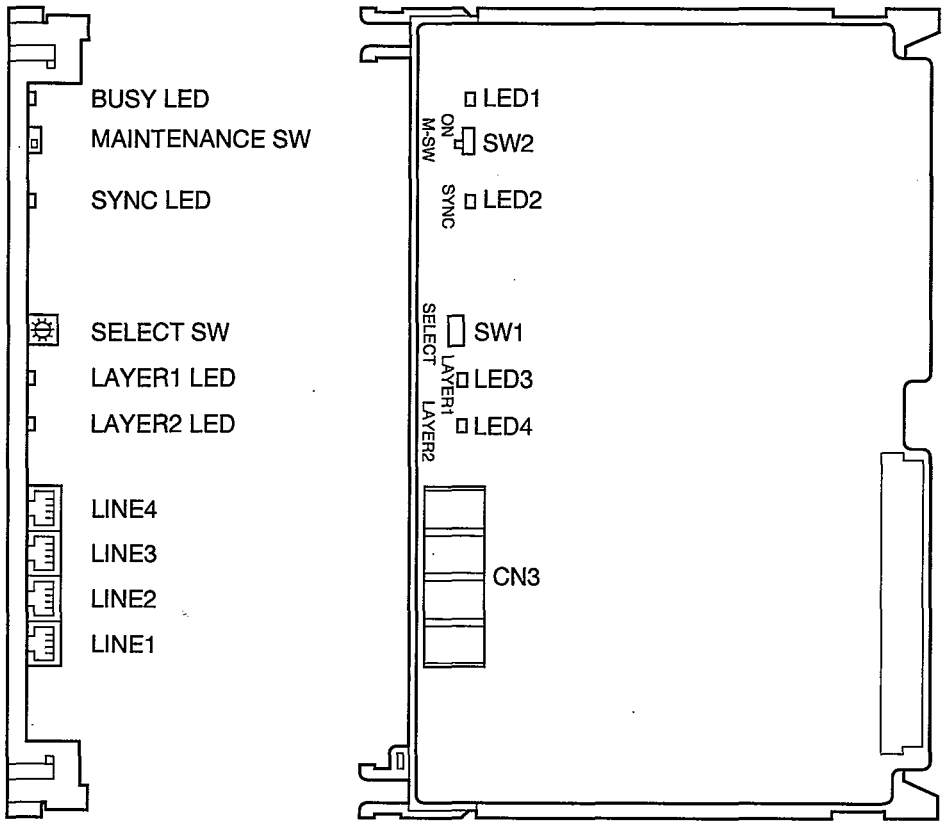



***Maintenance switch (SW1) settings of LTRK/8 card***

| Setting | Description |
|---|---|
| ON | Card is in closed status, and can be mounted and removed when power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending/receiving of calls is disabled after speech ends.) |
| OFF | Normal operation (This switch is set to OFF for normal operation.) |

# (7) TBRI/4 card (VB-44530):BRI Card (T-point)

The following shows the locations and settings of switches on the TBRI/4 card.




***Maintenance switch (SW2) settings of TBRI/4 card***

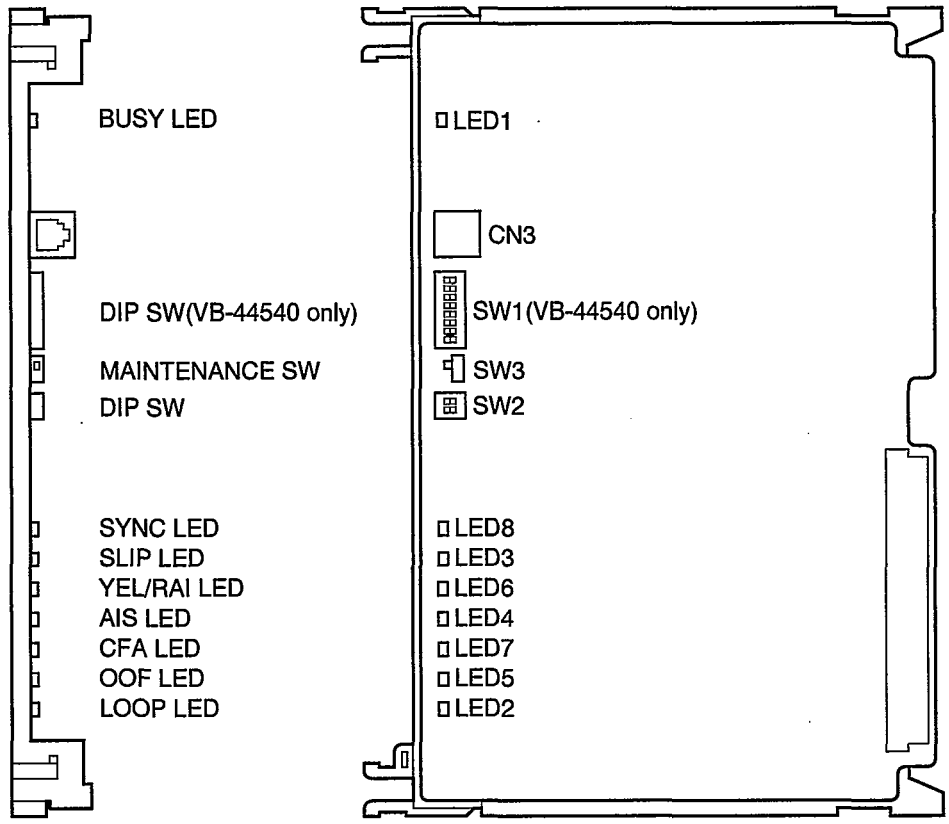
| Setting | Description |
|---|---|
| ON | Card is in closed status, and can be mounted and removed when the power is ON. (Sending / receiving of calls is disabled. If this is set during speech, sending / receiving of calls is disabled after speech ends.) |
| OFF | Normal operation (This switch is set to OFF for normal operation.) |

***Circuit select switch (SW1) settings of TBRI/4 card***

| Switch position | LED indication |
|---|---|
| 0 | OFF (default setting when unit is shipped) |
| 1 | 1st interface condition displayed by LAYER1 LED and LAYER2 LED |
| 2 | 2nd interface condition displayed by LAYER1 LED and LAYER2 LED |
| 3 | 3rd interface condition displayed by LAYER1 LED and LAYER2 LED |
| 4 | 4th interface condition displayed by LAYER1 LED and LAYER2 LED |
| 5 to 9 | Not available |

## (8) PRI/23 card (VB-44540):PRI Card
## PRI/30 card (VB-44540UK):PRI Card

The following shows the locations and settings of switches on the PRI/23 and PRI/30 cards.




***Maintenance switch (SW3) settings of PRI/23 card and PRI/30 card***

| Setting | Description |
|---|---|
| ON | Card is in closed status, and can be mounted and removed when power is ON. (Sending / receiving of calls is disabled. If this is set during speech, sending / receiving of calls is disabled after speech ends.) |
| OFF | Normal operation (This switch is set to OFF for normal operation.) |

***Dip switch (SW1) settings of PRI/23 card(VB-44540 only)***

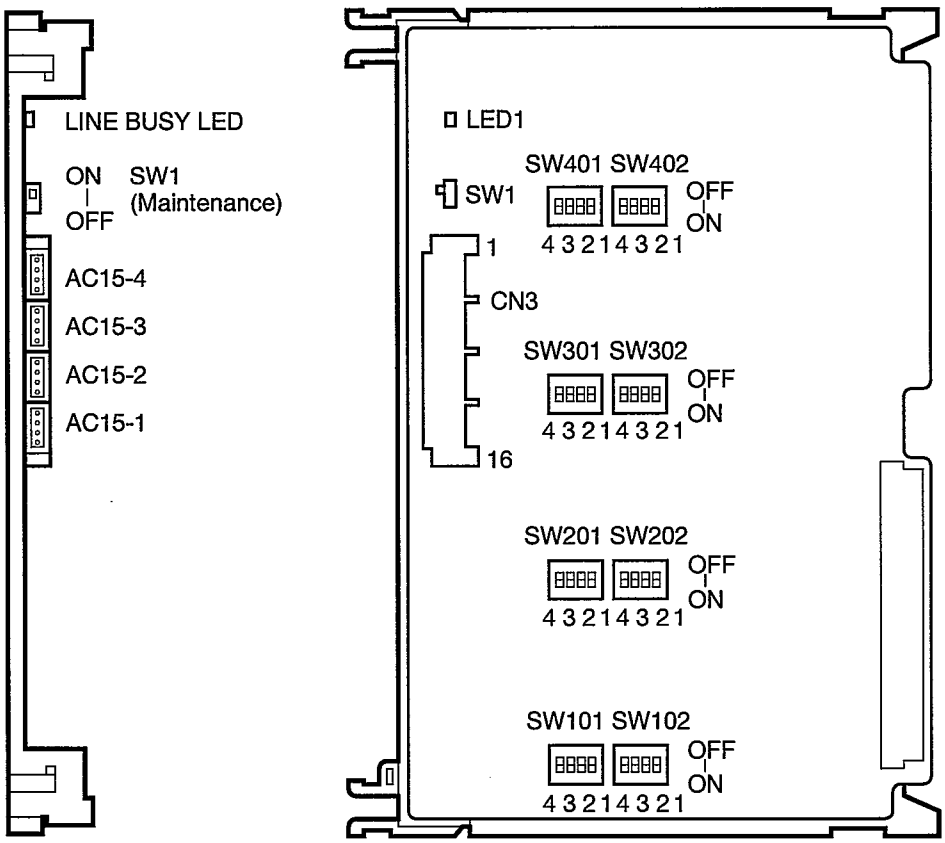
| Switch No. | Distance from the ICX to the DSU | | |
|---|---|---|---|
| | 0 to 150 ft. | 150-450 ft. | 450-655 ft. |
| SW1-1 | ON | OFF | OFF |
| SW1-2 | OFF | ON | OFF |
| SW1-3 | OFF | OFF | ON |
| SW1-4 | OFF | ON | OFF |
| SW1-5 | OFF | OFF | ON |
| SW1-6 | OFF | ON | OFF |
| SW1-7 | OFF | OFF | ON |
| SW1-8 | Not used | | |

***Dip switch (SW2) settings of PRI/23 card and PRI/30 card***

| Switch No. | Description | | |
|---|---|---|---|
| SW2-1 | ON | | Sets to "exchange line" for T-point. |
| | OFF | | Sets to "internal line" for S-point. |
| SW2-2 (VB-44540) | ON | PRI/30 card | Sets to "other mode" where 1 to 16B+D, 1 to 24B+D or 1 to 30B+D channels set by programme can be used. |
| | OFF | | Sets to "8ch mode" where 1 to 8B+D channels can be used. |
| SW2-2 (VB-44540UK) | OFF | PRI/23 card | Sets to "other mode" where 1 to 16B+D or 1 to 23B+D channels set by program can be used. |
| | ON | | Sets to "8ch mode" where 1 to 8B+D channels can be used. |

## (9) AC15/4 card (VB-44570UK):AC-15 Card

The following shows the locations and settings of switches on the AC15/4 card.




***Maintenance switch (SW1) settings of AC15/4 card***

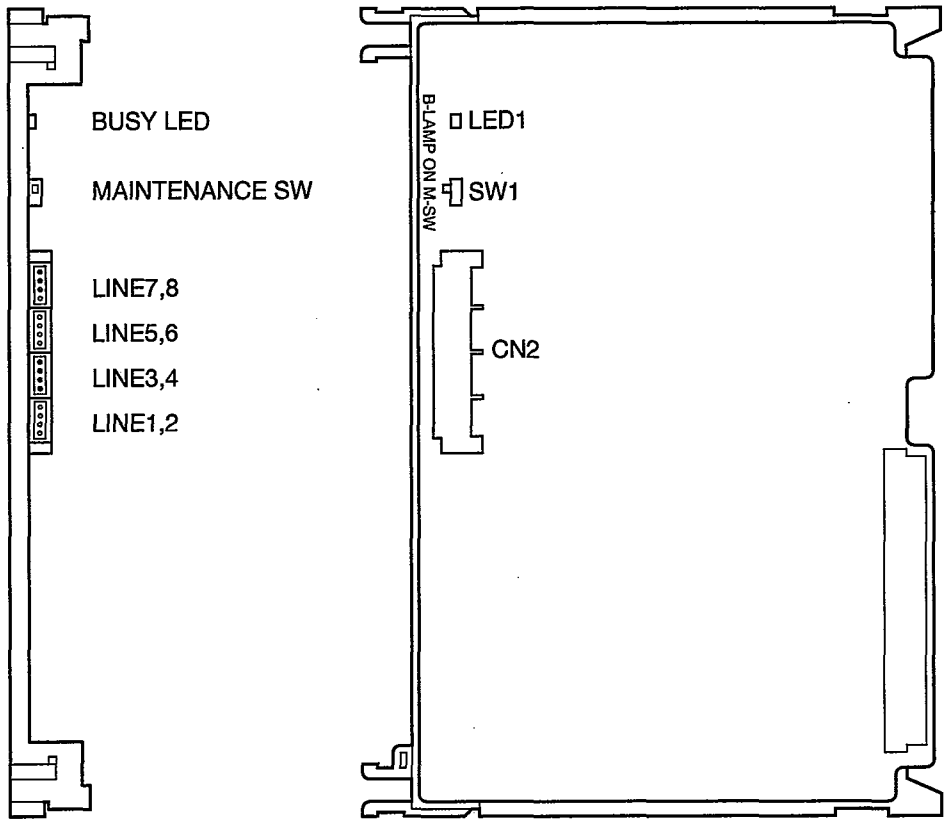
| Setting | Description |
|---|---|
| ON | Card is in closed status, and can be mounted and removed when the power is ON. (Sending/receiving of calls is disabled. If this is set during speech, sending / receiving of calls is disabled after speech ends.) |
| OFF | Normal operation (This switch is set to OFF for normal operation.) |

***AC15/4 Card Dip Switch settings***

<table>
<tr><th>Switch No.</th><th>Setting</th></tr>
<tr><td>SW101,<br>SW201,<br>SW301,<br>SW401</td><td>For incoming calls loss plan
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>Loss plan with in card</th><th>Remarks</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+1dB</td><td>Initial value</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>-1dB</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>-3dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>-5dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>-7dB</td><td></td></tr>
</table>
Note: Gain is obtained in a card only for the amount of wiring loss.</td></tr>
<tr><td>SW102,<br>SW202,<br>SW302,<br>SW402</td><td>For outgoing calls loss plan
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>Loss plan with in card</th><th>Remarks</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+4dB</td><td>Initial value</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>+2dB</td><td></td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>0dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>-2dB</td><td></td></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td><td>--4dB</td><td></td></tr>
</table>
Note: Gain is obtained in a card only for the amount of wiring loss.</td></tr>
</table>

# (10) DIDTR8 card (VB-44520HK):DID Trunk Card (HK only)

The following shows the locations and settings of switches on the DIDTR8 card.

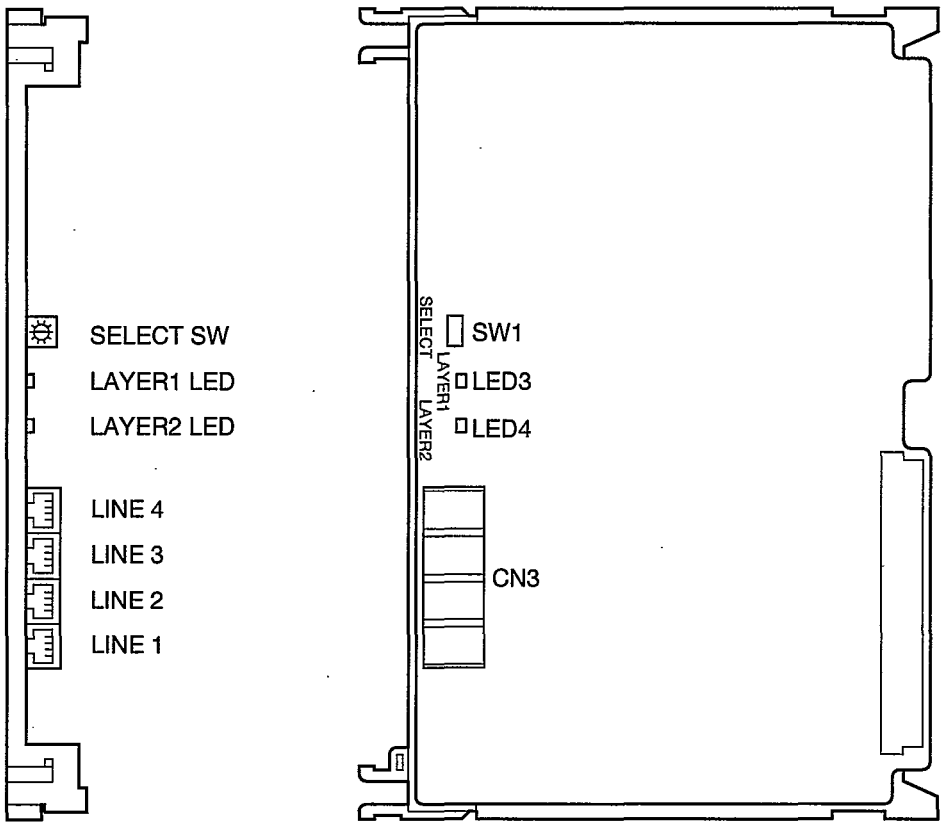



***Maintenance switch (SW1) settings of DIDTR8 card***

| Setting | Description |
|---|---|
| ON | Card is in closed status, and can be mounted and removed when power is ON. (Sending / receiving of calls is disabled. If this is set during speech, sending / receiving of calls is disabled after speech ends.) |
| OFF | Normal operation (This switch is set to OFF for normal operation.) |

# (11) SBRI/4 card (VB-44630):BRI Card (S-point)

The following shows the locations and settings of switches on the SBRI/4 card.




***Settings of circuit selection switch (SW1) of SBRI/4 card***

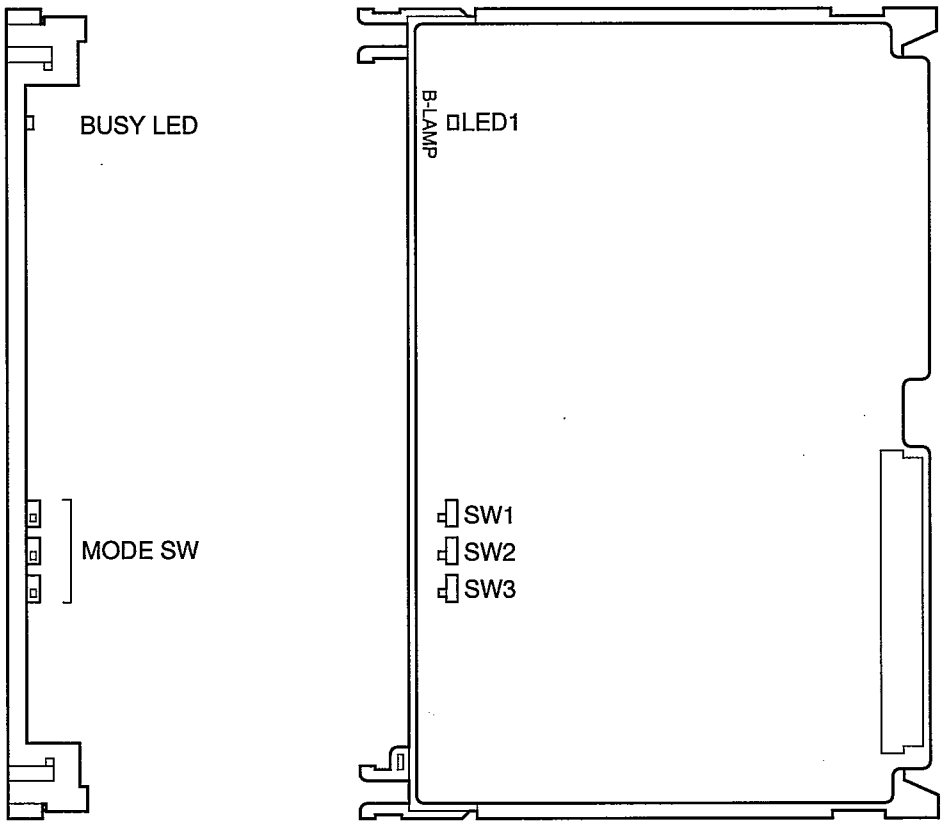
| Switch position | LED indication |
|---|---|
| 0 | OFF (default setting when unit is shipped) |
| 1 | 1st interface condition displayed by LAYER1 LED and LAYER2 LED |
| 2 | 2nd interface condition displayed by LAYER1 LED and LAYER2 LED |
| 3 | 3rd interface condition displayed by LAYER1 LED and LAYER2 LED |
| 4 | 4th interface condition displayed by LAYER1 LED and LAYER2 LED |
| 5 to 9 | Not available |

## (12) CONF card (VB-44120UK/HK):Conference Card

The locations and settings of switches on CONF card are shown below.

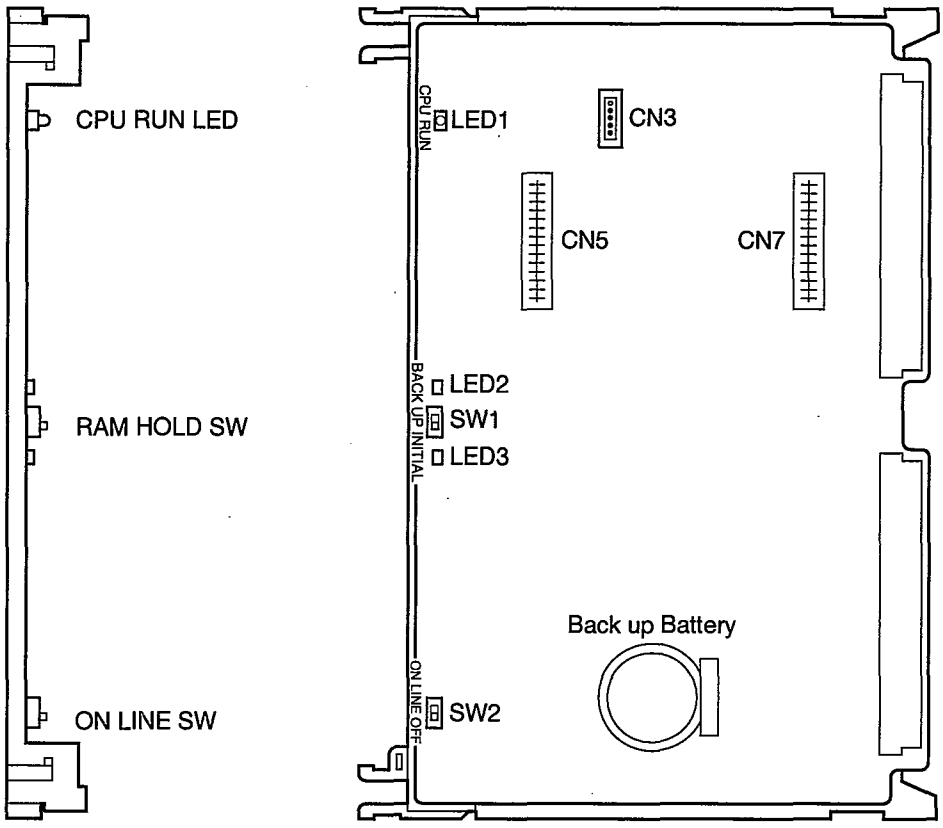
**CAUTION:**

- Don't change the switches an the CONF card from the default setting.
  SW1, SW2 and SW3 must be set "OFF".
  Otherwise, the mounting slot position of the CONF card and other cards are restricted.



# (13) ACD card (VB-44140/UK):ACD Card

The following shows the locations and settings of switches on the ACD card.

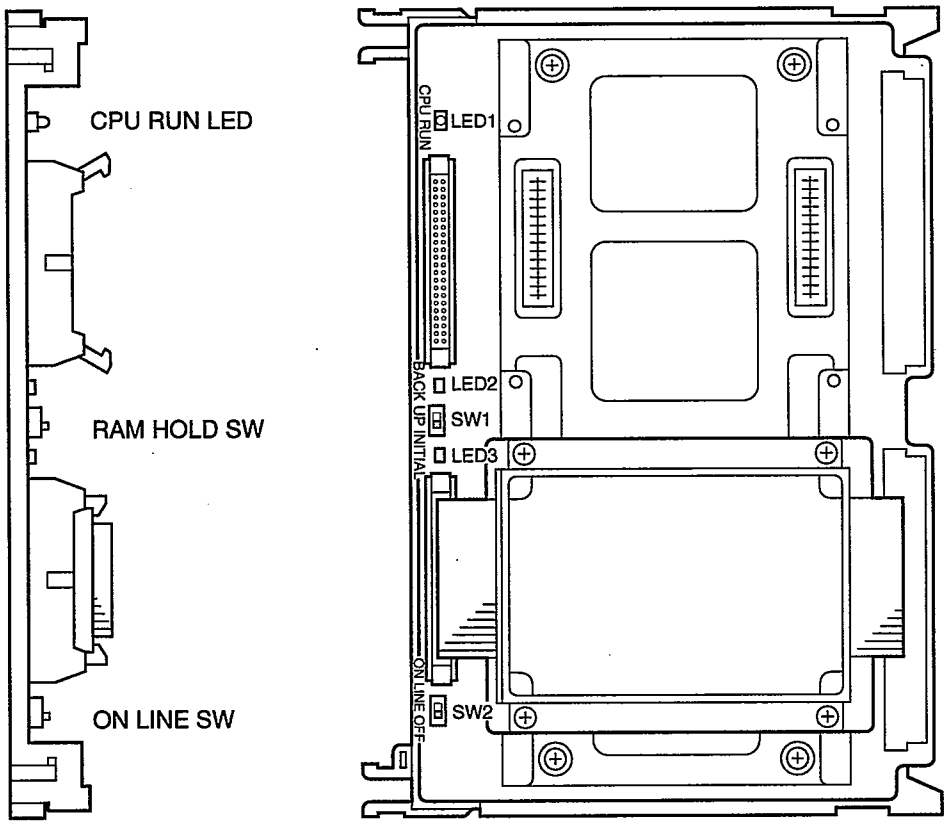



***ACD Card Switch Settings***

| Switch No. | Setting | Description |
|---|---|---|
| SW1 | BACK UP | Set when retaining RAM data. |
| | INITIAL | Set when clearing RAM data. |
| SW2 | ON LINE | Normal operation (set to ON LINE during regular operation) |
| | OFF LINE | Set when replacing the HDD system. |

# (14) VSSC card (VB-44170/UK):Voice Storage Service Card

The following shows the locations and settings of switches on the VSSC card.




***VSSC Card Switch Settings***

| Switch No. | Setting | Description |
|---|---|---|
| SW1 | BACK UP | Set when retaining RAM data. |
| | INITIAL | Set when clearing RAM data. |
| SW2 | ON LINE | Normal operation (set to ON LINE during regular operation) |
| | OFF LINE | Set when replacing the HDD system. |

# ■ OPERATION

## 1. Key phone/DSLT

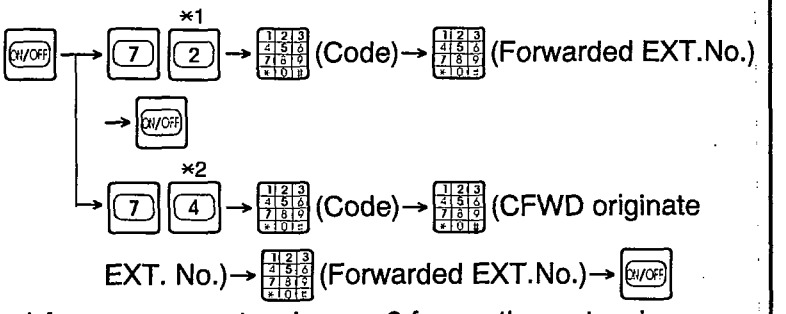
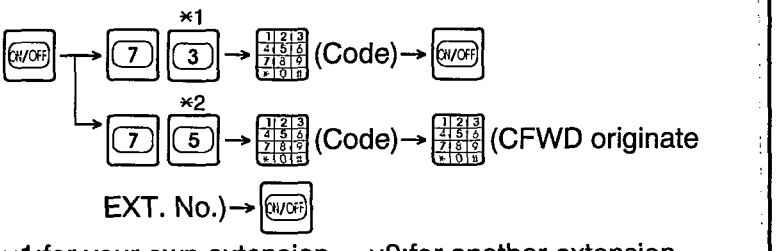
### (1) Basic Features

| Features | | | Operation |
|---|---|---|---|
| **Call Transfer** | To another extension or an outside | | While on a call→ [HOLD] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→ [handset] → [handset] or [ON/OFF]<br>→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (9 or 81-84:Exchange Line Access code)→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone. No.)<br>→ [handset] → [handset] |
| **Conference Calls** | Three-Party Conferencing | | While on a call→ [HOLD] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→When answered<br>→ [CONF]<br>→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (9 or 81-84:Exchange Line Access code)→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone. No.)<br>→When answered→ [CONF] |
| | Eight-Party Conferencing | Idle status | [handset] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Eight-Party Conference Code)→<br>→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→When answered→ [CONF] → [HOLD] →<br>→ [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→When answered→ [CONF]<br>***Eight-Party Conference Code: default=788*** |
| | | Current call | While on a call→ [HOLD] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Eight-Party Conference Code)<br>→ [HOLD] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→When answered→ [CONF]<br>***Eight-Party Conference Code: default=788*** |
| **Intercom Calling** | Tone call | | [handset] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→ [handset] → [handset] |
| | Voice call | | [handset] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.)→ [1] → [handset] → [handset] |

## (2) Exchange Line

| Features | | | Operetion |
|---|---|---|---|
| **Speed Dialling** | To assign | Key Tele-phone | [ON/OFF] → [PROG] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Bin No.) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Dial No.) → [HOLD] → [ON/OFF] |
| | | DSLT | [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Speed Dial Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Bin No.) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Dial No.) → [HOLD] → [ON/OFF]<br>***Speed Dial Code: default=710***<br>***Bin No.: 80-99 for Personal Speed Dial(PSD)***<br>***00-79 or 000-799 for System Speed Dial(SSD)*** |
| | To dial | Key Tele-phone | [Handset] or [ON/OFF] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Bin No.) → [Handset] → [Handset]<br>***If necessary access an outsie line before pressing MEMORY Key.*** |
| | | DSLT | [Handset] or [ON/OFF] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Speed Dial Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Bin No.) → [Handset] → [Handset] or [ON/OFF]<br>***Speed Dial Code: default=80***<br>***Bin No. 80-99 for Personal Speed Dial(PSD)***<br>***00-79 or 000-799 for System Speed Dial(SSD)*** |
| **Exchange line Access** | Exchange line Key Access (Key Telephone only) | | [Exchange line Key] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone No.) → [Handset] → [Handset] |
| | Direct Exchange line Access | | [Handset] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Direct Exchange line Access Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Exchange line No.) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone No.)<br>***Direct Exchange line Access Code: default=88*** |
| | MCO Exchange line Preference (Key Telephone only) | | [Handset] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone No.) |
| **Exchange line Access** | MCO Exchange line Access | | [Handset] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (9 or 81-84:Exchange line Access Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Phone No.)<br>***Exchange line Access Code: 9: MCO1 83: MCO4***<br>***81: MCO2 84: MCO5***<br>***82: MCO3*** |

## (3) Internal Features

| Features | | Operation |
|---|---|---|
| **Call Forwarding** | To set<br><br>(CFWO=Call Forward) |  <br>(Code)→ (Forwarded EXT.No.)<br>→<br>(Code)→ (CFWD originate EXT. No.)→ (Forwarded EXT.No.)→<br>*1:for your own extension *2:for another extension<br>***Code: 1:All Calls 2:Busy 3:No Answer*** |
| **Call Forwarding** | To cancel |  <br>(Code)→<br>(Code)→ (CFWD originate EXT. No.)→<br>*1:for your own extension *2:for another extension<br>***Code: 1:All Calls 2:Busy 3:No Answer*** |
| **Call Pickup** | Extension Group Pickup | or → (EXT. Group Call Pickup Code)→ → or<br>***EXT. Group Call Pickup Code: default=701:All Calls default=702:External Calls*** |
| | Specified Group Pickup | or → (Specified Group Call Pickup Code)→ (01-72:EXT. Group No.)→ → or<br>***Specified Group Call Pickup Code: default=703*** |
| | Extension Direct Pickup | or → (Extension Direct Call Pickup Code)→ (Ringing EXT. No.)→ → or<br>***Extension Direct Call Pickup Code: default=704*** |
| | Exchange line Group Pickup | or → (Exchange line Group Call Pickup Code) → → or<br>***Exchange line Direct Call Pickup Code: default=709*** |
| | Exchange line Direct Pickup | or → (Exchange line Direct Call Pickup Code) → (Ringing Exchange line No.)→ → or<br>***Exchange line Group Call Pickup Code: default=*0*** |

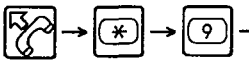
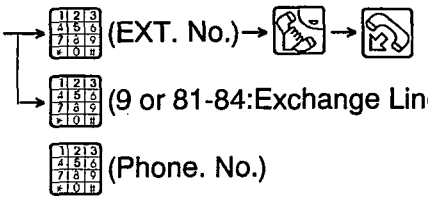
| Features | | | Operation |
|---|---|---|---|
| **Do Not Disturb (DND)** | own extension | To set or cancel | [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (DND Code) → [ON/OFF]<br>***DND Code: default=set:720*** |
| | another extension | To set or cancel | [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (DND Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (EXT. No.) → [ON/OFF]<br>***DND Code: default=set:740***<br>***default=cancel:750*** |
| **Paging** | To make | | [↗] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Group Paging Code) → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (0-9:Paging Group No.) → [↘]<br>***Group Paging Code: default=#*** |
| | To answer | | [↗] or [ON/OFF] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Meet Me Answer Code)<br>***Group Paging Code: default=##*** |

## (4) Additional Features

| Features | | Operation |
|---|---|---|
| **One Touch Keys** | To program | [ON/OFF] → [PROG] → [ ] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (phone No.) → [HOLD] → [ON/OFF] |
| | To assign System Speed Dial | [ON/OFF] → [PROG] → [ ] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (System Speed Dial No.) → [HOLD] → [ON/OFF] |
| | To chain | [ON/OFF] → [PROG] → [ ] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (System Speed Dial No.) → [REDIAL] → [MEMORY] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Speed Dial No.) → [HOLD] → [ON/OFF] |
| | To assign a Feature Code | [ON/OFF] → [PROG] → [ ] → [MEMORY] → [*] → [#] → [1 2 3 / 4 5 6 / 7 8 9 / * 0 #] (Feature Code) → [HOLD] → [ON/OFF] |
| | To check | [ON/OFF] → [CONF] → [ ] → [ON/OFF] |

## 2. SLT

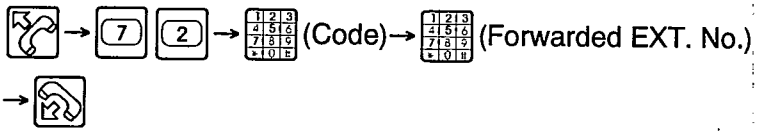
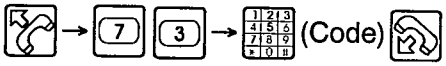
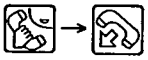
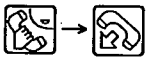
## (1) BASIC FEATURES

| Features | | | Operation |
|---|---|---|---|
| **Call Hold** | System/ Exclusive Hold | | While on a call→Hookflash |
| | Floating Hold Retrieve | |  →Floating Hold orbit No. (Exchange Line No.) |
| | Broker's Hold | | While on the first call→Hookflash→While on the second call→Hookflash |
| **Call Transfer** | To another extension or an outside | | While on a call→Hookflash→<br>  <br>(EXT. No.)→ → <br>(9 or 81-84:Exchange Line Access code)→<br>(Phone. No.) |
| **Conference Calls** | Three-Party Conferencing | | While on a call→Hookflash→ (EXT. No.)→When answered→Hookflash |
| | Eight-Party Conferencing | Idel status | → (Eight-Party Conference Code)→ (EXT. No.)→When answered→Hookflash→Hookflash→ (EXT. No.)→When answered→Hookflash<br>***Eight-Party Conference Code: default=788*** |
| | | Current call | While on a call→Hookflash→ (Eight-Party Conference Code)→Hookflash→ (EXT.No.)→When answered→ Hookflash→Hookflash→ (EXT. No.)→When answered →Hookflash<br>***Eight-Party Conference Code: default=788*** |
| **Intercom Calling** | Tone call | | → (EXT. No.)→ → |
| | Voice call | | → (EXT. No.)→ 1 → → |

## (2) EXCHANGE LINE FEATURES

| Features | | Operation |
|---|---|---|
| **Last Number Redial** | | → 7 → 1 → 2 → → <br>**Note:** Direct Exchange line Access is not available to redial. |
| **Speed Dialling** | To assign | → (Speed Dial Code)→ (Bin No.)→ (Dial No.)→Hookflash→ <br>*Speed Dial Code: default=710*<br>*Bin No. 80-99 for Personal Speed Dial(PSD)*<br>*00-79or000-799 for System Speed Dial(SSD)* |
| | To dial | → (Speed Dial Code)→ (Bin No.)→ <br>→ <br>*Speed Dial Code: default=80*<br>*Bin No. 80-99 for Personal Speed Dial(PSD)*<br>*00-79or000-799 for System Speed Dial(SSD)* |
| **Exchange line Access** | Direct Exchange line Access | → (Direct Exchange line Access Code)→ <br>(Exchange line No.)→ (Phone No.)<br>*Direct Exchange line Access Code: default=88* |
| | MCO Exchange line Access | → (9 or 81-84:Exchange line Access No.)→ <br>(Phone No.)<br>*Exchange line Access No.: 9: MCO1*<br>*81: MCO2*<br>*82: MCO3*<br>*83: MCO4*<br>*84: MCO5* |
| **Exchange line Queuing** | | → (Exchange line Access Code)→ (Callback Request Code)→ →Wait for the Exchange line Callback alert tone→ <br>*Callback Request Code: default=3* |

## (3) INTERNAL FEATURES

| Features | | Operation |
|---|---|---|
| **Call Forwarding** | To set |  (Code)→  (Forwarded EXT. No.) → <br>***Code: 1:All Calls***<br>***2:Busy***<br>***3:No Answer*** |
| | To cancel |  (Code) <br>***Code: 1:All Calls***<br>***2:Busy***<br>***3:No Answer*** |
| **Call Pickup** | Extension Group Pickup |  (EXT. Group Call Pickup Code)→ <br>***EXT. Group Call Pickup Code: default=701:All Calls***<br>***default=702:External Calls*** |
| | Specified Group Pickup |  (Specified Group Pickup Code)→  (01-72 :EXT. Group No.)→  <br>***Specified Group Pickup Code: default=703*** |
| | Extension Direct Pickup |  (EXT. Direct Call Pickup Code)→  (Ringing EXT. No.)→  <br>***EXT. Direct Call Pickup Code: default=704*** |

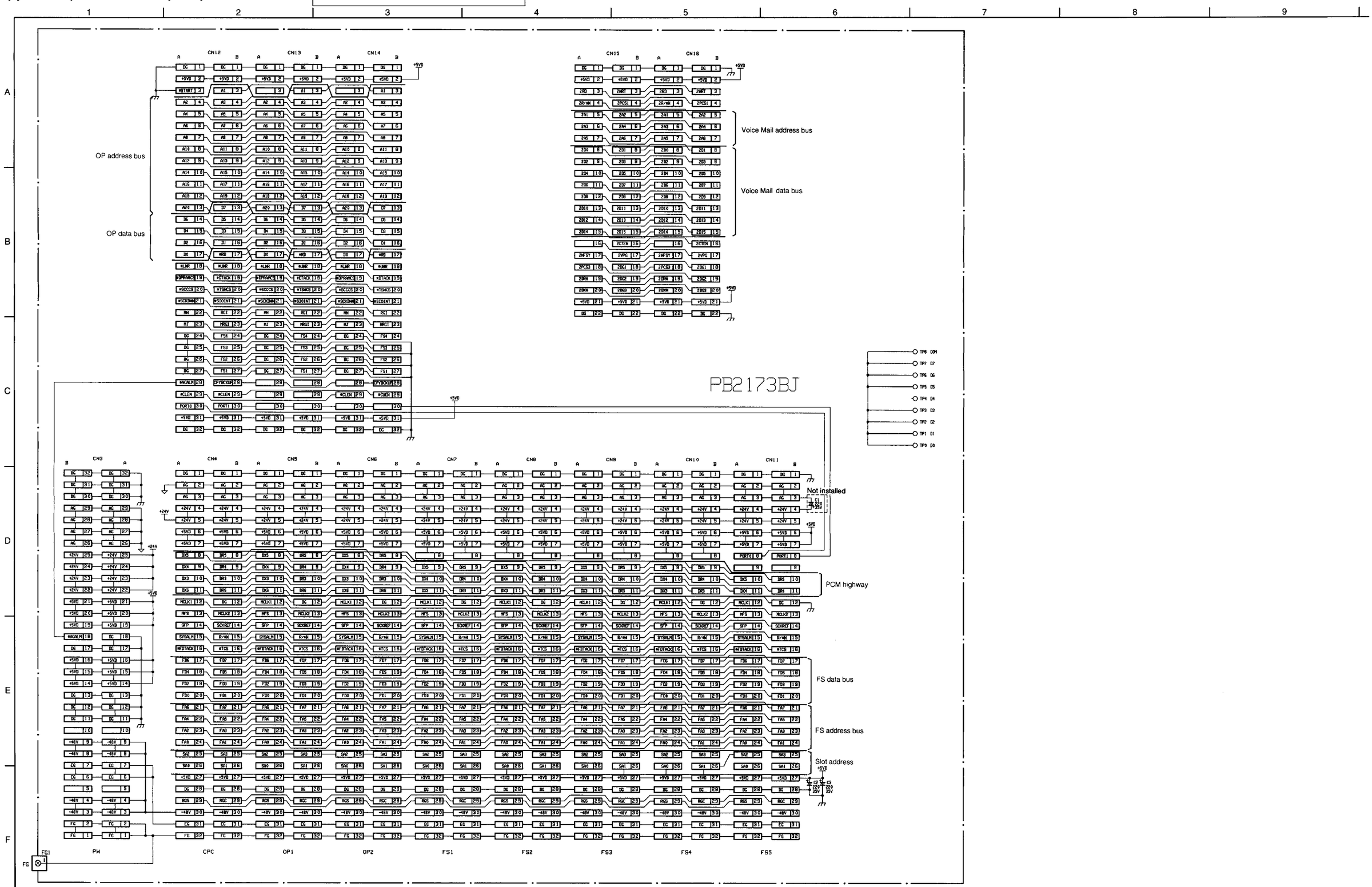
| Features | | | Operation |
|---|---|---|---|
| **Call Pickup** | Exchange line Group Pickup | | → (Exchange line Group Call Pickup Code) → → <br>***Exchange line Group Call Pickup Code: default=709*** |
| | Exchange line Direct Pickup | | → → → (Exchange line Direct Call Pickup Code) → (Ringing Exchange line No.)→ → <br>***Exchange line Direct Call Pickup Code: default=*0*** |
| **Do Not Disturb (DND)** | own extension | To set or cancel | → (DND Code)→ <br>***DND Code: default=720*** |
| **Paging** | To make | | → (Group Paging Code)→ (0-9:Paging Group No.)→ → <br>***Group Paging Code: default=#*** |
| | To answer | | → (Meet Me Answer Code) <br>***Meet Me Answer Code: default=##*** |

# ■SCHEMATIC DIAGRAM

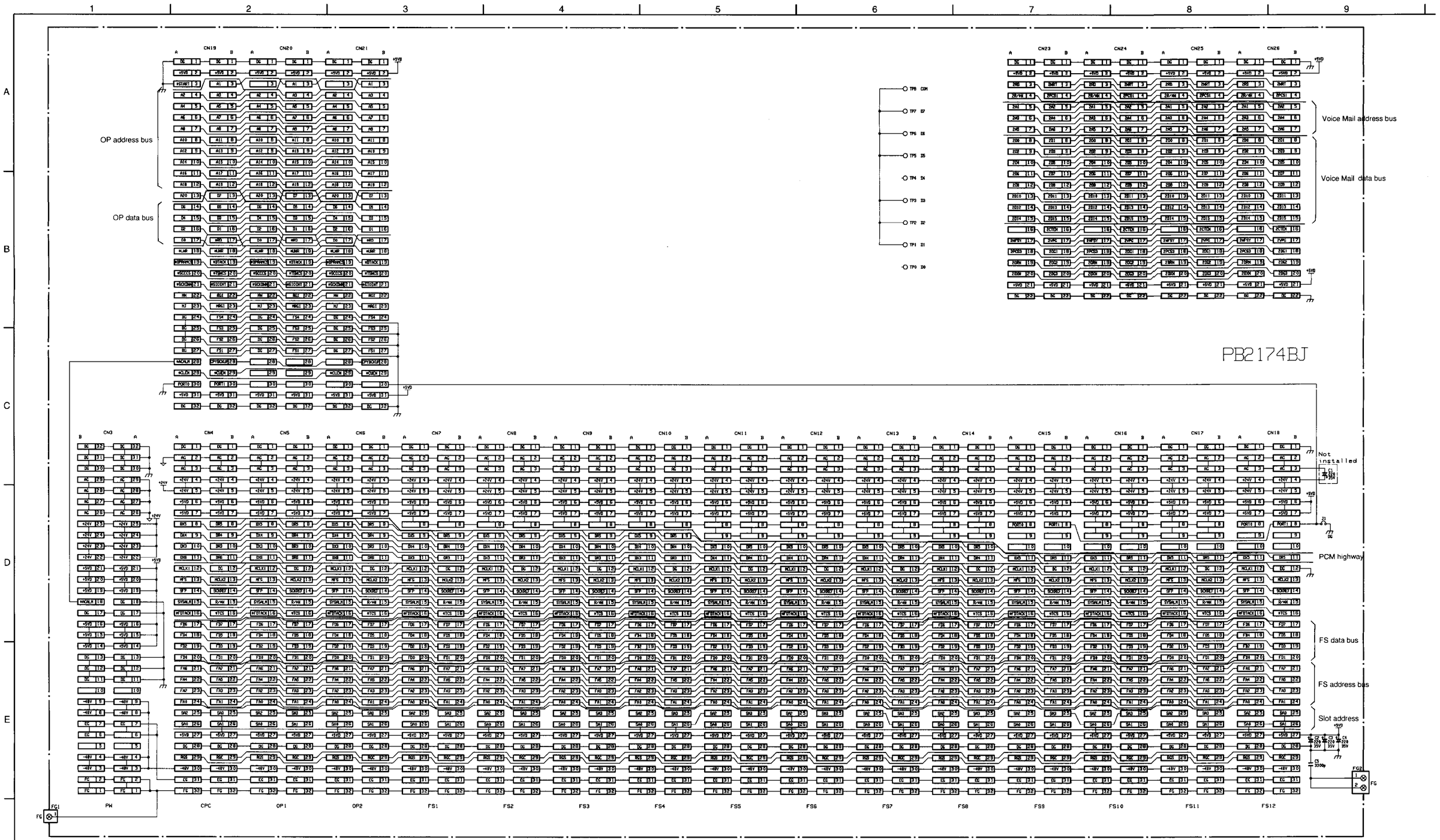
## 1.CCU

## (1) CAB40 (VB-44010UK/HK) : 40 port CCU

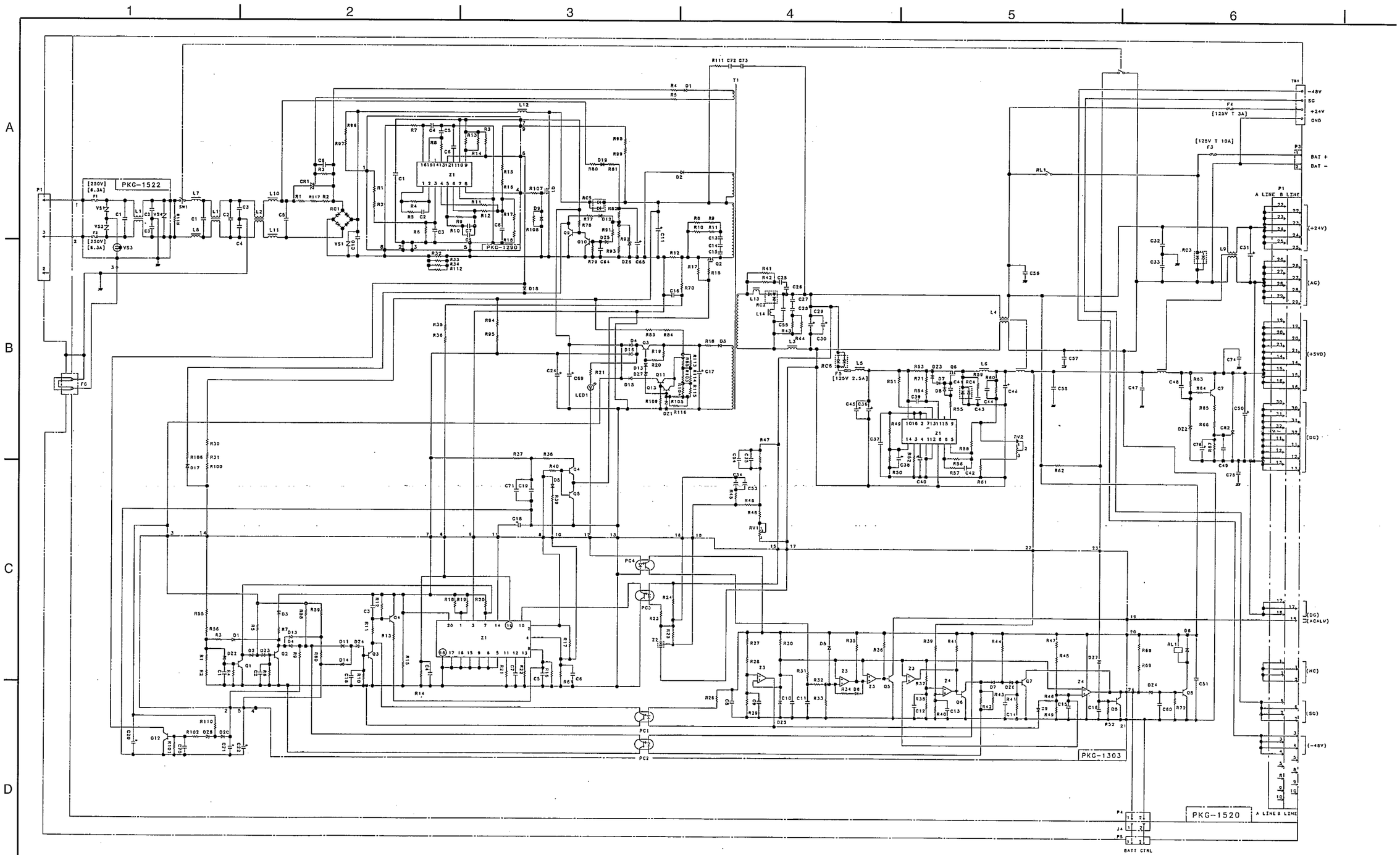
**Important safety notice**
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.



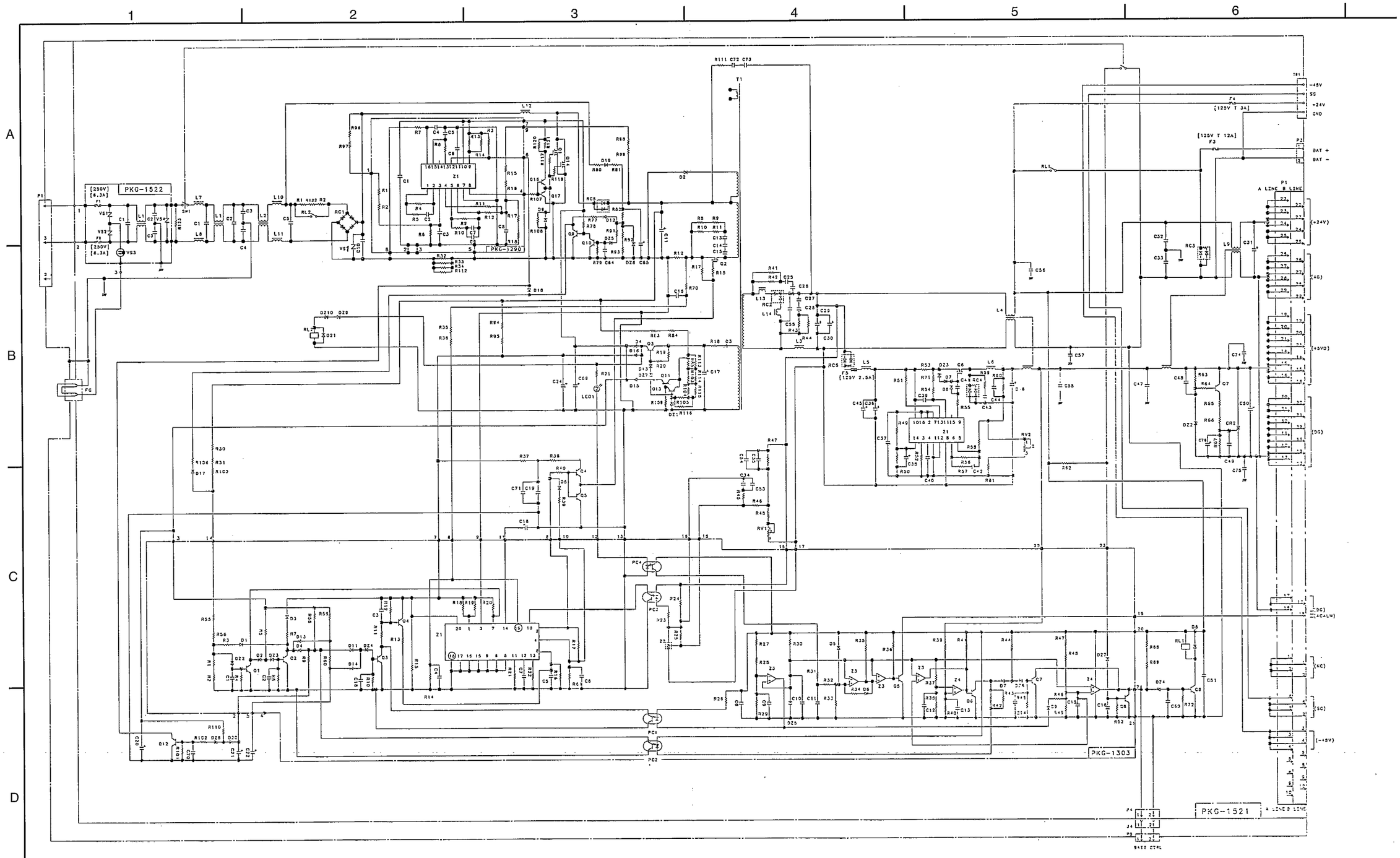
## (2) CAB96 (VB-44020UK/HK) : 96 port CCU
## CAB96B (VB-44021UK/HK) : 96 expand port CCU



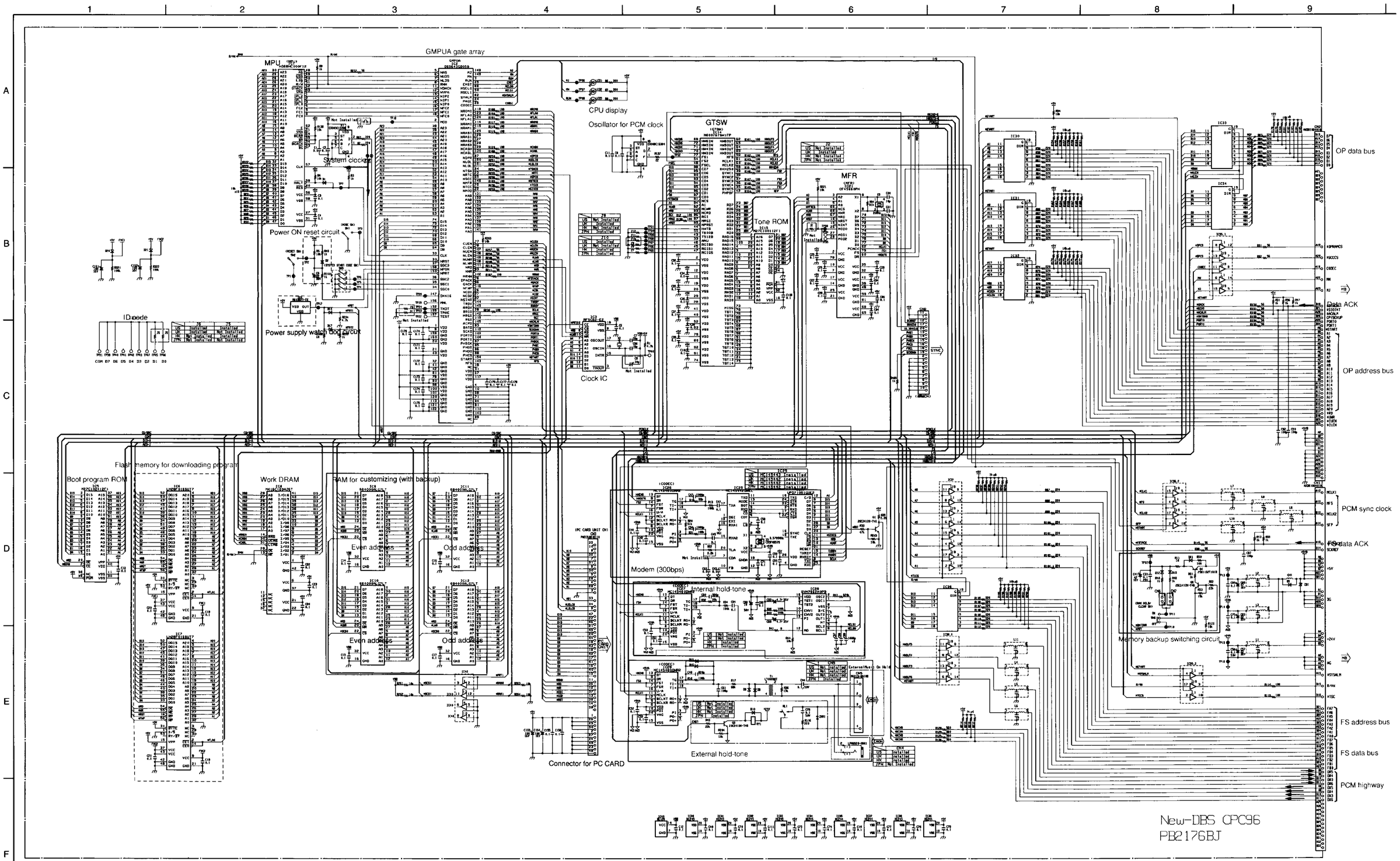
## (3) Power Supply Unit of CAB40



## (4) Power Supply Unit of CAB96/CAB96B



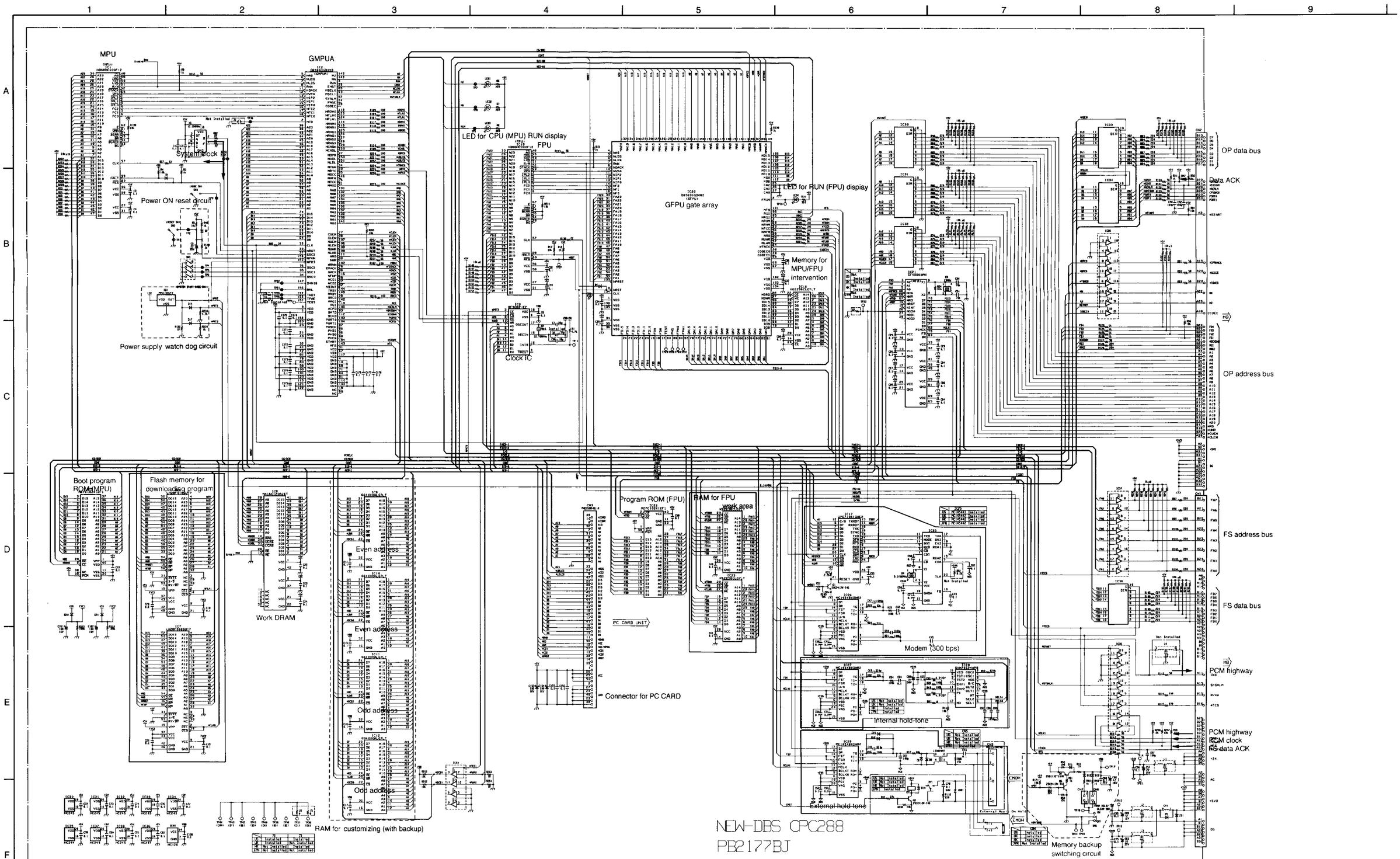
## 2.Card
## (1) CPC96 card (VB-44410UK/HK) : CPU96 card




| Pin No | IC1 | | | | | | | IC2 | | IC14 | | | | | IC21 | IC27 | IC28 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 8 | 9 | 45 | 46 | 47 | 57 | 148 | 149 | 36 | 61 | 77 | 87 | 91 | 60 | 13 | 12 |
| Stand by (V) | – | – | – | – | – | – | – | (5) H | (5) H | – | – | – | – | – | | | |
| Operation (V) | | | | | | | | (5) H | (5) H | | | | | | | | |
| Remarks | | | | | | | | | | | | | | | *1 | *2 | *2 |

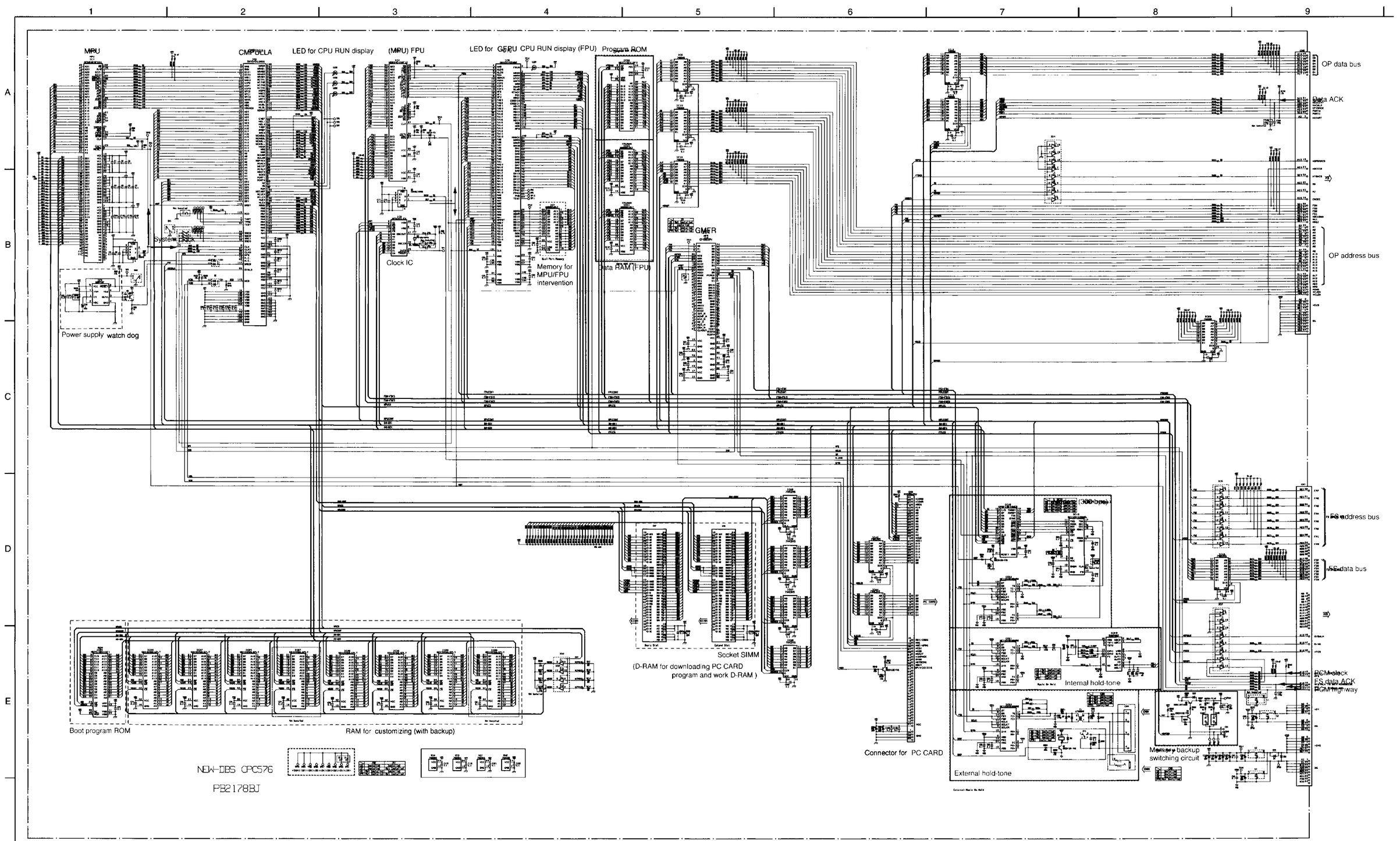
*1 During sending DTMF signal from SLT
*2 During holding

## (2) CPC288 card (VB-444201UK/HK) : CPU288 card



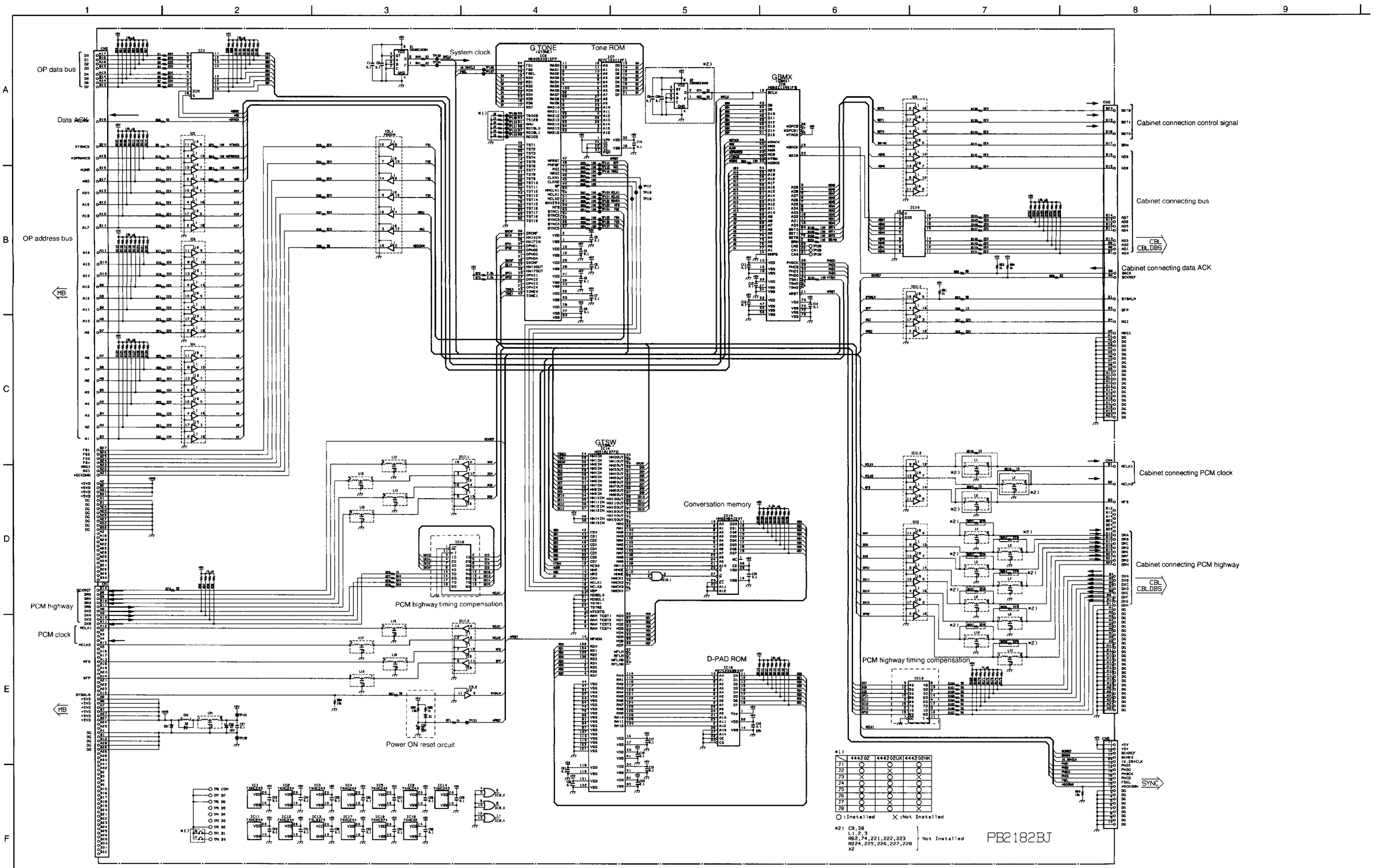

| Pin No | IC1 | | | | | | | IC2 | | | | | IC19 | | | | | | | IC20 | | IC36 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 8 | 9 | 45 | 46 | 47 | 57 | 105 | 112 | 143 | 148 | 149 | 7 | 8 | 9 | 45 | 46 | 47 | 57 | 95 | 96 | 12 |
| Stand by (V) | – | – | – | – | – | – | – | (5) H | – | – | (5) H | (5) H | – | – | – | – | – | – | – | (5) H | – | – |
| Operation (V) | | | | | | | | (5) H | | | (5) H | (5) H | | | | | | | | (5) H | | |
| Remarks | | | | | | | | | | | | | | | | | | | | | | |

## (3) CPC576 card (VB-444301UK/HK) : CPU576 card



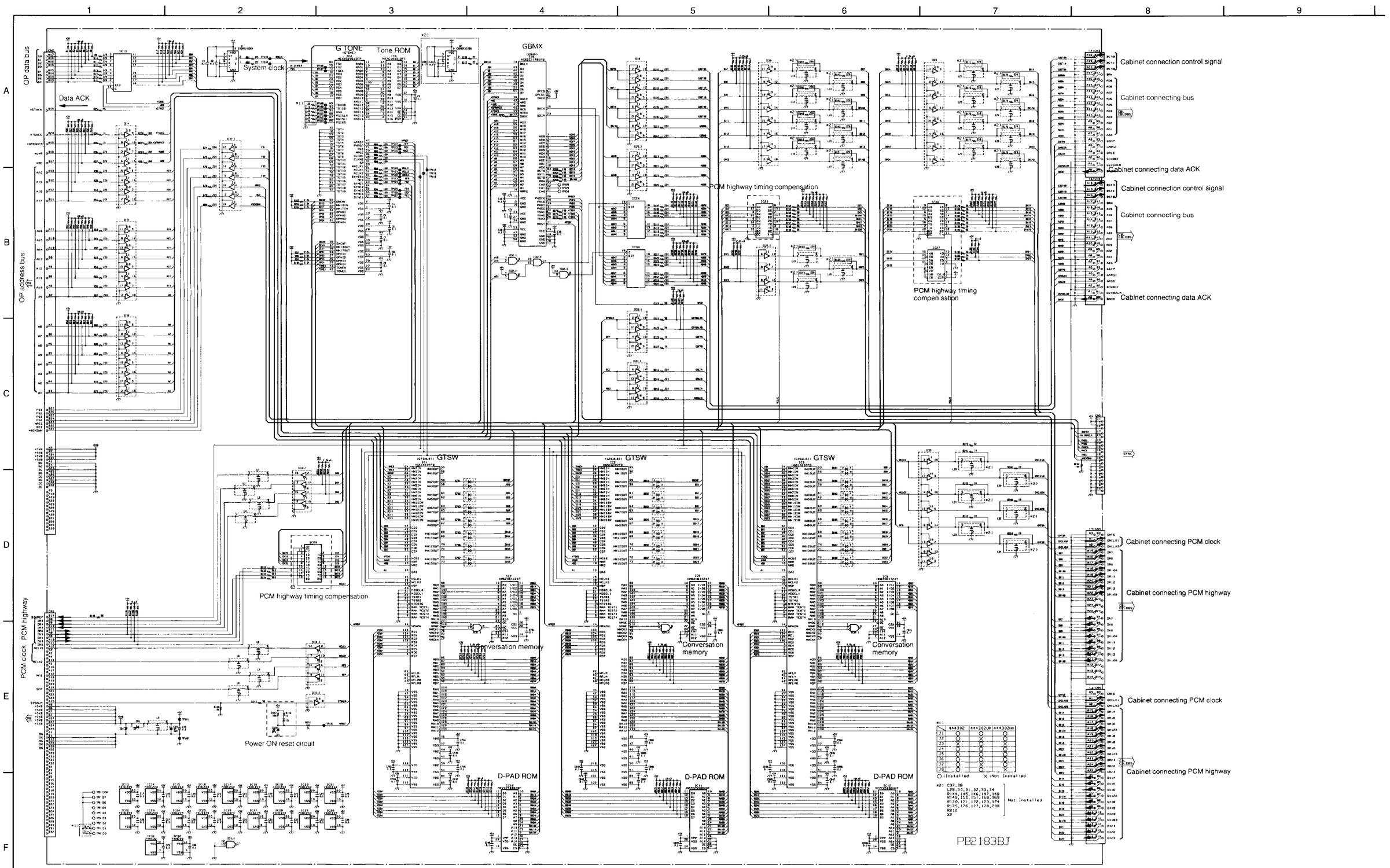

| Pin No | IC1 | | | IC2 | | IC6 | | | | | | | | IC21 | | | IC22 | | | IC23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 72 | 73 | 68 | 69 | 8 | 17 | 18 | 54 | 55 | 95 | 96 | 114 | 11 | 13 | 14 | 11 | 13 | 14 | 12 |
| Stand by (V) | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| Operation (V) | | | | | | | | | | | | | | | | | | | | |
| Remarks | | | | | | | | | | | | | | | | | | | | |

## (4) TSW288 card (VB-444202UK/HK) : Time Switch 288 card




| Pin No | IC1 | | | IC4 | | IC5 | | IC6 | | | IC14 | | IC17 | | | | IC18 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11 | 12 | 13 | 3 | 18 | 3 | 18 | 54 | 65 | 84 | 15 | 18 | 7 | 8 | 12 | 14 | 13 | 14 |
| Stand by (V) | – | – | (5) H | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| Operation (V) | | | (5) H | | | | | | | | | | | | | | | |
| Remarks | | | | | | | | | | | | | | | | | | |

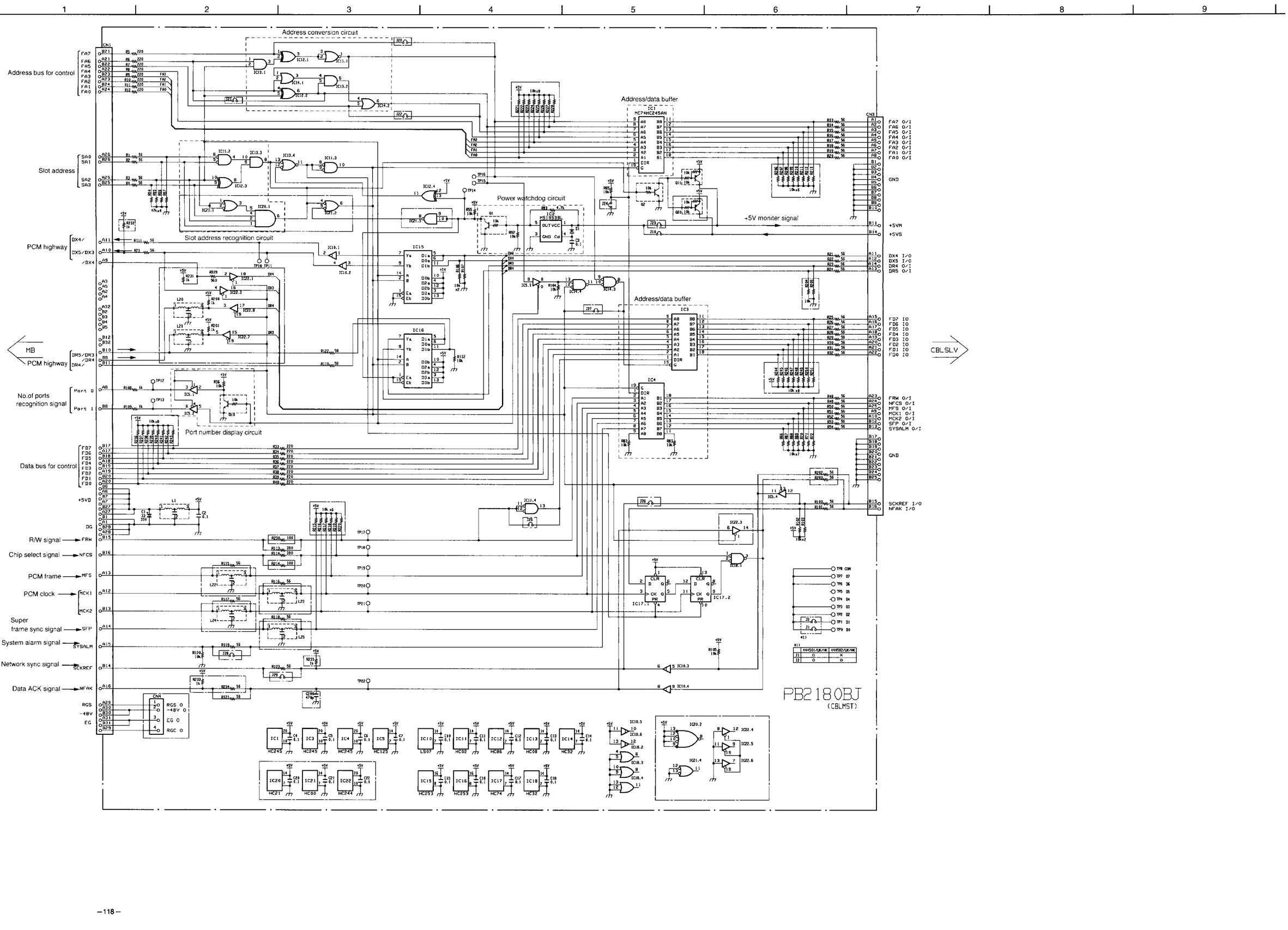
## (5) TSW576 card (VB-444302UK/HK) : Time Switch 576 card



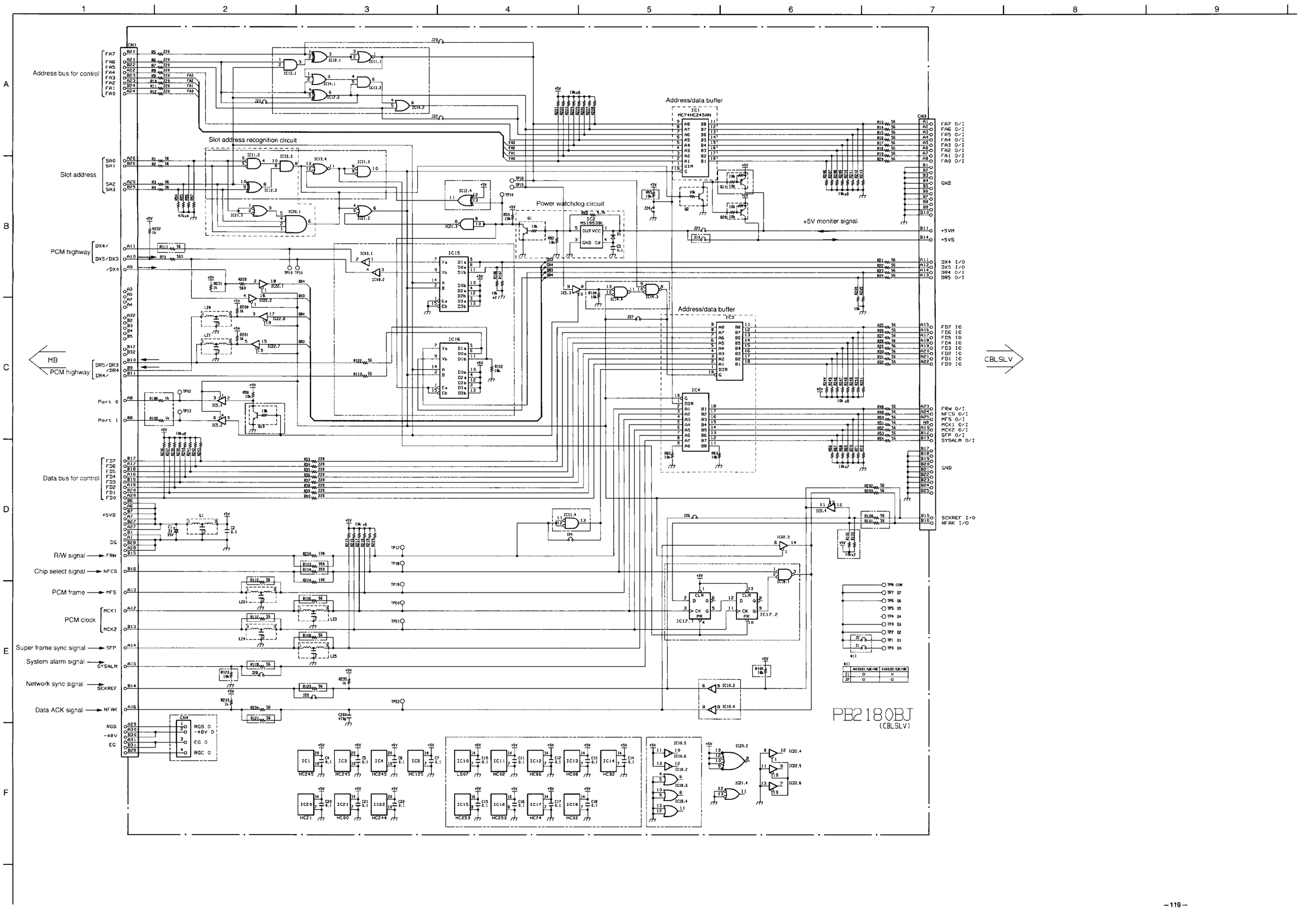

| Pin No | IC4 | | IC13 | | IC16 | | IC17 | | IC18 | | IC28 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 45 | 46 | 8 | 9 | 3 | 18 | 3 | 16 | 9 | 14 | 13 | 14 |
| Stand by (V) | – | – | – | – | – | – | – | – | – | – | – | – |
| Operation (V) | | | | | | | | | | | | |
| Remarks | | | | | | | | | | | | |

## (6) CBLKIT (VB-44450) : Connection Cable Kit

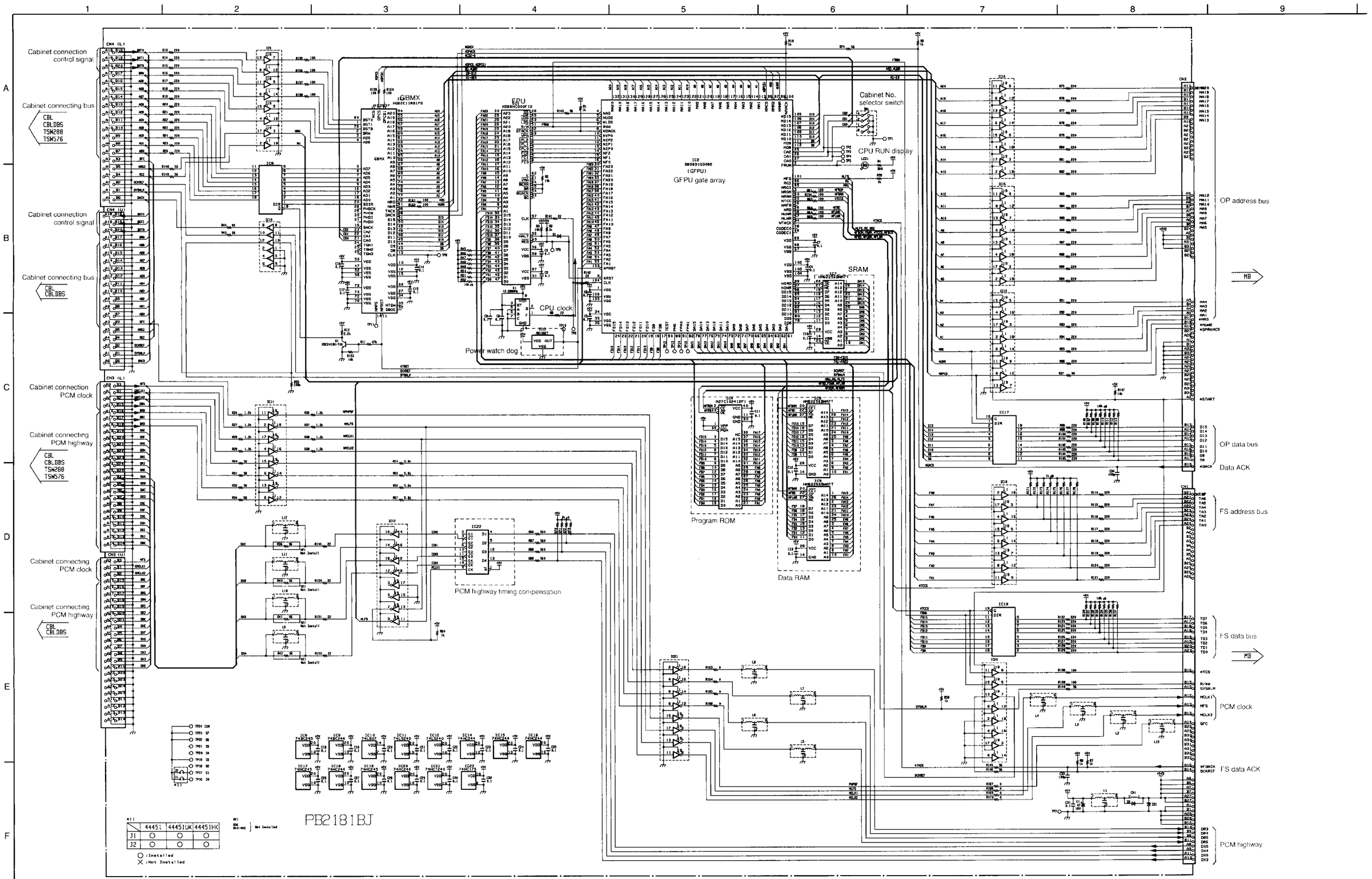
### · CBLMST card : Connection Cable card-Master



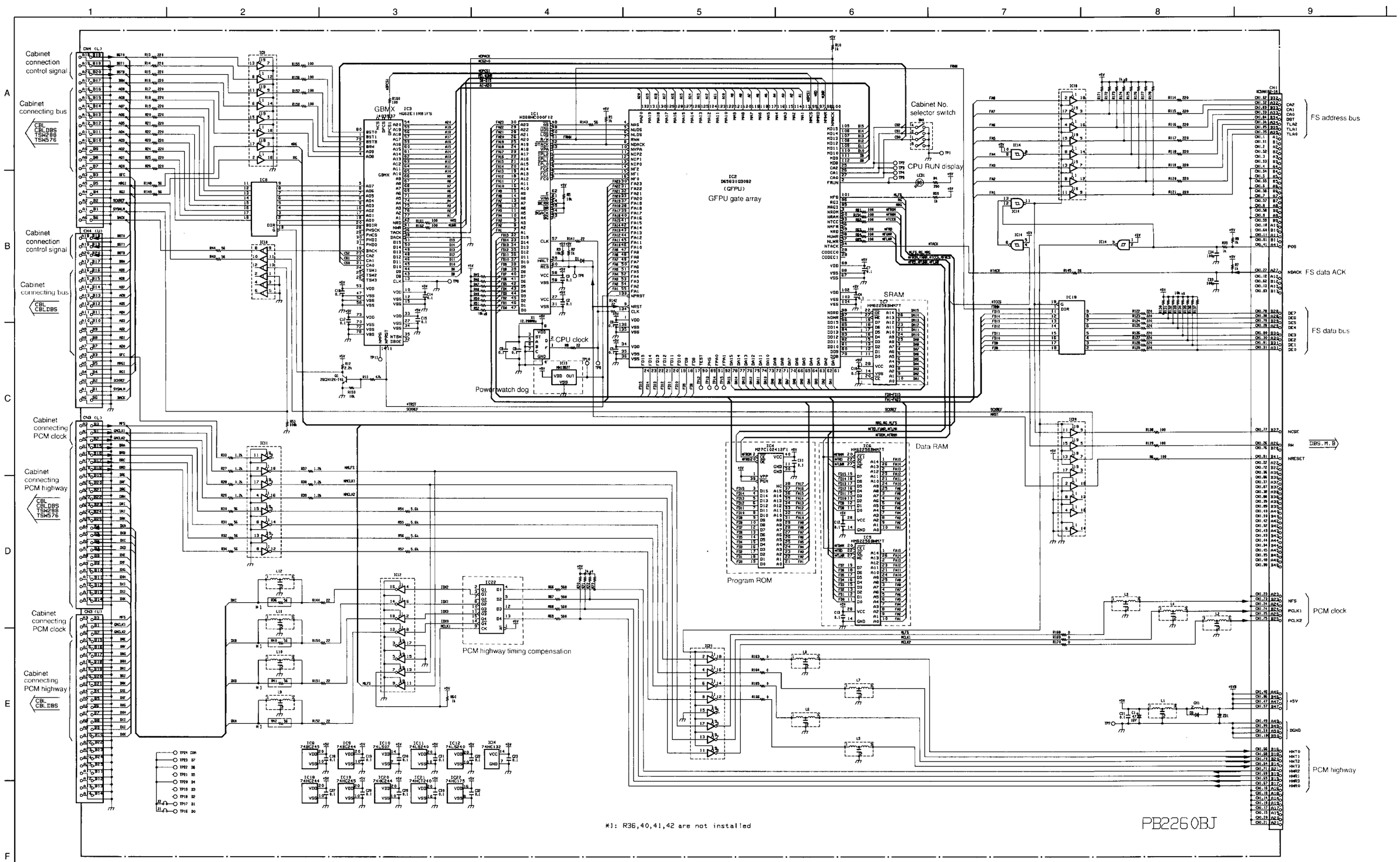
## · CBLSLV card : Connection Cable card-Slave



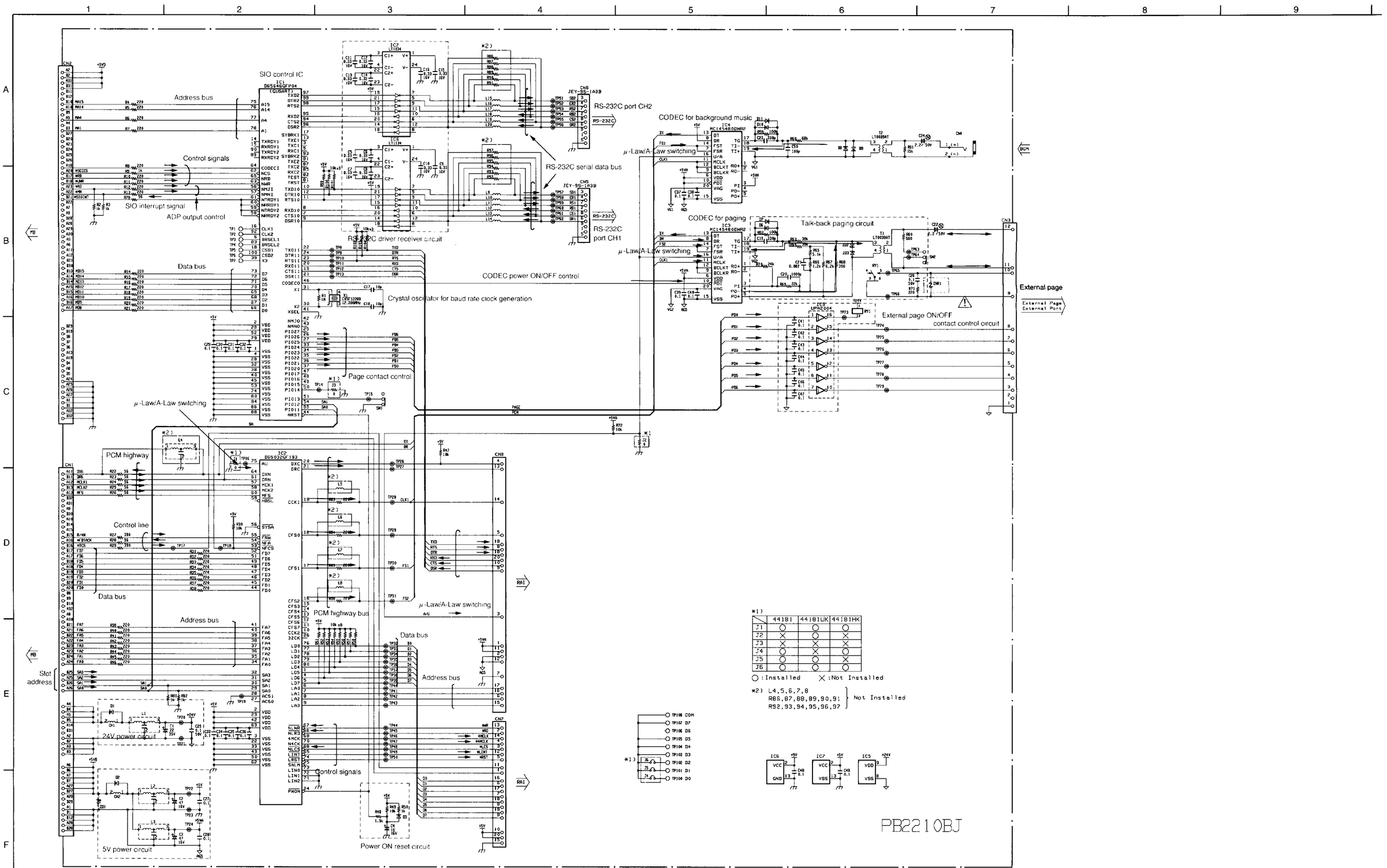
## (7) CBL card (VB-44451) : Building Block card



## (8) CBLDBS card (VB-44452) : Connection Cable card-DBS



## (9) SCC card (VB-44181UK/HK) : Service Control Card




*1)

| | 44181 | 44181UK | 44181HK |
|---|---|---|---|
| J1 | ○ | ○ | ○ |
| J2 | × | ○ | × |
| J3 | × | × | × |
| J4 | ○ | × | ○ |
| J5 | ○ | ○ | × |
| J6 | ○ | ○ | ○ |

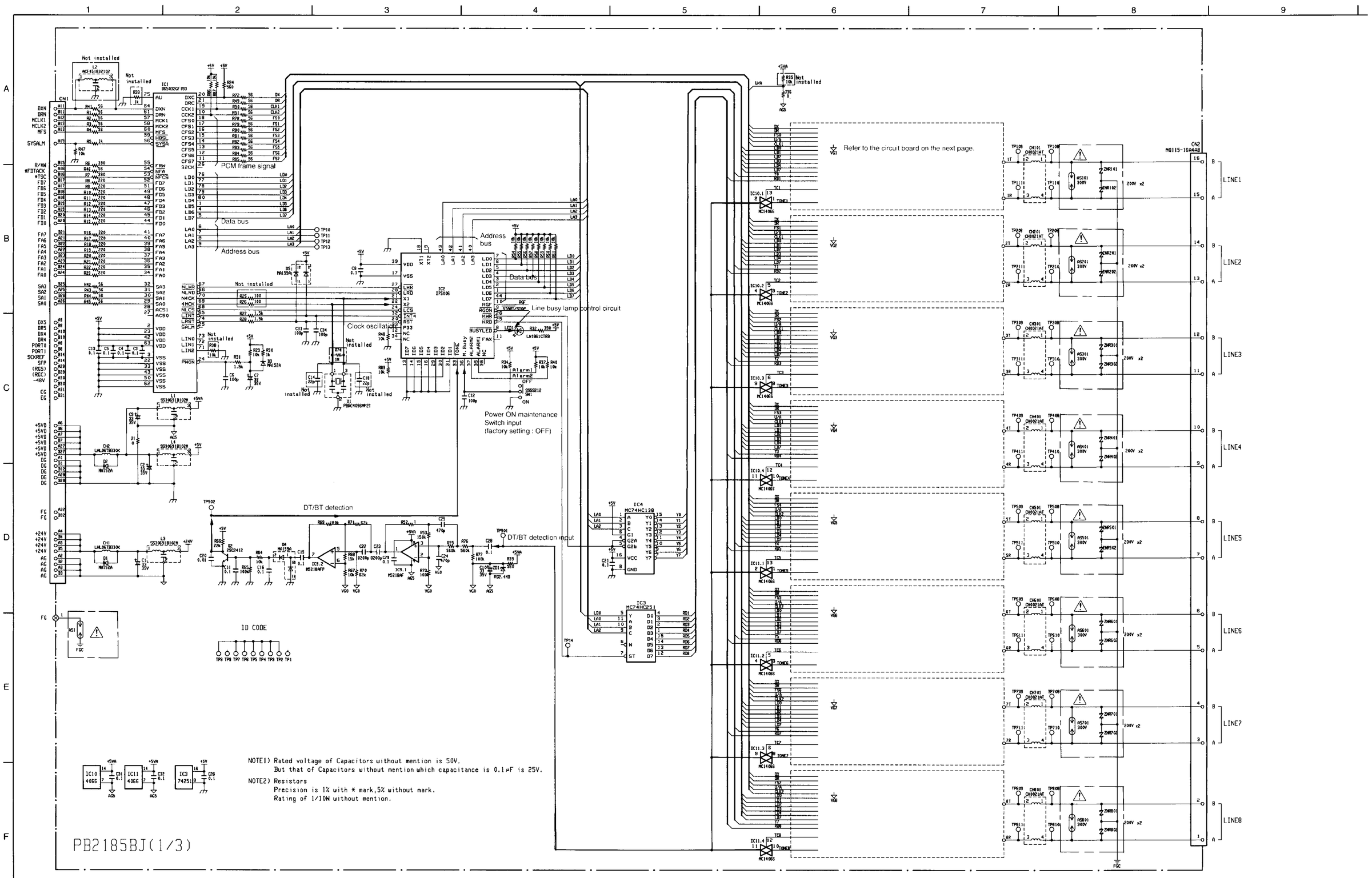
○ : Installed × : Not Installed

*2) L4,5,6,7,8
R86,87,88,89,90,91
R92,93,94,95,96,97
} Not Installed

| Pin No | IC1 | | | | | | IC2 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | 56 | 57 | 64 | 66 | 67 | 16 | 17 | 19 | 61 | 64 |
| Stand by (V) | (5) H | (5) H | (5) H | (5) H | (5) H | (5) H | | | | | |
| Operation (V) | (5) H | (5) H | (5) H | (5) H | (5) H | (5) H | | | | | |
| Remarks | | | | | | | *1 | *1 | *1 | *1 | *1 |

*1 During paging

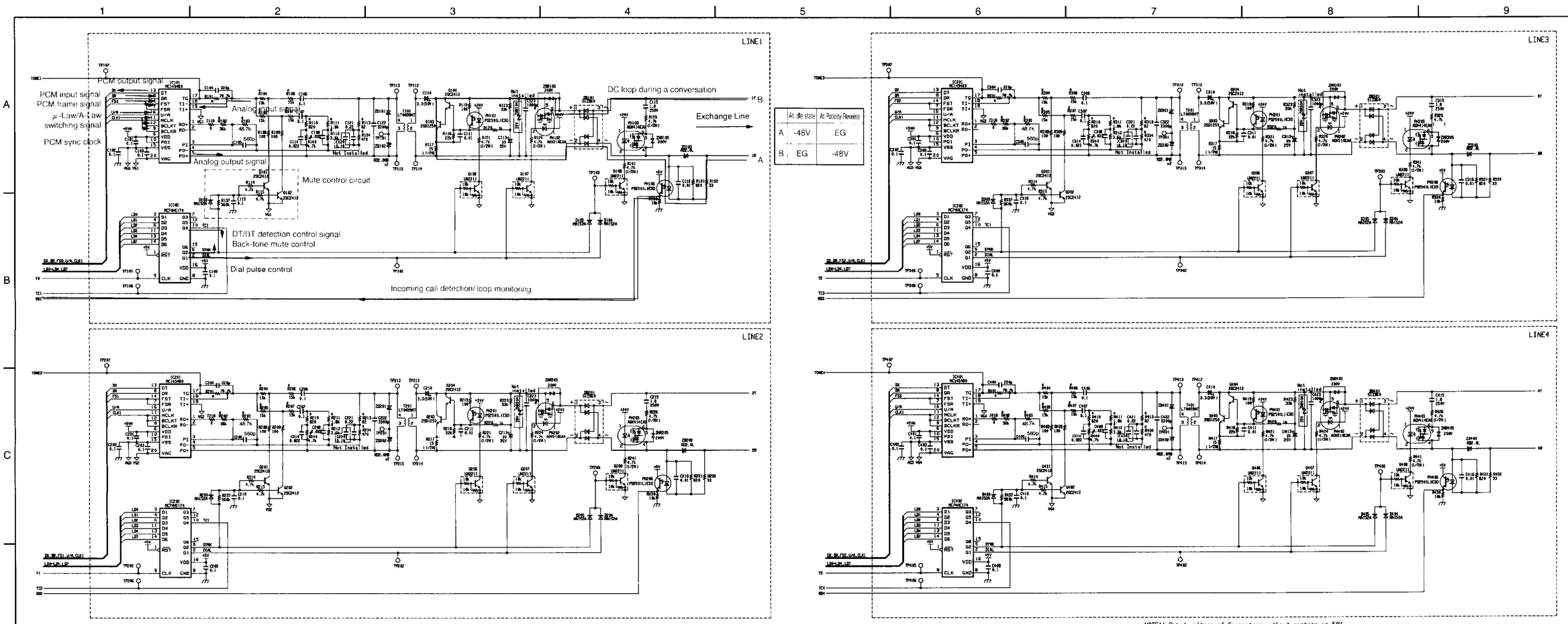
## (10) LTRK/8 card (VB-44510UK) : Loop Start Trunk Card (1/3)




| Pin No | IC1 | | | | | | | | | | IC2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 29 | 30 | 34 | 35 | 44 | 45 | 61 | 64 | 20 | 21 | 22 | 24 | 27 | 28 | 32 |
| Stand by (V) | | | | (5) H | | | | | | | (5) H | | | | | (5) H | |
| Operation (V) | | | | (5) H | | | | | | | (5) H | | | | | | |
| Remarks | *1 | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

## LTRK/8 card (VB-44510UK) : Loop Start Trunk Card (2/3)




| At idle state | At Polarity Reverse |
|---|---|
| A -48V | EG |
| B EG | -48V |

LINE 1 to 8 are common.
LINE 1: IC, Q, C, R, D, PH are from 100 to 199.
LINE 2: IC, Q, C, R, D, PH are from 200 to 299.
LINE 3: IC, Q, C, R, D, PH are from 300 to 399.
LINE 4: IC, Q, C, R, D, PH are from 400 to 499.

| Pin No | IC101 | | | | | IC102 | |
|---|---|---|---|---|---|---|---|
| | 1 | 8 | 13 | 17 | 18 | 2 | 2 |
| Stand by (V) | (2) H | | | (2) H | (2) H | – | (5) H |
| Operation (V) | | | | | (2) H | | (0) L |
| Remarks | *1 | *1 | *1 | *1 | *1 | *2 | *1 |

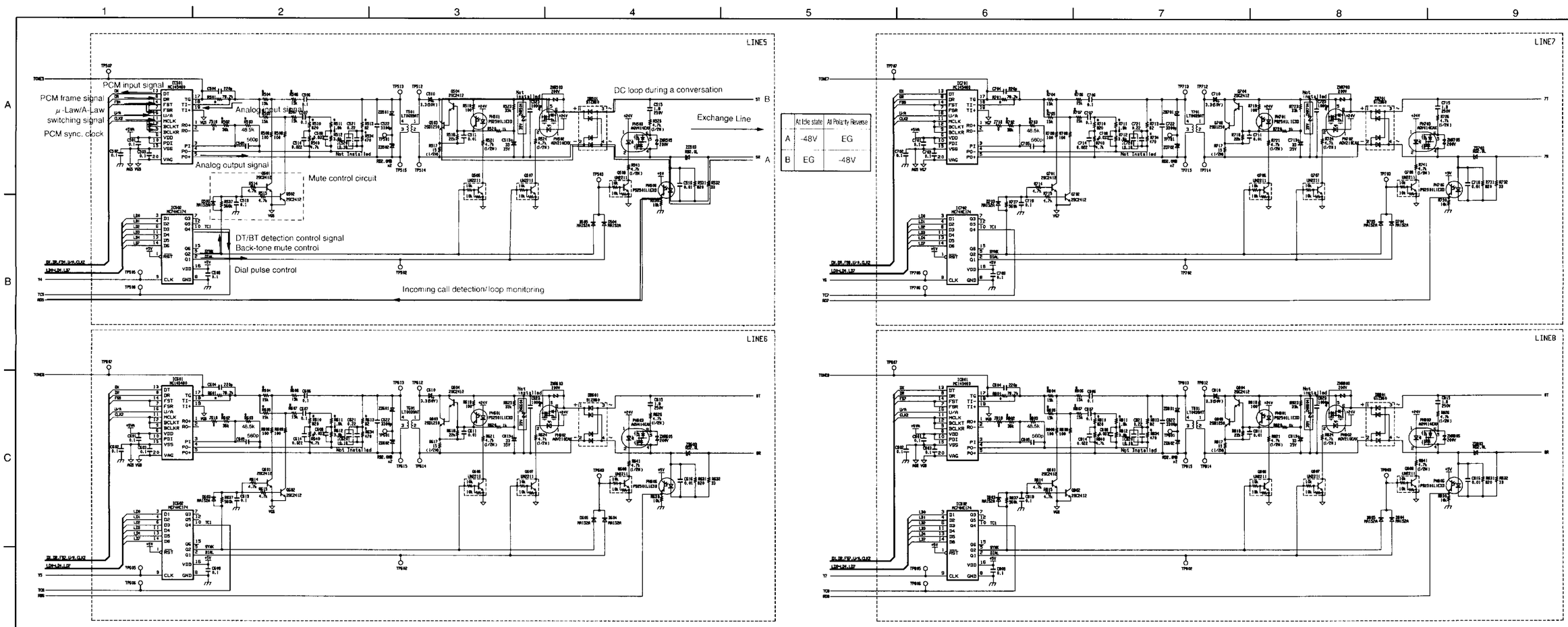
*1 During communication
*2 At DP dialling

NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark,5% without mark.
Rating of 1/10W without mention.

PB2185BJ(2/3)

## LTRK/8 card (VB-44510UK) : Loop Start Trunk Card (3/3)




| | At Idle state | At Polarity Reverse |
|---|---|---|
| A | -48V | EG |
| B | EG | -48V |

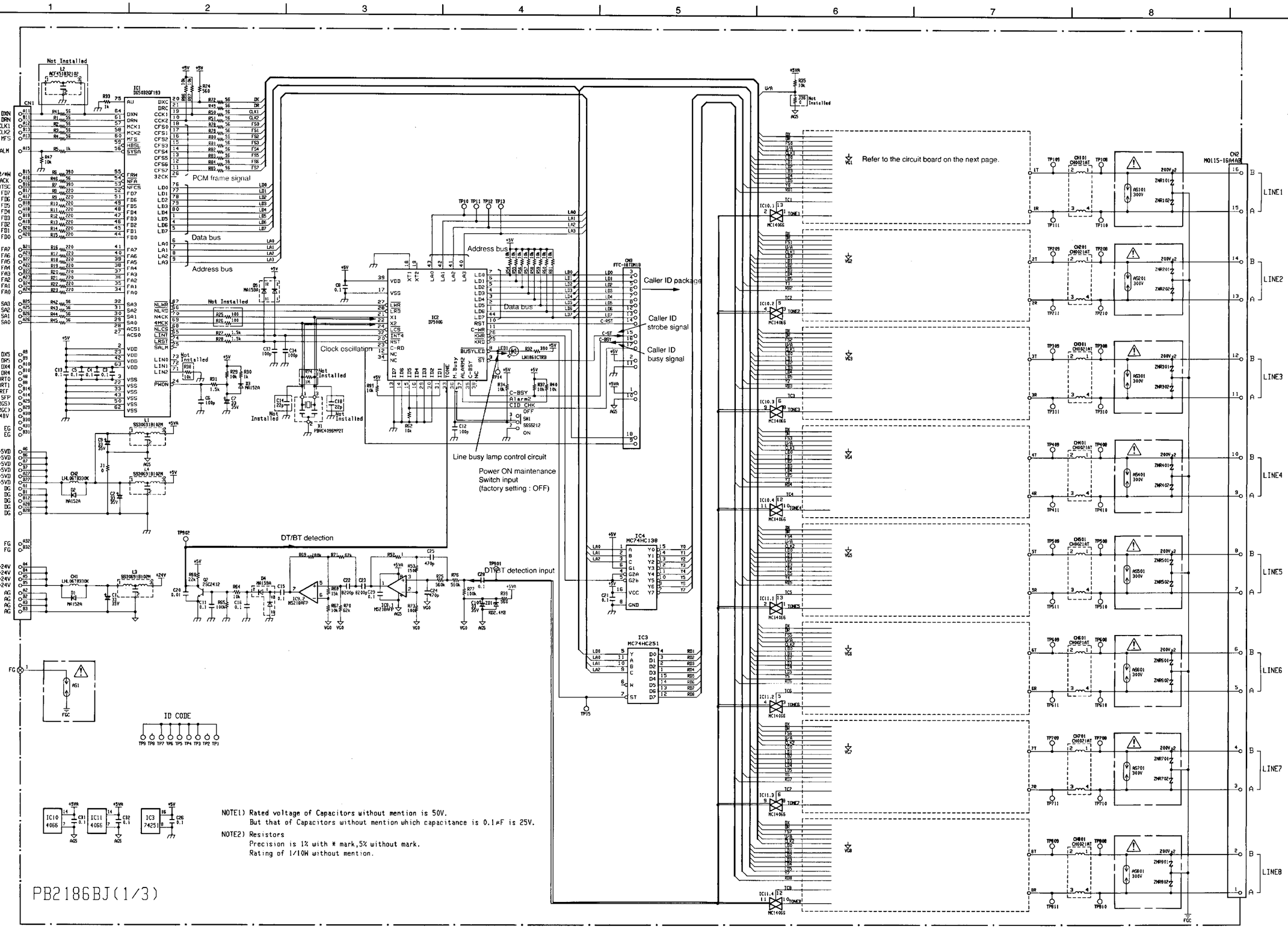
LINE 1 to 8 are common.
LINE 5: IC, Q, C, R, D, PH are from 500 to 599.
LINE 6: IC, Q, C, R, D, PH are from 600 to 699.
LINE 7: IC, Q, C, R, D, PH are from 700 to 799.
LINE 8: IC, Q, C, R, D, PH are from 800 to 899.

NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark, 5% without mark.
Rating of 1/10W without mention.

PB2185BJ(3/3)

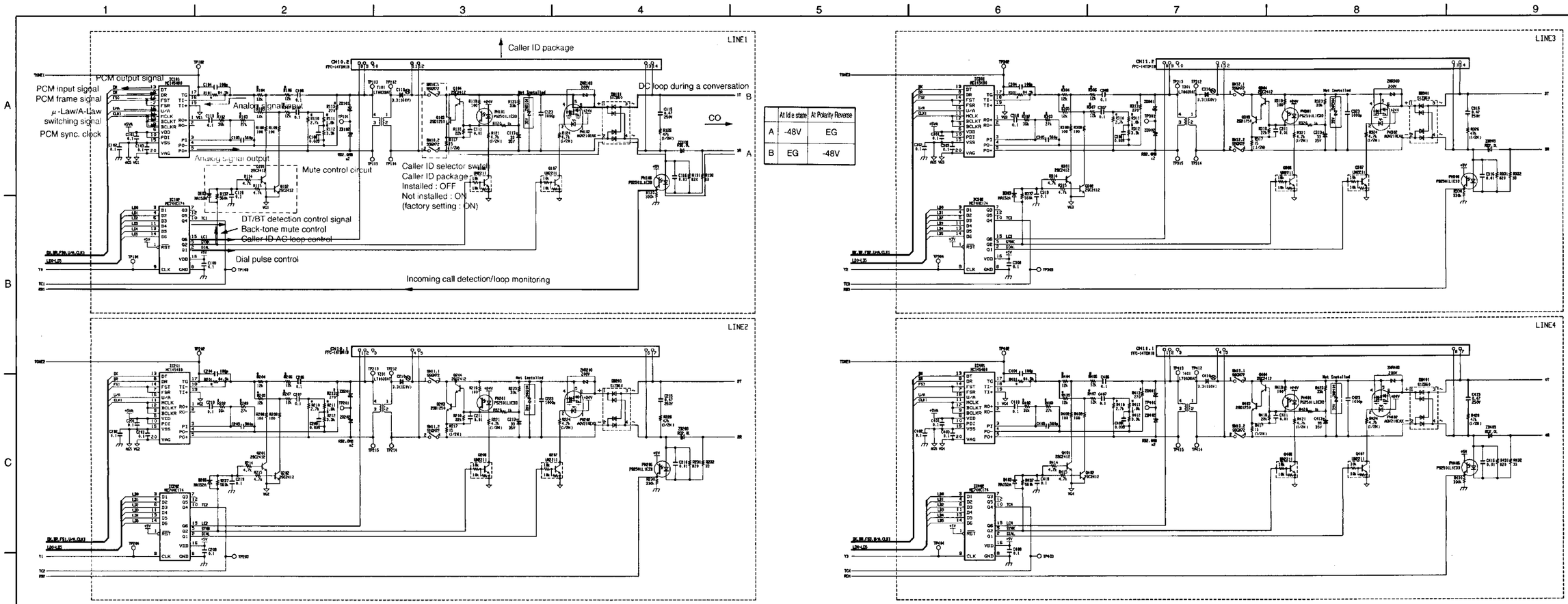
## (11) LTRK/8 card (VB-44510HK) : Loop Start Trunk Card (1/3)




| Pin No | IC1 | | | | | | | | | | IC2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 29 | 30 | 34 | 35 | 44 | 45 | 61 | 64 | 20 | 21 | 22 | 24 | 27 | 28 | 32 |
| Stand by (V) | | | | (5) H | | | | | | | (5) H | | | | | (5) H | |
| Operation (V) | | | | (5) H | | | | | | | (5) H | | | | | | |
| Remarks | *1 | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

## LTRK/8 card (VB-44510HK) : Loop Start Trunk Card (2/3)




| | At Idle state | At Polarity Reverse |
|---|---|---|
| A | -48V | EG |
| B | EG | -48V |

LINE 1 to 8 are common.
LINE 1: IC, Q, C, R, D, PH are from 100 to 199.
LINE 2: IC, Q, C, R, D, PH are from 200 to 299.
LINE 3: IC, Q, C, R, D, PH are from 300 to 399.
LINE 4: IC, Q, C, R, D, PH are from 400 to 499.

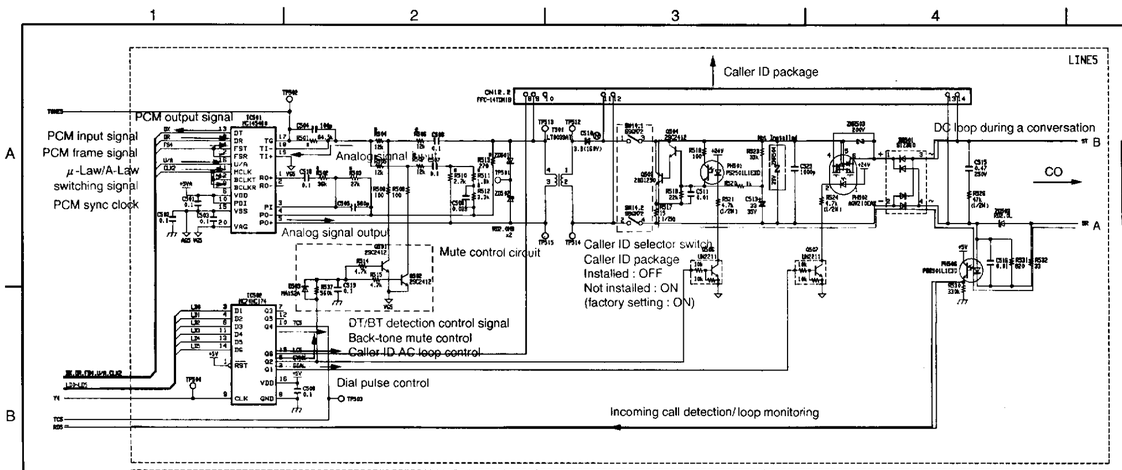
| Pin No | IC101 | | | | | IC102 | |
|---|---|---|---|---|---|---|---|
| | 1 | 8 | 13 | 17 | 18 | 2 | 2 |
| Stand by (V) | (2) H | | | (2) H | (2) H | – | (5) H |
| Operation (V) | | | | | (2) H | | (0) L |
| Remarks | ✱1 | ✱1 | ✱1 | ✱1 | ✱1 | ✱2 | ✱1 |

✱1 During communication
✱2 At DP dialling

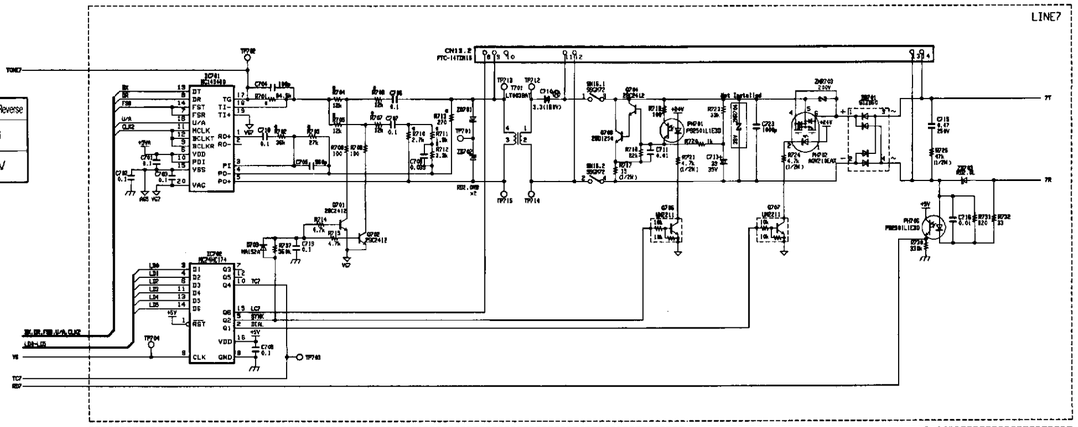
NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1≠F is 25V.
NOTE2) Resistors
Precision is 1% with ✱ mark,5% without mark.
Rating of 1/10W without mention.

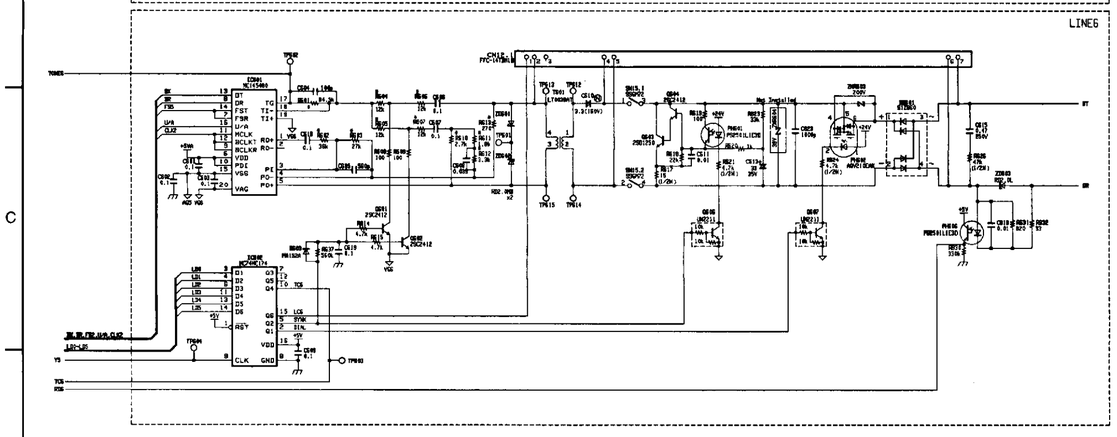
PB2186BJ(2/3)

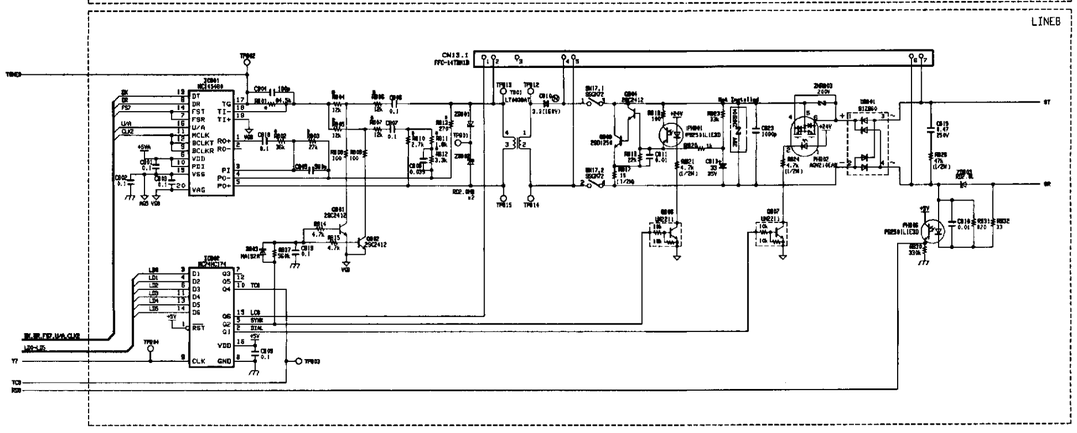
## LTRK/8 card (VB-44510HK) : Loop Start Trunk Card (3/3)




| | At Idle state | At Polarity Reverse |
|---|---|---|
| A | -48V | EG |
| B | EG | -48V |



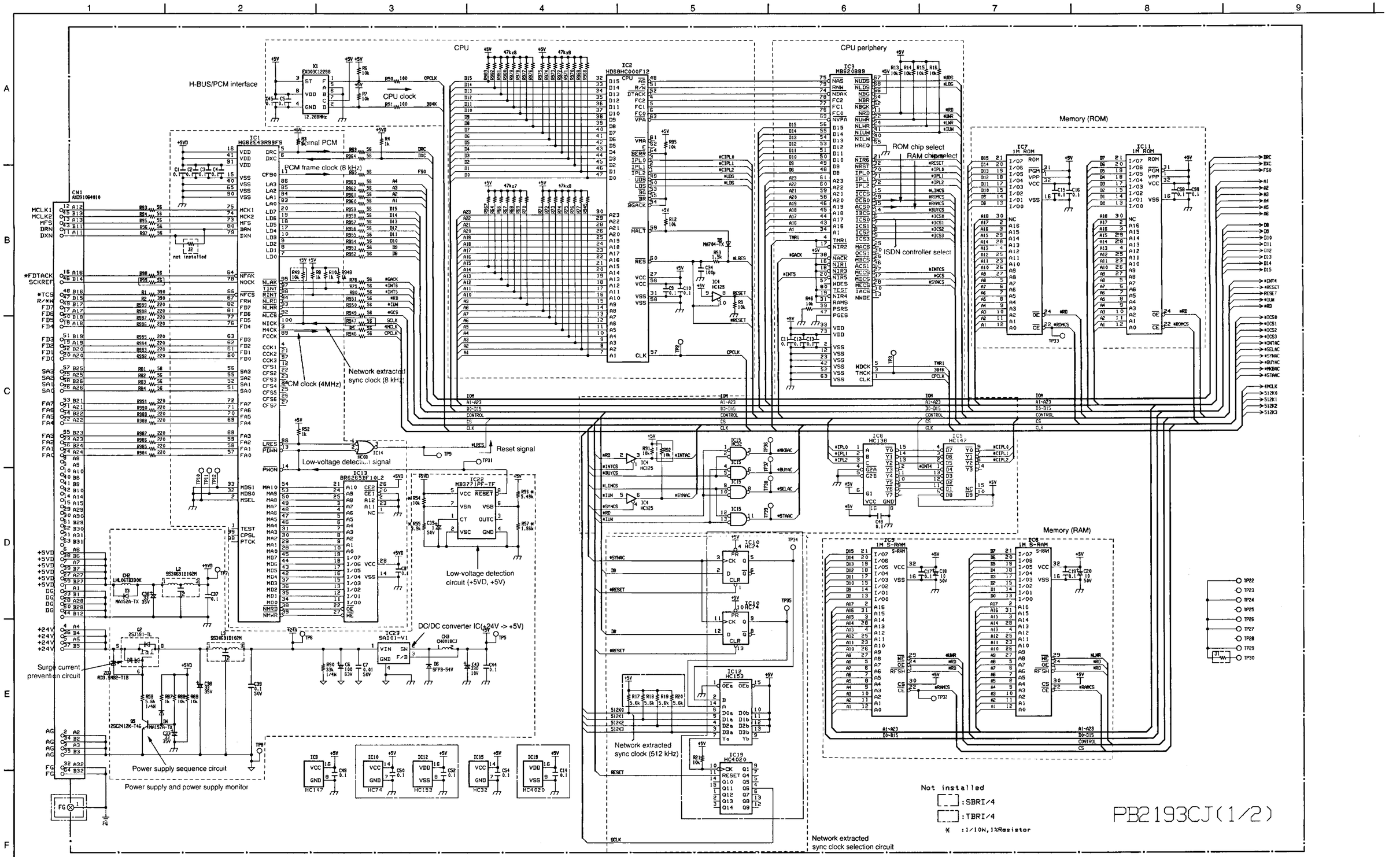

LINE 1 to 8 are common.
LINE 5: IC, Q, C, R, D, PH are from 500 to 599.
LINE 6: IC, Q, C, R, D, PH are from 600 to 699.
LINE 7: IC, Q, C, R, D, PH are from 700 to 799.
LINE 8: IC, Q, C, R, D, PH are from 800 to 899.

NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark,5% without mark.
Rating of 1/10W without mention.

PB2186BJ
(3/3)

## (12) TBRI/4 card (VB-44530) : BRI Card (T-point) (1/2)
## SBRI/4 card (VB-44630) : BRI Card (S-point) (1/2)




| Pin No | IC1 | | | | | | | | | IC3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 51 | 52 | 57 | 58 | 60 | 61 | 73 | 79 | 80 | 1 | 5 |
| Stand by (V) | (5) H | (5) H | | | | | | | | | |
| Operation (V) | (5) H | (5) H | | | | | | | | | |
| Remarks | | | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

**TBRI/4 card (VB-44530) : BRI Card (T-point) (2/2)**
**SBRI/4 card (VB-44630) : BRI Card (S-point) (2/2)**

LSI For ISDN BRI (includes secondary protection circuit)

External transformer (includes primary protection circuit)

TE/NT setting

Interruption cause line select

Interrupt signal

Circuit select switch

Network synchronization established lamp

Line busy lamp

Synchronization established lamp

Data link established lamp

Power supply circuit (DC/DC converter +24V → -40V)

Transmission/Reception line selection

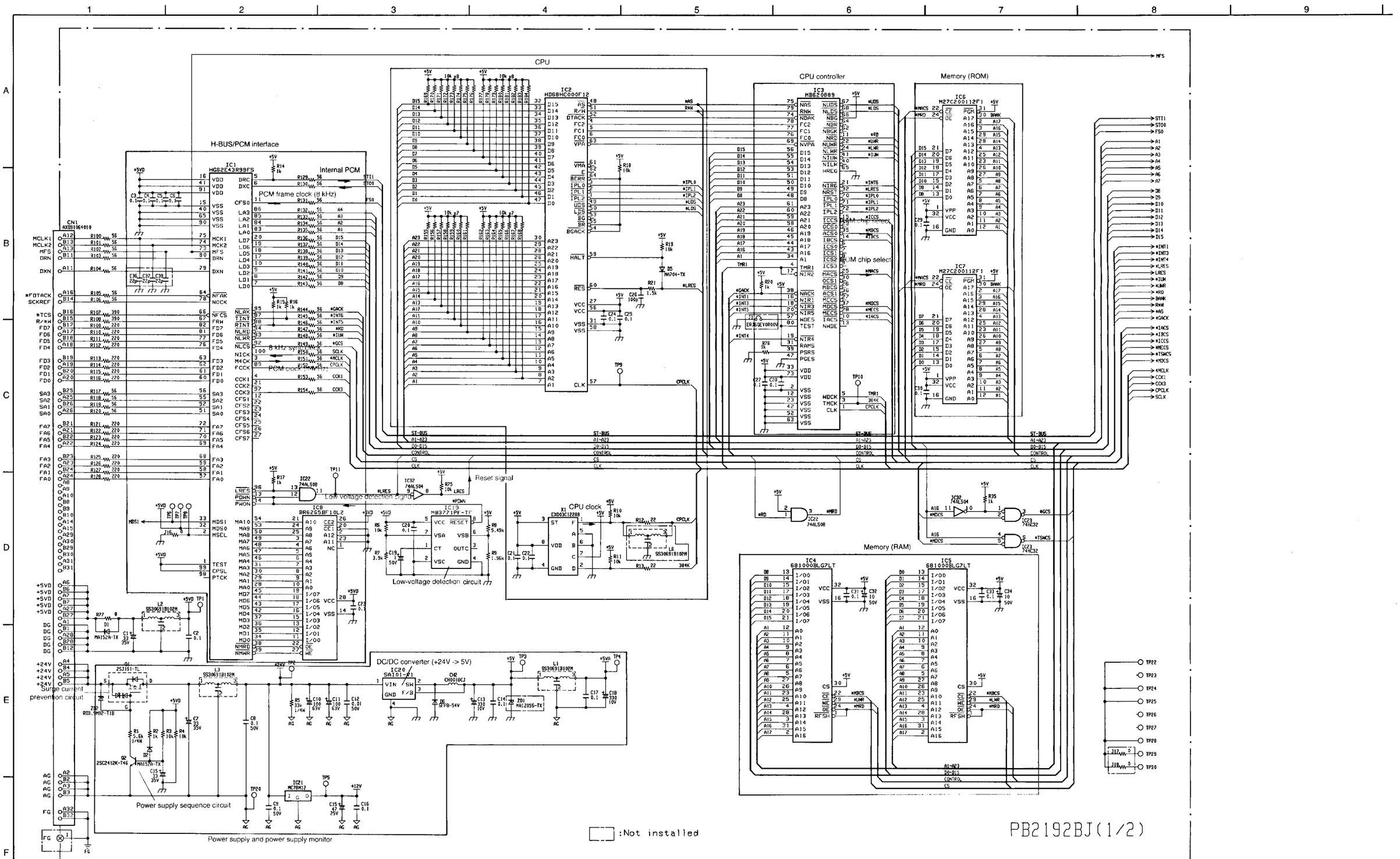
ISDN controller operation clock

PB2193CJ(2/2)

| Pin No | IC101 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 12 | 14 | 16 | 22 | 23 | 24 | 25 | 27 | 30 | 37 | 38 | 51 | 54 | 58 | 59 |
| Stand by (V) | | | | | | | | | | | | | | | | |
| Operation (V) | | | | | | | | | (5) H | | | | | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

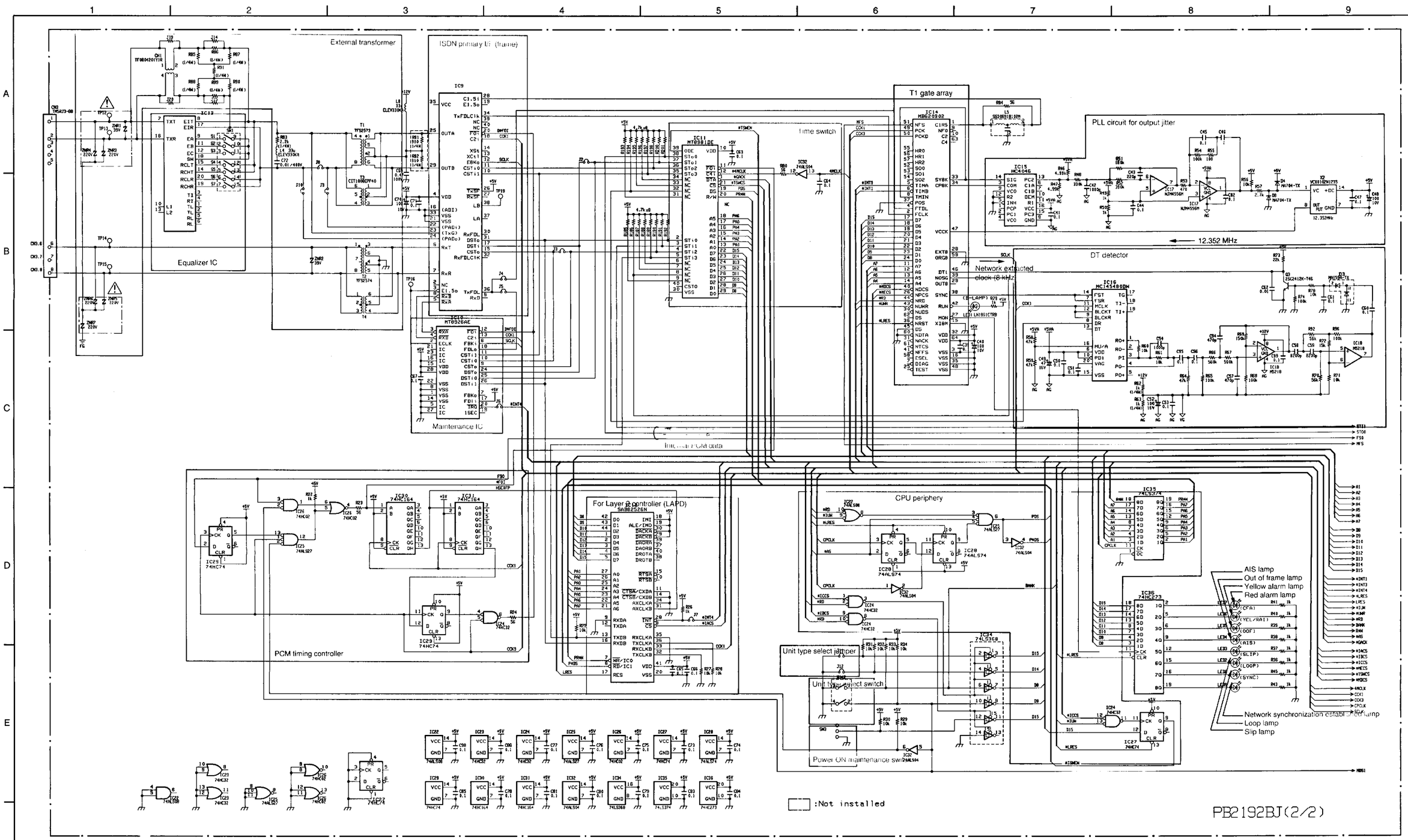
## (13) PRI/23 card (VB-44540) : PRI Card (23B+D) (1/2)




| Pin No | IC2 | IC3 | |
|---|---|---|---|
| | 57 | 3 | 5 |
| Stand by (V) | | | |
| Operation (V) | | | |
| Remarks | *1 | *1 | *1 |

*1 During communication

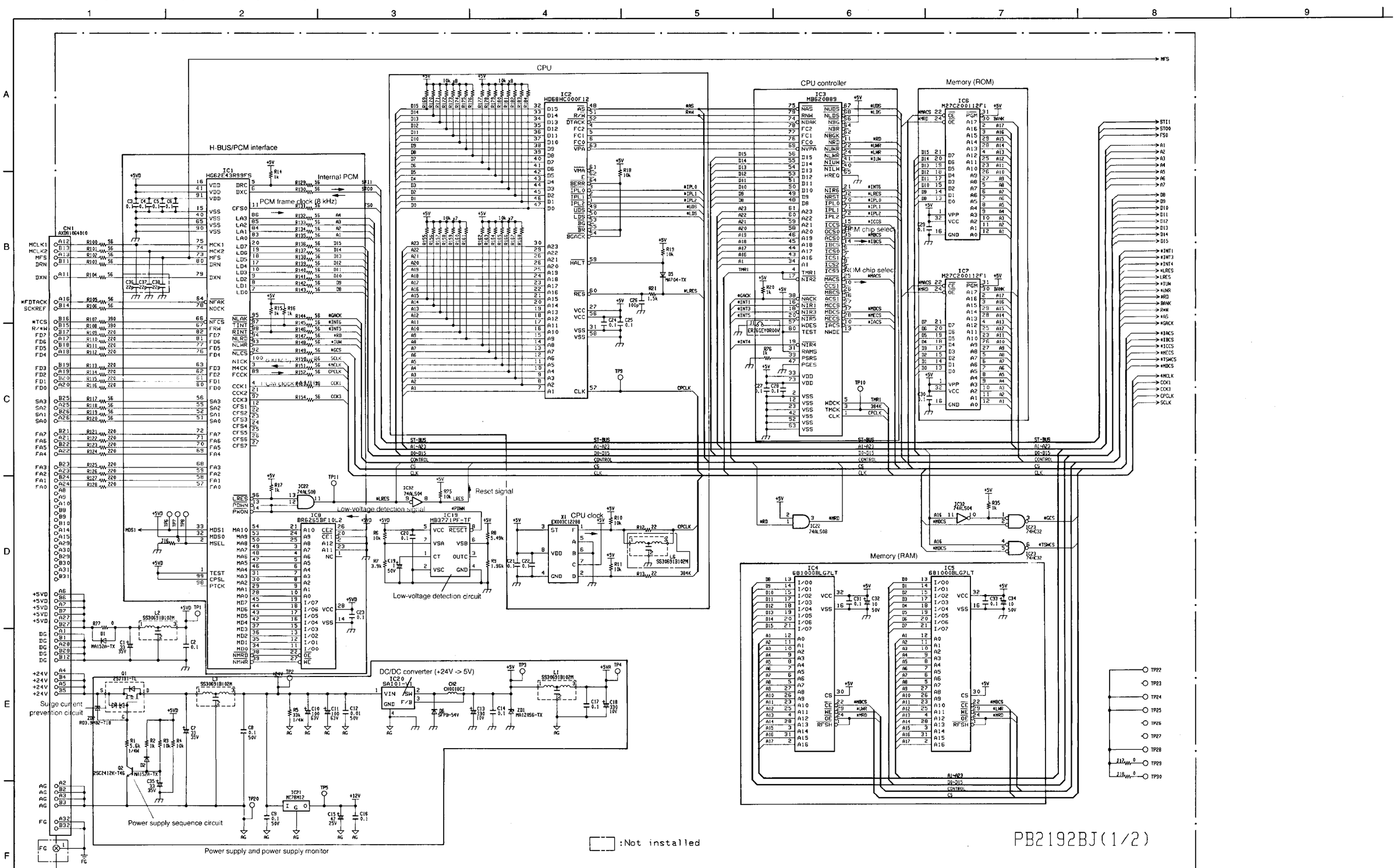
## PRI/23 card (VB-44540) : PRI Card (23B+D) (2/2)




| Pin No | IC9 | | | | | | | | | | IC11 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 10 | 11 | 12 | 15 | 17 | 25 | 29 | 31 | 1 | 3 | 11 | 12 | 13 | 14 | 19 | 21 | 28 | 29 | 38 |
| Stand by (V) | | | | | | | | | | | (5) H | | | | | | | (5) H | | | |
| Operation (V) | | | | | | | | | | | (5) H | | | | | | | (5) H | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | *1 | | *1 | *1 | *1 |

*1 During communication

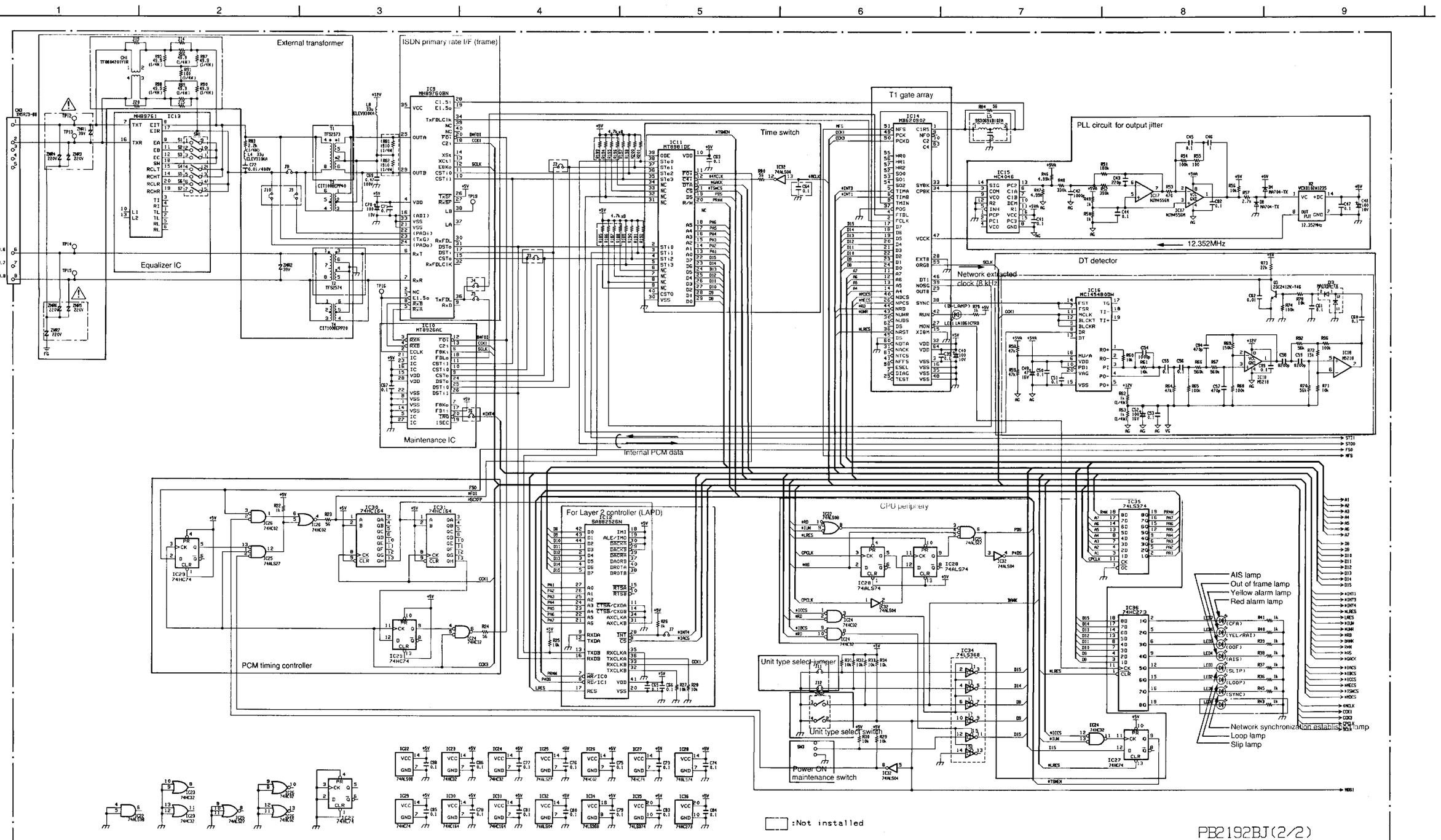
## (14) PRI/30 card (VB-44540UK) : PRI Card (30B+D) (1/2)




| Pin No | IC2 | IC3 | |
|---|---|---|---|
| | 57 | 3 | 5 |
| Stand by (V) | | | |
| Operation (V) | | | |
| Remarks | *1 | *1 | *1 |

*1 During communication

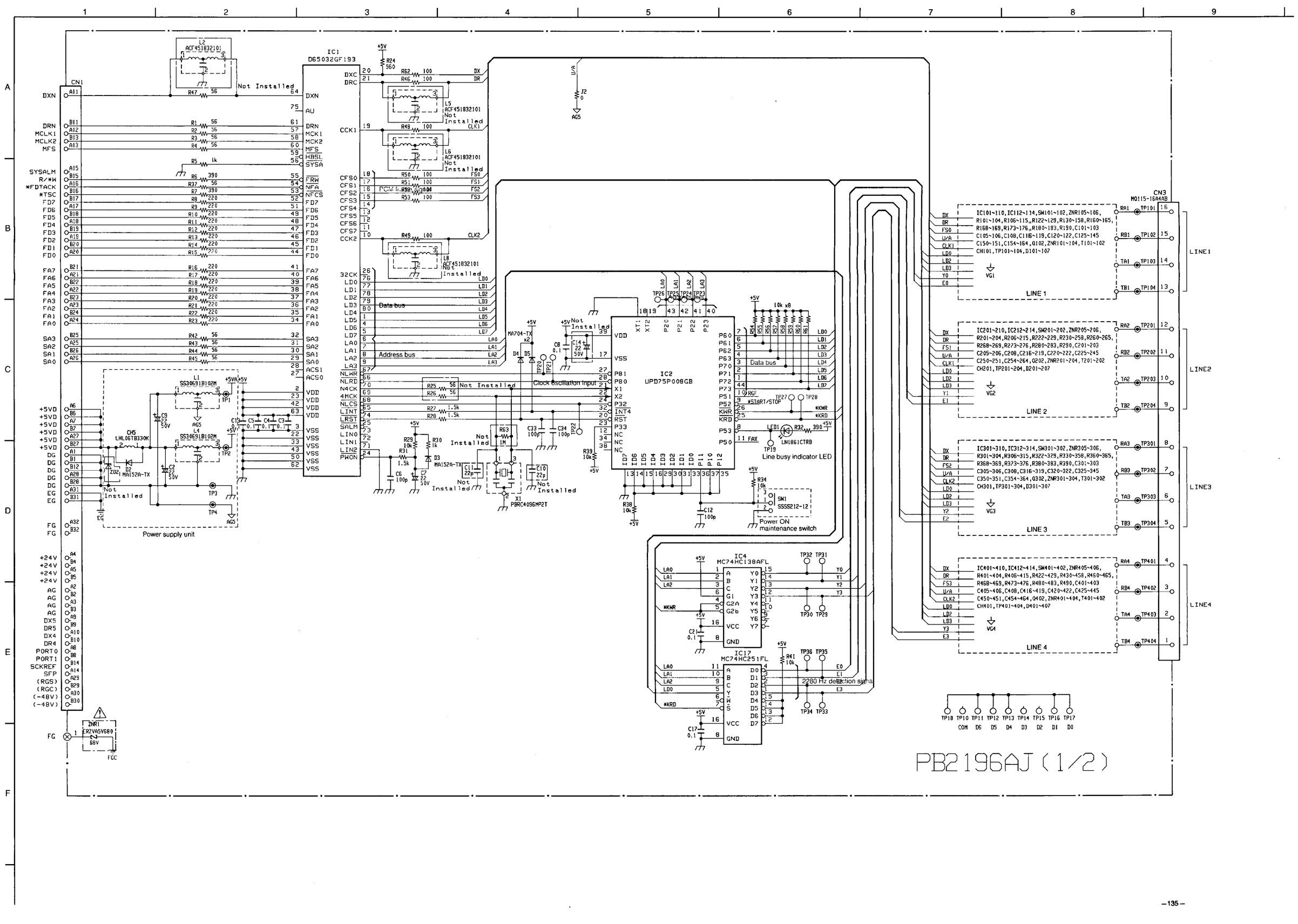
## PRI/30 card (VB-44540UK) : PRI Card (30B+D) (2/2)



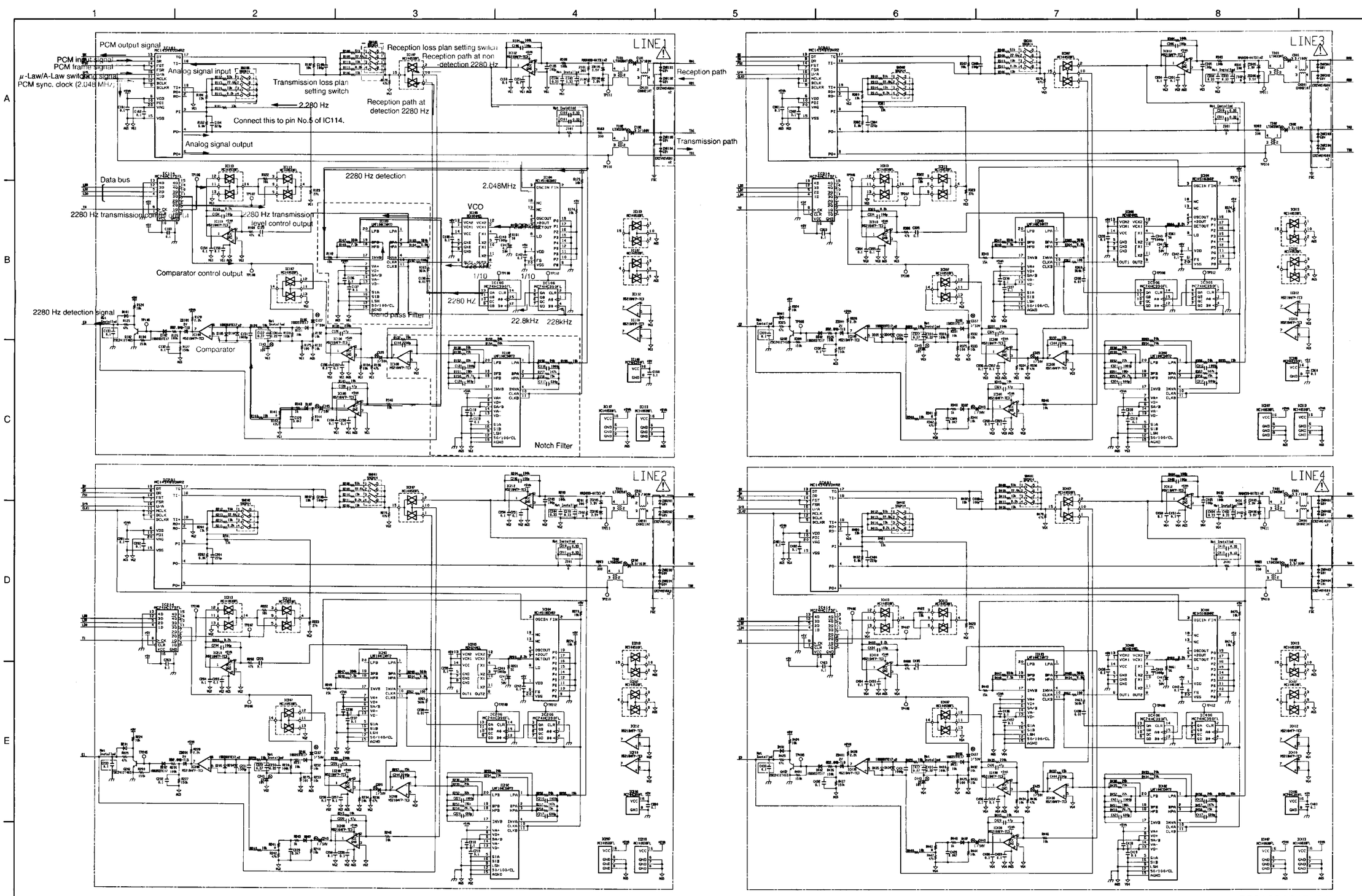

| Pin No | IC2 | | | | | | | | | | IC2 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 10 | 11 | 12 | 15 | 17 | 25 | 29 | 31 | 1 | 3 | 11 | 12 | 13 | 14 | 19 | 21 | 28 | 29 | 38 |
| Stand by (V) | | | | | | | | | | | (5) H | | | | | | | (5) H | | | |
| Operation (V) | | | | | | | | | | | (5) H | | | | | | | (5) H | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | *1 | | *1 | *1 | *1 |

*1 During communication

## (15) AC15/4 card (VB-44570UK) : AC-15 Card (UK only) (1/2)

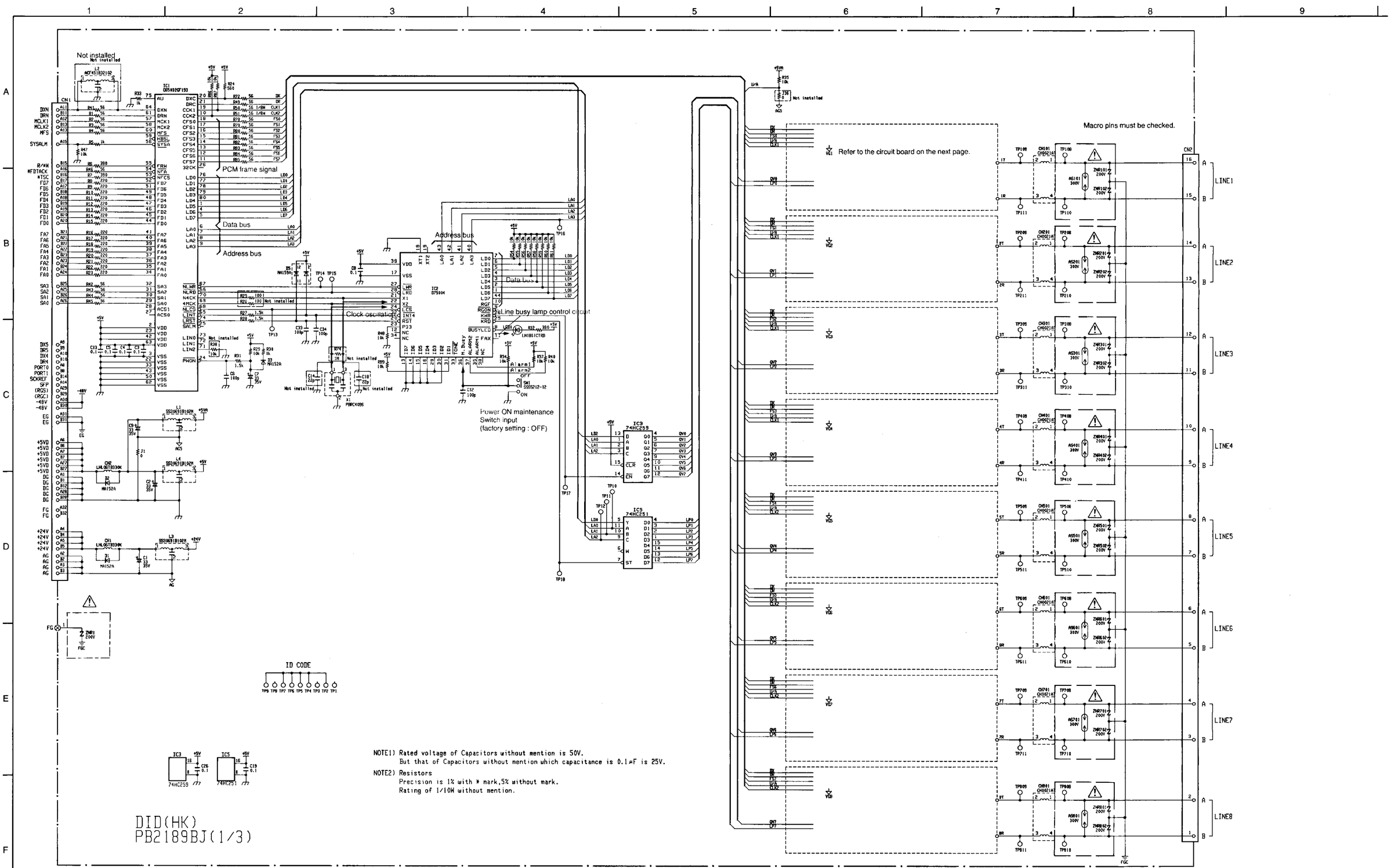


## AC15/4 card (VB-44570UK) : AC-15 Card (UK only) (2/2)




PB2196AJ(2/2)

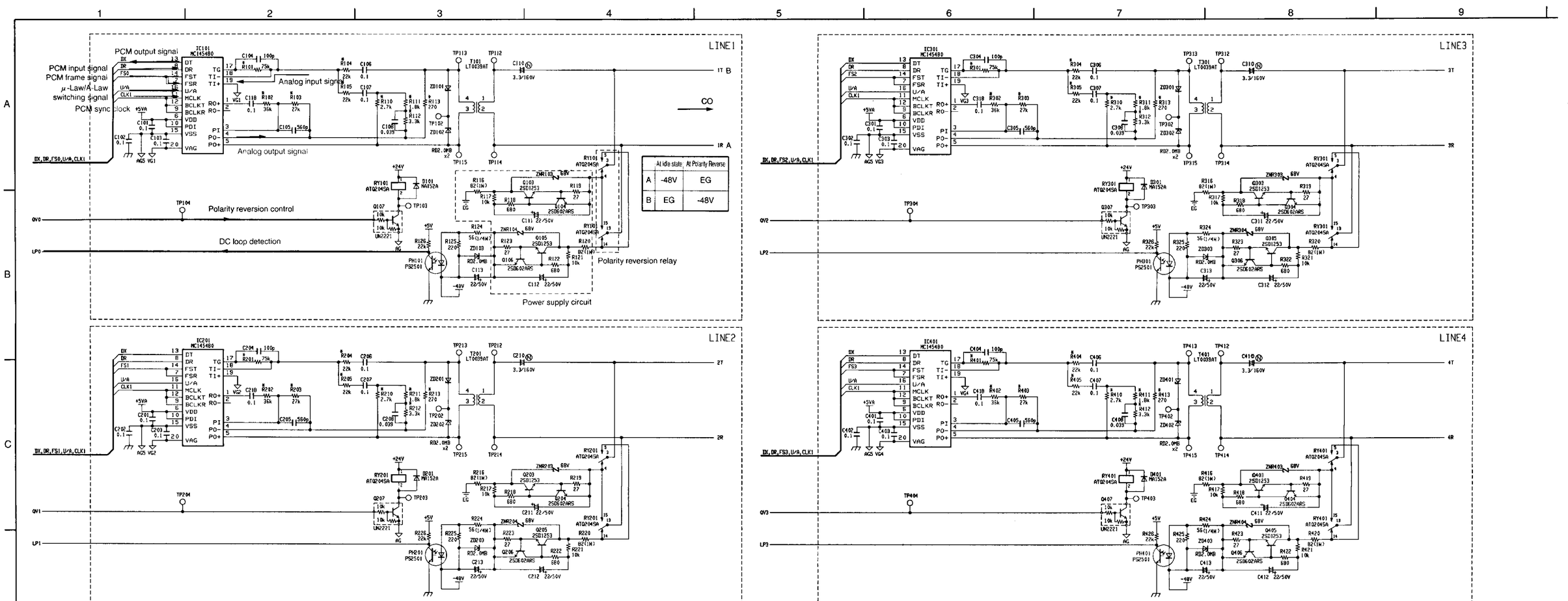
## (16) DIDTR8 card (VB-44520HK) : DID Trunk Card (HK only) (1/3)




NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark,5% without mark.
Rating of 1/10W without mention.

## DIDTR8 card (VB-44520HK) : DID Trunk Card (HK only) (2/3)




| | At idle state | At Polarity Reverse |
|---|---|---|
| A | -48V | EG |
| B | EG | -48V |

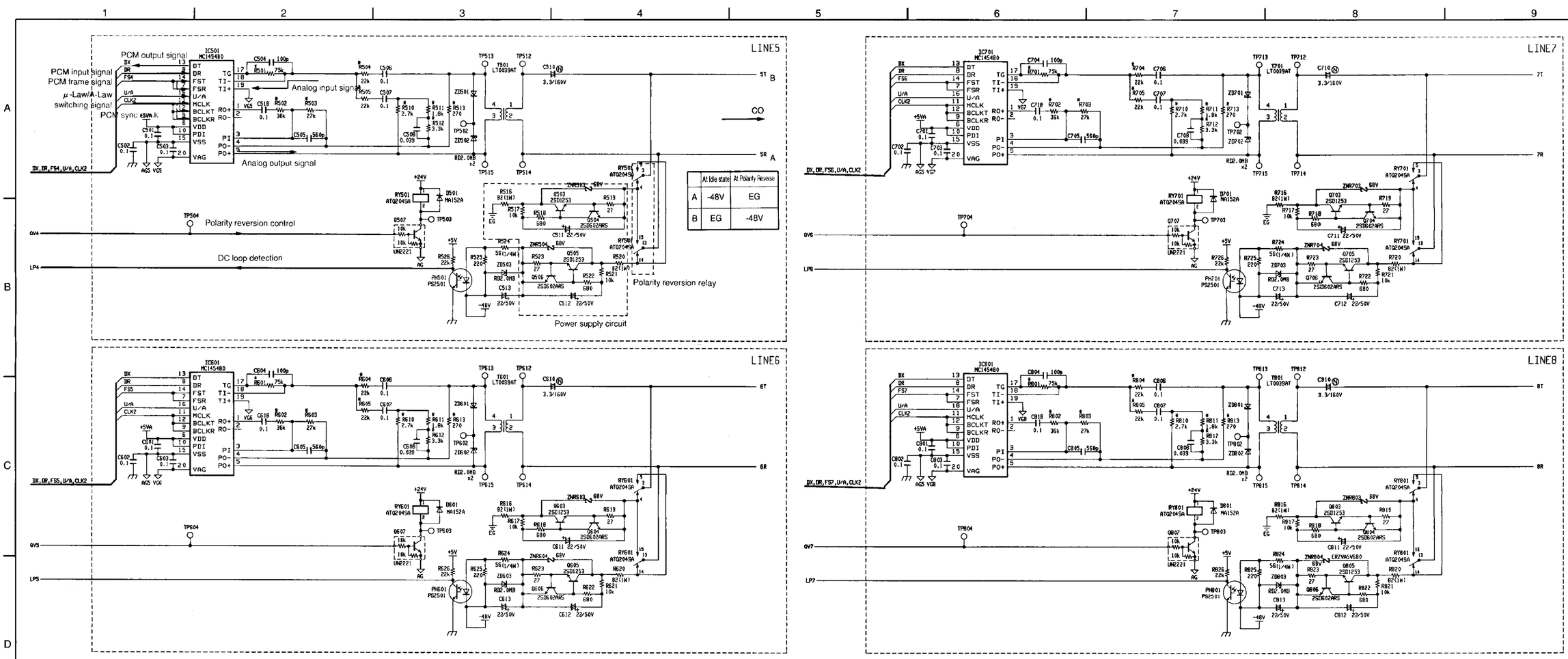
LINE 1 to 8 are common.
LINE 1: IC, Q, C, R, D, PH are from 100 to 199.
LINE 2: IC, Q, C, R, D, PH are from 200 to 299.
LINE 3: IC, Q, C, R, D, PH are from 300 to 399.
LINE 4: IC, Q, C, R, D, PH are from 400 to 499.

PB2189BJ(2/3)

NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark, 5% without mark.
Rating of 1/10W without mention.

## DIDTR8 card (VB-44520HK) : DID Trunk Card (HK only) (3/3)



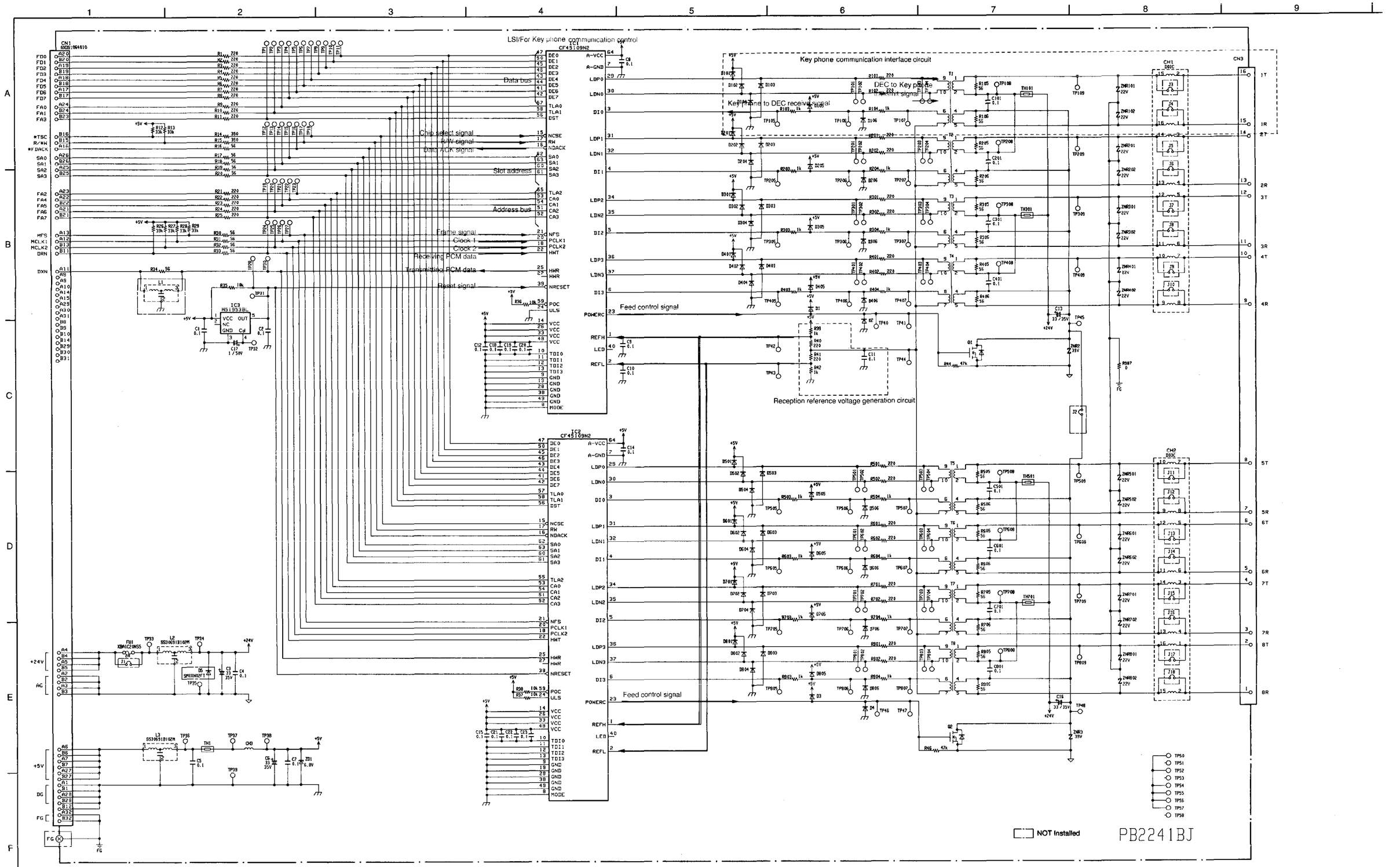

LINE 1 to 8 are common.
LINE 5: IC, Q, C, R, D, PH are from 500 to 599.
LINE 6: IC, Q, C, R, D, PH are from 600 to 699.
LINE 7: IC, Q, C, R, D, PH are from 700 to 799.
LINE 8: IC, Q, C, R, D, PH are from 800 to 899.

PB2189BJ(3/3)

NOTE1) Rated voltage of Capacitors without mention is 50V.
But that of Capacitors without mention which capacitance is 0.1μF is 25V.

NOTE2) Resistors
Precision is 1% with * mark,5% without mark.
Rating of 1/10W without mention.

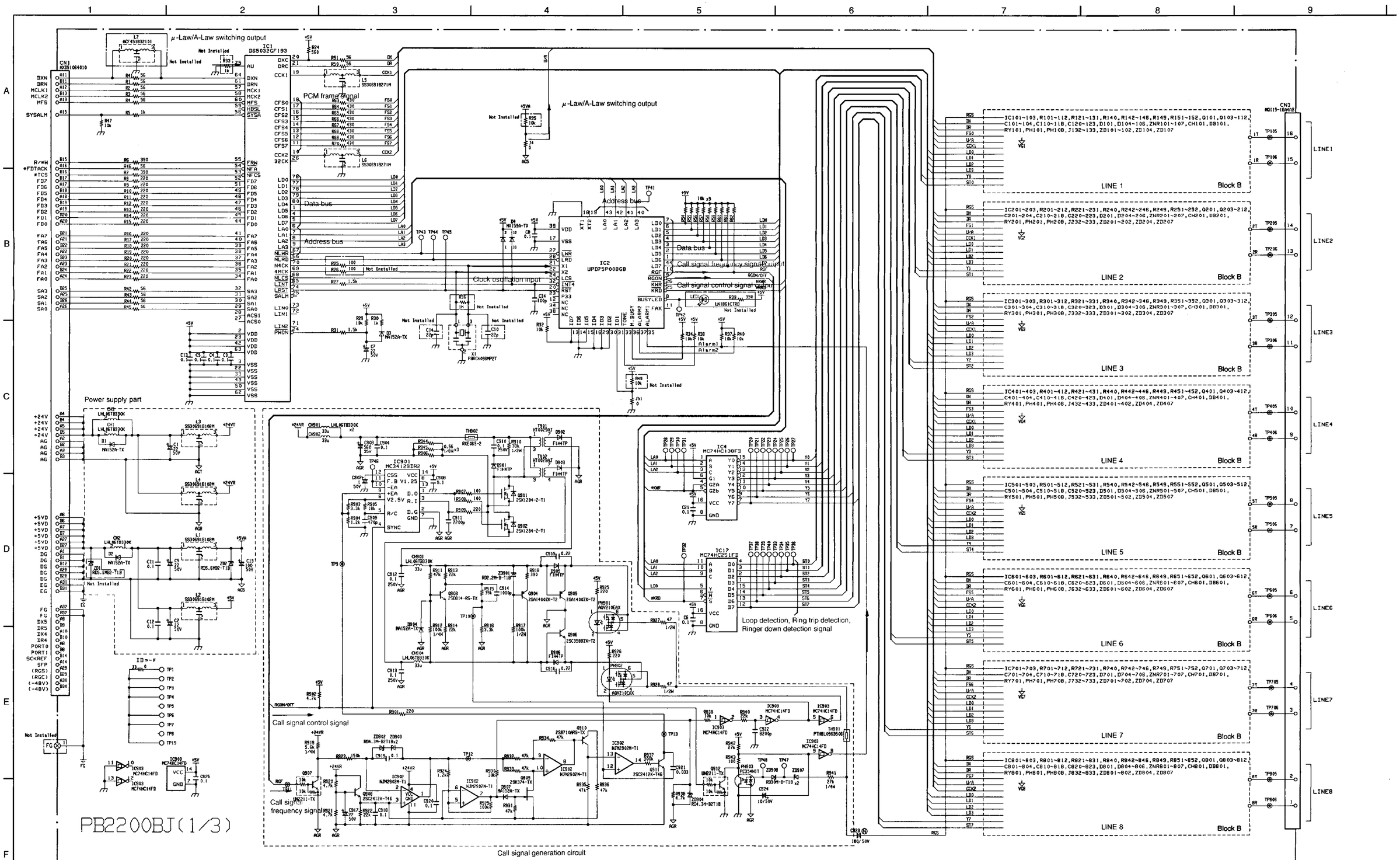
## (17) DEC/8 card (VB-44610UK) : Digital Extension Card




| Pin No. | IC1 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 18 | 20 | 21 | 22 | 25 | 29 | 30 | 47 | 50 |
| Stand by (V) | | | | | | | | | | |
| Operation (V) | | | | | | | | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

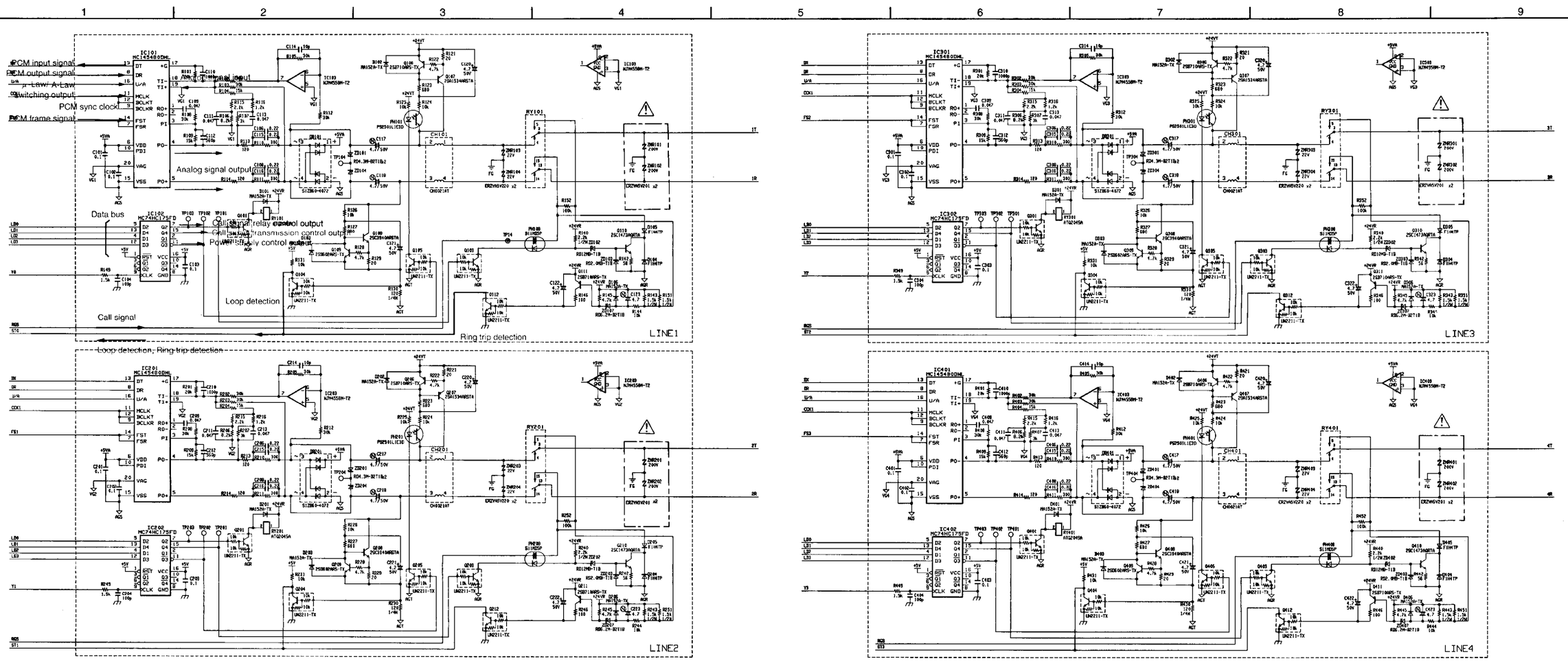
## (18) AEC/8 card (VB-44620UK) : Analog Extension Card (1/3)




| Pin No | IC1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 17 | 18 | 19 | 20 | 21 | 76 | 77 |
| Stand by (V) | | | | | | | | | |
| Operation (V) | | | | | | | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

## AEC/8 card (VB-44620UK) : Analog Extension Card (2/3)

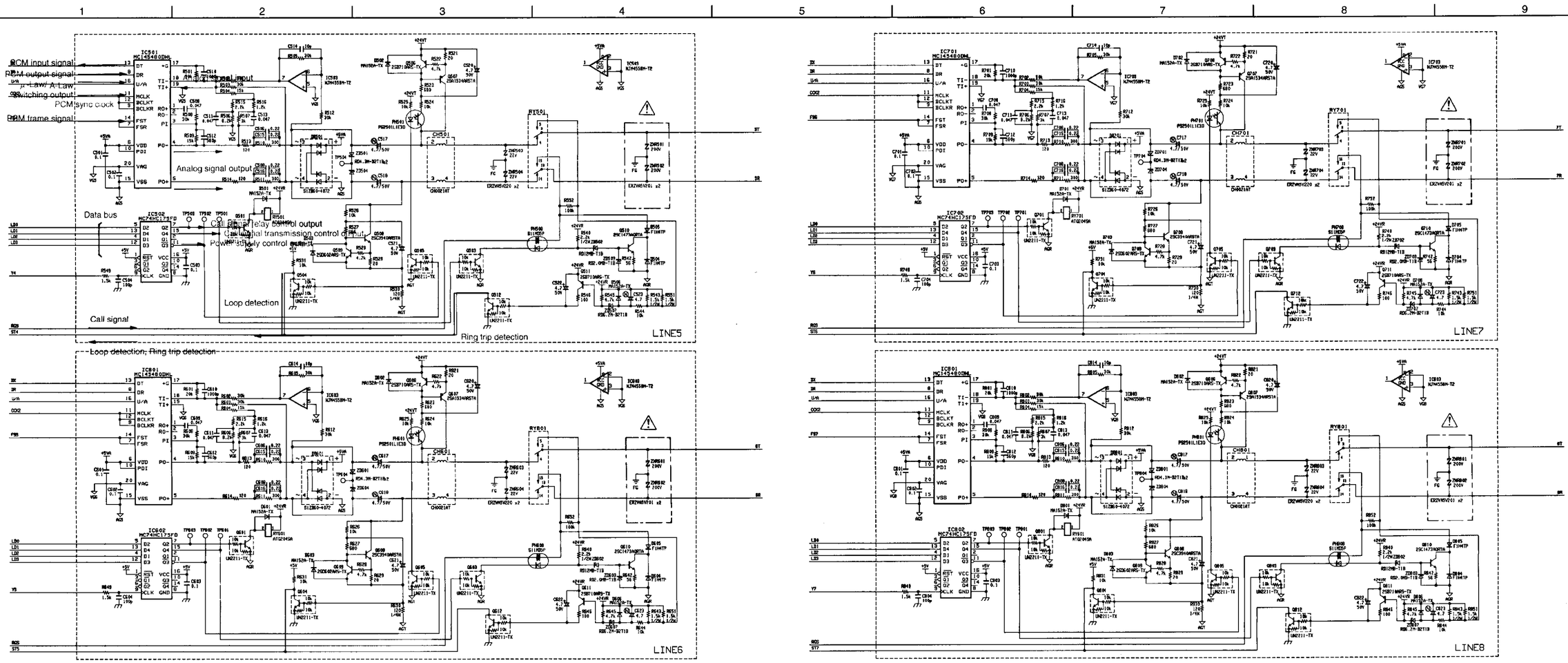



| Pin No | IC101 | |
|---|---|---|
| | 4 | 18 |
| Stand by (V) | (5) H | (5) H |
| Operation (V) | | (5) H |
| Remarks | *1 | *1 |

*1 During communication

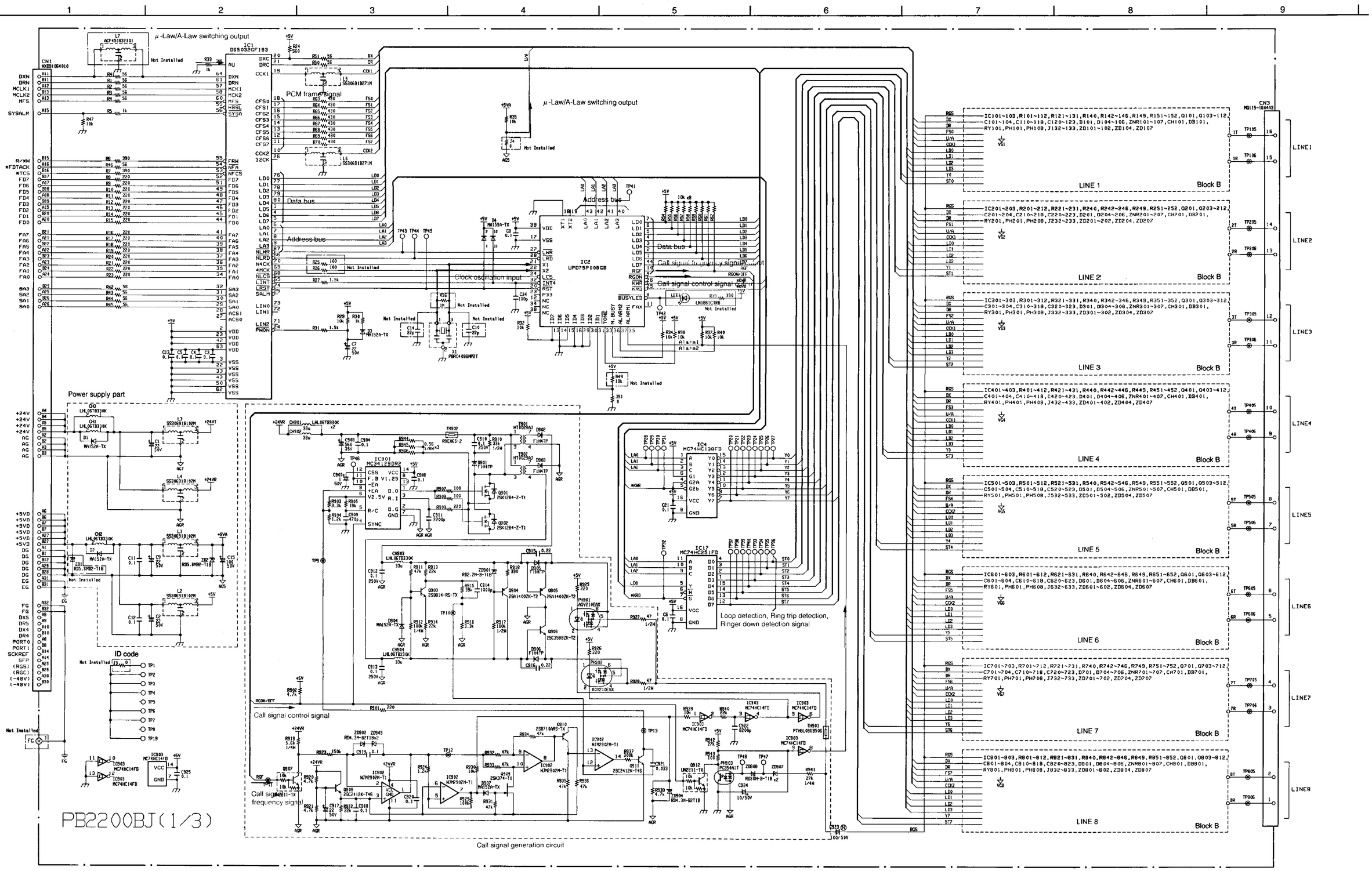
PB2200BJ(2/3)

## AEC/8 card (VB-44620UK) : Analog Extension Card (3/3)




PB2200BJ(3/3)

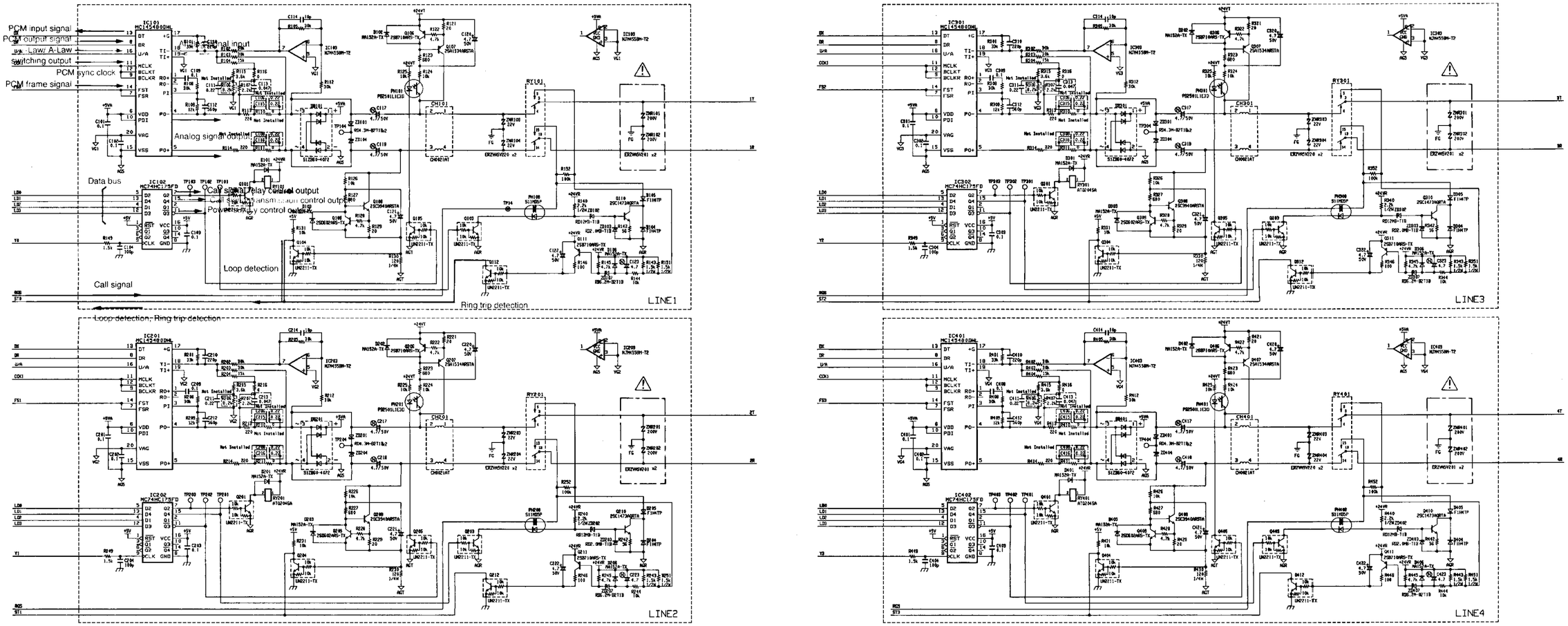
## (19) AEC/8 card (VB-44620HK) : Analog Extension Card (1/3)




| Pin No | IC1 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 17 | 18 | 19 | 20 | 21 | 76 | 77 |
| Stand by (V) | | | | | | | | | |
| Operation (V) | | | | | | | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 During communication

# AEC/8 card (VB-44620HK) : Analog Extension Card (2/3)

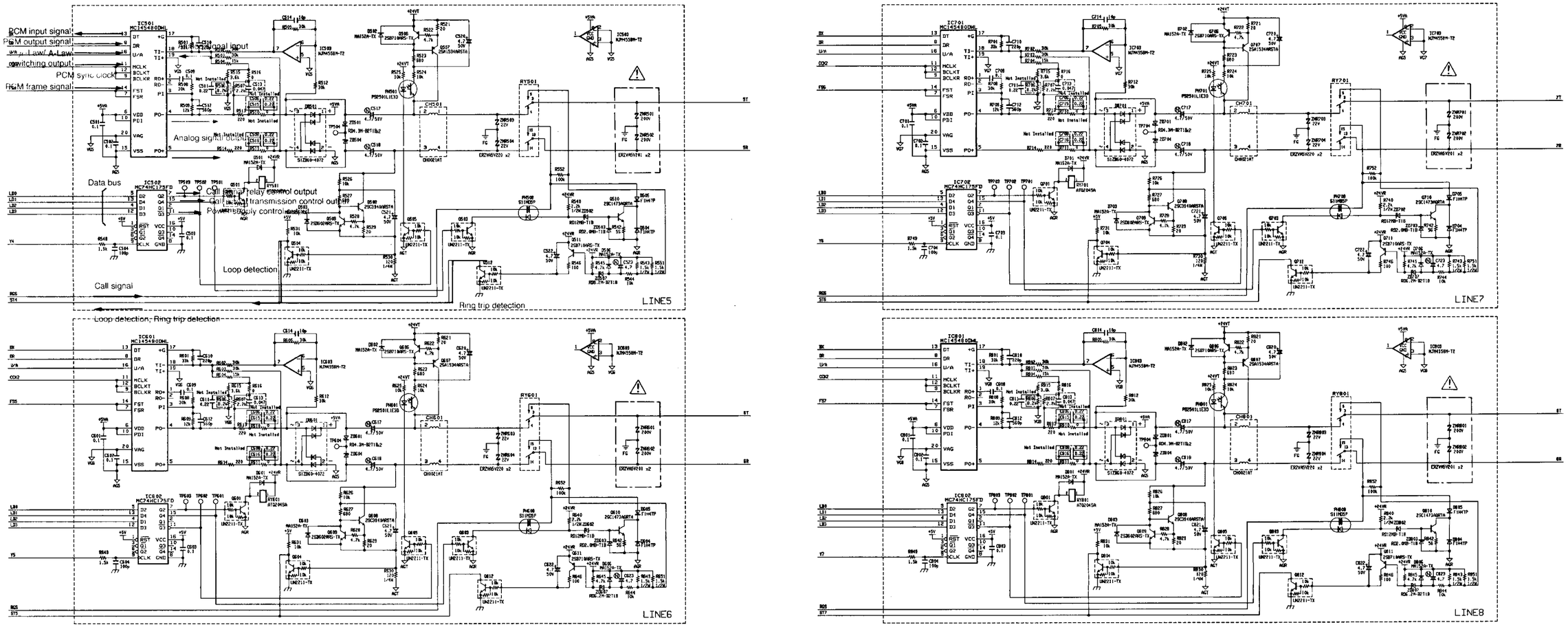



| Pin No | IC101 | |
|---|---|---|
| | 4 | 18 |
| Stand by (V) | (5) H | (5) H |
| Operation (V) | 2.5 0 | (5) H |
| Remarks | ✱1 | ✱1 |

✱1 During communication

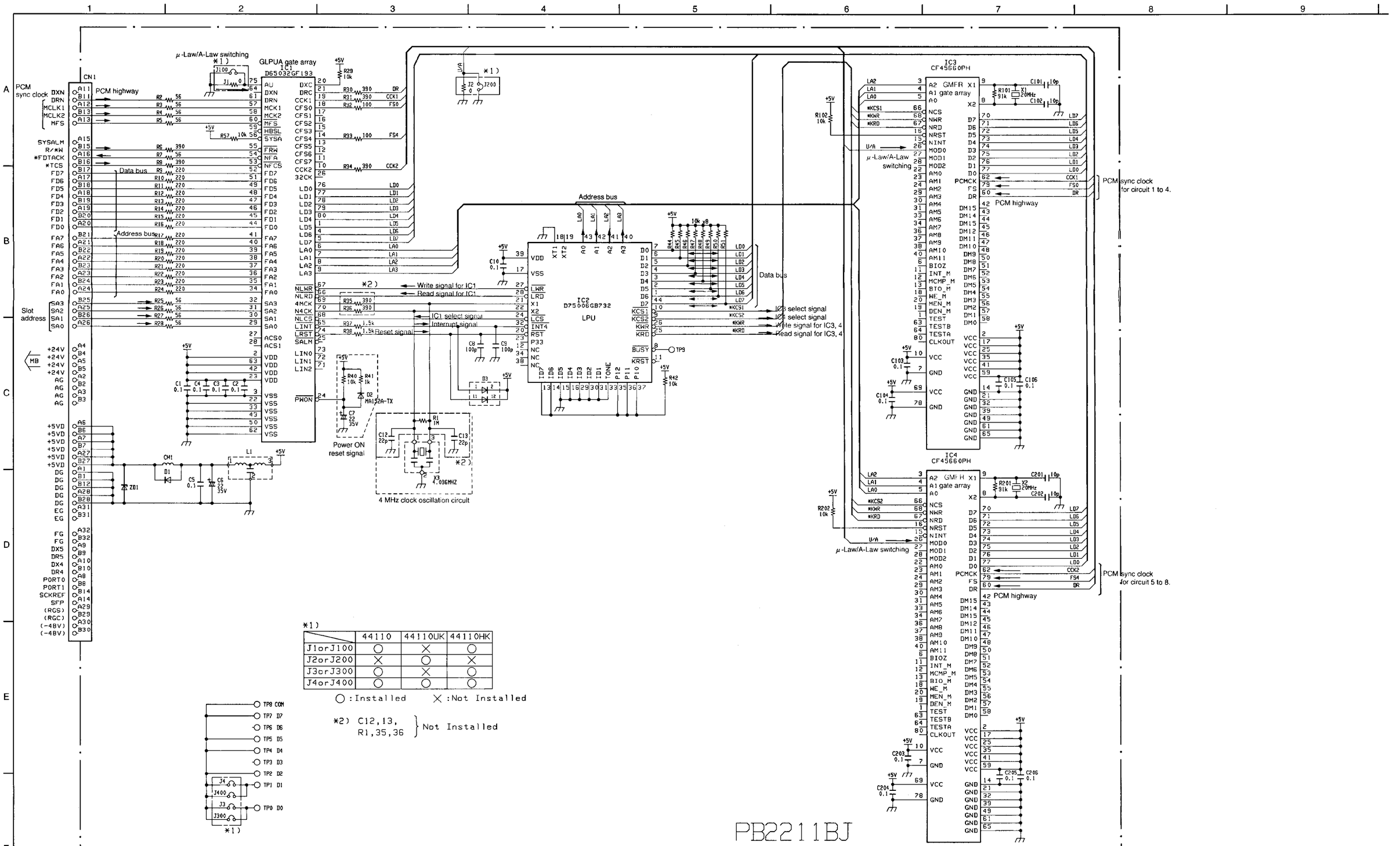
PB2200BJ(2/3)

# AEC/8 card (VB-44620HK) : Analog Extension Card (3/3)




PB2200BJ(3/3)

## (20) MFR/8 card (VB-44110UK/HK) : 8 DTMF Receiver Card




*1)

| | 44110 | 44110UK | 44110HK |
|---|---|---|---|
| J1orJ100 | ○ | × | ○ |
| J2orJ200 | × | ○ | × |
| J3orJ300 | ○ | × | ○ |
| J4orJ400 | ○ | ○ | ○ |

○ : Installed × : Not Installed

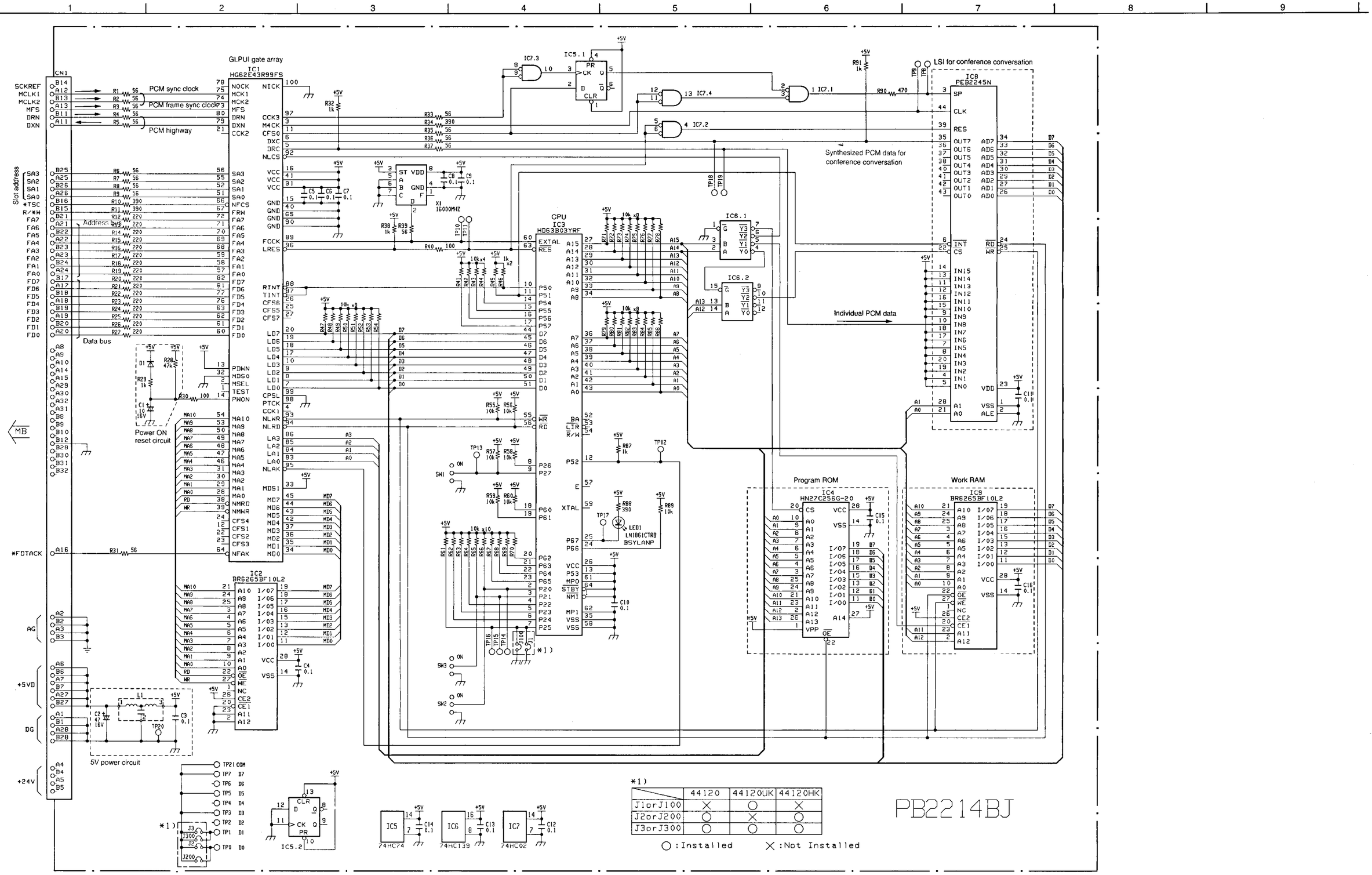
*2) C12, 13, R1, 35, 36 } Not Installed




PB2211BJ

| Pin No | IC1 | | | | | | | | | | | | | | | | | | | | IC2 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | 7 | 8 | 10 | 14 | 18 | 19 | 21 | 29 | 30 | 34 | 35 | 53 | 54 | 55 | 57 | 58 | 60 | 61 | 65 | 74 | 9 | 10 | 25 | 26 |
| Stand by (V) | – | – | – | – | – | – | – | – | (5) H | (5) H | – | – | – | – | – | – | – | – | – | – | (5) H | – | – | – | (5) H |
| Operation (V) | | | | | | | | | (5) H | (5) H | | | | | | | | | | | (5) H | | | | (5) H |
| Remarks | | | | | | | | | | | | | | | | | | | | | | | | | |

## (21) CONF card (VB-44120UK/HK) : Conference Card




*1)

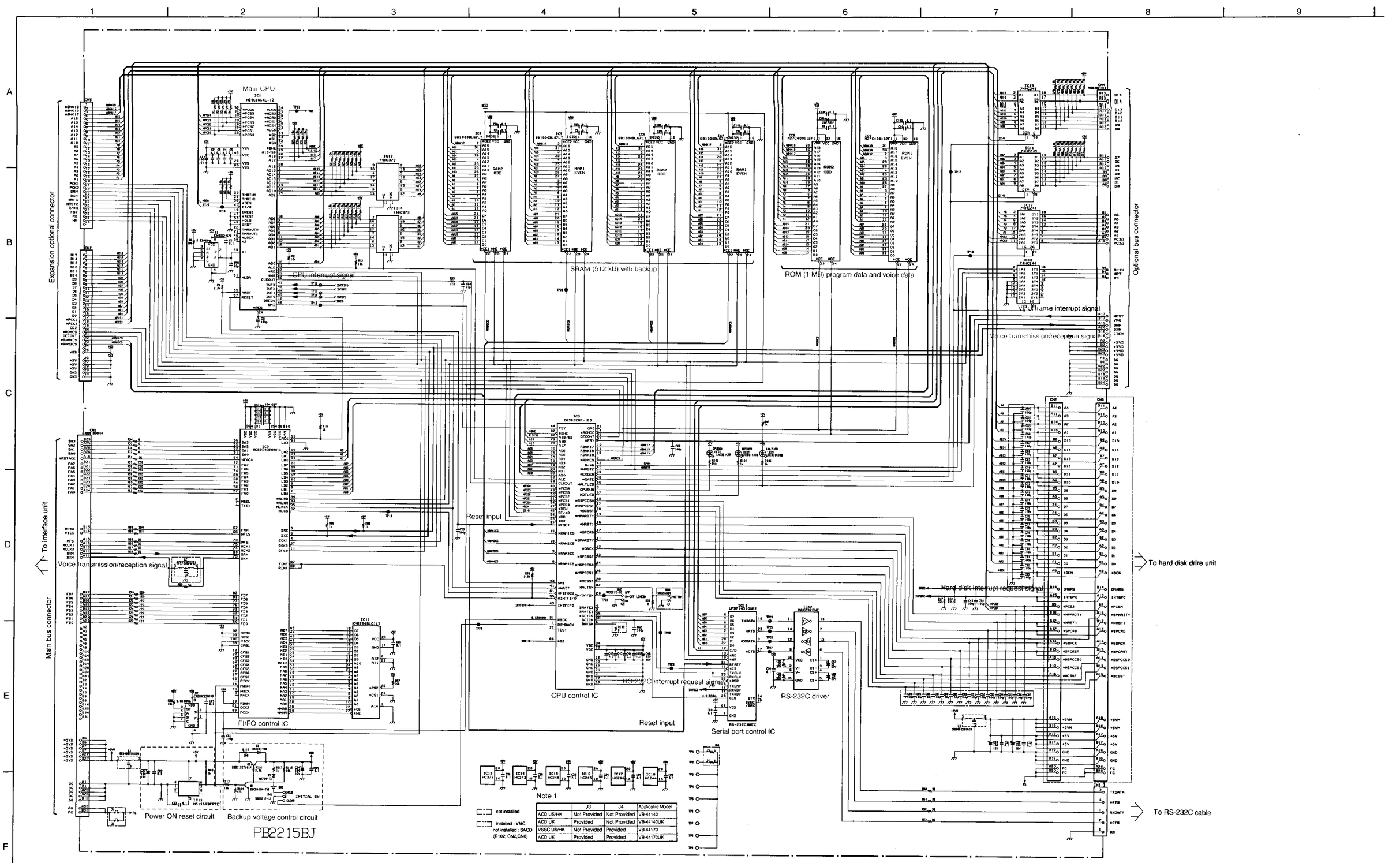
| | 44120 | 44120UK | 44120HK |
|---|---|---|---|
| J1orJ100 | × | ○ | × |
| J2orJ200 | ○ | × | ○ |
| J3orJ300 | ○ | ○ | ○ |

○ : Installed × : Not Installed

| Pin No | IC1 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 5 | 6 | 7 | 8 | 9 | 11 | 28 | 29 | 34 | 35 | 36 | 38 | 39 | 83 | 84 | 85 | 92 | 97 |
| Stand by (V) | | | | | | | | | (5) H | (5) H | (5) H | (5) H | (5) H | (5) H | | | | | |
| Operation (V) | | | | | | | | | (5) H | (5) H | (5) H | (5) H | (5) H | (5) H | | | | | |
| Remarks | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | | | | | | | *1 | *1 | *1 | *1 | *1 |

*1 During communication

## (22) ACD card (VB-44140UK/44140) : ACD Card
## VSSC card (VB-44170UK/44170) : Voice Storage Service Card

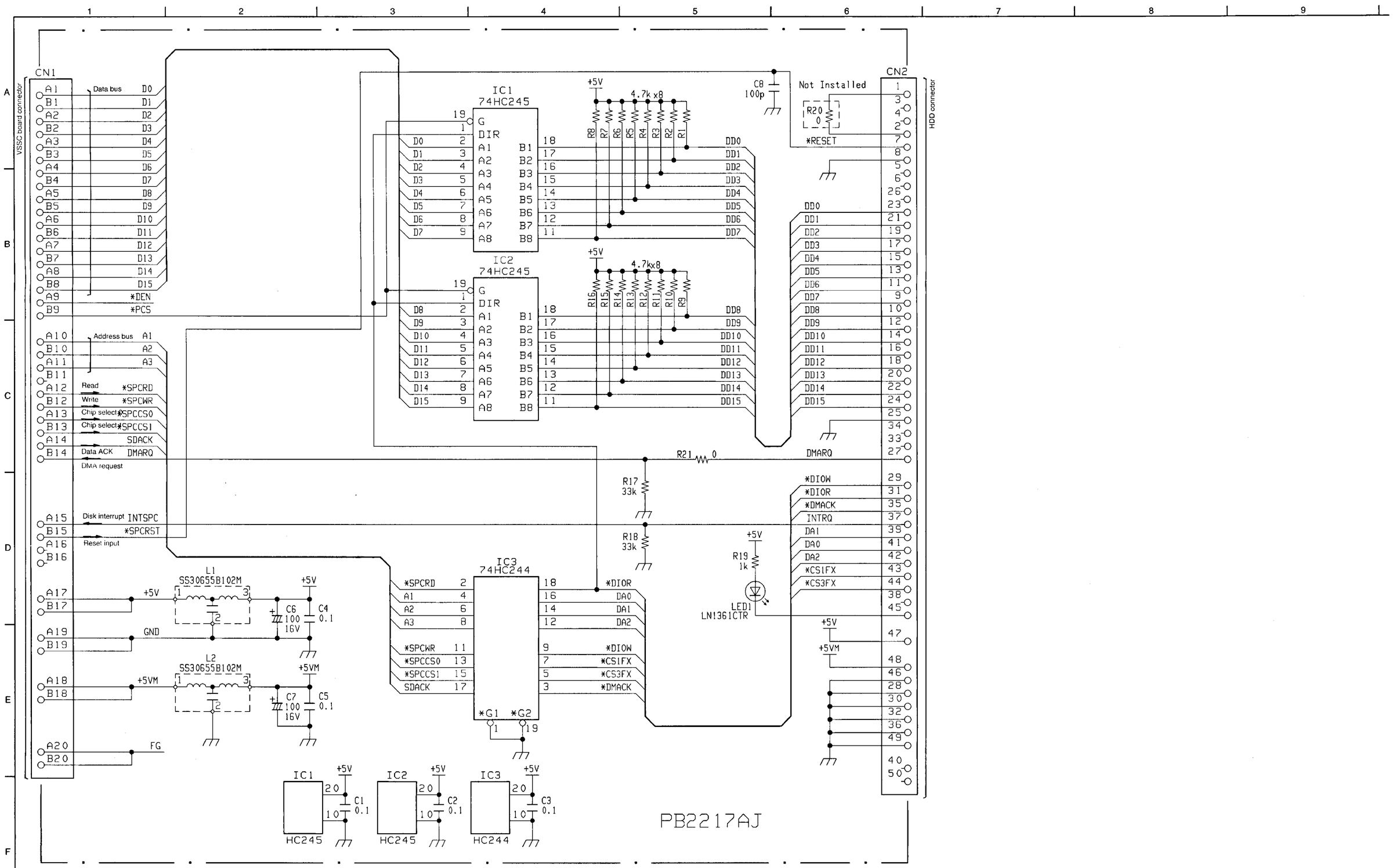



| | J3 | J4 | Applicable Model |
|---|---|---|---|
| ACD US/HK | Not Provided | Not Provided | VB-44140 |
| ACD UK | Provided | Not Provided | VB-44140UK |
| VSSC US/HK | Not Provided | Provided | VB-44170 |
| ACD UK | Provided | Provided | VB-44170UK |

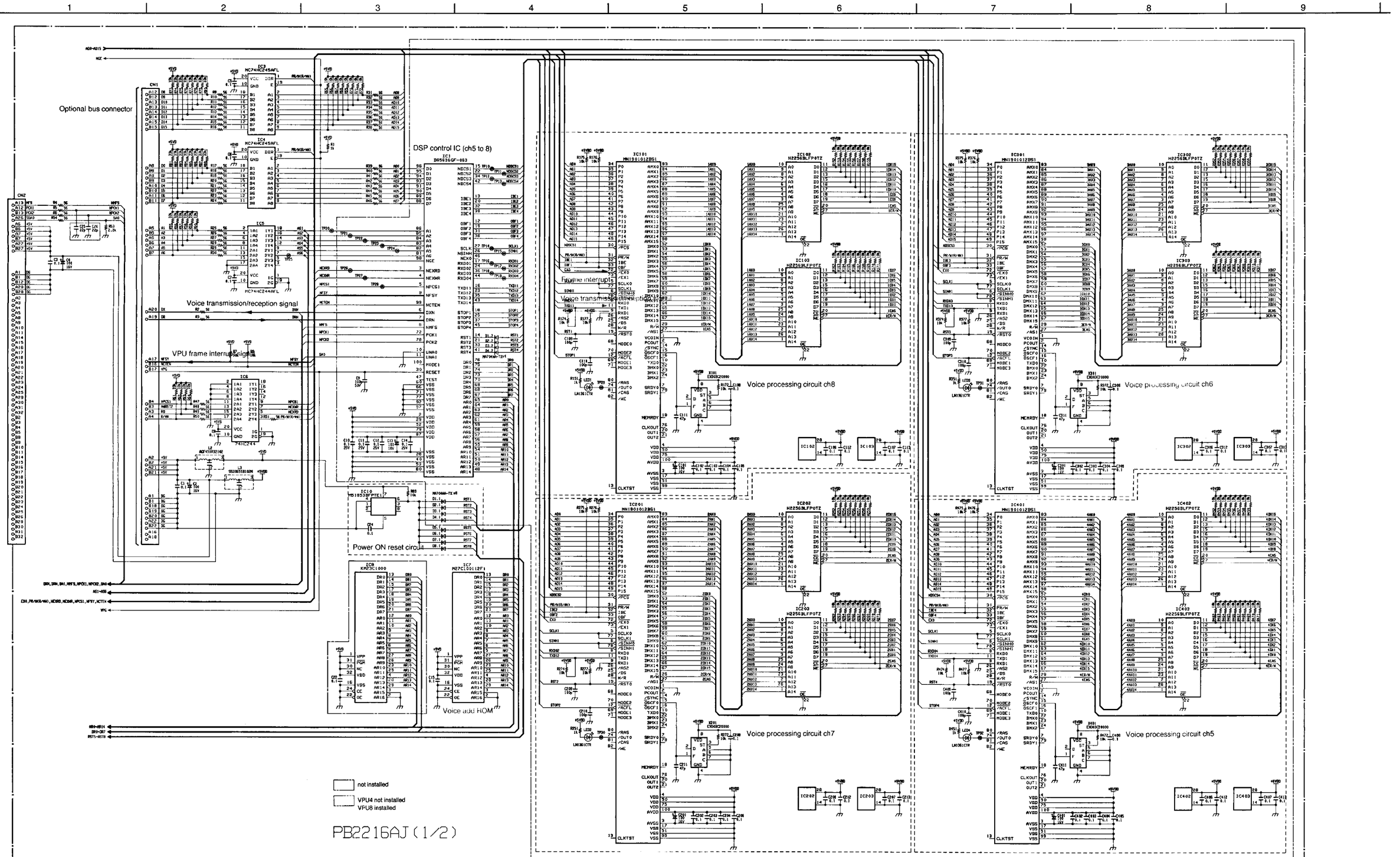
| Pin No | IC1 | | | | | | | | IC2 | | | | IC4 | | | | | | IC5 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 11 | 13 | 15 | 25 | 27 | 28 | 56 | 59 | 7 | 8 | 9 | 89 | 2 | 10 | 11 | 12 | 13 | 14 | 13 | 14 |
| Stand by (V) | | | | | | (5) H | | | | | | | | | | | | | | |
| Operation (V) | | | | | | (5) H | | | | | | | | | | | | | | |
| Remarks | *1 | *1 | *1 | *1 | *1 | | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 | *1 |

*1 At voice mail

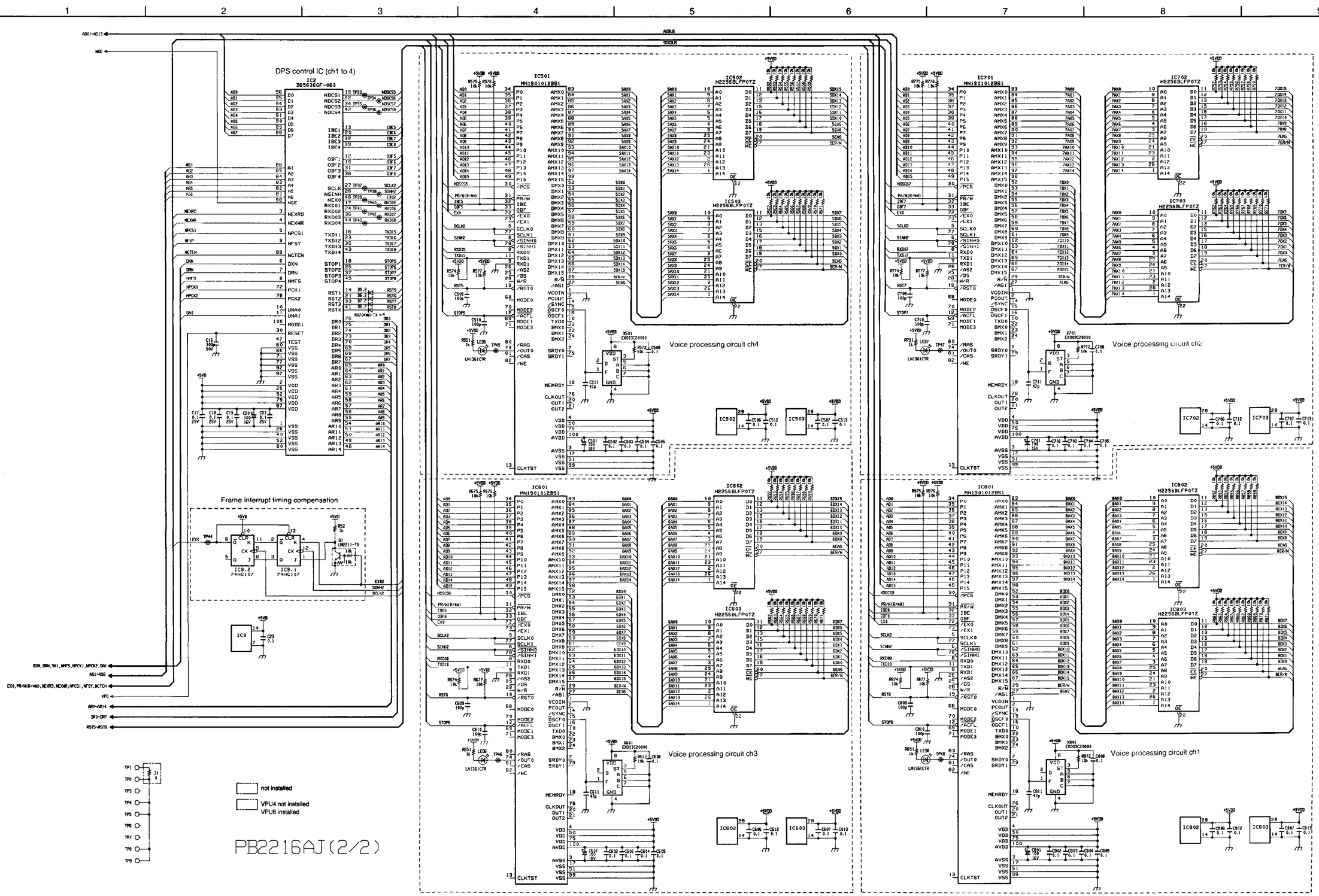
## VSSCHD (VB-44171) : Hard Disc Drive Unit



## (23) VPU/8 card (VB-44150UK/44150) : 8 Voice Processing Card (1/2)
## VPU/4 card (VB-44160UK/44160) : 4 Voice Processing Card (1/2)

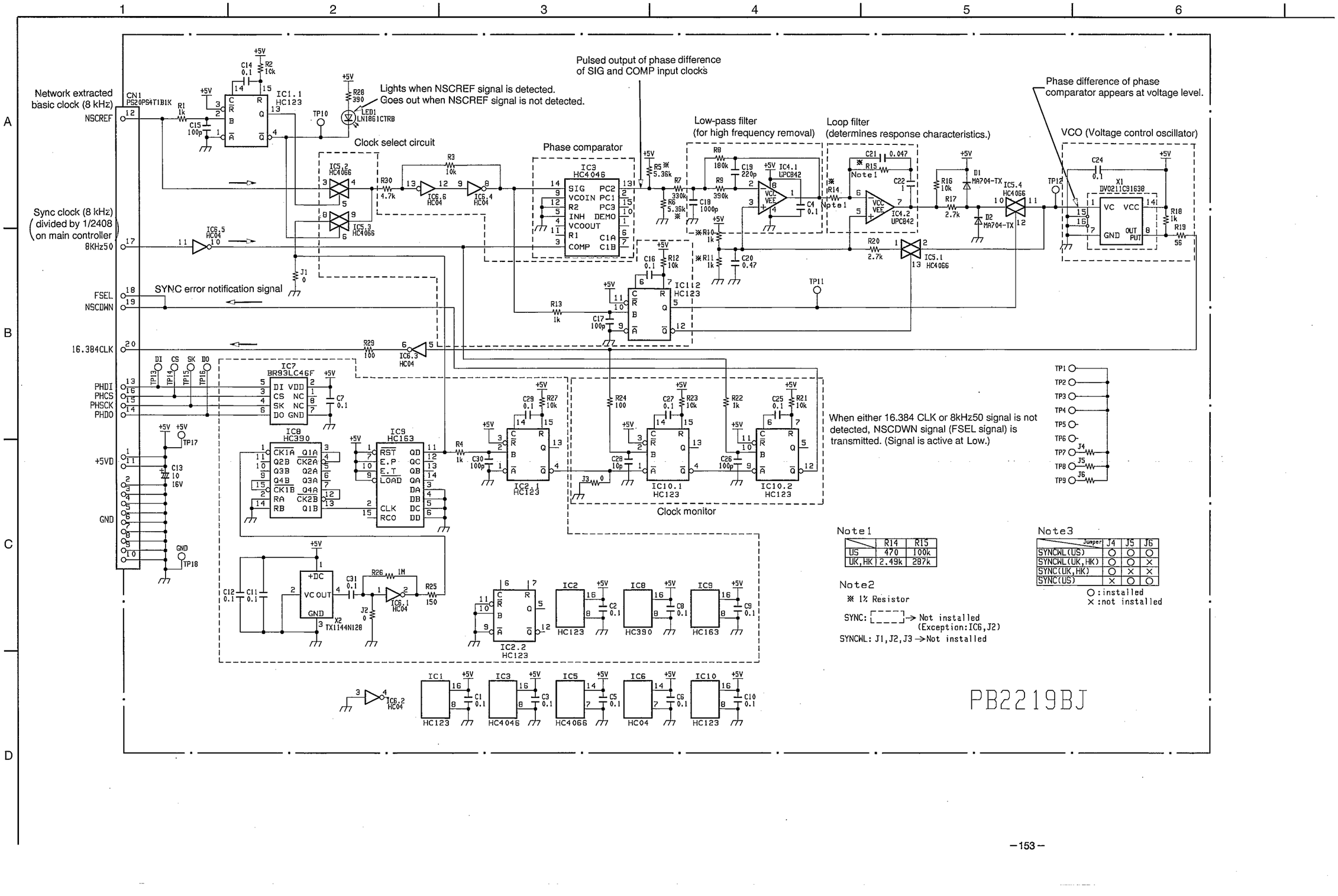


**VPU/8 card (VB-44150UK/44150) : 8 Voice Processing Card (2/2)**
**VPU/4 card (VB-44160UK/44160) : 4 Voice Processing Card (2/2)**




| Pin No | IC2 | | | | | IC501 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3 | 4 | 5 | 72 | 78 | 15 | 34 | 35 | 36 | 52 | 53 | 83 | 84 | 85 |
| Stand by (V) | | | | | | | | | | | | | | |
| Operation (V) | | | | | | | | | | | | | | |
| Remarks | | | | | | | | | | | | | | |

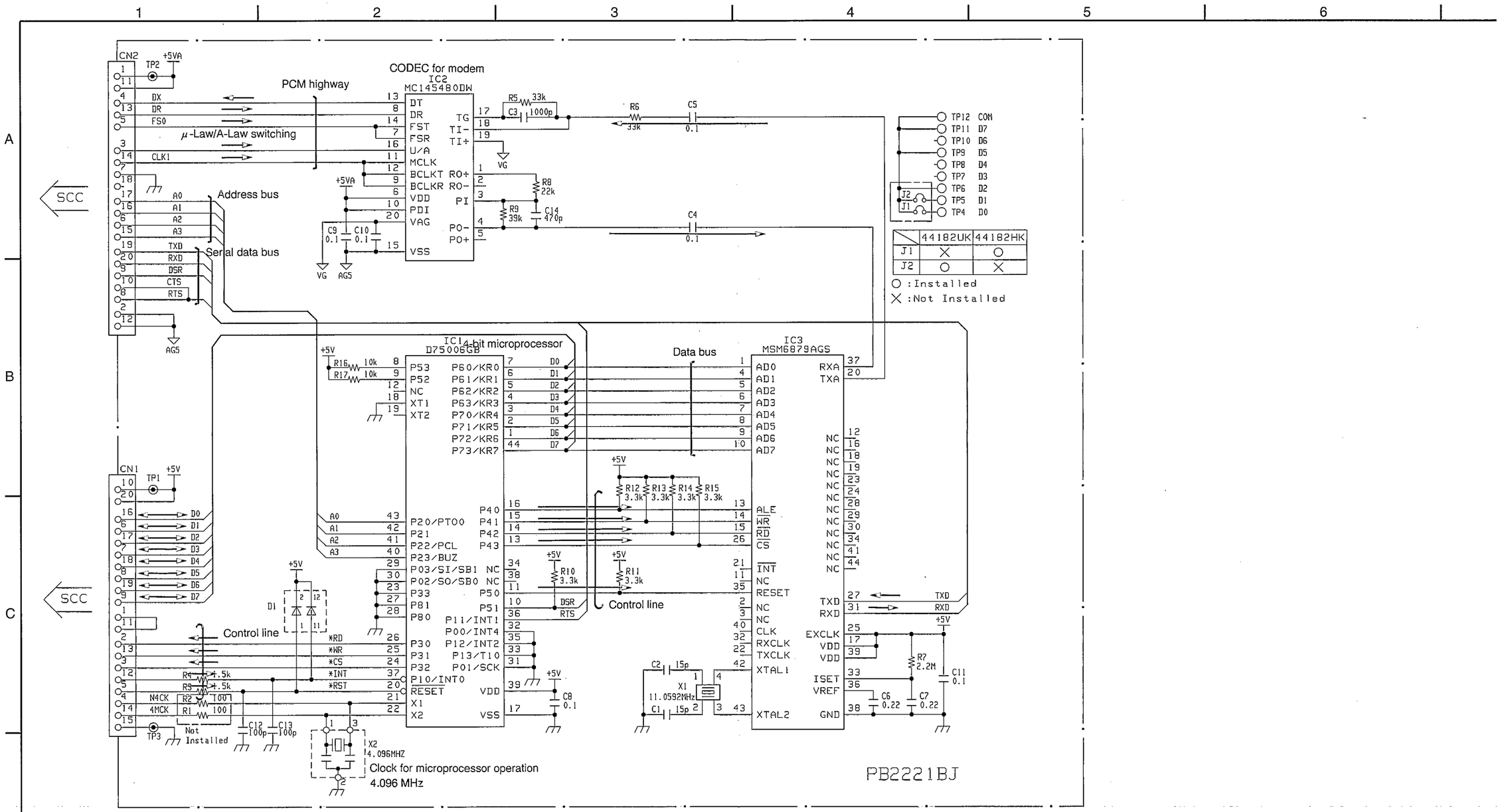
## (24) SYNC Package (VB-44460UK) : Sync. Package/Network Unit



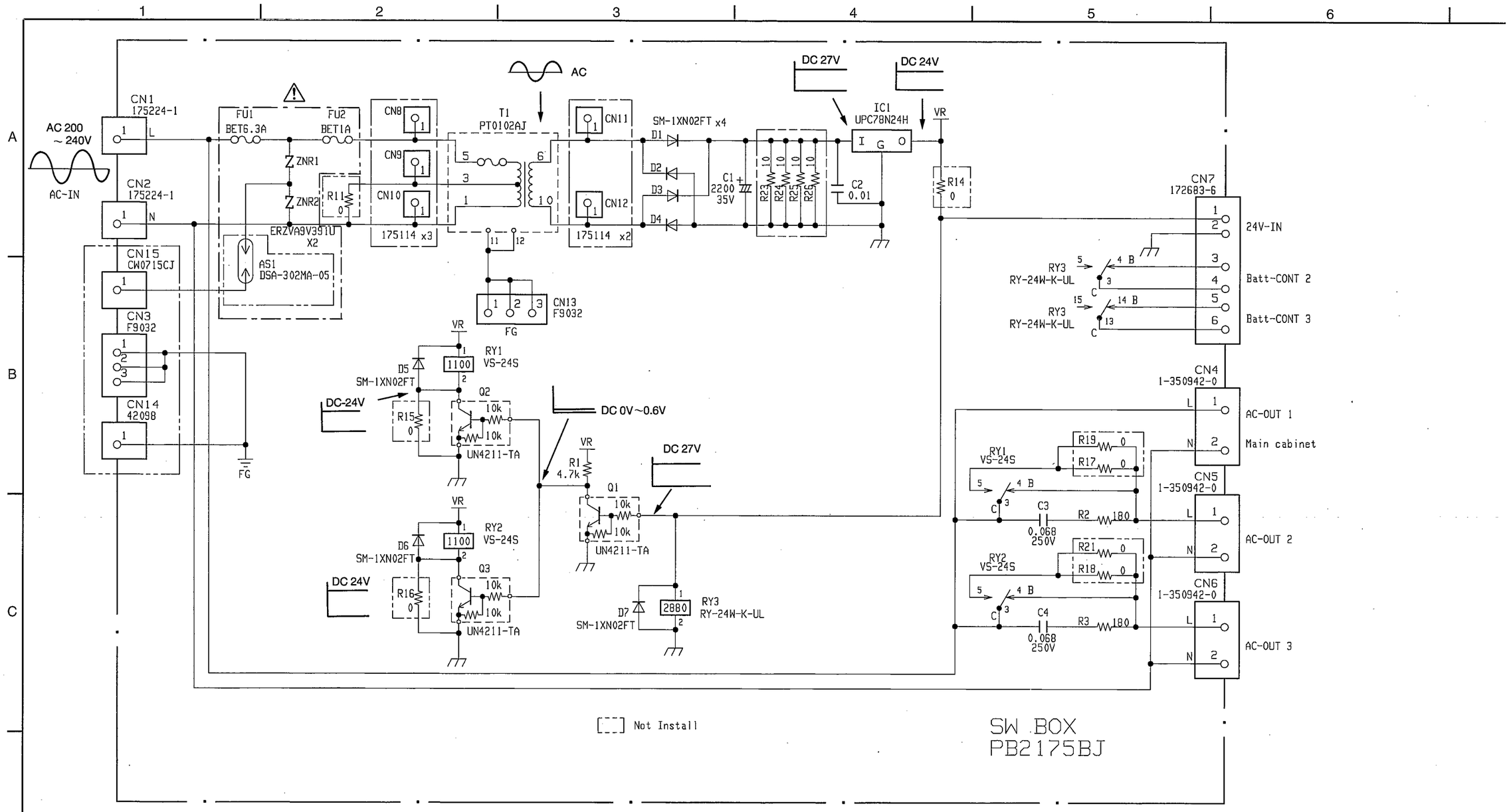

| | R14 | R15 |
|---|---|---|
| US | 470 | 100k |
| UK, HK | 2.49k | 287k |

| Jumper | J4 | J5 | J6 |
|---|---|---|---|
| SYNCWL(US) | ○ | ○ | ○ |
| SYNCWL(UK, HK) | ○ | ○ | × |
| SYNC(UK, HK) | ○ | × | × |
| SYNC(US) | × | ○ | ○ |

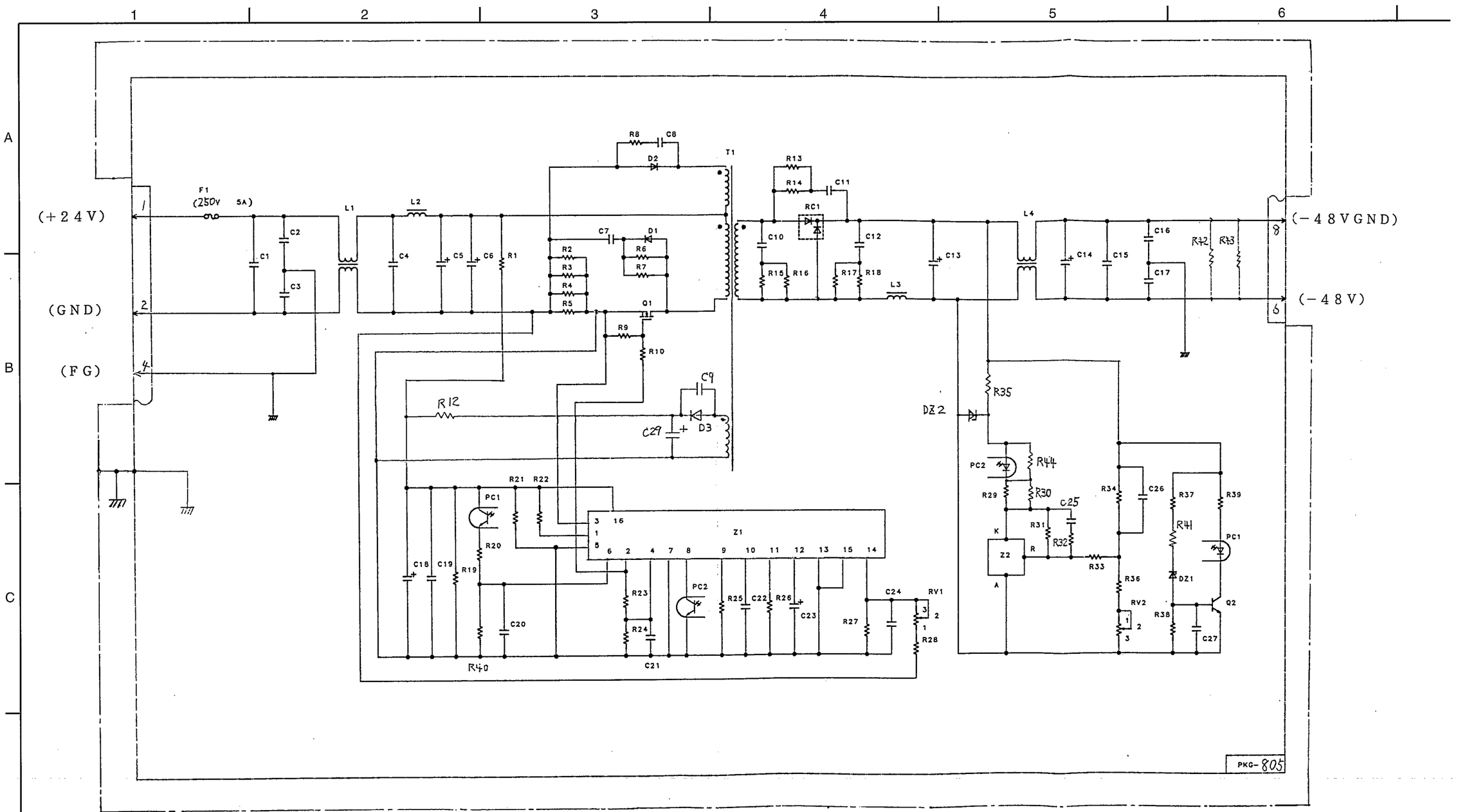
## (25) RAI Unit (VB-44182UK/HK) : Remote Administration Unit



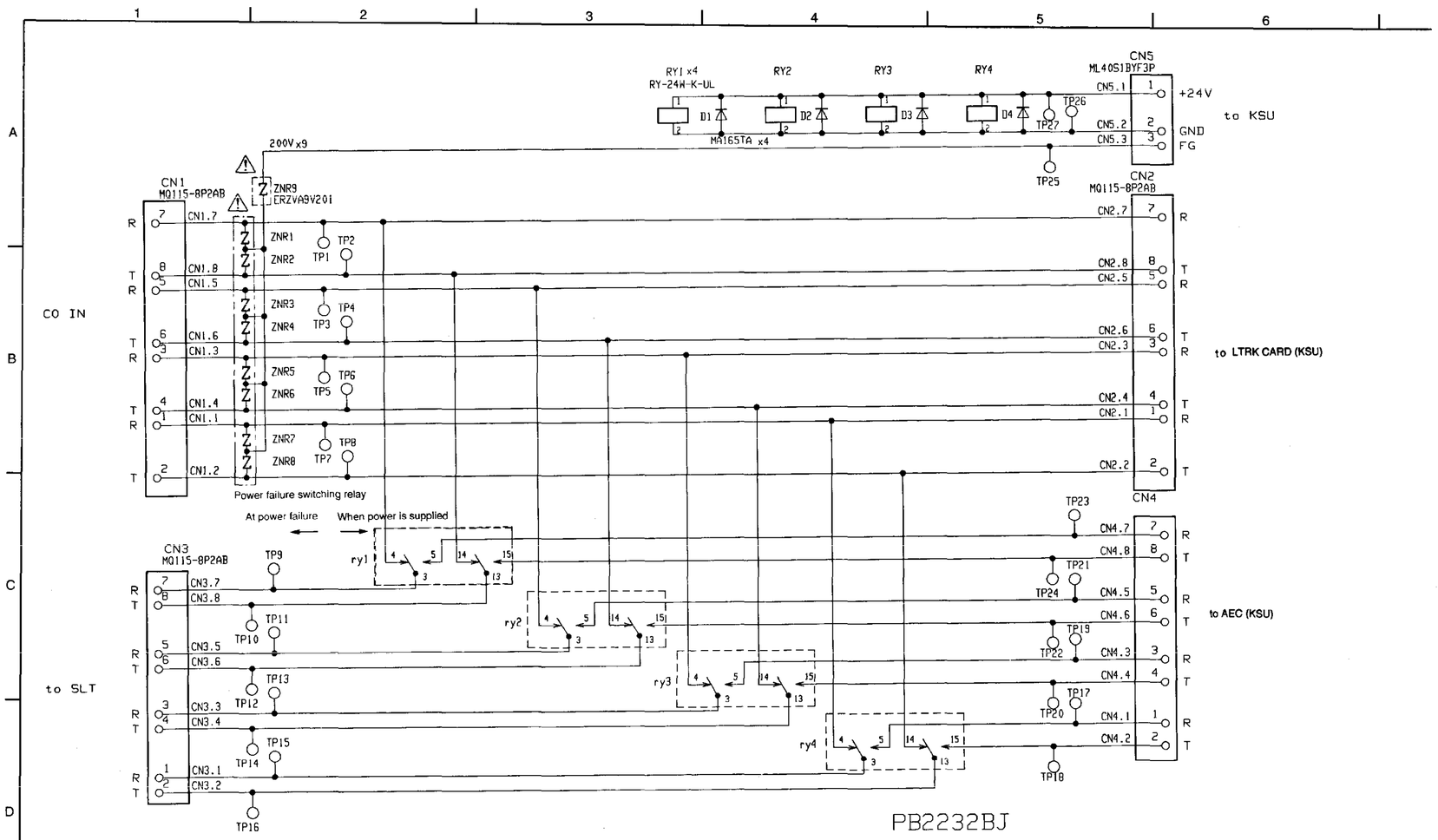
## 3. Power Supply & External Optional Equipment
## (1) SWBOX (VB-44023UK/HK) : Switch Box



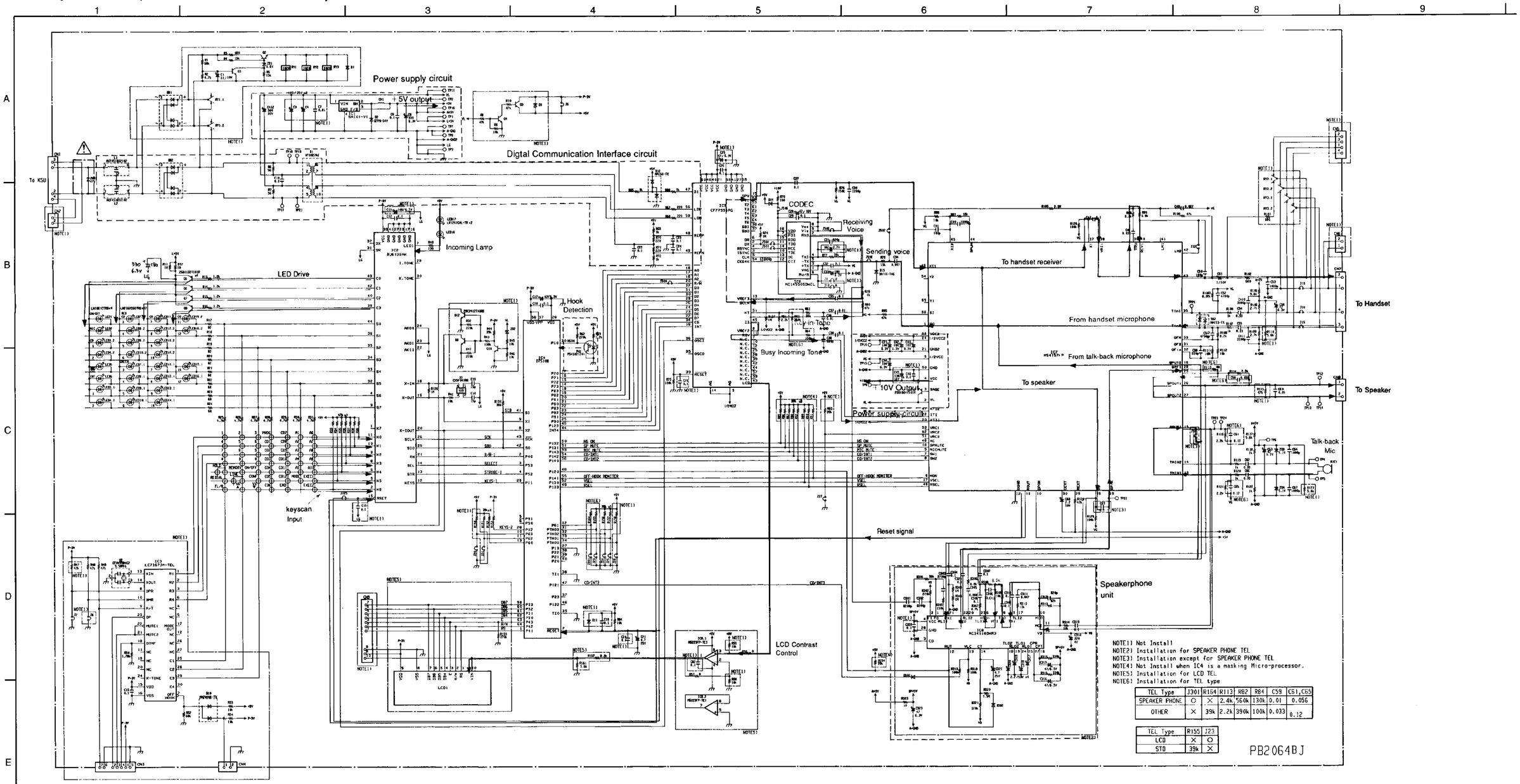
## (2) POW-48 (VB-44022) :-48V Power Supply



## (3) PFU (VB-43703UK) : Power Failure Unit



## 4. Key Phones
## (1) 12 Key (VB-D411UK)　12 Key-SPU (VB-44221HK)
## 12 Key-LCD/SPU (VB-D411DSUK/VB-44223HK)

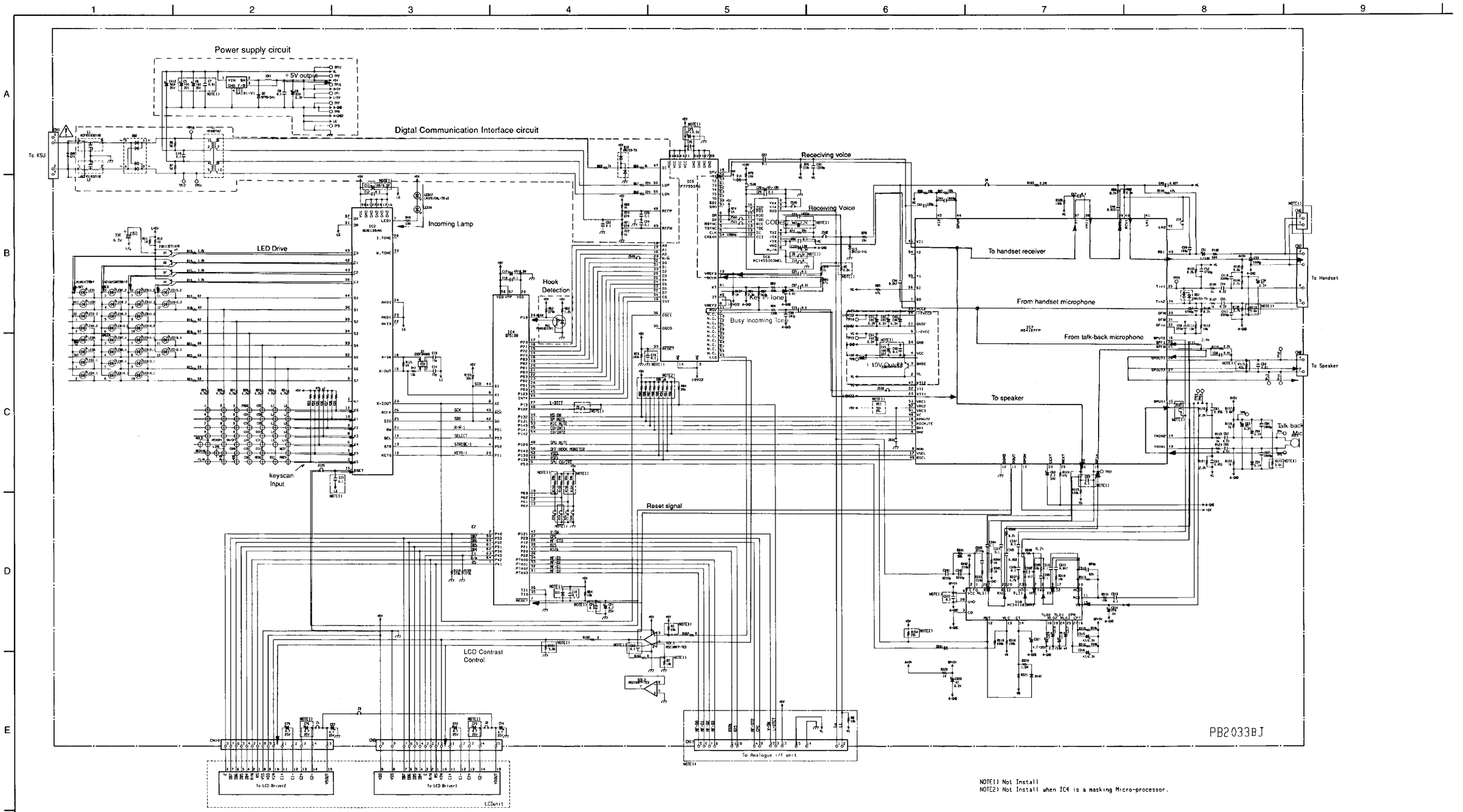



| TEL Type | J301 | R164 | R113 | R82 | R84 | C59 | C61,C65 |
|---|---|---|---|---|---|---|---|
| SPEAKER PHONE | ○ | × | 2.4k | 560k | 130k | 0.01 | 0.056 |
| OTHER | × | 39k | 2.2k | 390k | 100k | 0.033 | 0.12 |

| TEL Type | R155 | J23 |
|---|---|---|
| LCD | × | ○ |
| STD | 39k | × |

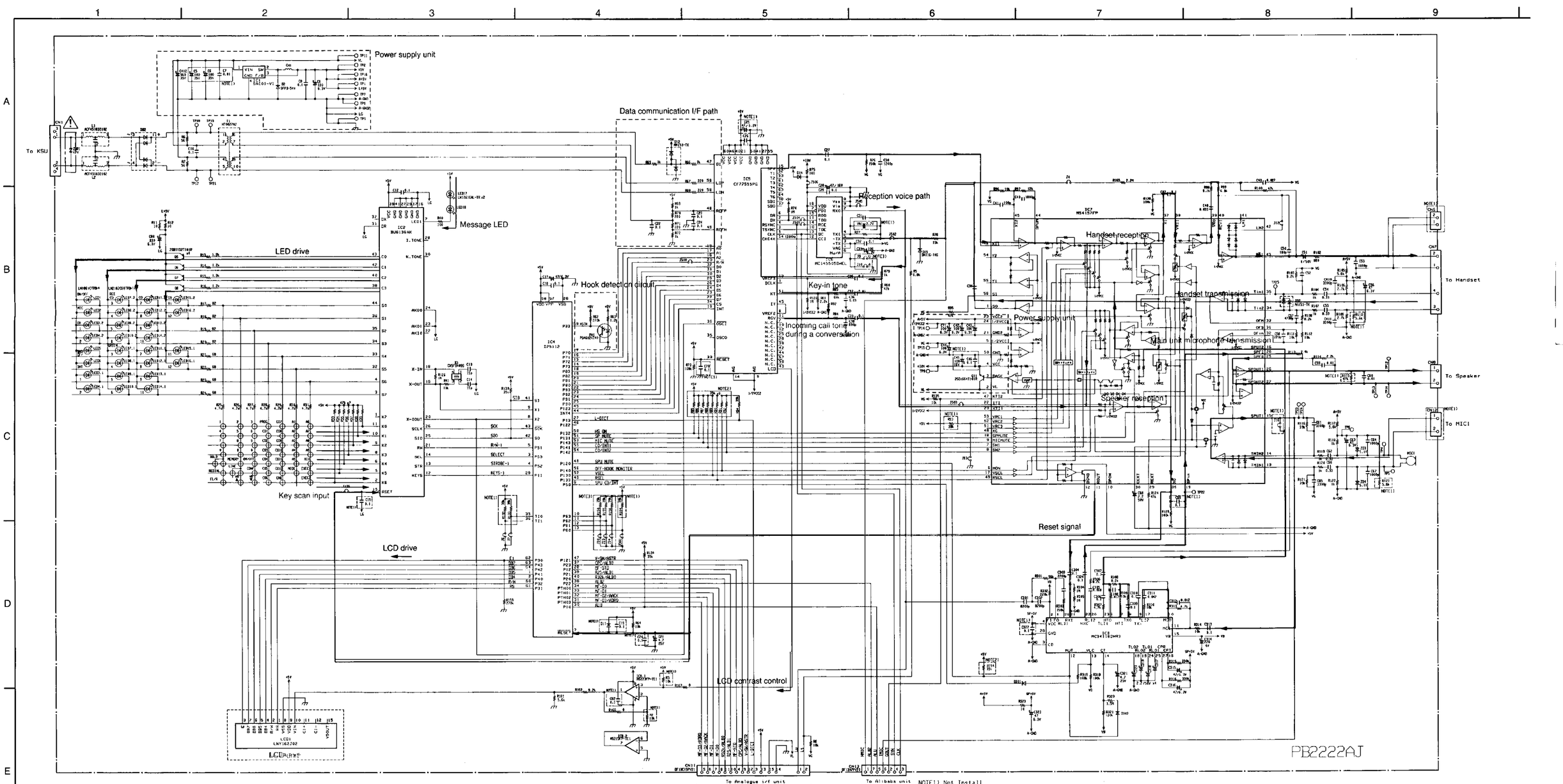
PB2064BJ

## (2) 12 Key LLCD/SPU (VB-D411LDSUK/VB-44225HK)




NOTE1) Not Install
NOTE2) Not Install when IC4 is a masking Micro-processor.

## (3) 12 Key LCD/Soft key/Voice/SLT/SPU (VB-D411DSVUK/VB-44224HK)




NOTE1) Not Install
NOTE2) Not Install when IC4 is a masking Micro-processor.

NOTE3)

| TEL Type | J9 | J10 | R156 | J24 | R155 | J23 |
|---|---|---|---|---|---|---|
| VB-D411DSVUK | × | ○ | × | ○ | ○ | × |
| VB-44224HK | ○ | × | × | ○ | × | ○ |
| VB-44224 | ○ | × | ○ | × | × | ○ |

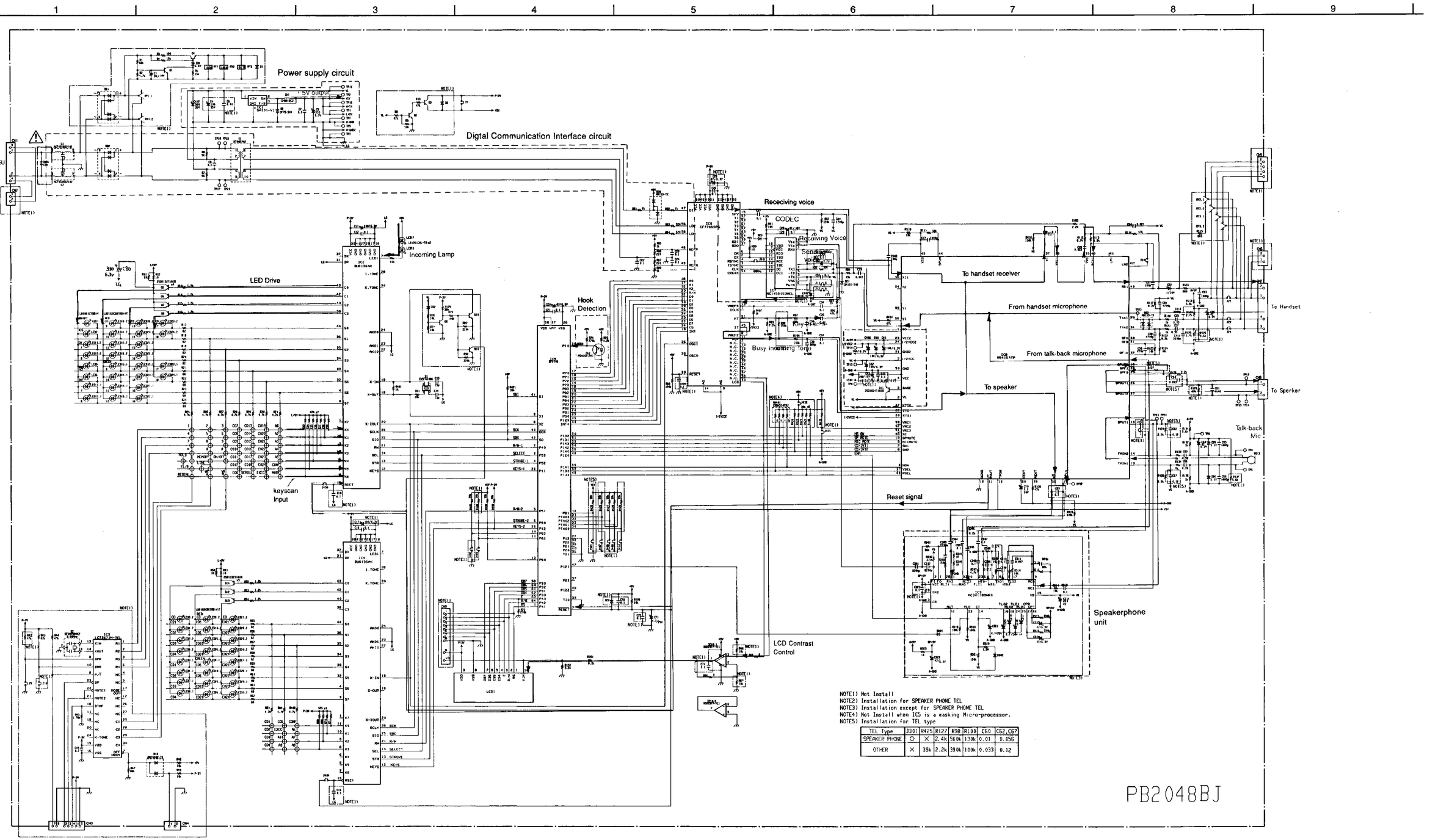
NOTE3)

| TEL Type | R156 | J20 |
|---|---|---|
| 6CO-key | ○ | × |
| 12CO-key | × | ○ |

| Pin No | IC2 | | IC5 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 36 | 44 | 2 | 3 | 4 | 5 | 6 | 15 | 36 | 47 | 54 | 56 | 58 |
| Stand by (V) | | | | | | | | (2.5) H | | | | | |
| Operation (V) | | | | | | | | (2.5) H | | | | | |
| Remarks | | | | | | *1 | *1 | | *1 | *1 | *1 | *1 | *1 |

*1 During communication

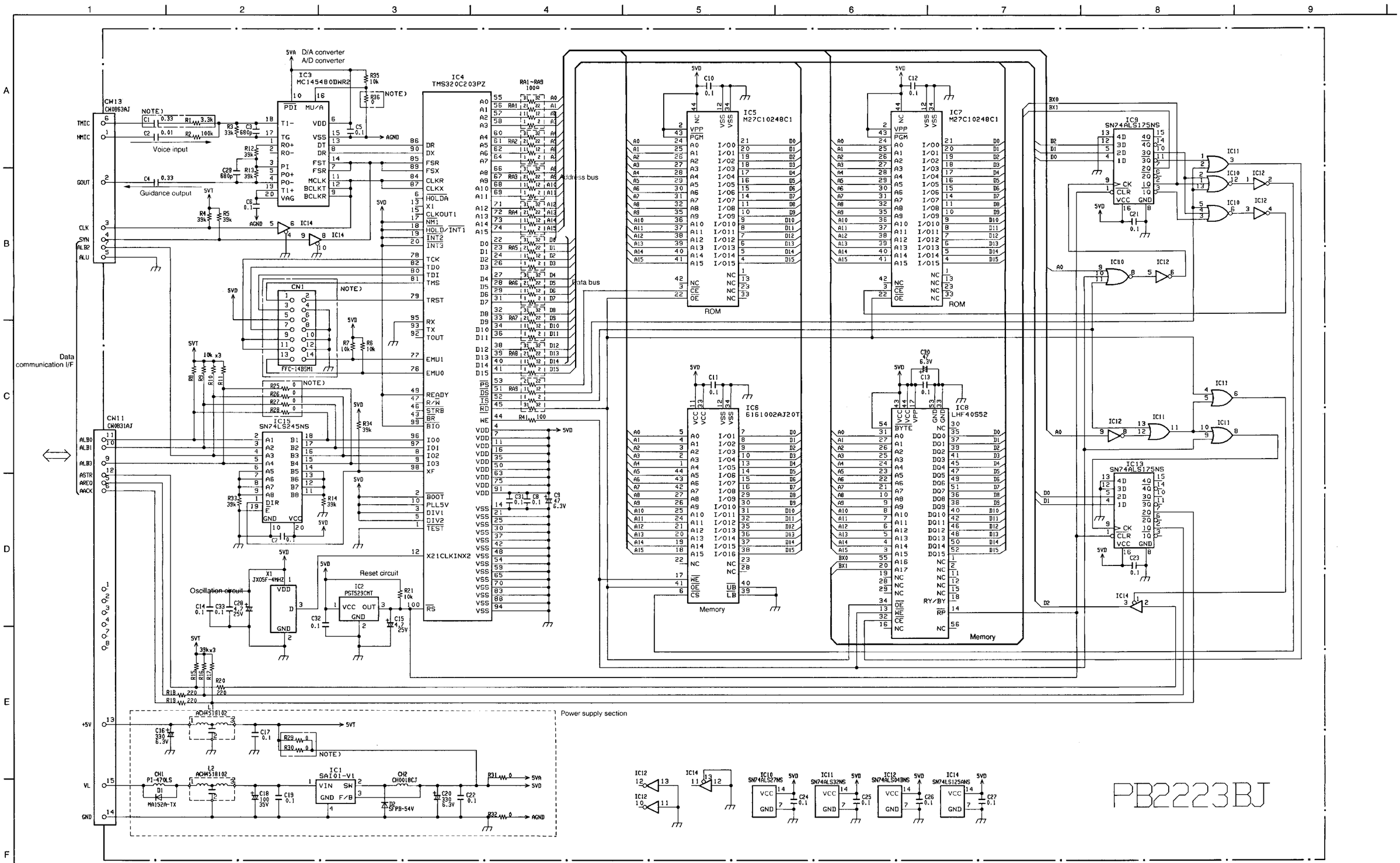
## (4) 24 Key -LCD (VB-D611DUK)
## 24 Key-LCD/SPU (VB-D611DSUK/VB-44233HK)




NOTE1) Not Install
NOTE2) Installation for SPEAKER PHONE TEL
NOTE3) Installation except for SPEAKER PHONE TEL
NOTE4) Not Install when IC5 is a masking Micro-processor.
NOTE5) Installation for TEL type

| TEL Type | J301 | R425 | R127 | R98 | R100 | C60 | C62,C67 |
|---|---|---|---|---|---|---|---|
| SPEAKER PHONE | ○ | × | 2.4k | 560k | 130k | 0.01 | 0.056 |
| OTHER | × | 39k | 2.2k | 390k | 100k | 0.033 | 0.12 |

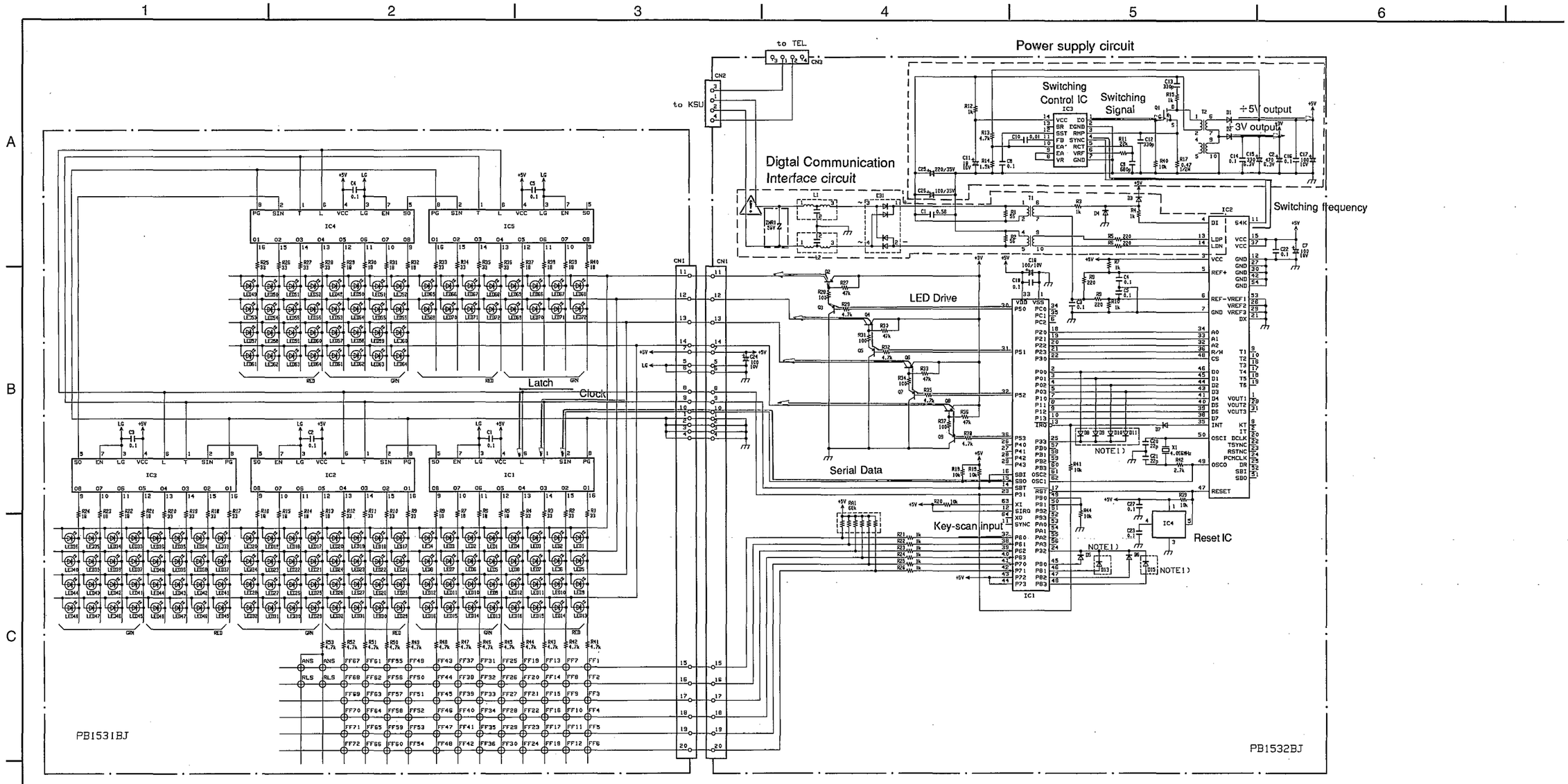
## (5) VRADP (VB-44101UK/HK) : Voice Recognition Adaptor




| Pin No | IC3 | | | | | | | | | | | | | | | | IC4 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 1 | 4 | 4 | 6 | 8 | 8 | 11 | 11 | 13 | 13 | 14 | 14 | 17 | 17 | 18 | 22 | 22 | 23 | 23 | 55 | 55 | 56 | 56 | 96 | 96 | 97 | 97 | 98 | 98 |
| Stand by (V) | (2.5) H | (2.5) H | (2.5) H | (2.5) H | (5) H | | | | | | | | | (2.5) H | (2.5) H | (2.5) H | | | | | | | | | | | – | – | | |
| Operation (V) | | | | | (5) H | | | | | | | | | (2.5) H | (2.5) H | | | | | | | | | | | | | | | |
| Remarks | *1 | *2 | *1 | *2 | | *3 | *2 | *3 | *2 | *3 | *2 | *3 | *2 | *3 | | | *3 | *2 | *3 | *2 | *3 | *2 | *3 | *2 | *3 | *2 | *3 | *2 | *3 | *2 |

*1 At voice recording
*2 At playing
*3 At recording

## (6) DSS (VB-D631UK/VB-44320HK)




Type of ICs

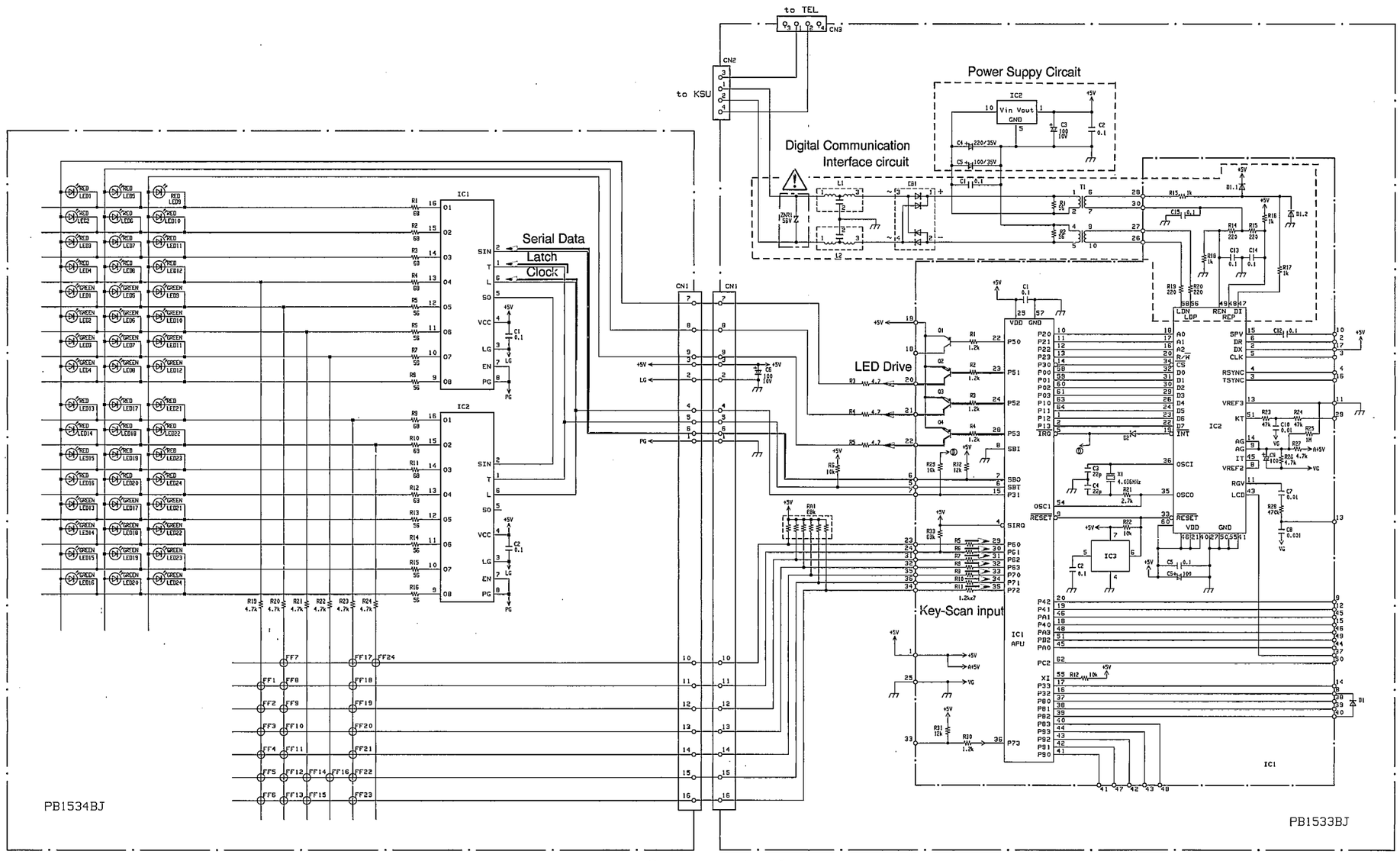
| | |
|---|---|
| IC1 | M54995FP |
| IC2 | M54995FP |
| IC3 | M54995FP |
| IC4 | M54995FP |
| IC5 | M54995FP |

Type of ICs

| | |
|---|---|
| IC1 | MN1554 |
| IC2 | CF77255N2 |
| IC3 | MC34129P |
| IC4 | M51953BL |

NOTE1) Not Install

## (7) EM24 (VB-D331UK/VB-44320HK)




Type of ICs

| | |
|---|---|
| IC1 | MS4995FP |
| IC2 | MS4995FP |

Type of ICs

| | |
|---|---|
| IC1 | HL0124BJ |
| IC2 | SI0201L |

# ■PCB AND WIERING CONNECTION DIAGRAM

**Guide to diagram**

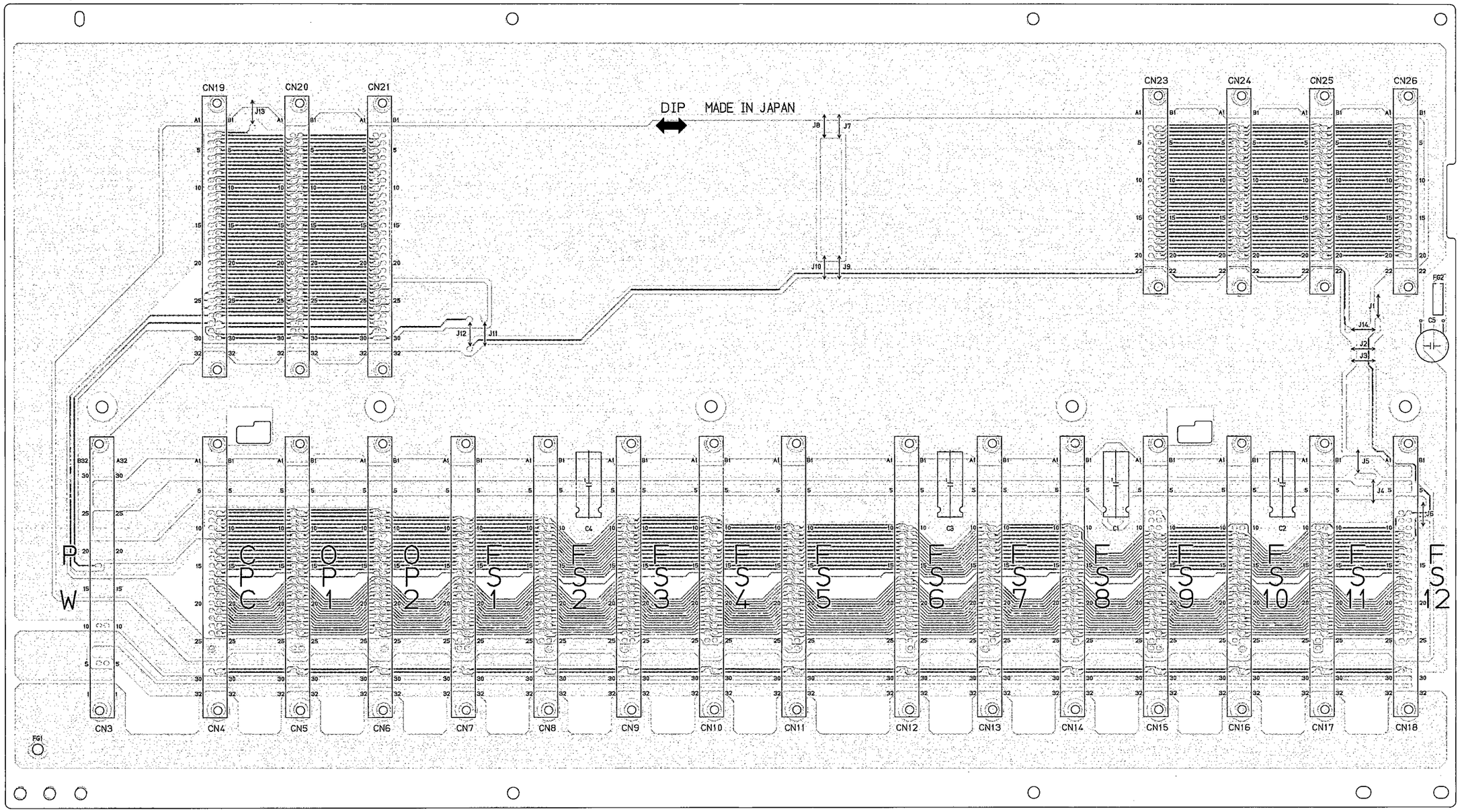
**:Component parts side pattern**

**:Soldering side pattern**

## 1.CCU

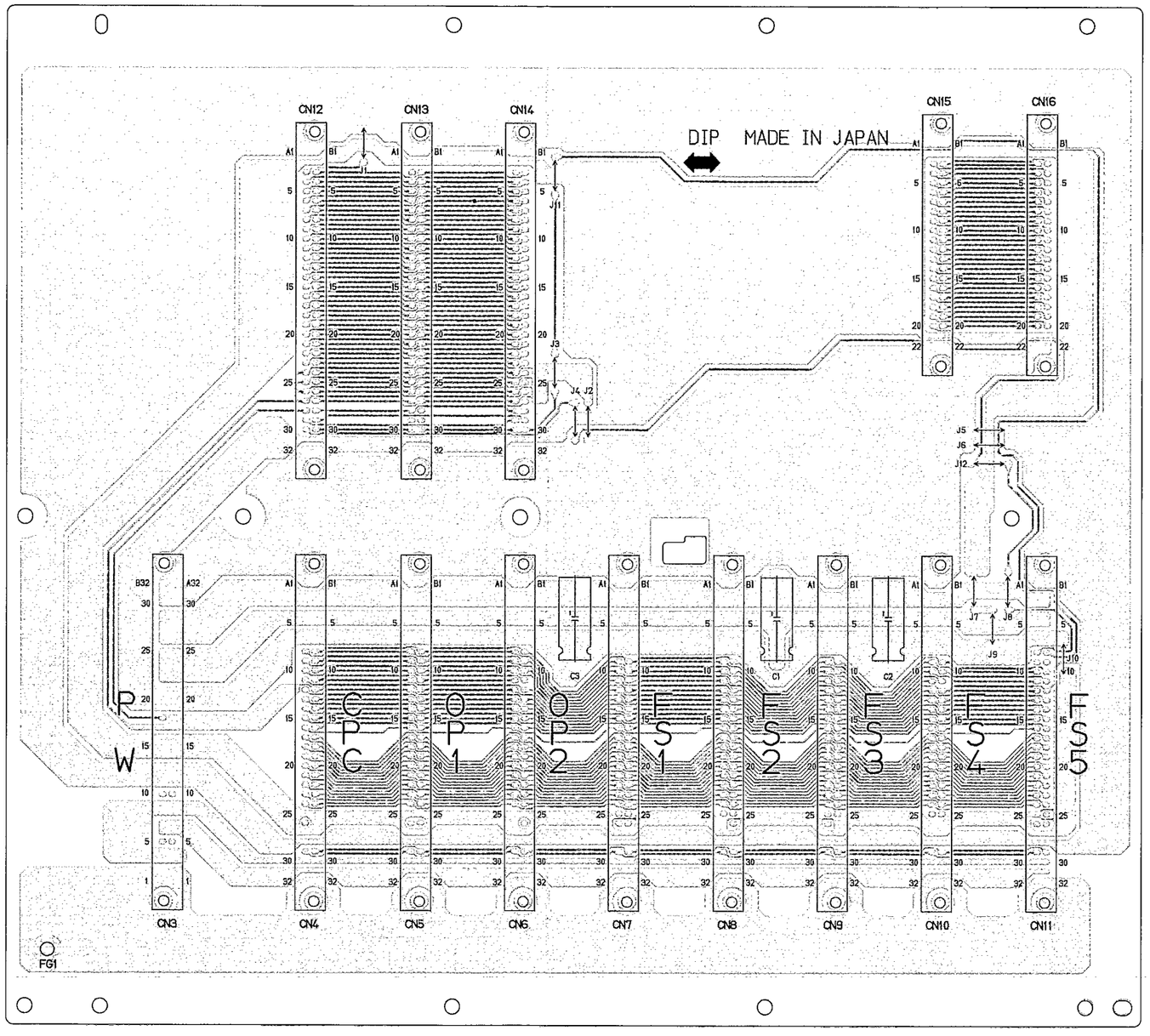
## (1)CAB40 (VB-44010UK/HK):40 port CCU [PB2173BJ]

**This PCB is viewed from the component parts side.**



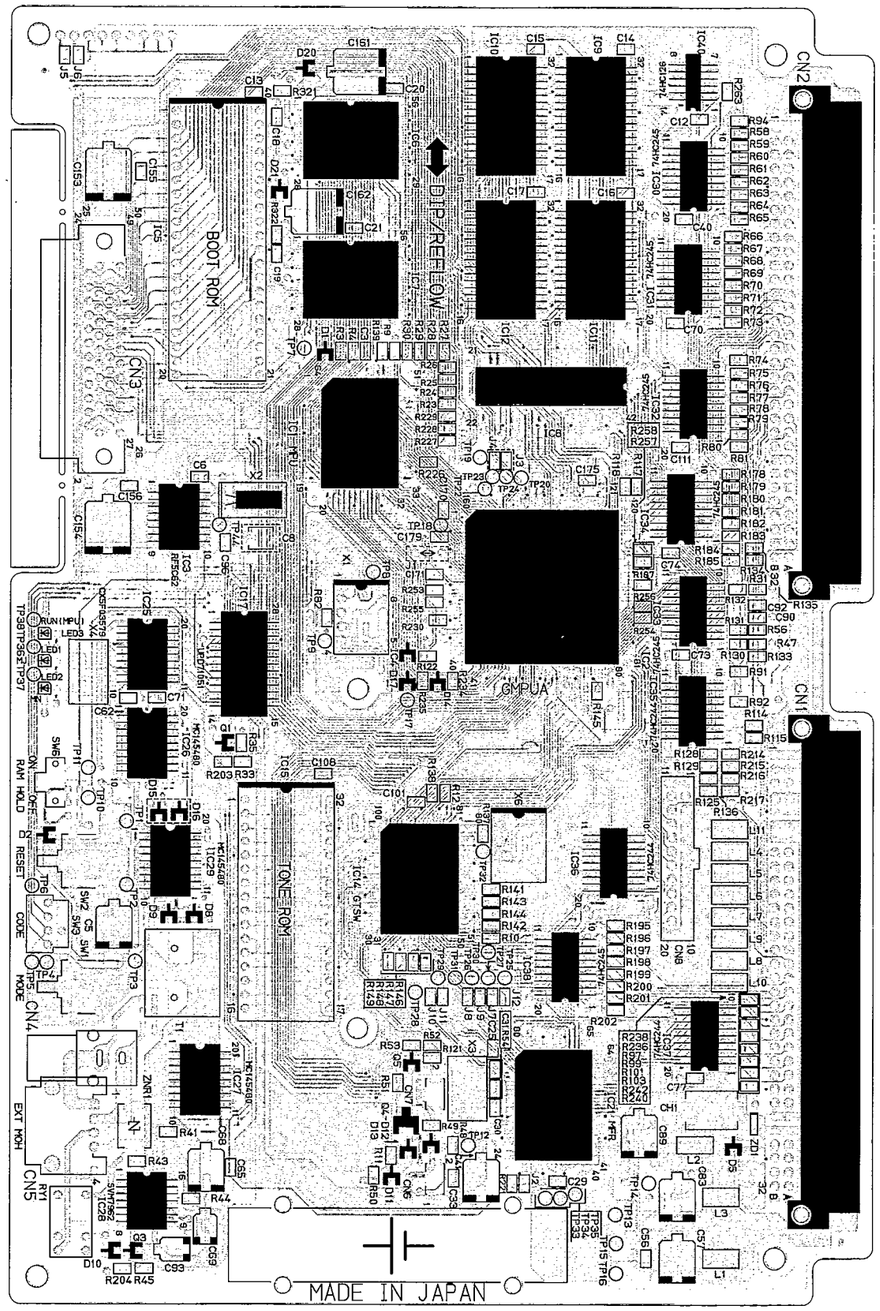
## (2)CAB96 (VB-44020UK/HK):96 port CCU [PB2174BJ]
## CAB96B (VB-44021UK/HK):96 expand port CCU [PB2174BJ]

**This PCB is viewed from the component parts side.**

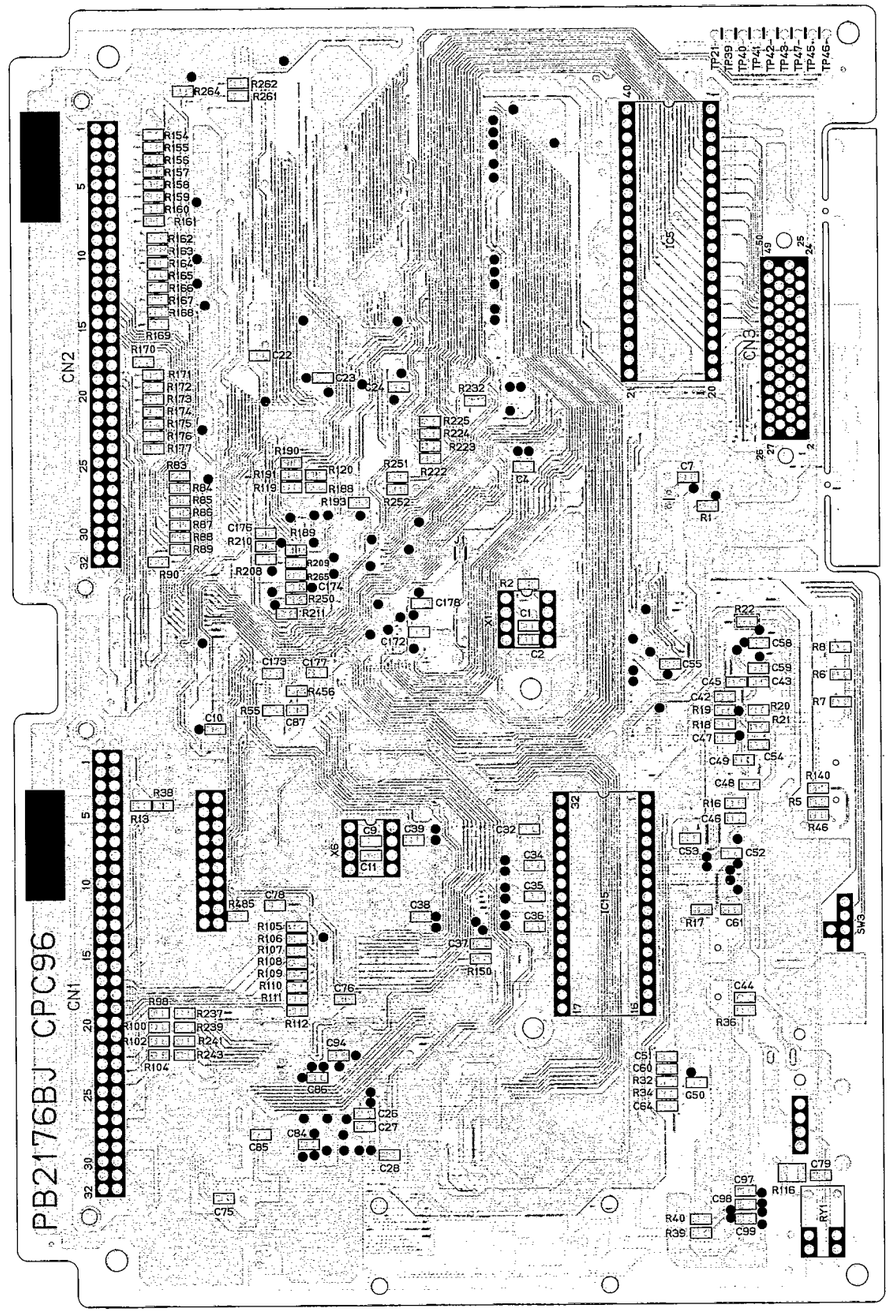


## 2.Card
## (1)CPC96 card (VB-44410UK/HK):CPC-M card [PB2176BJ]

**This PCB is viewed from the component parts side.**

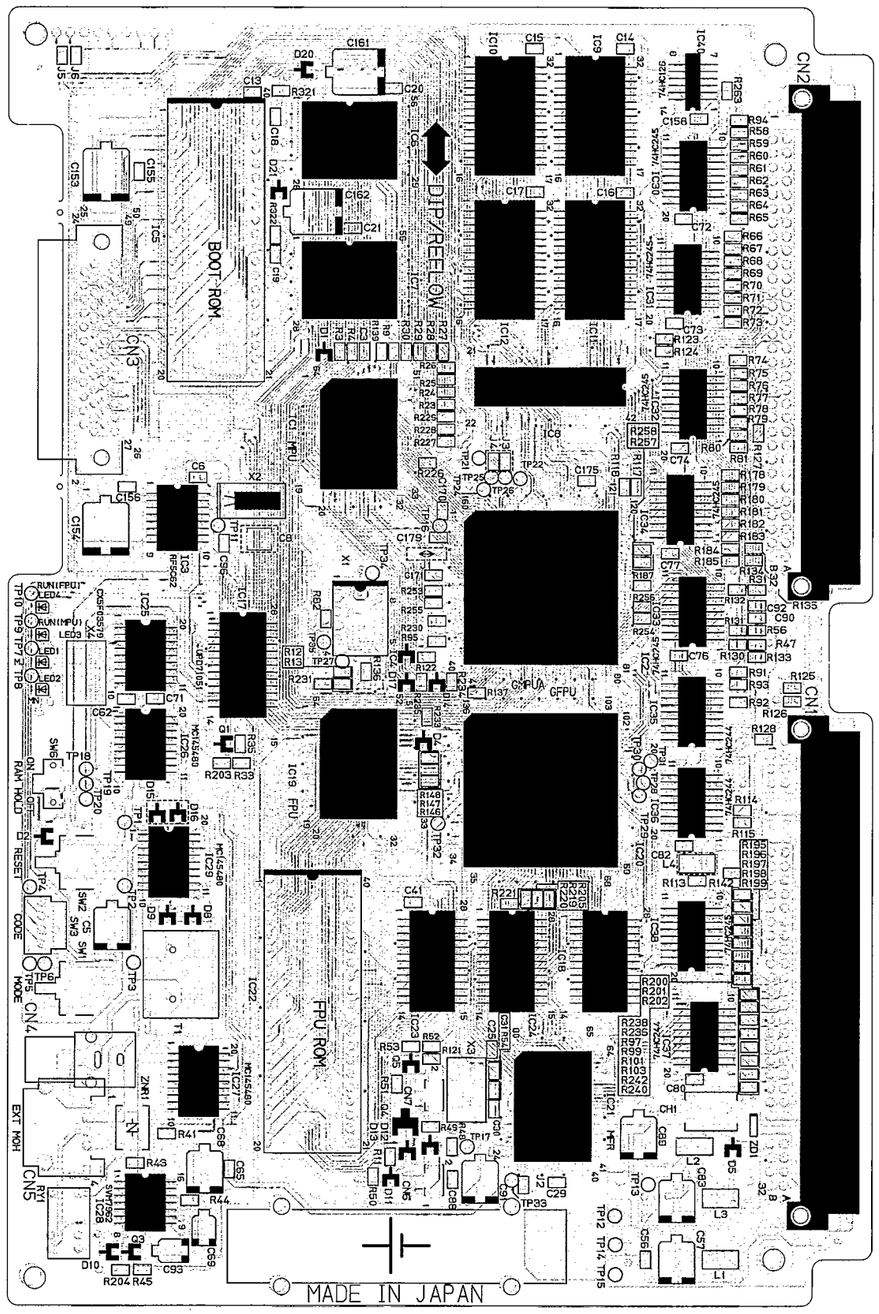



**This PCB is viewed from the soldering side.**

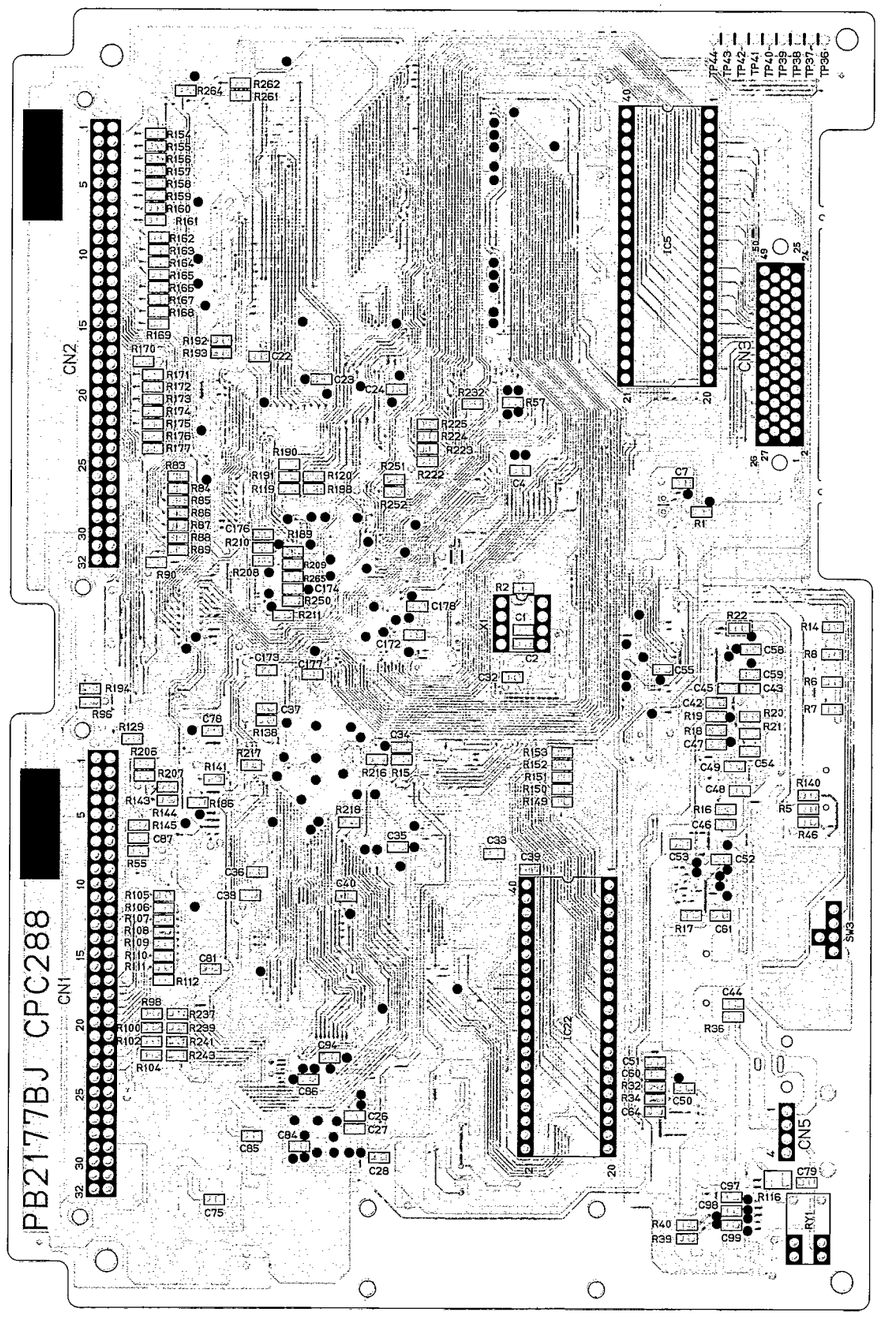


## (2)CPC288 card (VB-444201UK/HK):CPC-L card [PB2177BJ]

**This PCB is viewed from the component parts side.**

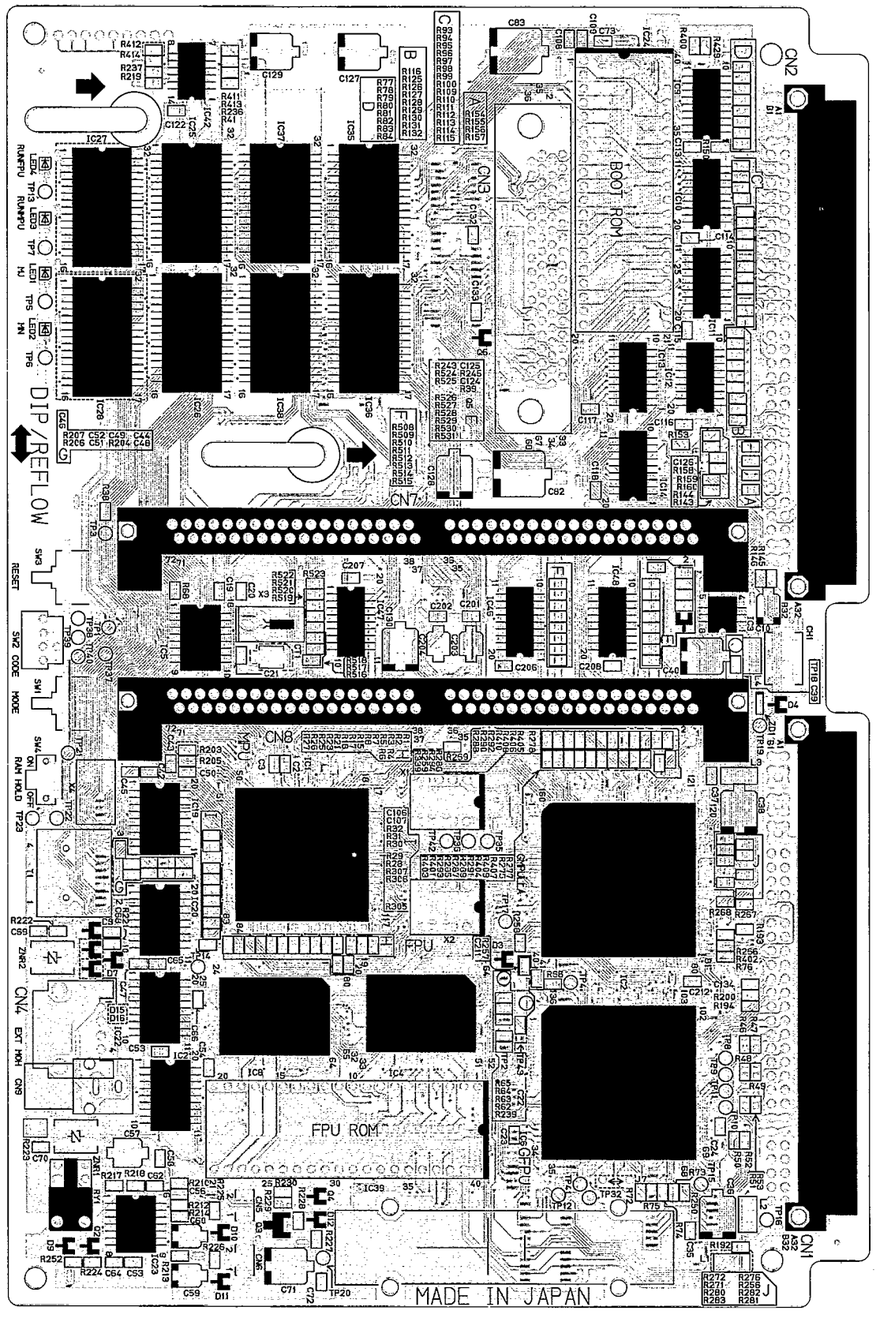



**This PCB is viewed from the soldering side.**

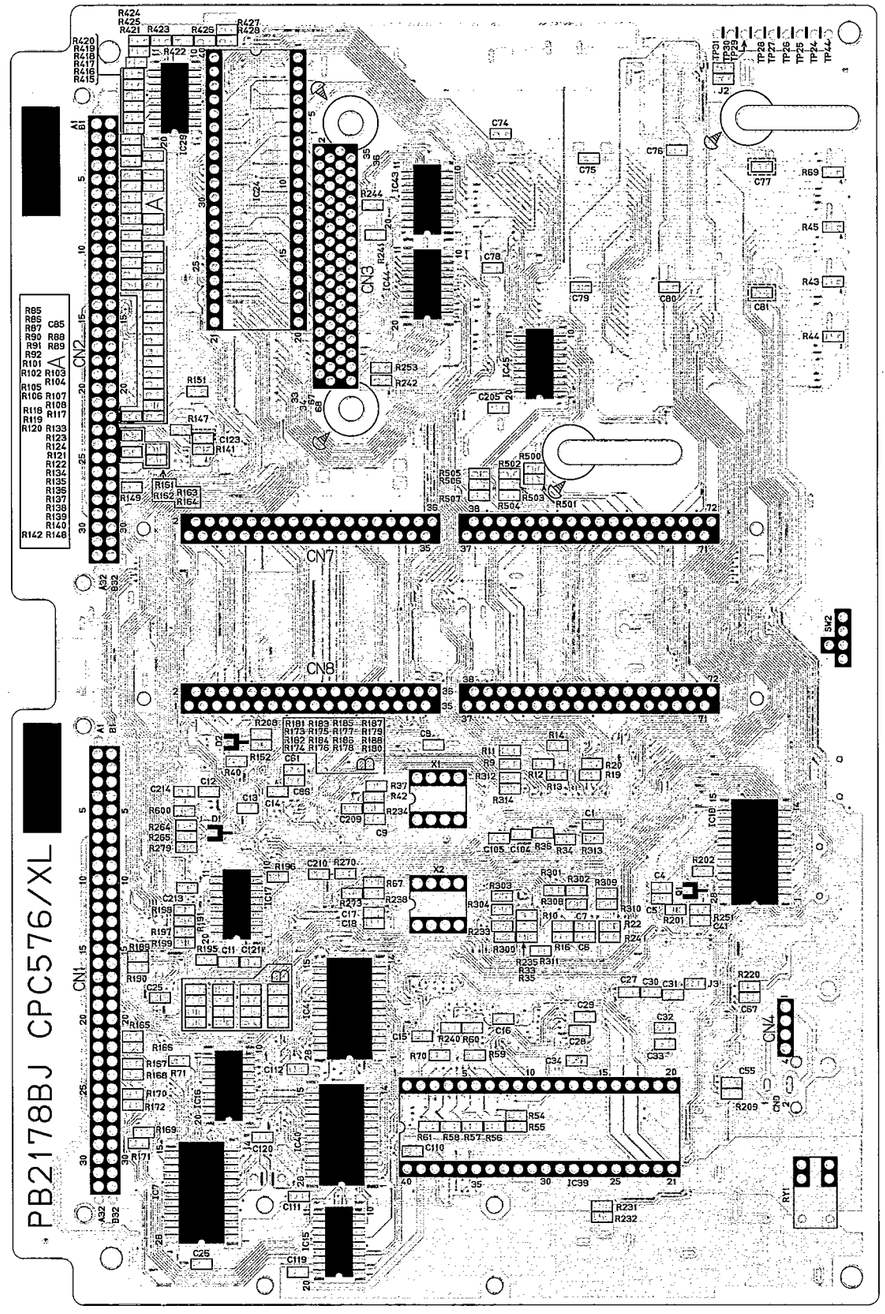


## (3)CPC576 card (VB-444301UK/HK):CPC-LL card [PB2178BJ]

**This PCB is viewed from the component parts side.**

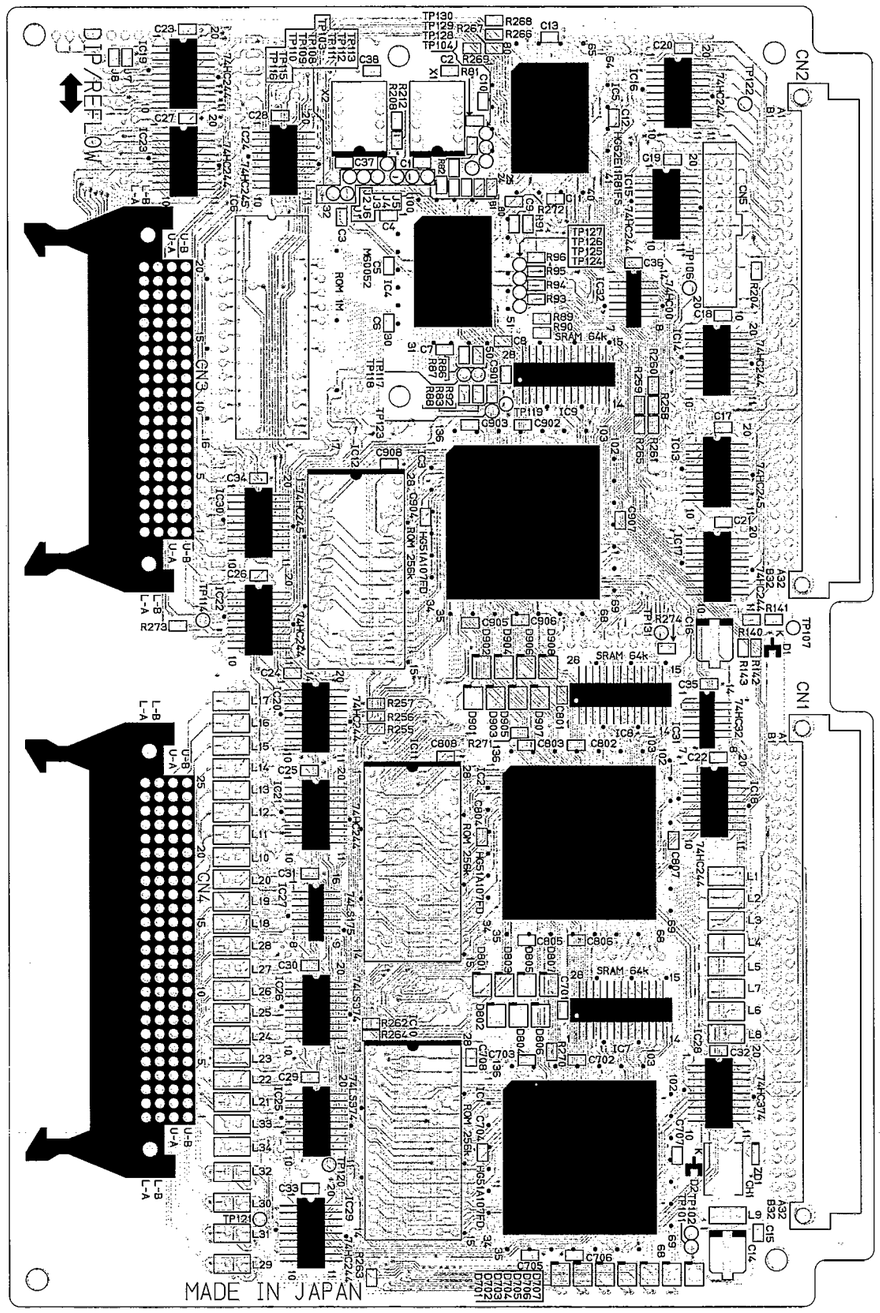



**This PCB is viewed from the soldering side.**

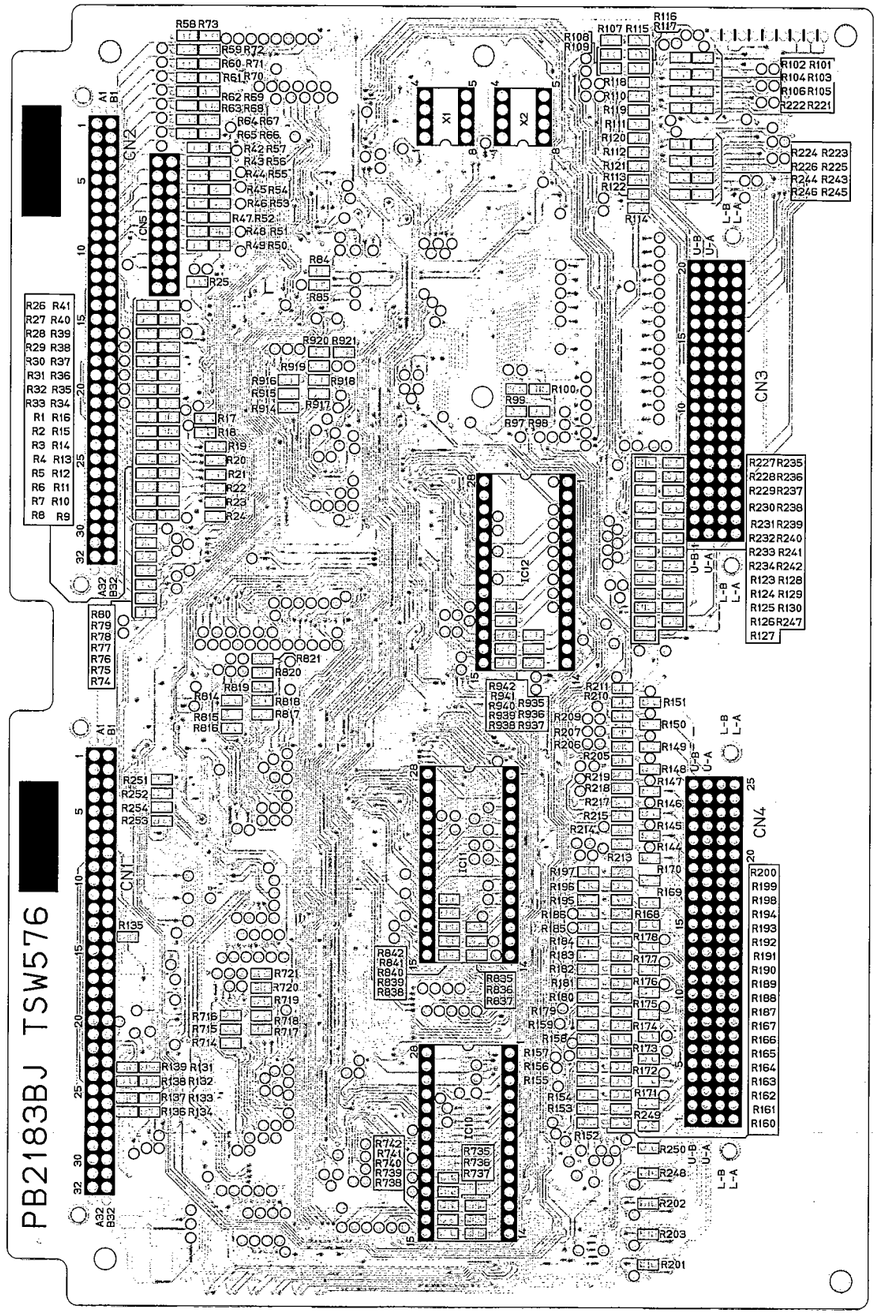


## (4)TSW576 card (VB-444302UK/HK):Time Switch card/LL [PB2183BJ]

**This PCB is viewed from the component parts side.**

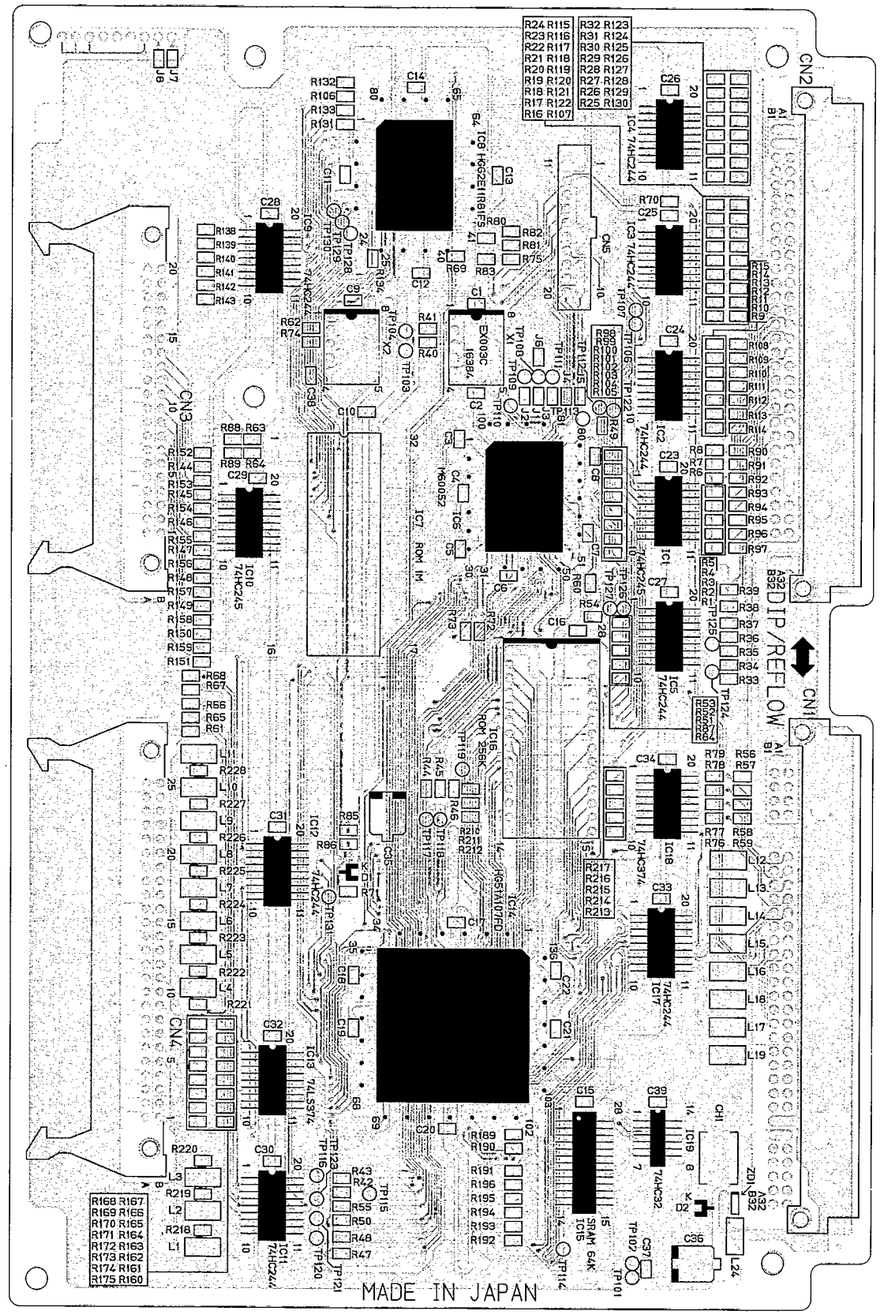



**This PCB is viewed from the soldering side.**



## (5)TSW288 card (VB-444202UK/HK):Time Switch card/L [PB2182BJ]

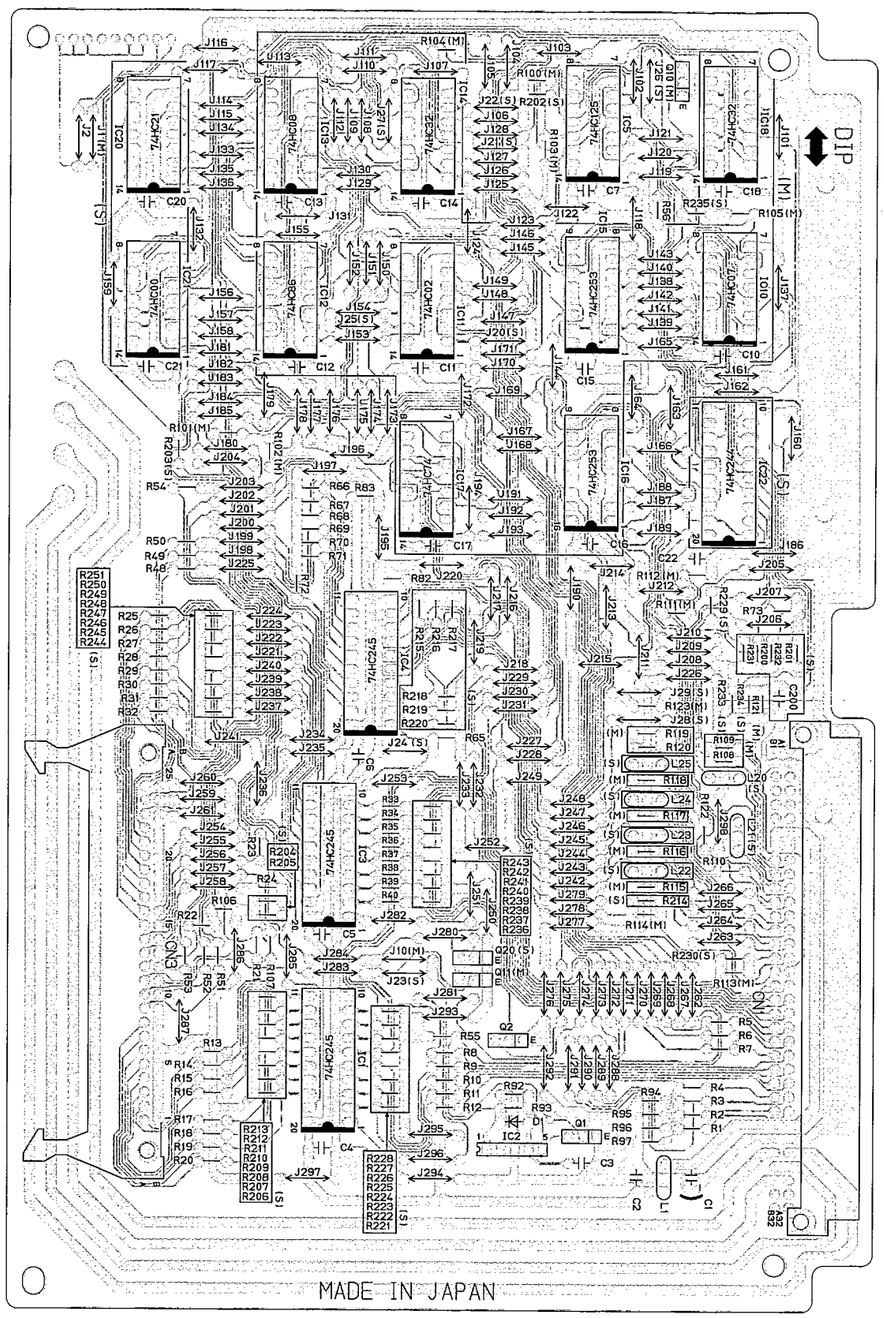
This PCB is viewed from the component parts side.




## (6)CBLKIT (VB-44450):Connection Cable Kit

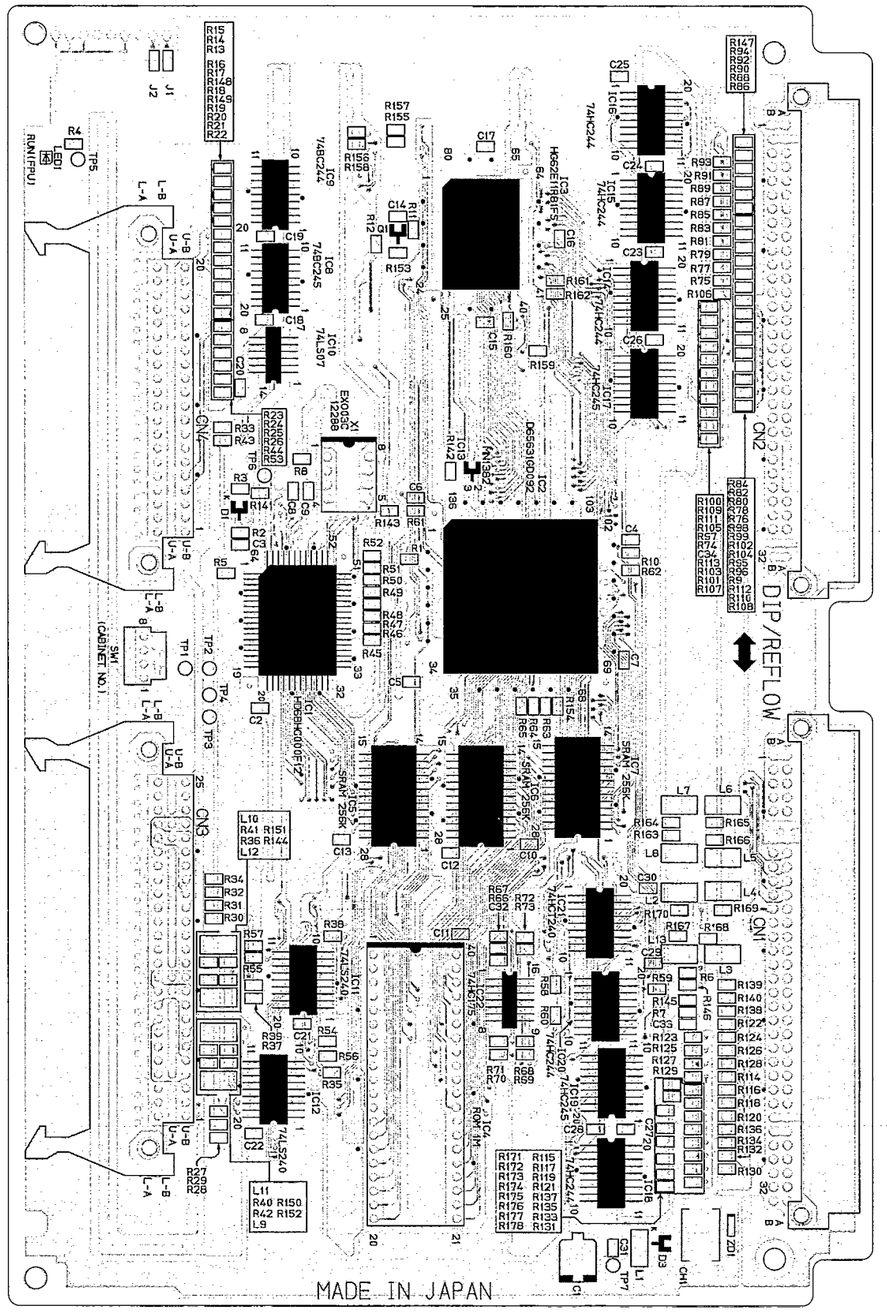
- CBLMST card:Connection Cable card-Master [PB2180BJ]
- CBLSLV card:Connection Cable card-Slave [PB2180BJ]

This PCB is viewed from the component parts side.



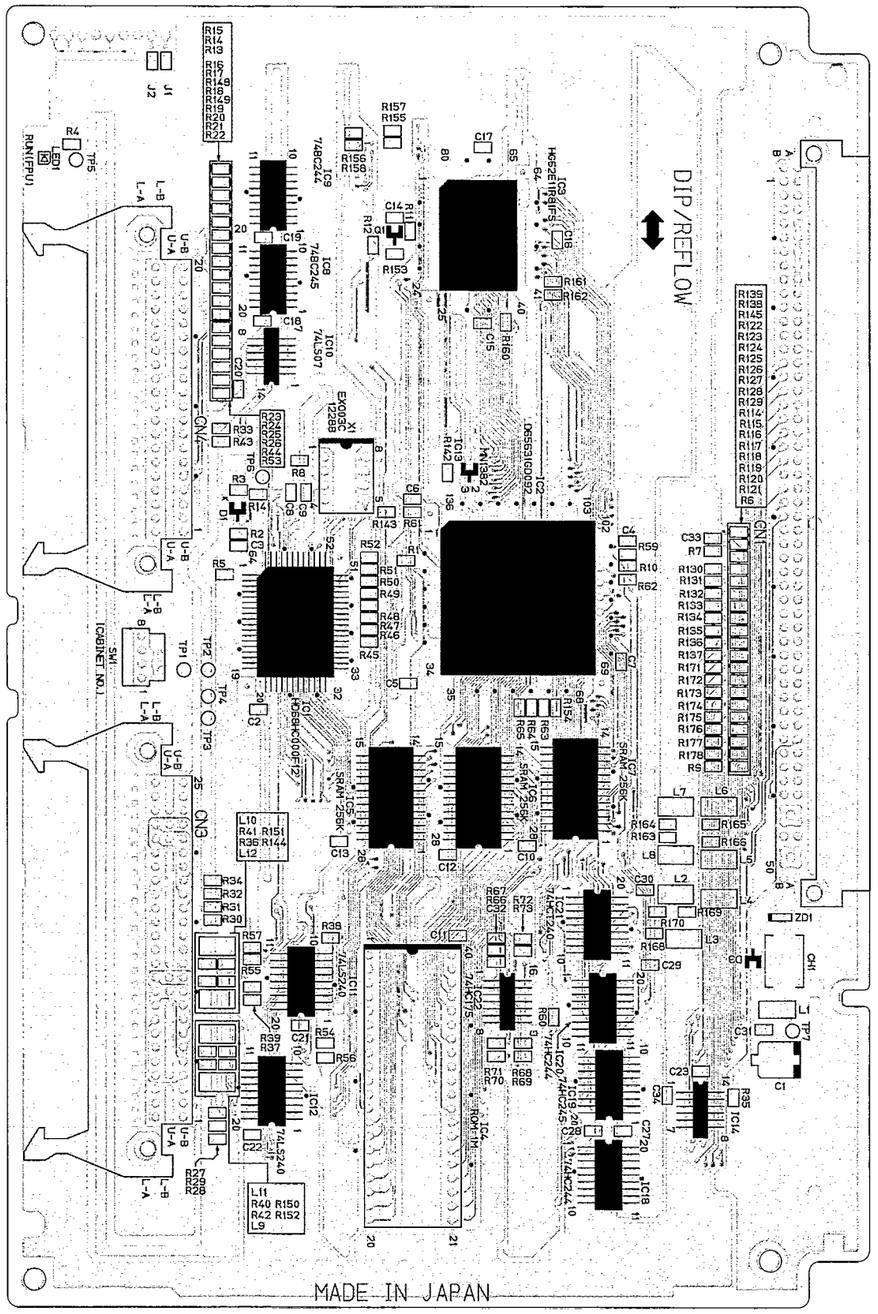
## (7)CBL card (VB-44451):Building Block card [PB2181BJ]

**This PCB is viewed from the component parts side.**



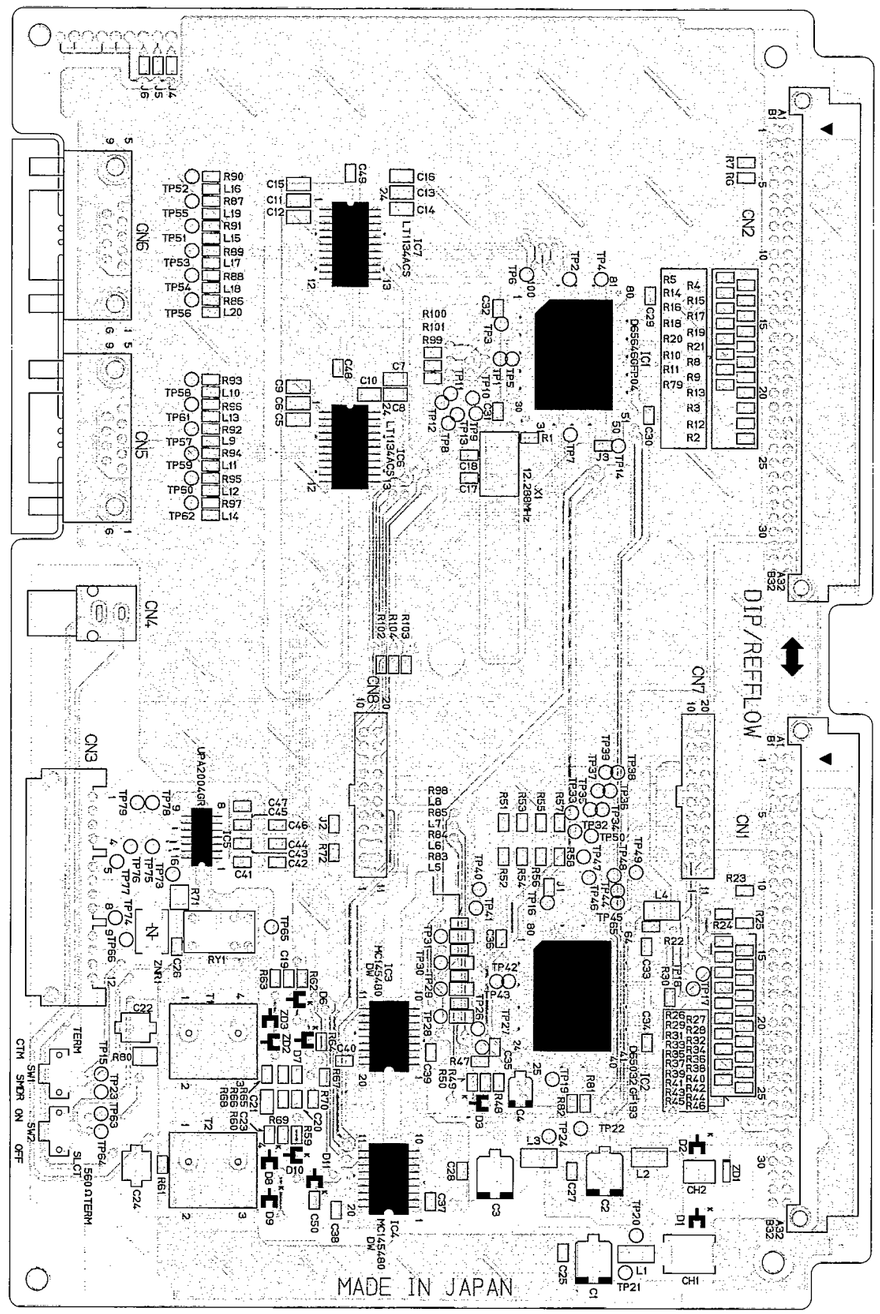

## (8)CBLDBS card (VB-44452):Connection Cable card-DBS [PB2260BJ]

**This PCB is viewed from the component parts side.**



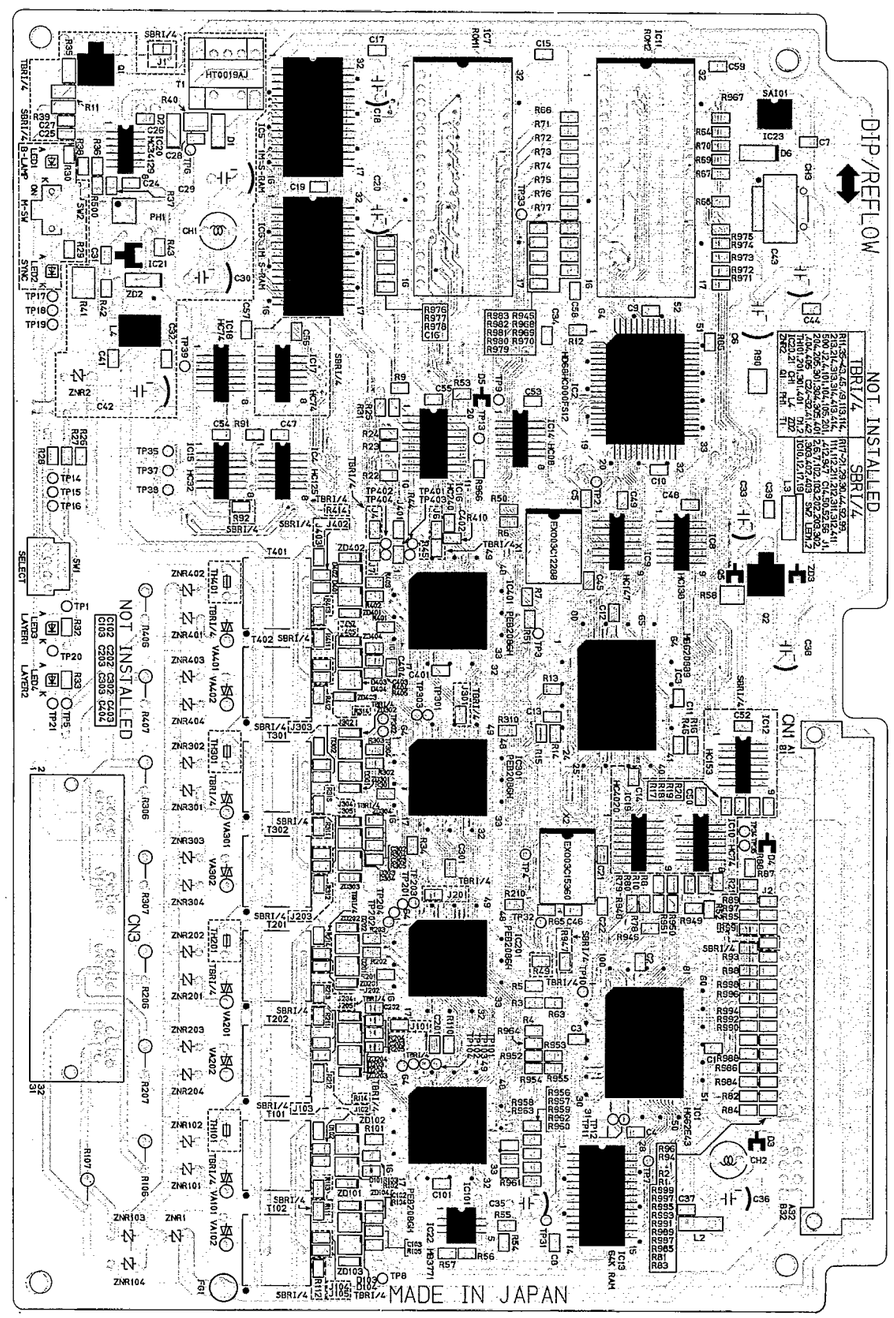
## (9)SCC card (VB-44181UK/HK):Service Control Card [PB2210BJ]

**This PCB is viewed from the component parts side.**



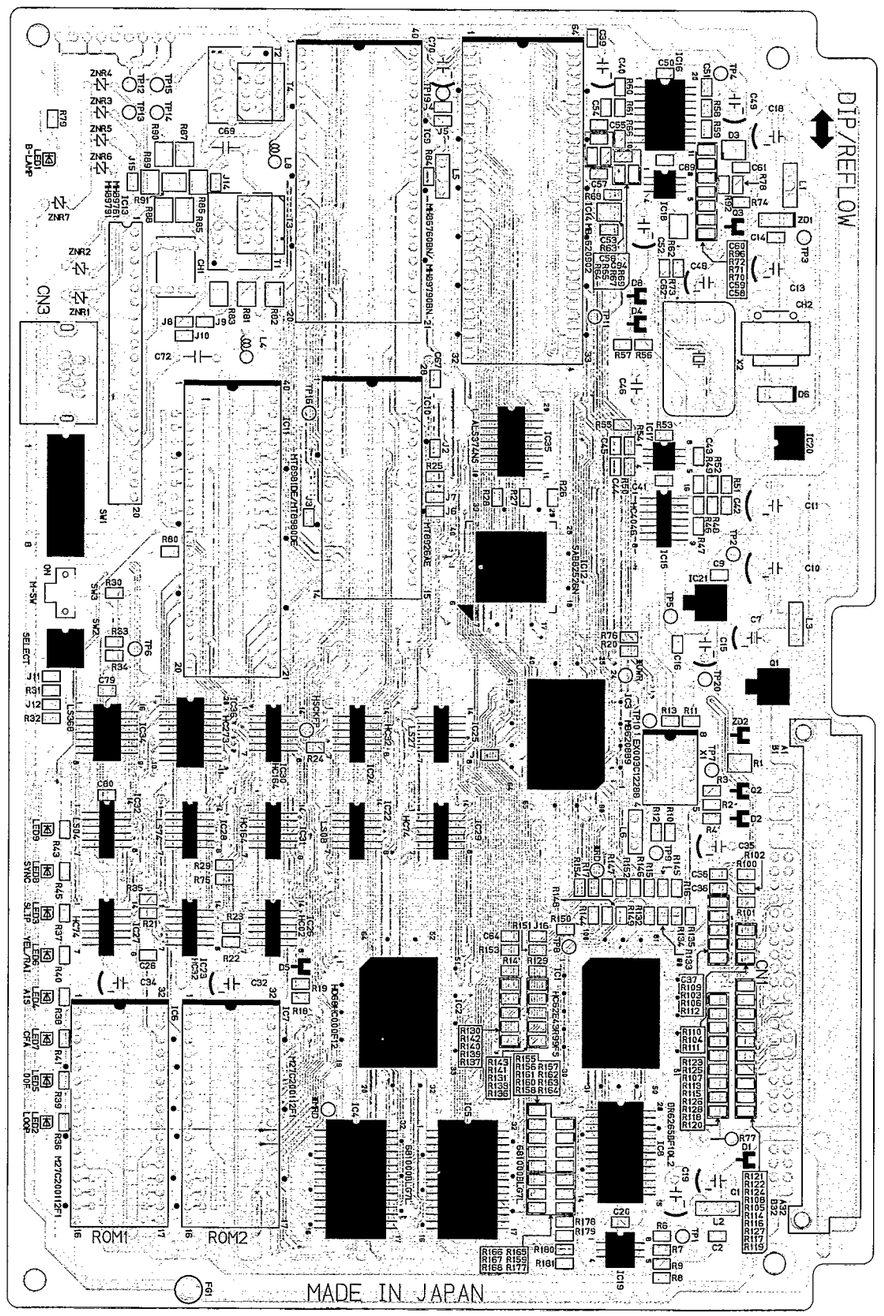

## (10)TBRI/4 card (VB-44530):BRI Card (T-point) [PB2193CJ]
## SBRI/4 card (VB-44630):BRI Card (S-point) [PB2193CJ]

**This PCB is viewed from the component parts side.**

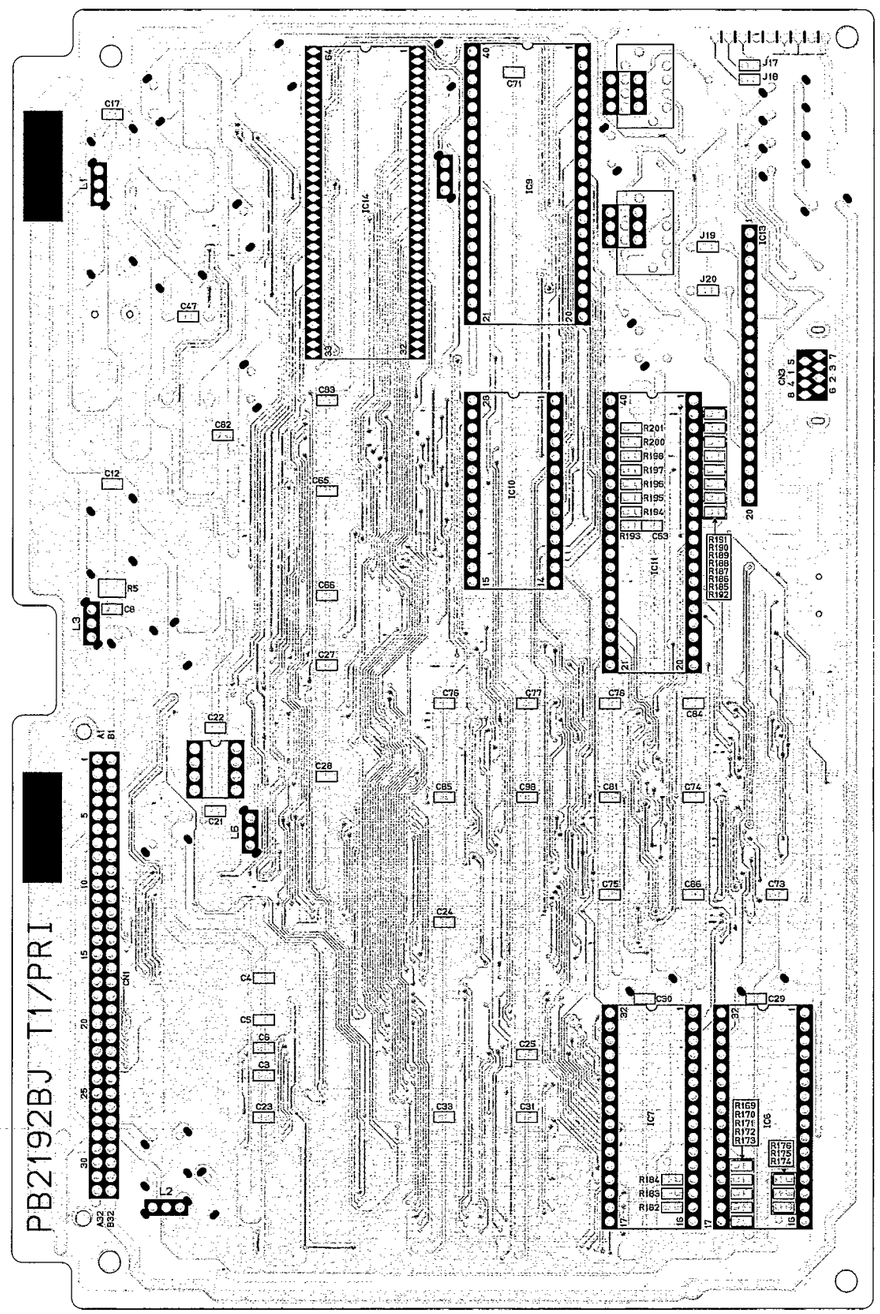


## (11)PRI/23 card (VB-44540):PRI Card (HK only) [PB2192BJ]
## PRI/30 card (VB-44540UK):PRI Card (UK only) [PB2192BJ]

**This PCB is viewed from the component parts side.**

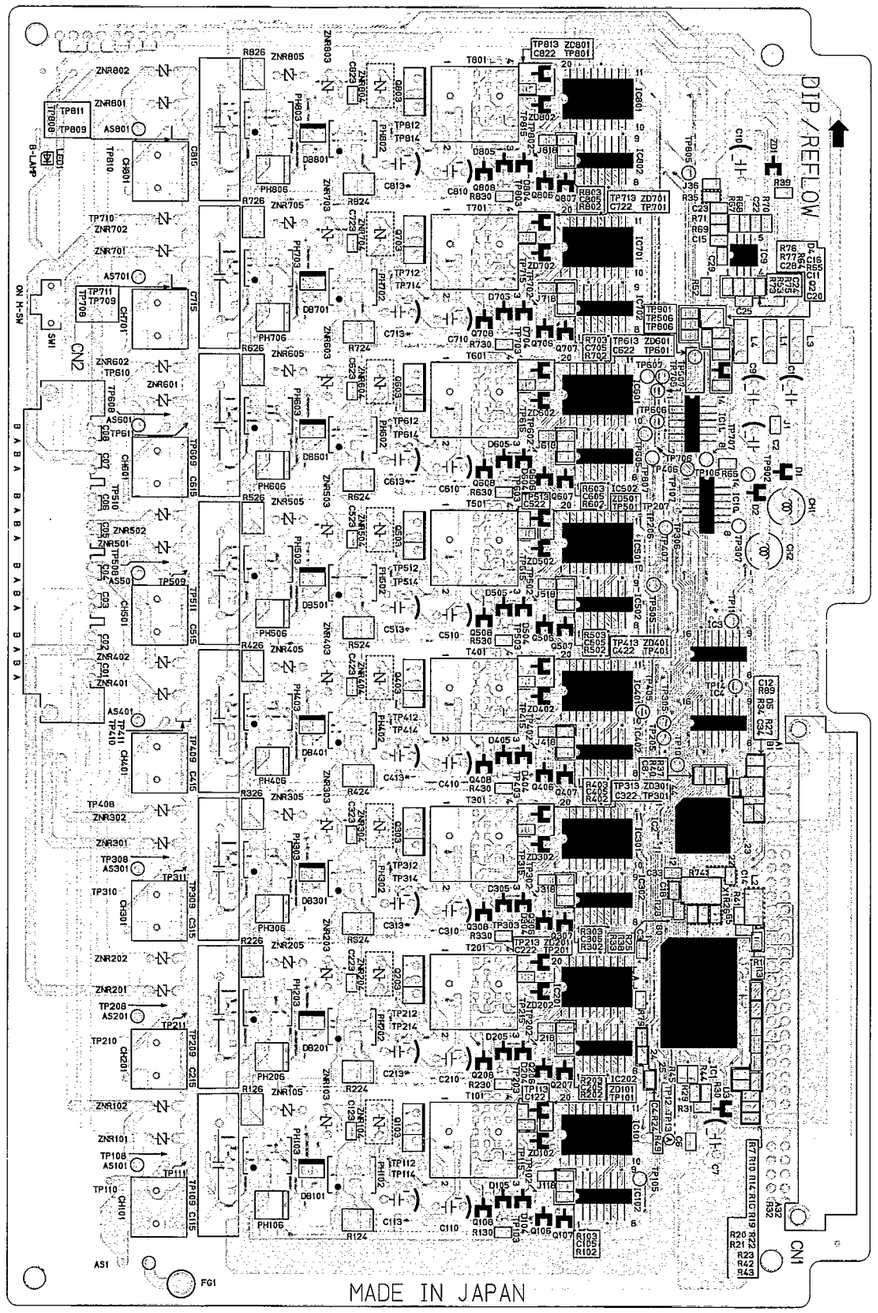



**This PCB is viewed from the soldering side.**

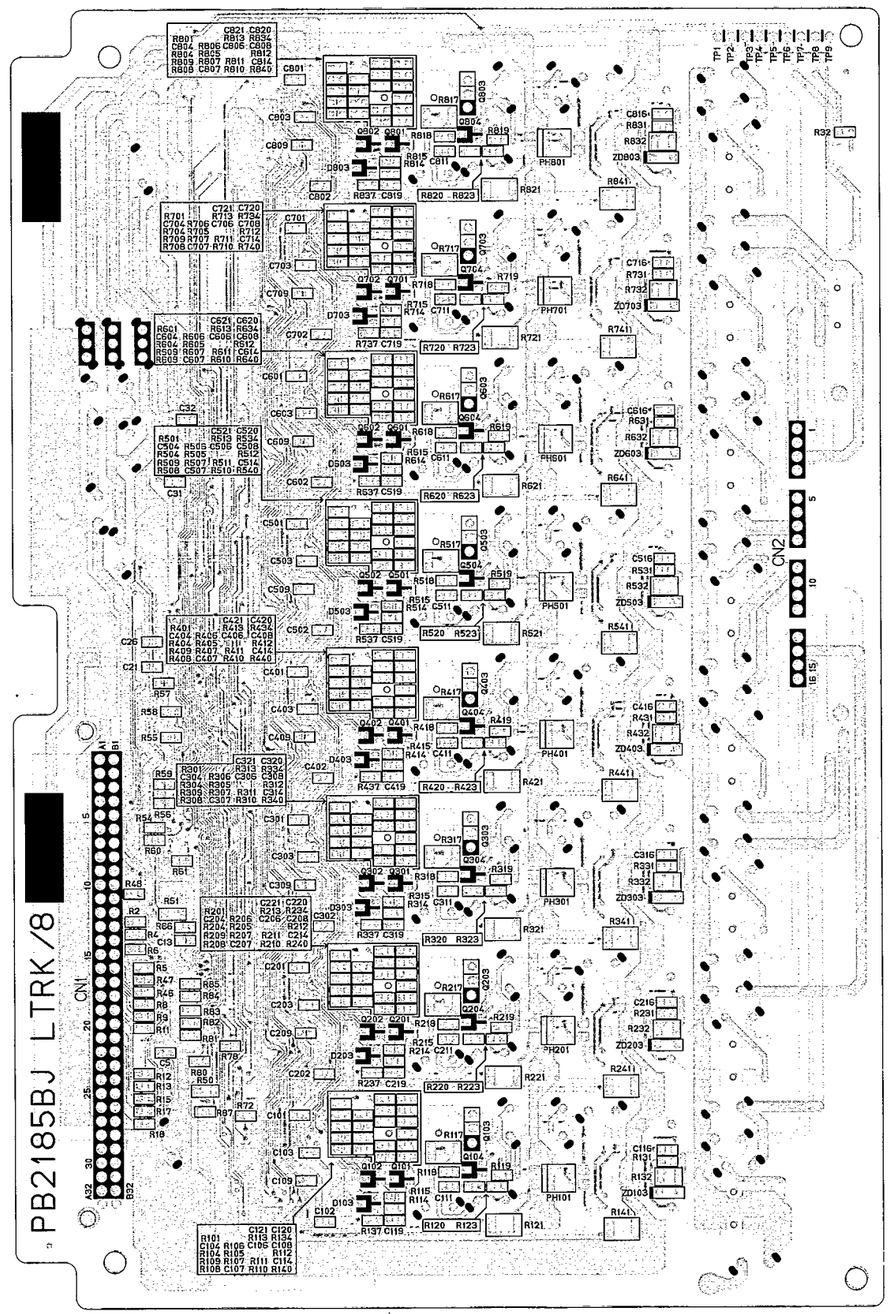


## (12)LTRK/8 card (VB-44510UK):Loop Start Trunk Card [PB2185BJ]

**This PCB is viewed from the component parts side.**

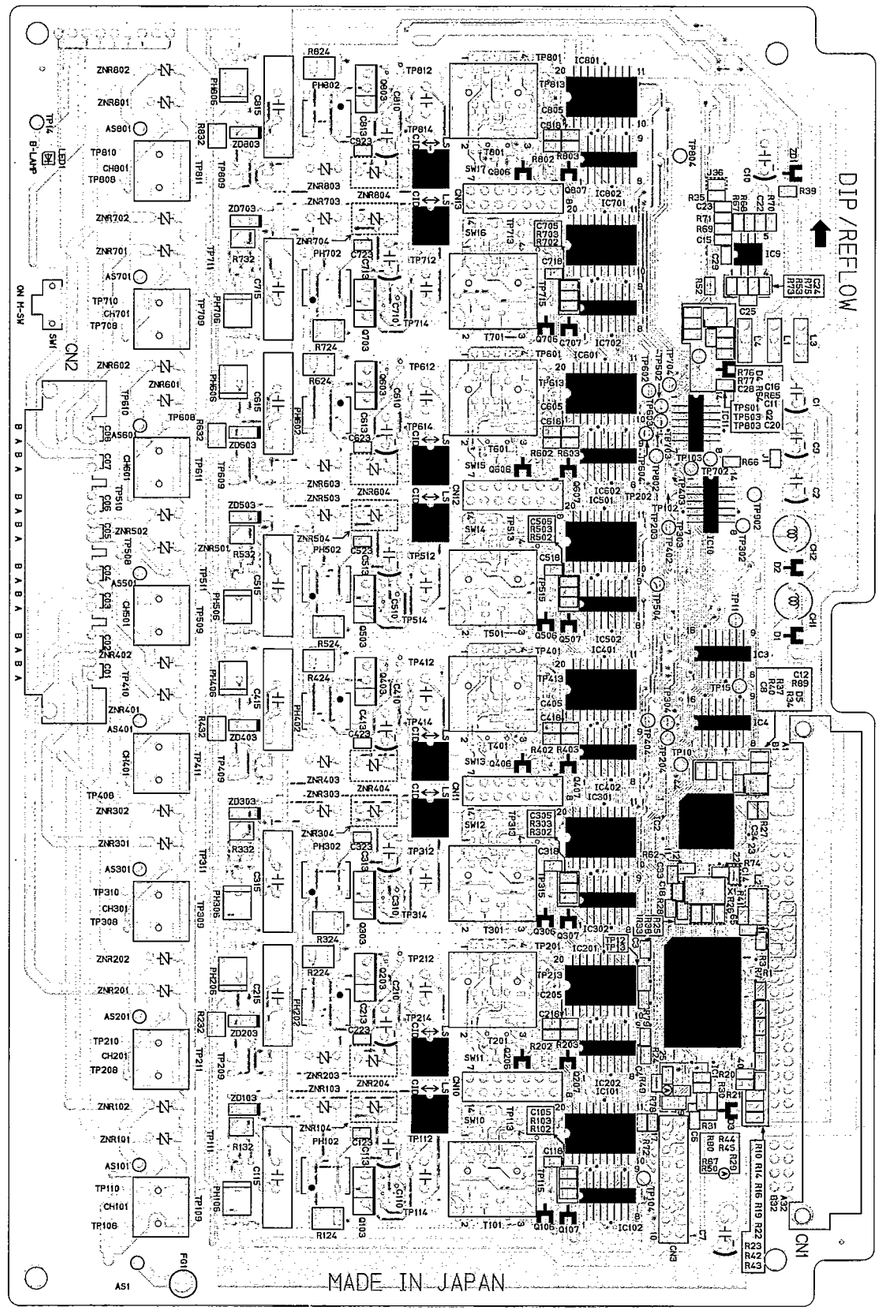



**This PCB is viewed from the soldering side.**

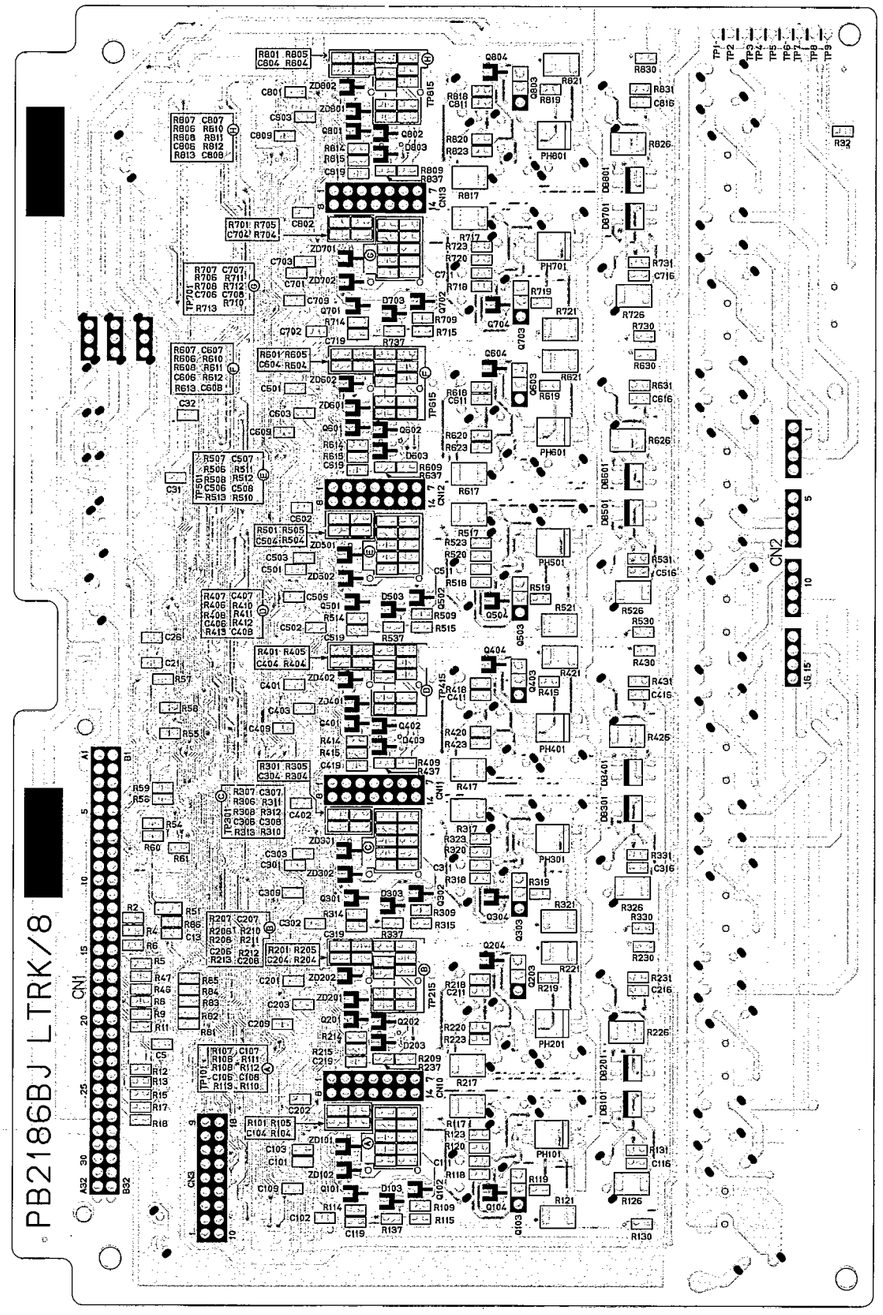


# (13)LTRK/8 card (VB-44510HK):Loop Start Trunk Card [PB2186BJ]

**This PCB is viewed from the component parts side.**

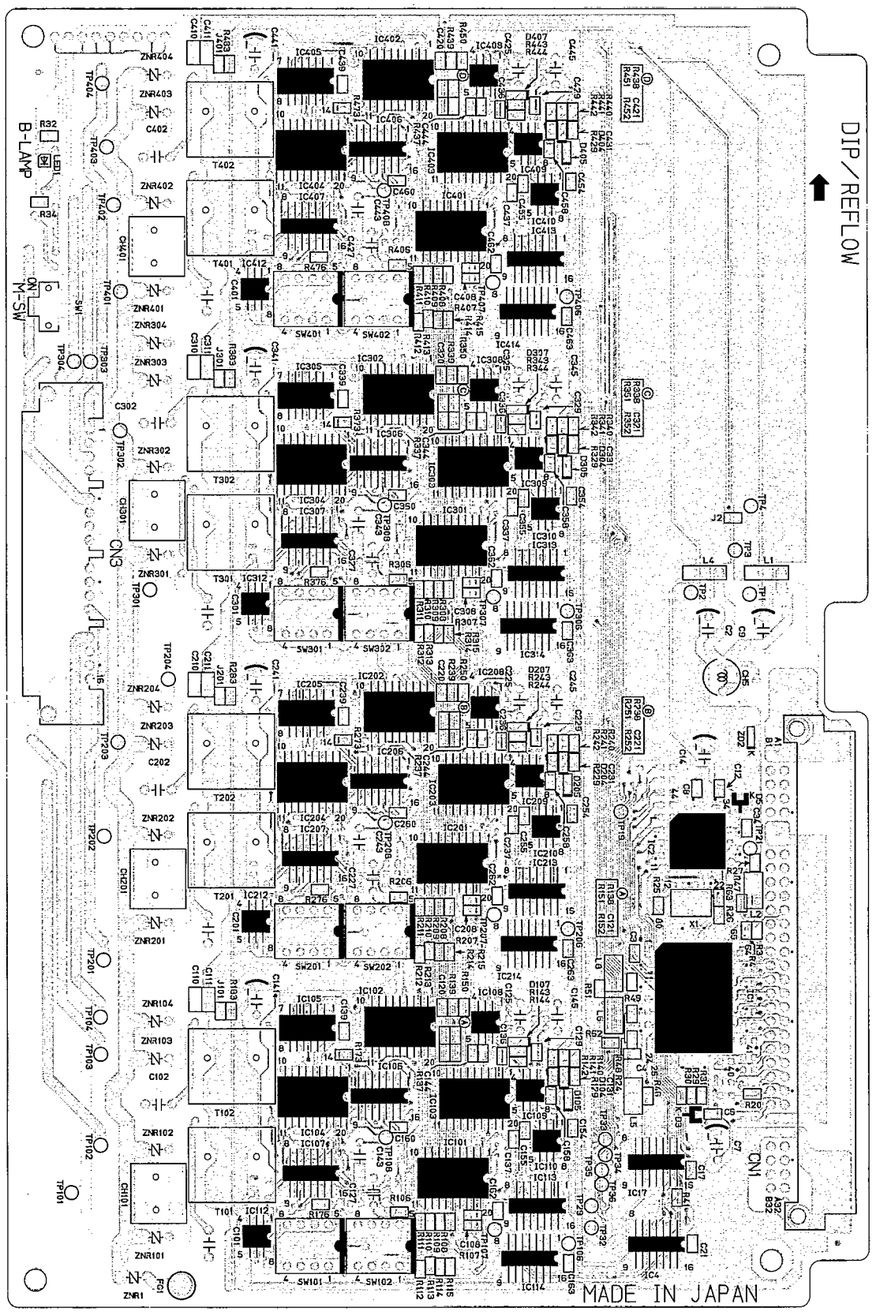



**This PCB is viewed from the soldering side.**

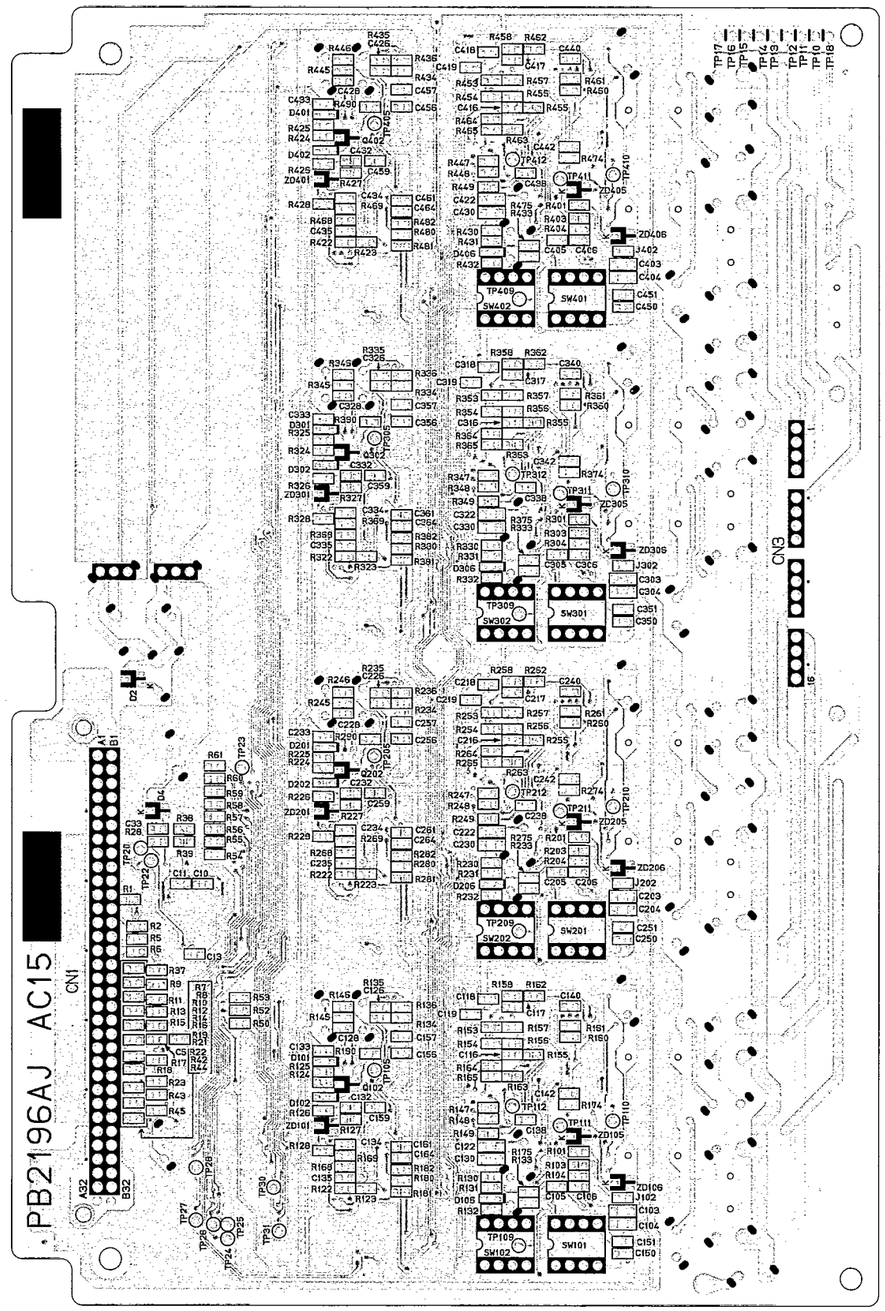


## (14)AC15/4 card (VB-44570UK):AC-15 Card (UK only) [PB2196AJ]

**This PCB is viewed from the component parts side.**

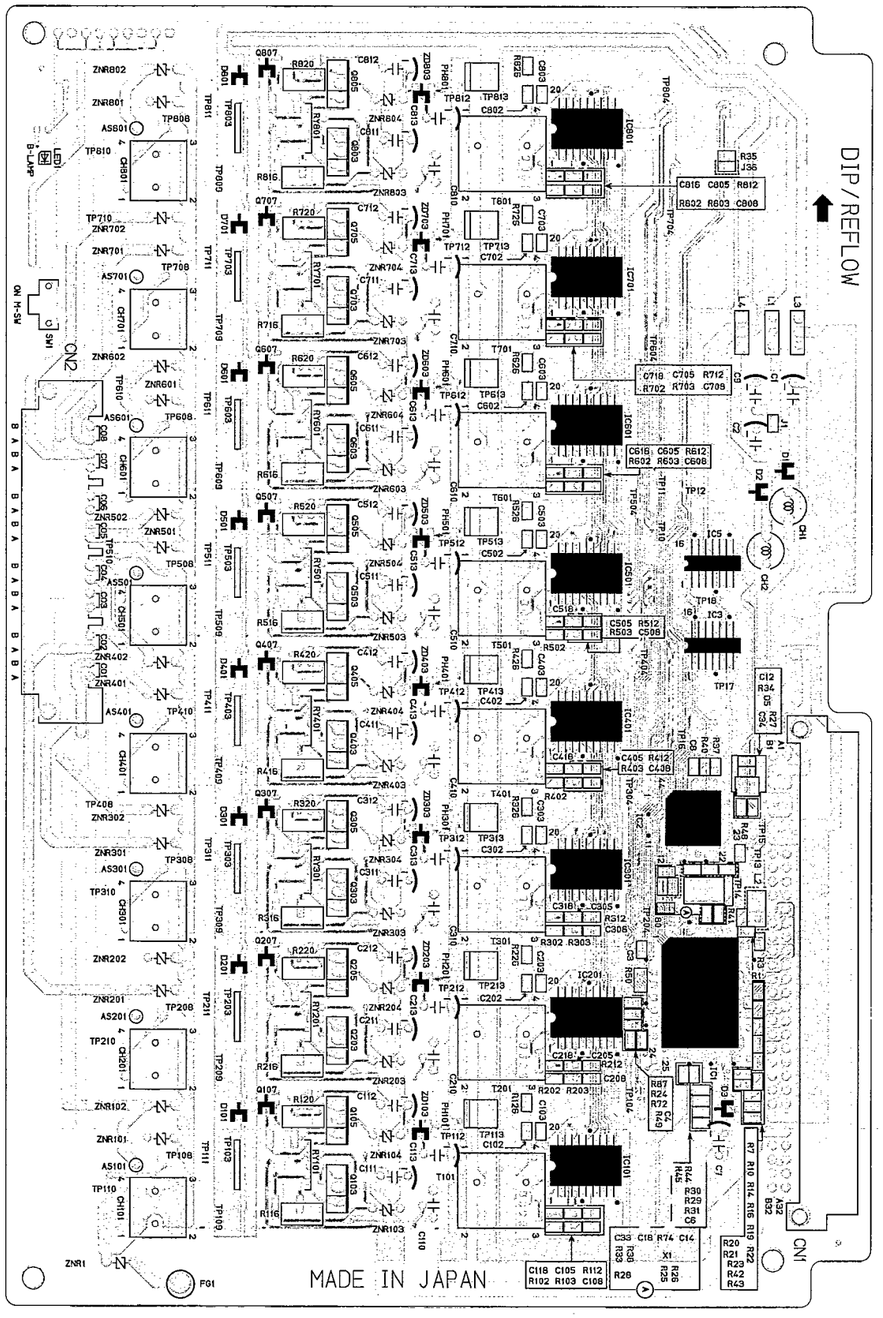



**This PCB is viewed from the soldering side.**

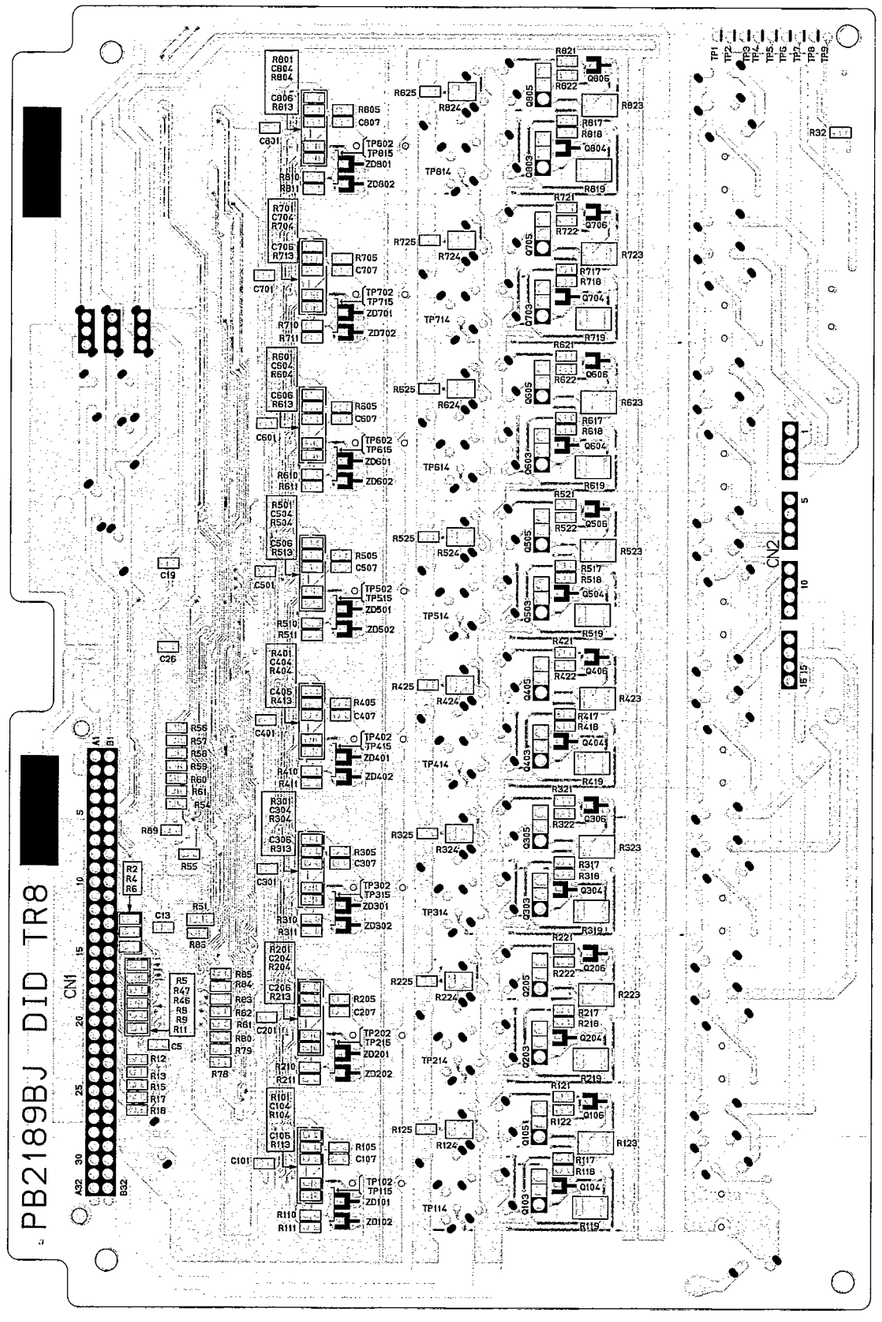


# (15)DIDTR8 card (VB-44520HK):DID Trunk Card (HK only) [PB2189BJ]

**This PCB is viewed from the component parts side.**

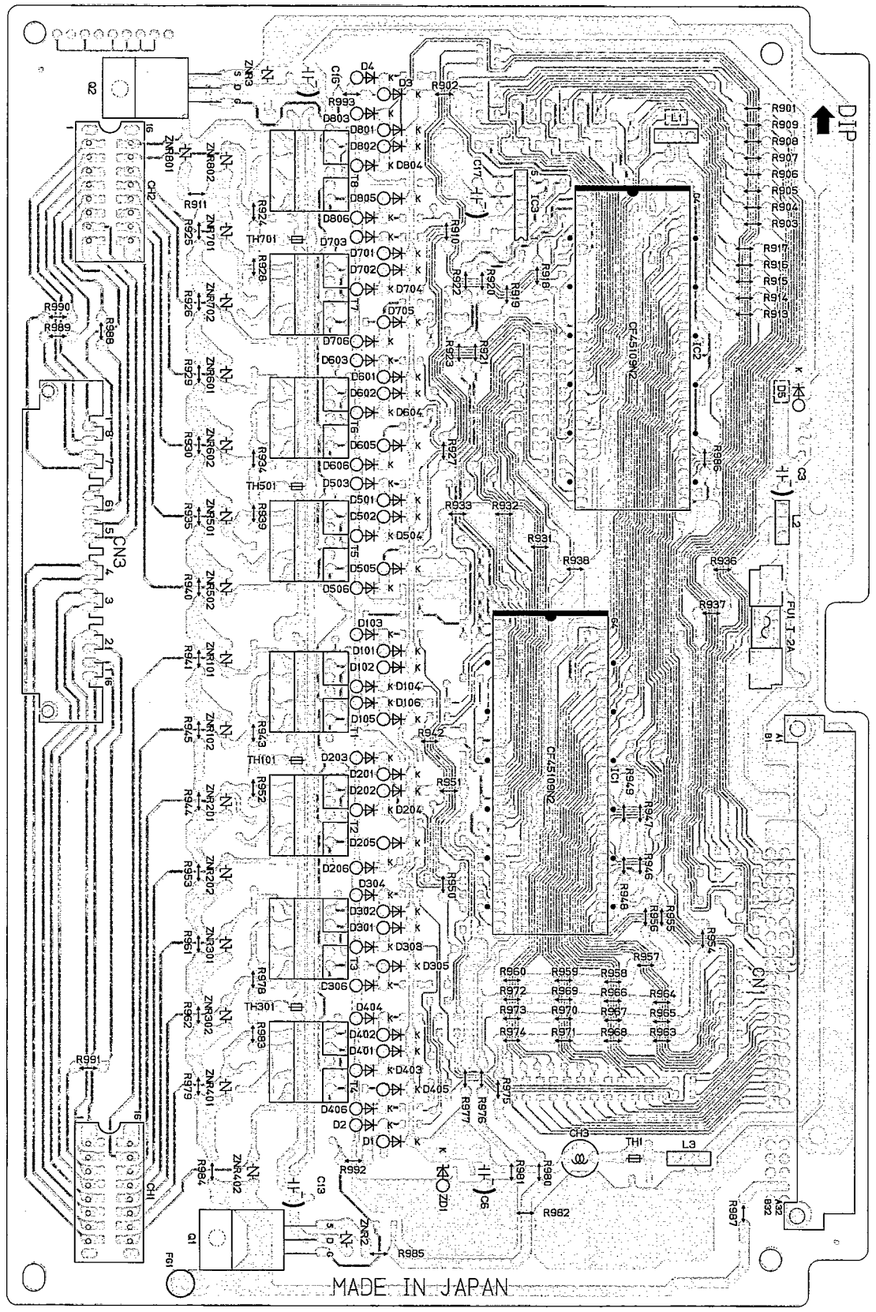



**This PCB is viewed from the soldering side.**

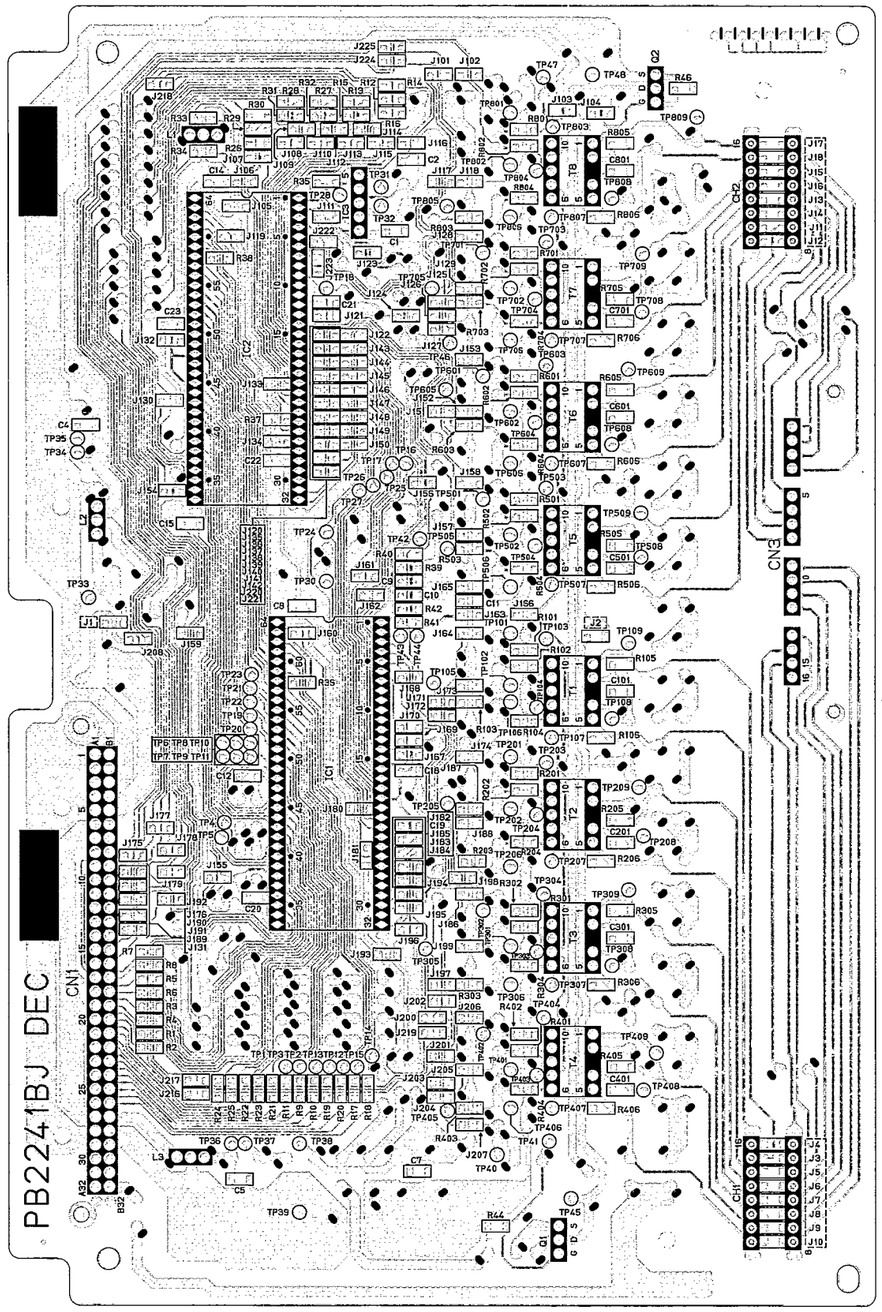


# (16)DEC/8 card (VB-44610UK):Digital Extension Card [PB2241BJ]

**This PCB is viewed from the component parts side.**

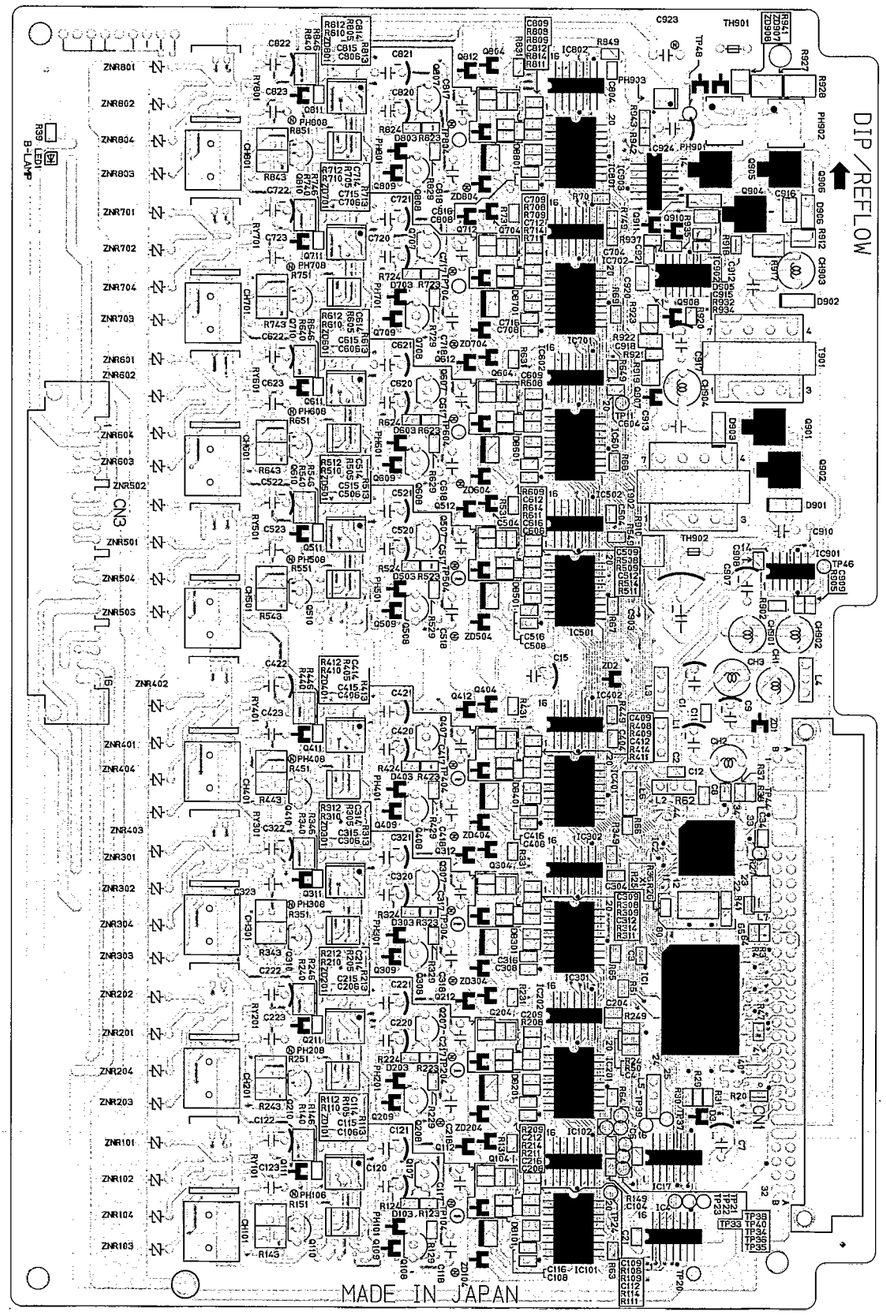



**This PCB is viewed from the soldering side.**

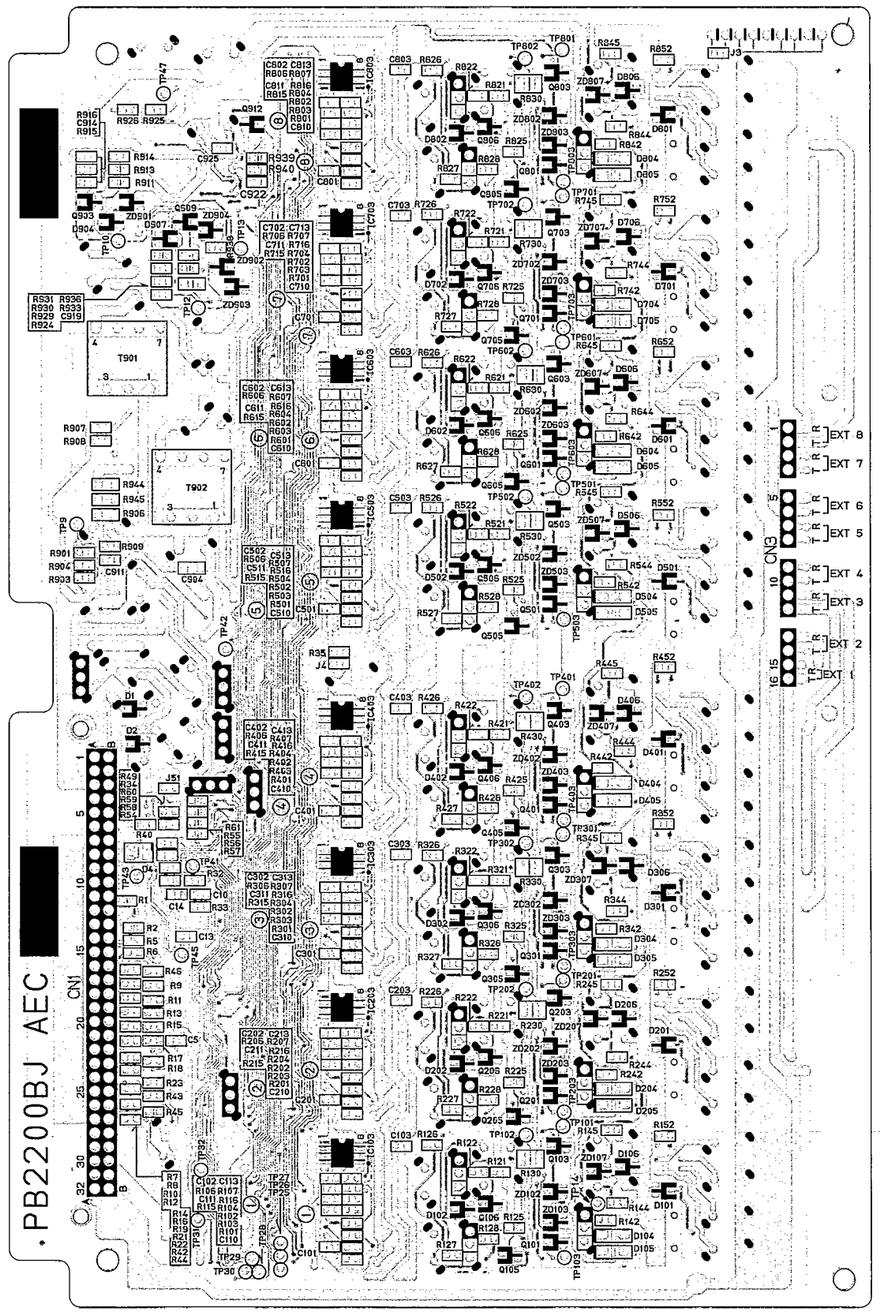


# (17)AEC/8 card (VB-44620UK/HK):Analog Extension Card [PB2200BJ]

**This PCB is viewed from the component parts side.**

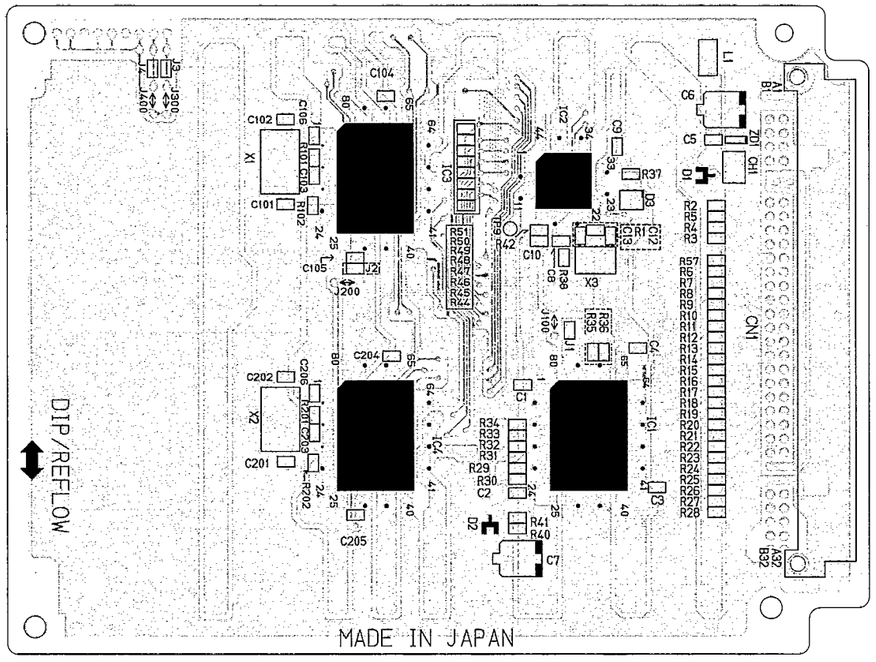



**This PCB is viewed from the soldering side.**



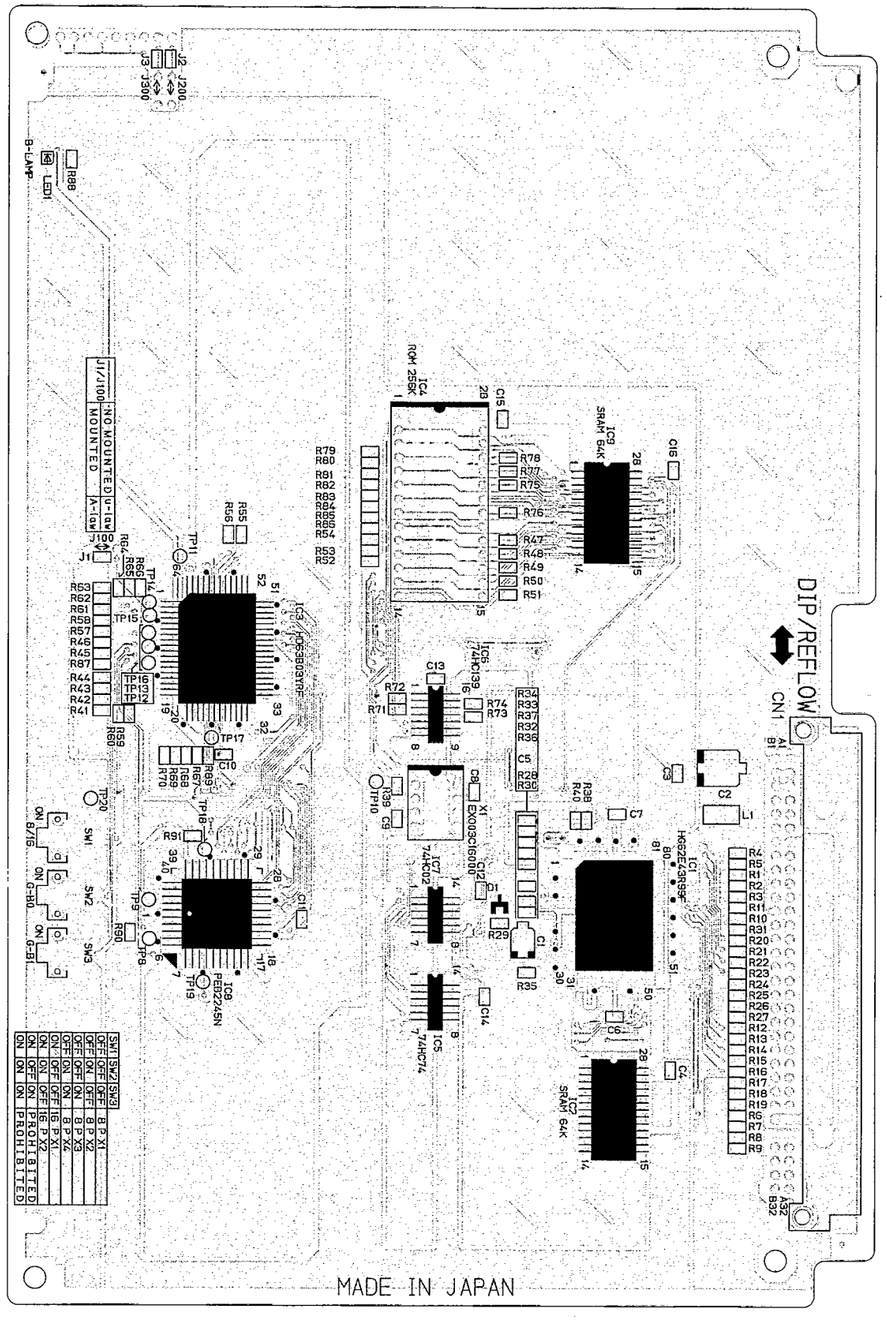
## (18)MFR/8 card (VB-44110UK/HK):8 DTMF Receiver Card [PB2211BJ]

**This PCB is viewed from the component parts side.**



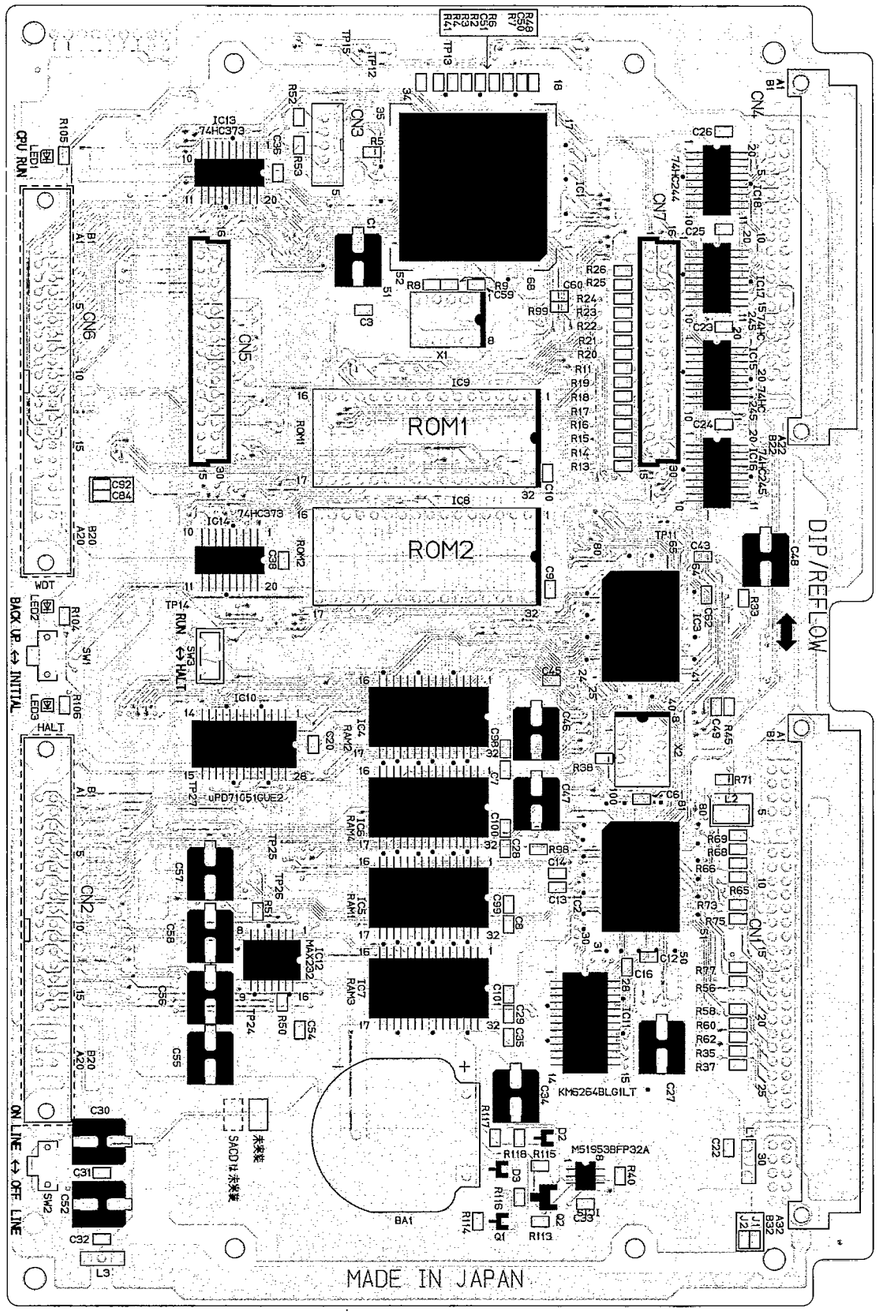

## (19)CONF card (VB-44120UK/HK):Conference Card [PB2214BJ]

**This PCB is viewed from the component parts side.**

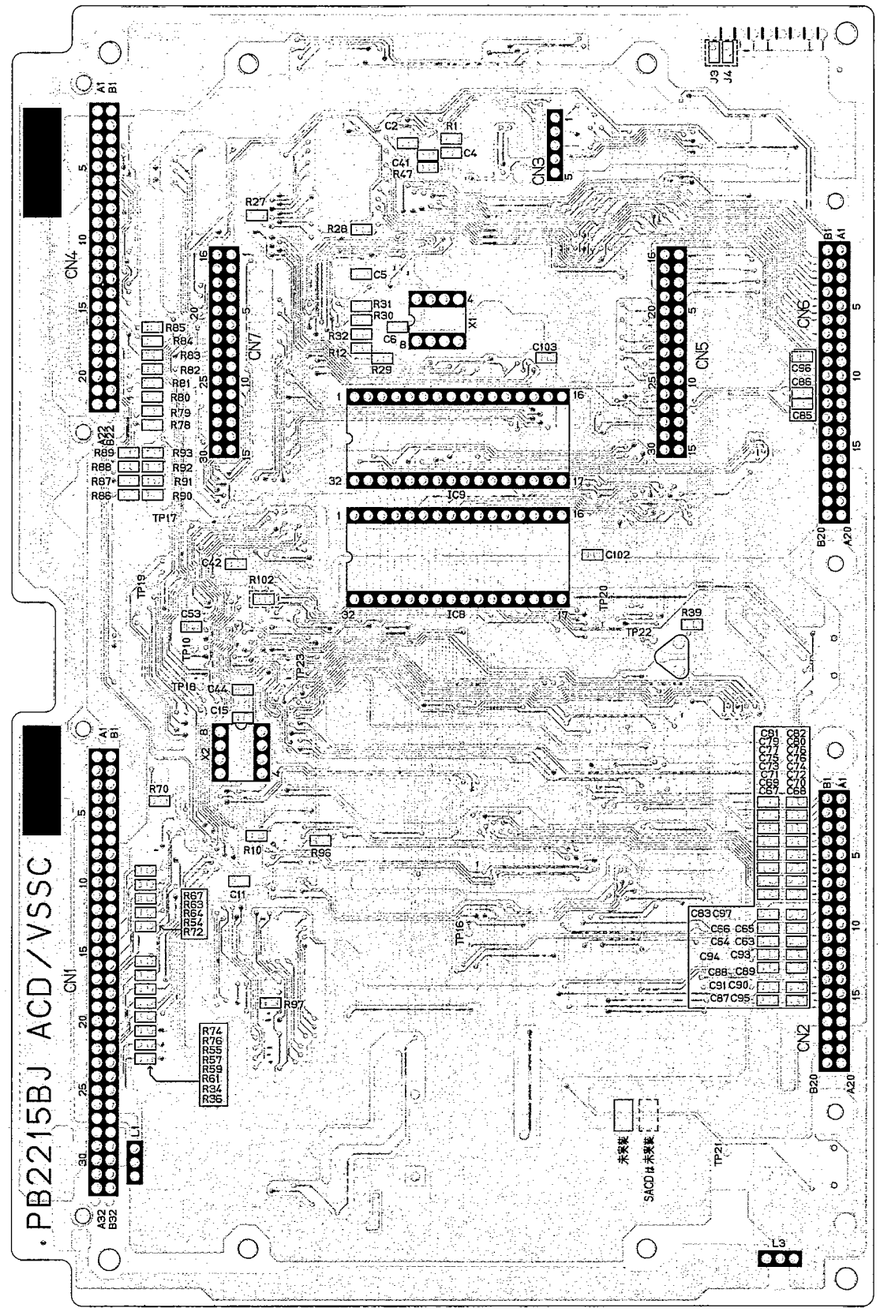


## (20)ACD card (VB-44140UK/44140):ACD Card [PB2215BJ]
## VSSC card (VB-44170UK/44170):Voice Storage Service Card [PB2215BJ]

**This PCB is viewed from the component parts side.**

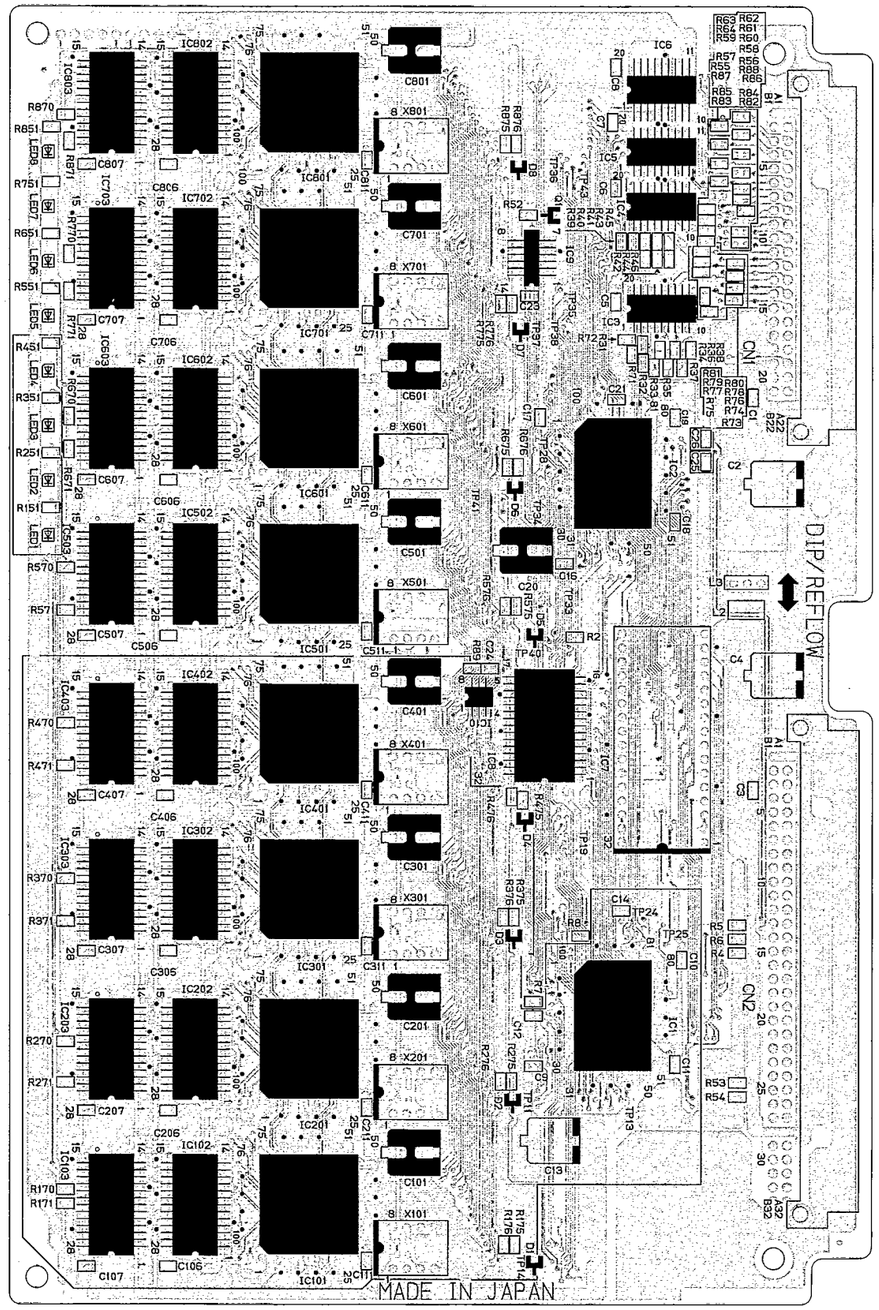



**This PCB is viewed from the soldering side.**

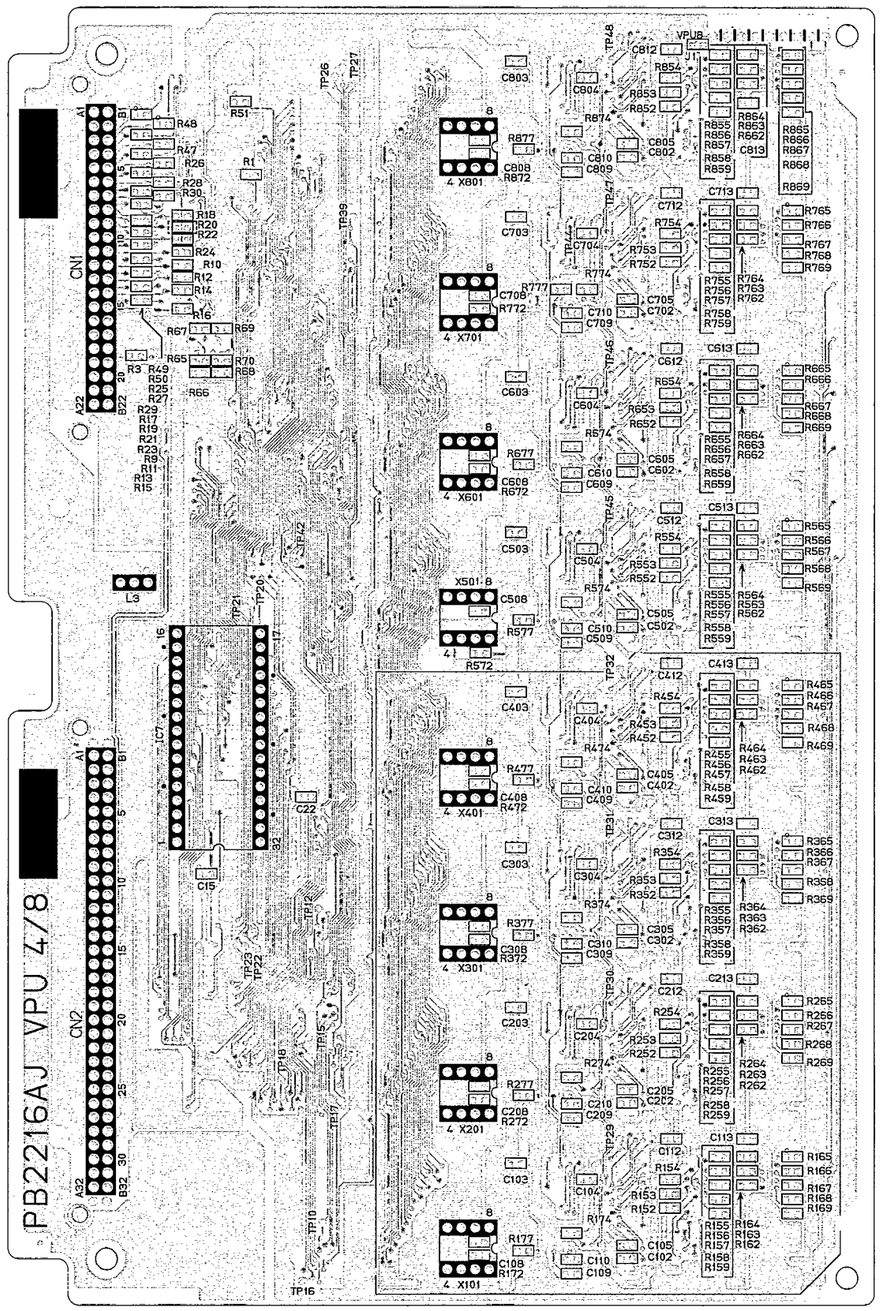


## (21)VPU/8 card (VB-44150UK/44150):8 Voice Processing Card [PB2216AJ]
## VPU/4 card (VB-44160UK/44160):4 Voice Processing Card [PB2216AJ]

**This PCB is viewed from the component parts side.**

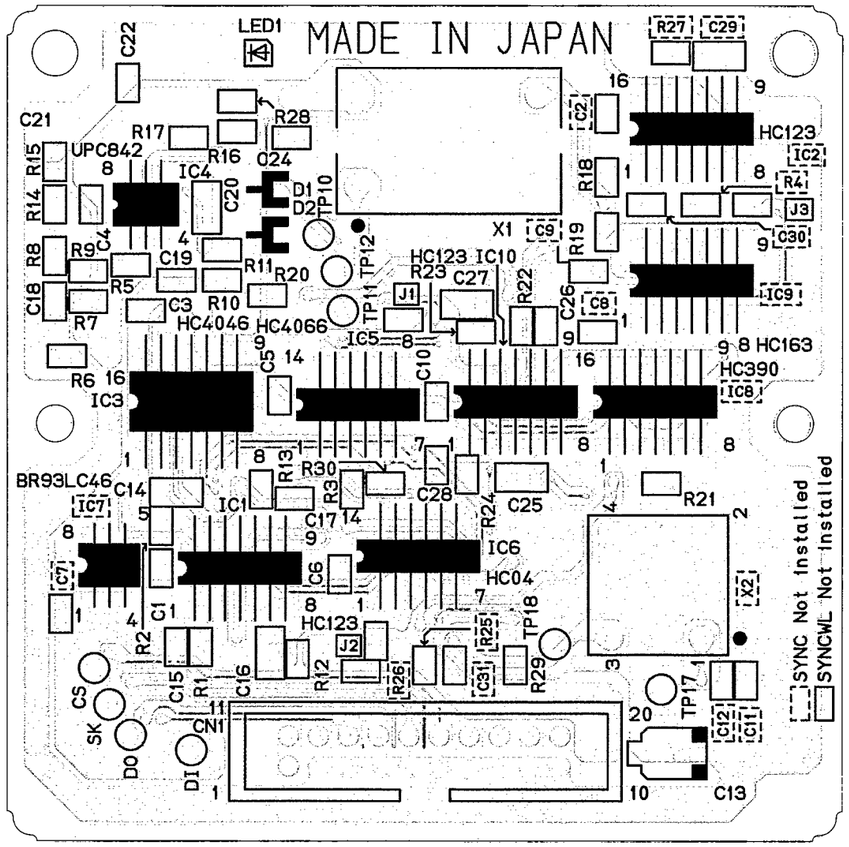



**This PCB is viewed from the soldering side.**

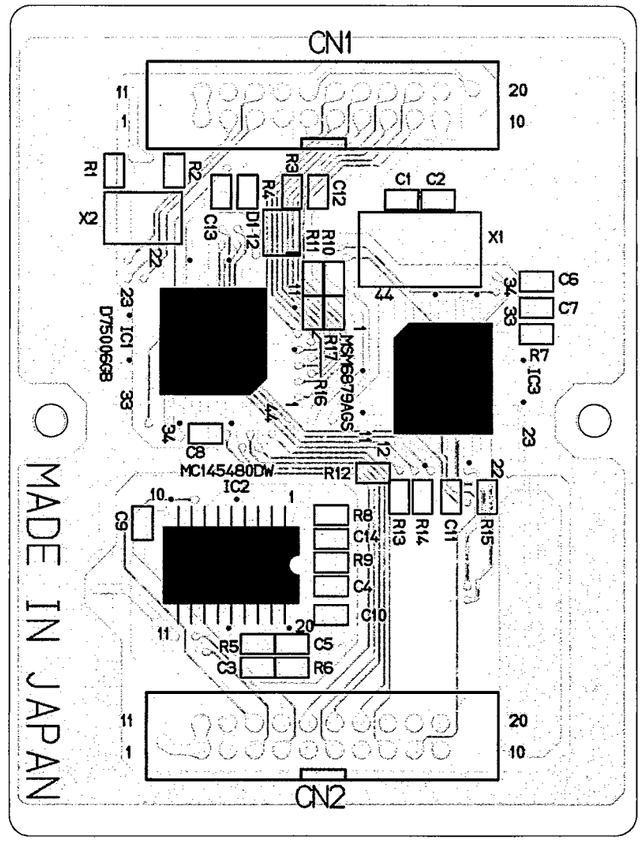


## (22)SYNC Package (VB-44460UK):Sync. Package/Network Unit [PB2219BJ]

**This PCB is viewed from the component parts side.**

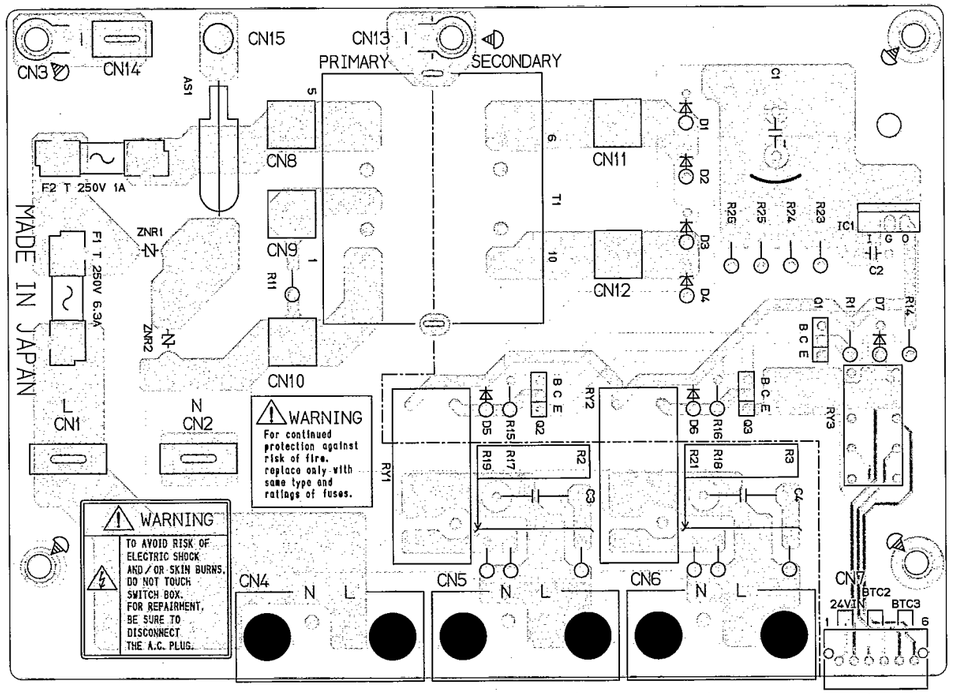



**This PCB is viewed from the component parts side.**



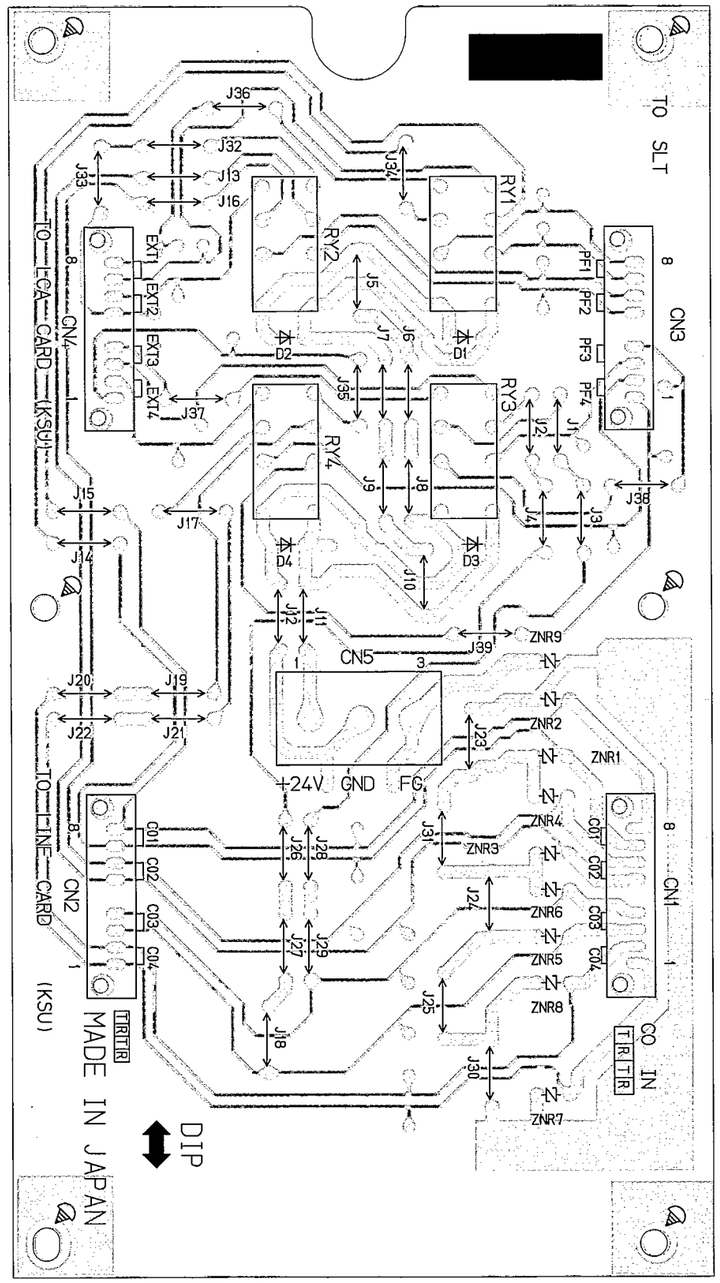
## 3.Power Supply & External Optional Equipment
## (1)SWBOX (VB-44023UK):Switch Box [PB2175BJ]

**This PCB is viewed from the component parts side.**



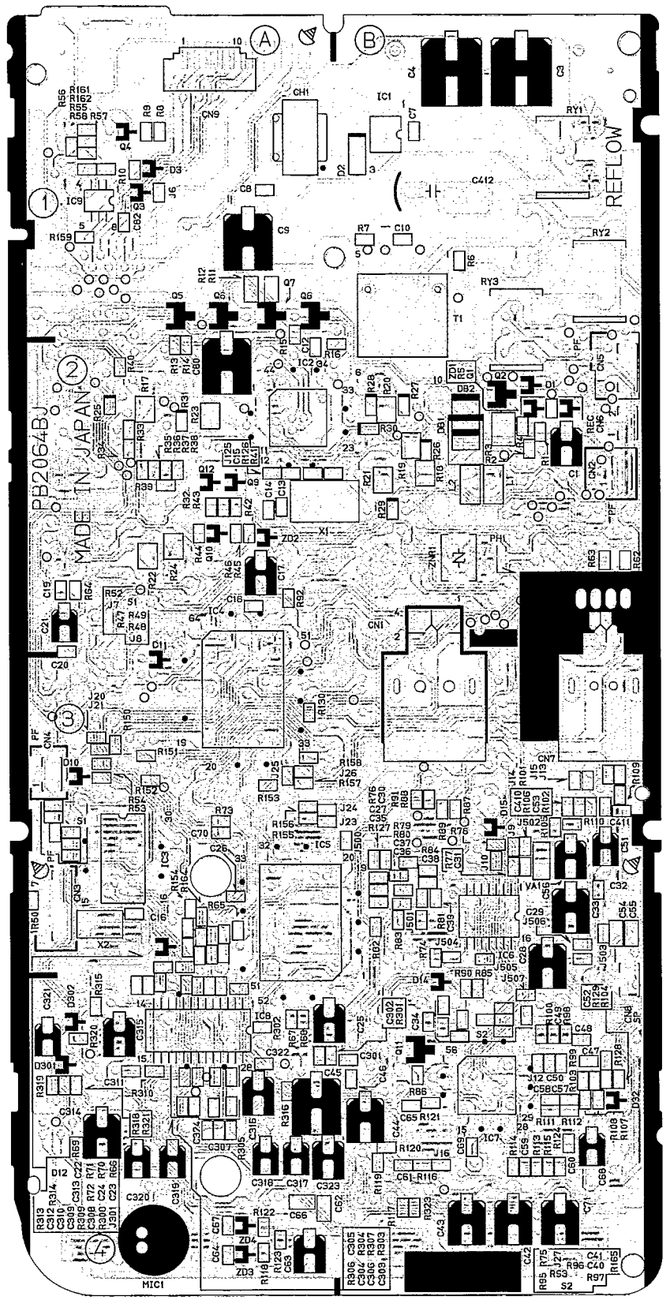

## (2)PFU (VB-43703UK):Power Failure Unit [PB2232BJ]

**This PCB is viewed from the component parts side.**

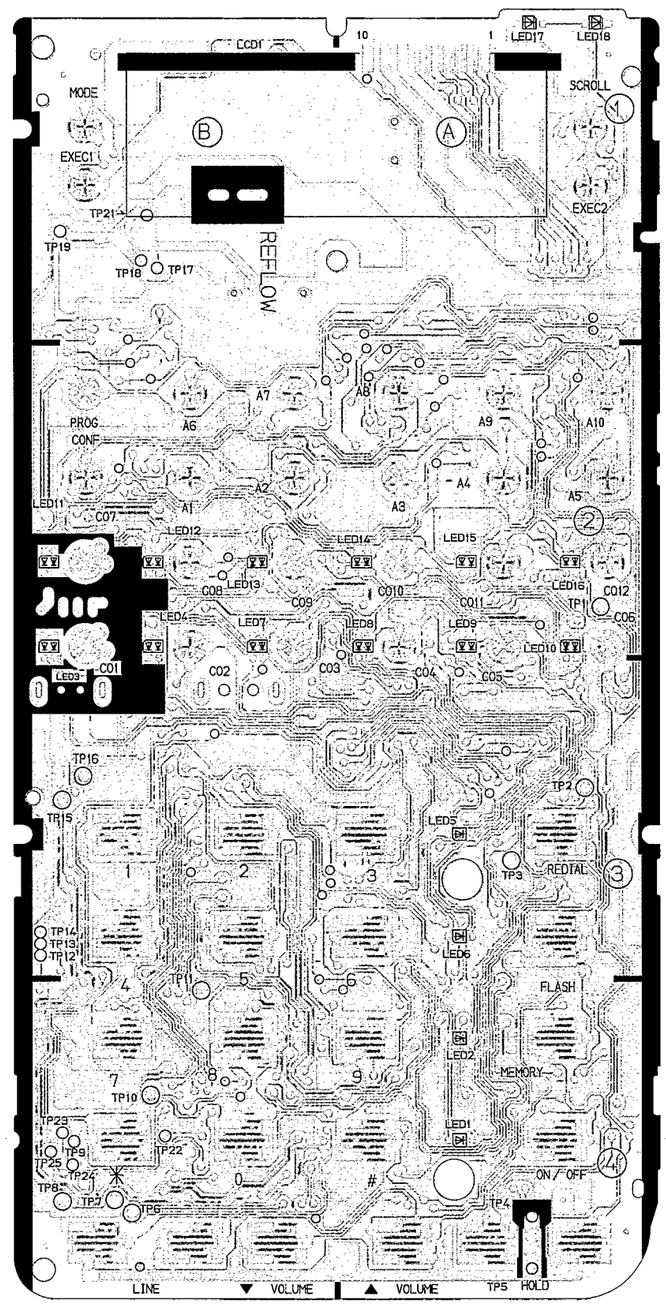


## 4.Key Phones
## (1)12 Key (VB-D411UK) [PB2064BJ]
## 12 Key-SPU (VB-44221HK) [PB2064BJ]
## 12 Key-LCD/SPU (VB-D411DSUK/VB-44223HK) [PB2064BJ]

**This PCB is viewed from the component parts side.**

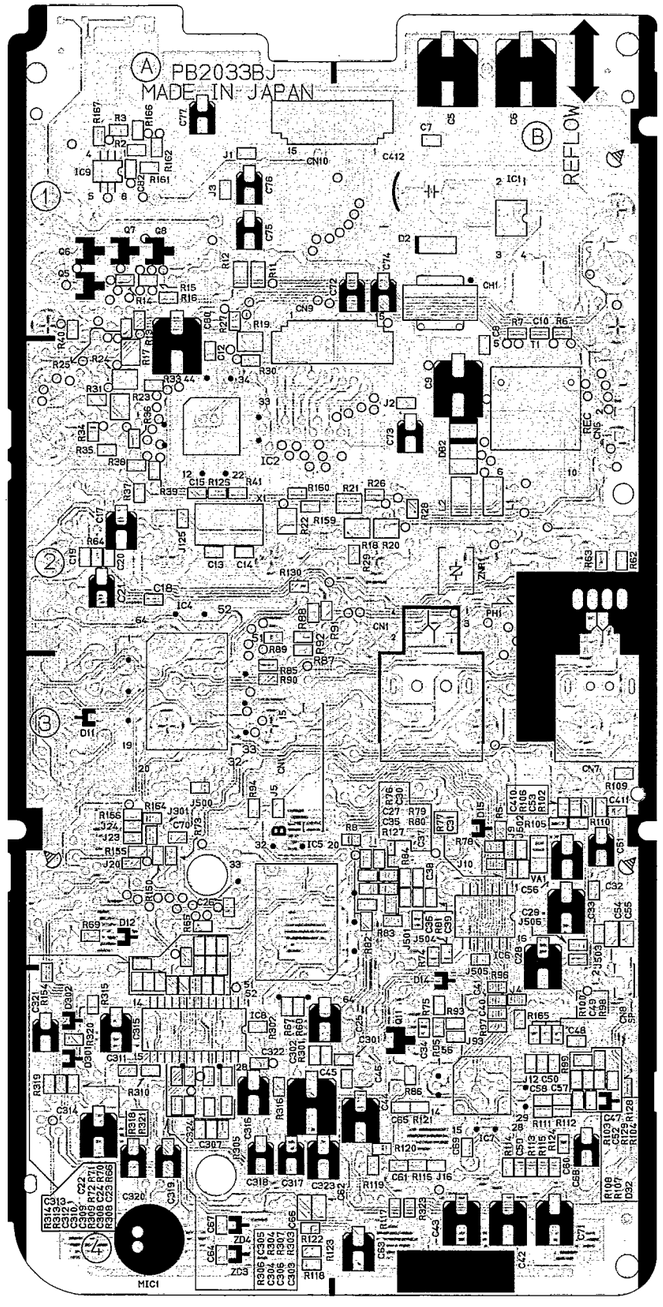



**This PCB is viewed from the soldering side.**

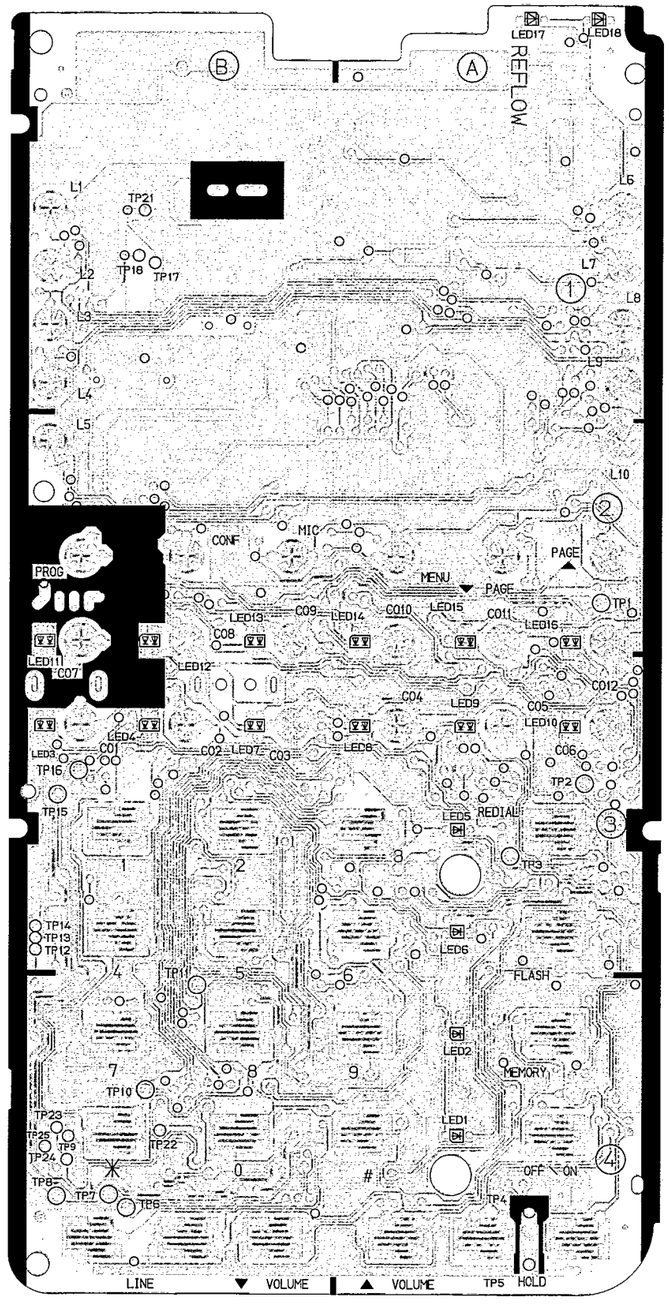


## (2)12 Key-LLCD/SPU (VB-D411LDSUK/VB-44225HK) [PB2033BJ]

**This PCB is viewed from the component parts side.**

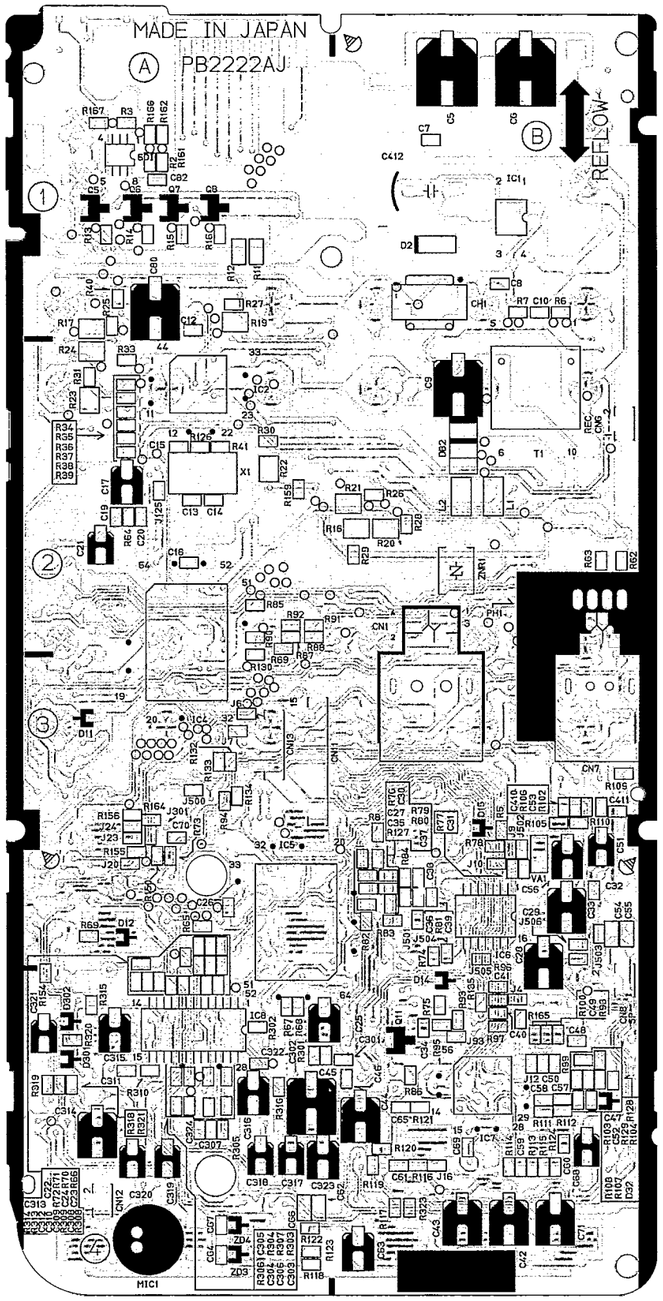



**This PCB is viewed from the soldering side.**

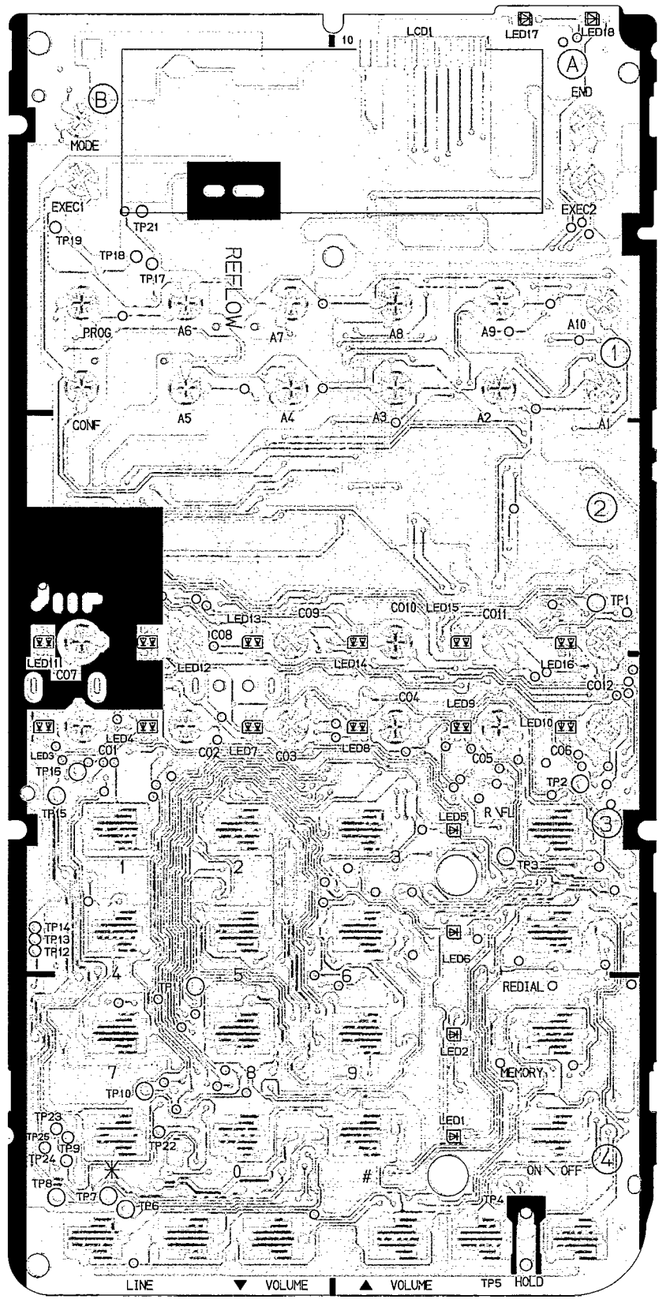


## (3)12 Key-LCD/Soft key/Voice/SLT/SPU (VB-D411DSVUK/VB-44224HK) [PB2222AJ]

**This PCB is viewed from the component parts side.**

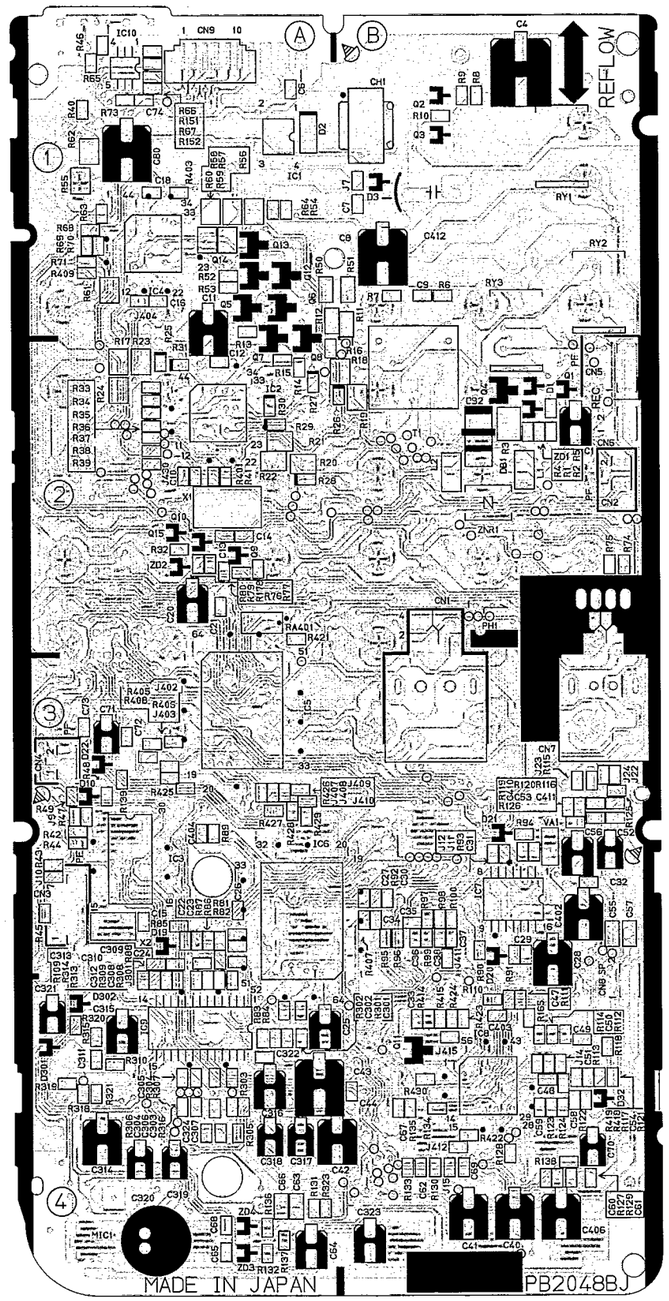



**This PCB is viewed from the soldering side.**

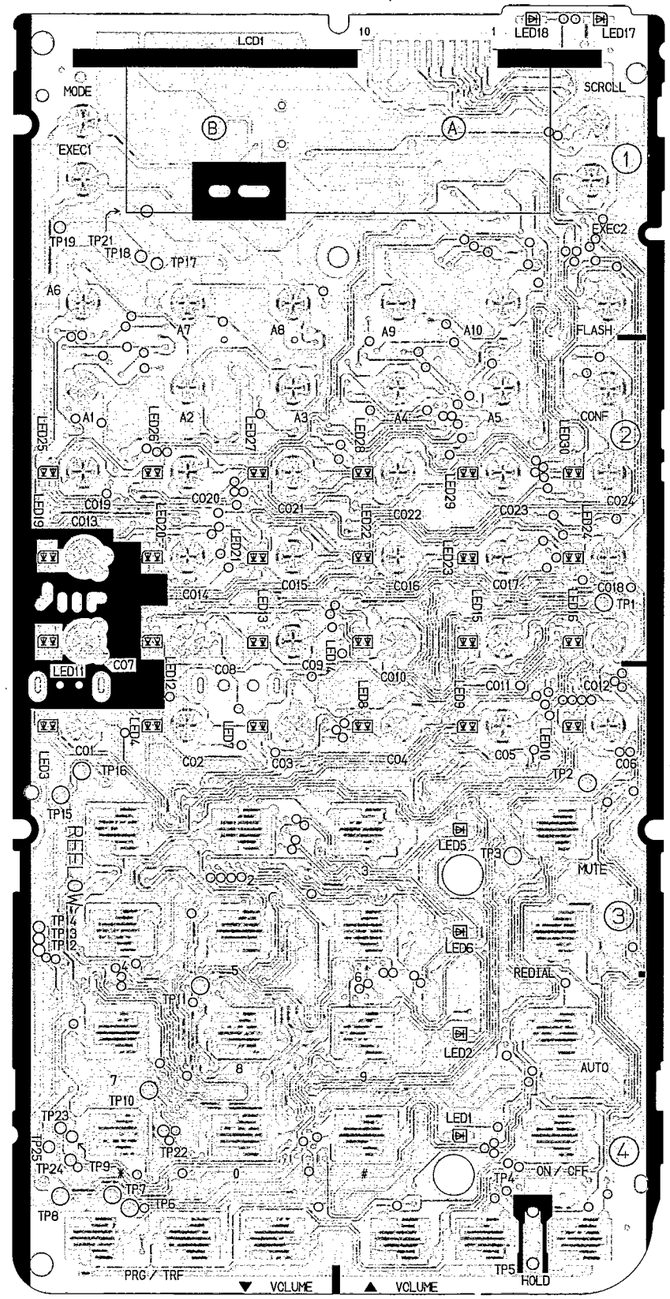


## (4)24 Key-LCD (VB-D611DUK) [PB2048BJ]
## 24 Key-LCD/SPU (VB-D611DSUK/VB-44233HK) [PB2048BJ]

**This PCB is viewed from the component parts side.**

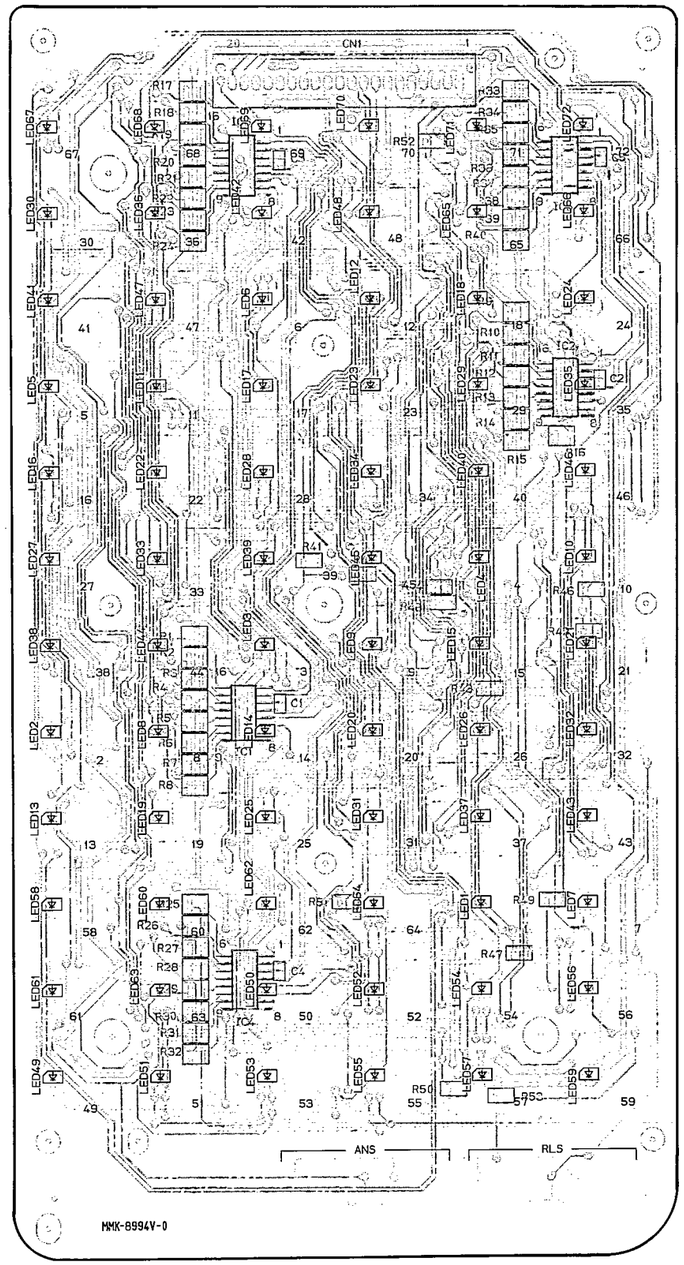



**This PCB is viewed from the soldering side.**



## (5)DSS (VB-D631UK/VB-44320HK) [PB1531BJ/PB1532BJ]

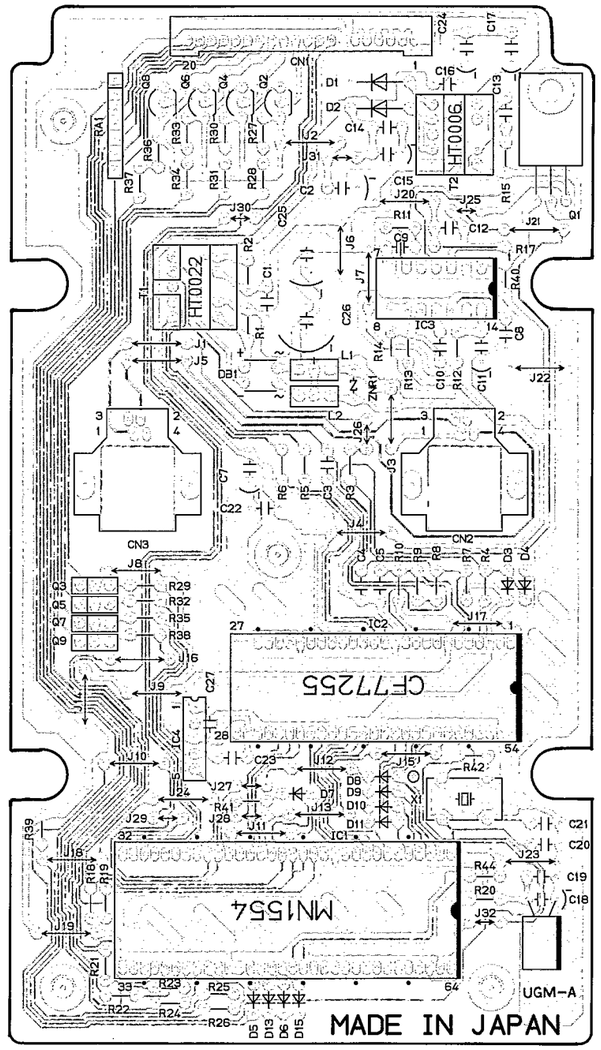
**This PCB is viewed from the component parts side.**




**[PB1531BJ]**

**:Parts mounted on the soldering side.**

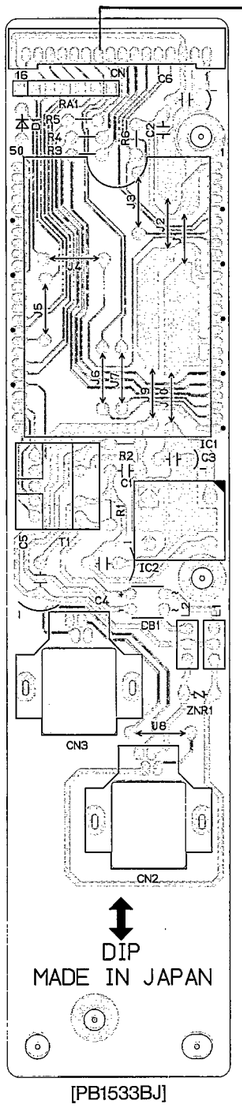
**This PCB is viewed from the component parts side.**



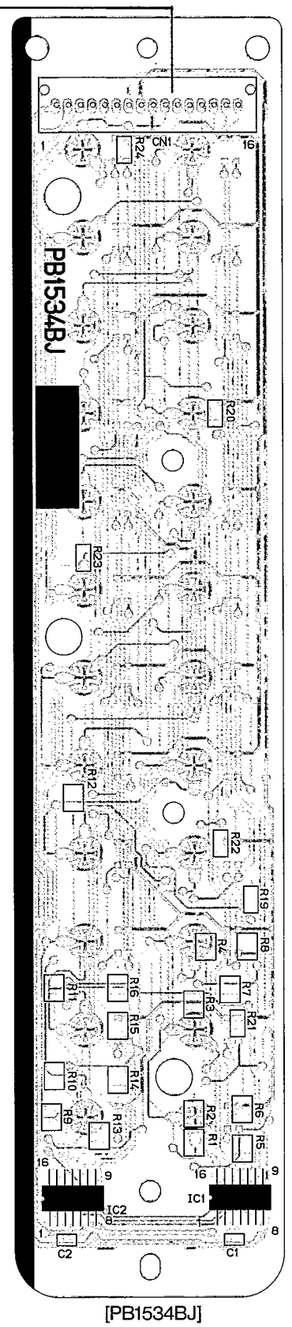

**[PB1532BJ]**

## (6)EM24 (VB-D331UK/VB-44310HK) [PB1533BJ/PB1534BJ]

**This PCB is viewed from the component parts side.**

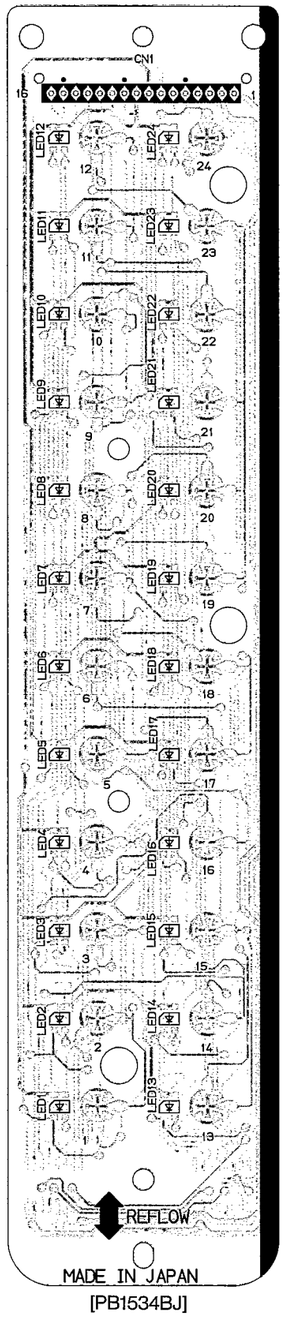



[PB1533BJ]




[PB1534BJ]

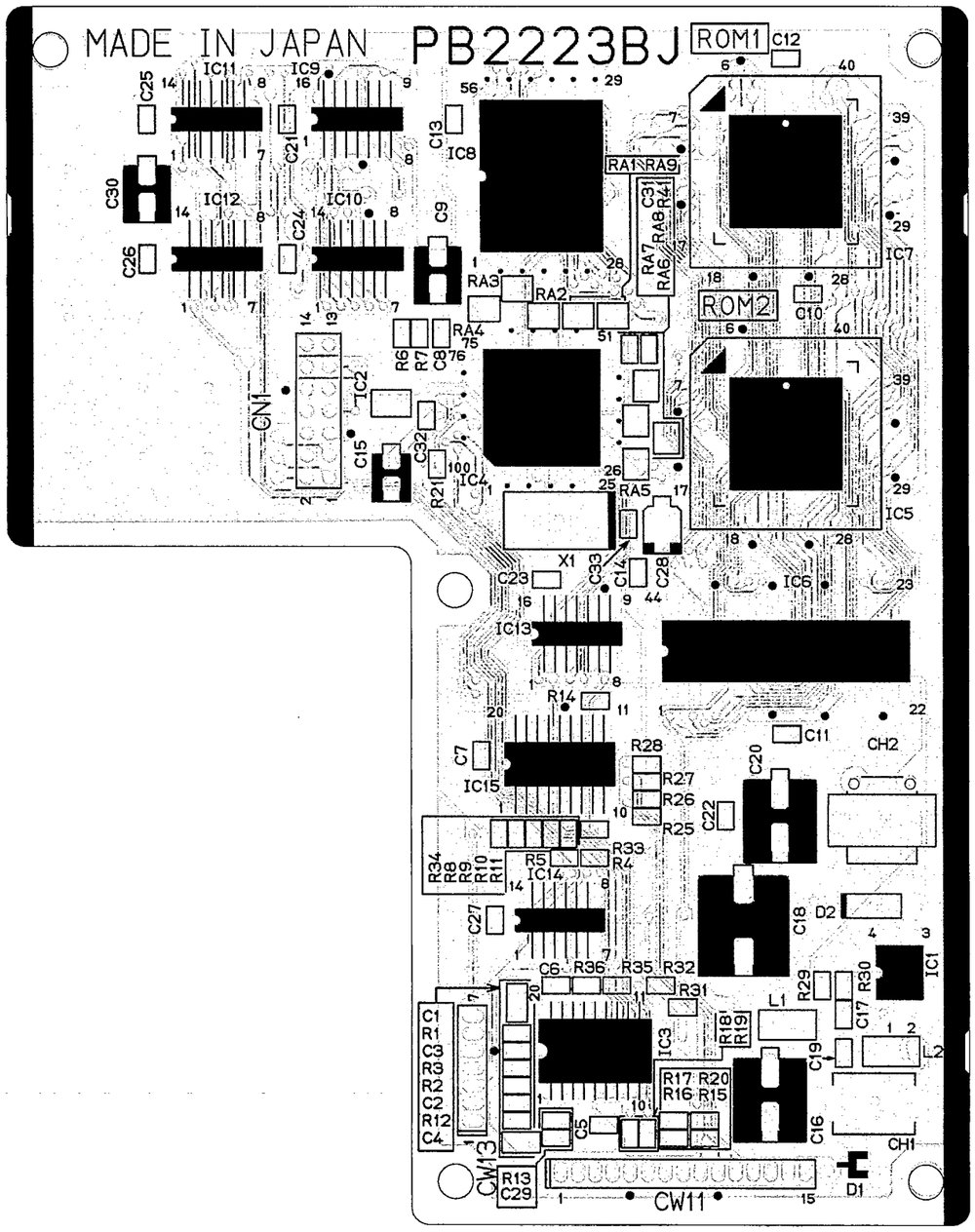
**This PCB is viewed from the soldering side.**




[PB1534BJ]

## (7)VRADP (VB-44101UK/HK):Voice Recognition Adaptor [PB2223BJ]

**This PCB is viewed from the component parts side.**



# ■ MAINTENANCE

## 1. Replacing the Battery Backup (VB-44025)

### (1) Guidelines

**CAUTION:**

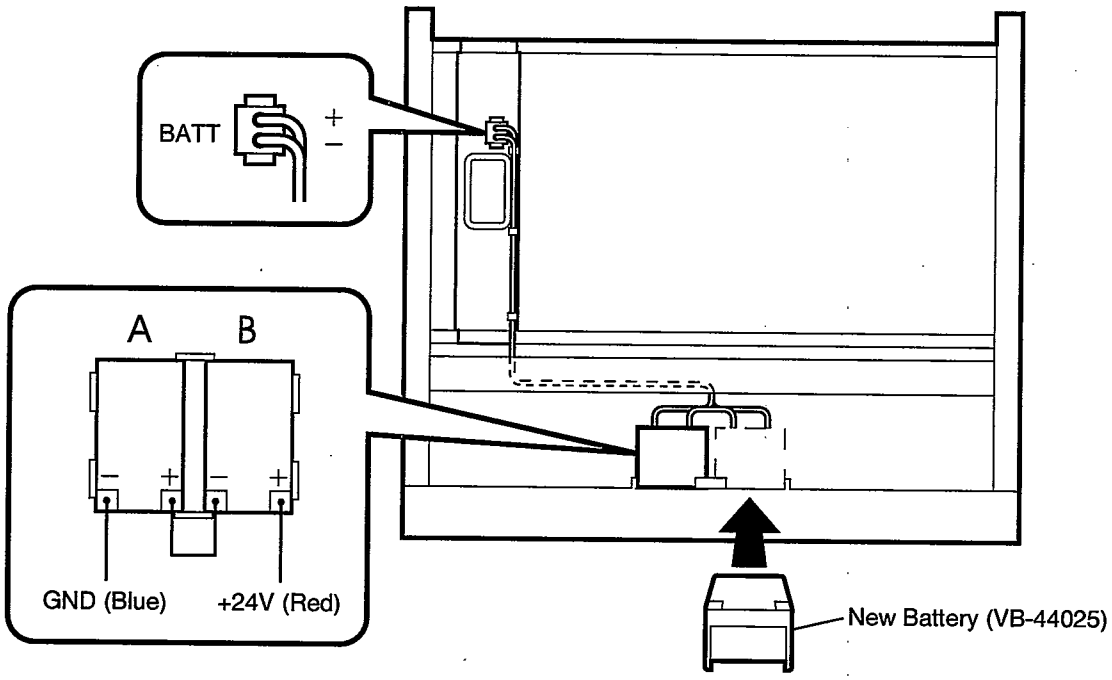
- Turn the power switch and the external breaker OFF, and disconnect the AC cable before installing the backup battery.
- Carefully note the polarity of the batteries to prevent short circuit.

- The battery cable must be at least AWG 18 (More than 1.1mm conductor in diameter).
- With normal condition, the backup batteries last for about 30 minutes for the CAB40, and about 20 minutes for the CAB96.
- The backup batteries should be replaced about every 3 years.

### (2) Replacement

1. Remove the old batteries from the CCU (Main Cabinet) and disconnect all the cables connected to the batteries.
2. Connect the +24V side cable on the battery unit's battery terminal to the + terminal on the new battery B.
3. Similarly, connect the GND cable to the - terminal of battery A.
4. Connect the + terminal of battery A to the - terminal of battery B.
5. Slot the batteries into the guides in the CCU (Main Cabinet).
   - Before installing battery, connect the cable to the battery first.
   - Cable connecting terminal should NOT touch the CCU (Main Cabinet)

*Example:Replacement of CAB40 backup batteries (VB-44025)*



# 2. Replacing the Backup Battery of CPC card

## (1) Guidelines

**CAUTION:**

- Turn the power switch and the external breaker OFF, and disconnect the AC cable before replacing the backup battery.
- The backup battery will last about 5 years. Be sure to replace the battery before it is exhausted.

- The backup batteries on the CPC96, CPC288,and CPC576 cards backup data such as program settings, speed dialing data, and the date and time. Besure to the backup batteries before they are exhausted.

## (2) Installation

1. Connect the new backup battery to the following connectors on the CPC96, CPC288, and CPC576 cards:

| Card | Connector |
|---|---|
| CPC96 | CN6 or CN7 |
| CPC288 | CN7 or CN6 |
| CPC576 | CN5 or CN6 |

Note:The two connectors on each of these cards are connected in parallel.

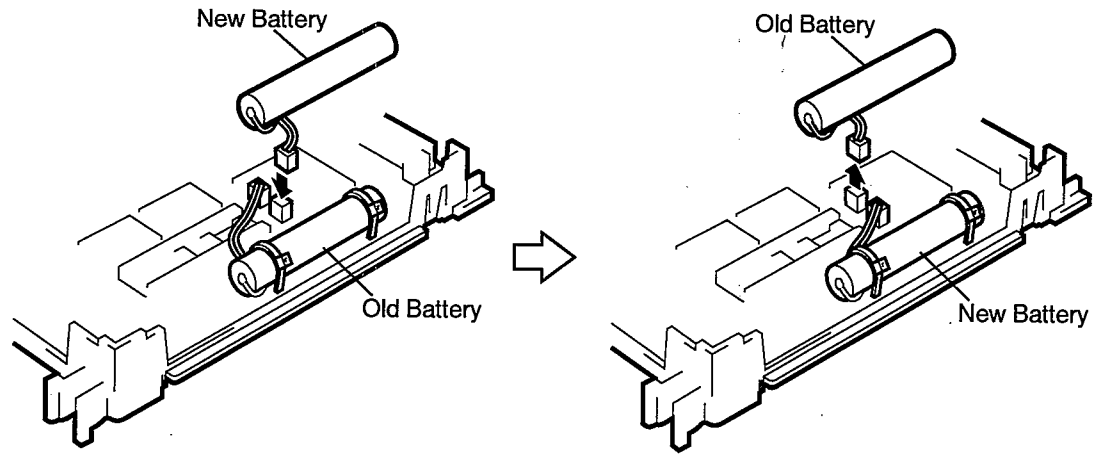
2. Cut the two tie-wraps using nippers to remove the old backup battery.

3. Secure the new backup battery using the two tie wraps.

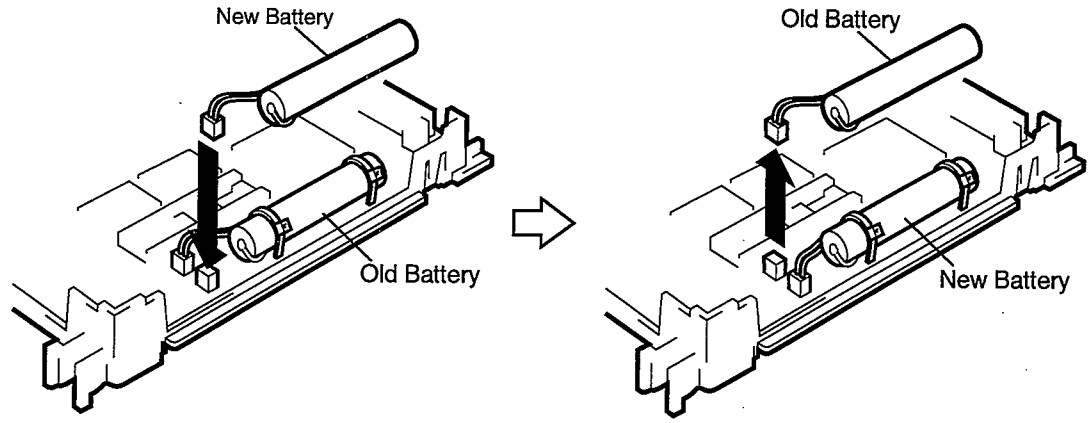
Note:Secure the battery so that it cannot move.

*Example:Replacing the backup battery of CPC card*

## ● CPC96 card and CPC288 card




## ● CPC576 card




**CAUTION:**

- Danger of explosion if battery is incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

# 3. How to Replace the Voice Mail HDD (hard disc drive)

**CAUTION:**

- Subjecting the HDD is subjected to sudden changes in temperature may cause condensation and consequent malfunction. If you have moved the HDD to another site when there is a temperature difference between the outside air and the installation site of 10℃ or more, leave the HDD wrapped inside a static-proof polythene bag for at least one hour to allow it to acclimatise.
- The HDD is a precision device. Subjecting the HDD to impact or vibrations may cause malfunction. When handling the HDD, do not subject it to impact or vibrations.
  Also, before moving the HDD, remove and wrap it in a sealed static-proof polythene bag, and store it in its packaging box.
- The life of the Voice Mail hard disc is about three years. Be sure to replace the Voice Mail hard disc every three years.
- When the HDD can no longer be used, messages saved on that hard disc can no longer be retrieved. Replace the HDD as soon as possible.
- If bad areas on the hard disc occur, or sound jumps during playback, this indicates that the HDD has reached the end of its life. Even if these phenomena occur as a result of frequent use or other conditions, the HDD sometimes can no longer be used because rotating parts have reached the end of their lives.

## (1) Guidelines

- Replacement HDD : VB-44171
- When replacing the HDD due to trouble, the data stored on the hard disc may not be retrievable depending on the symptoms.

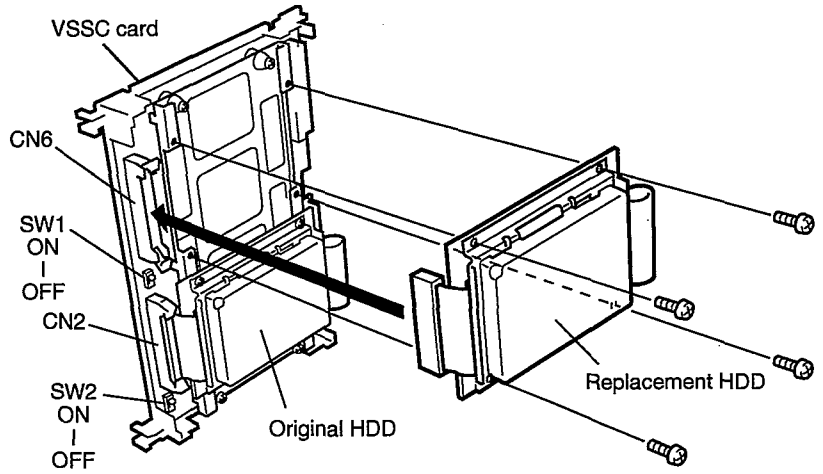
## (2) Replacing Method

The following describes the procedure for replacing the HDD including details of how to copy data on the hard disc. The following example is for a large-display telephone.

For details on the program settings, refer to the Voice Mail Programming Manual.

● Copying Data on Hard Disc

1. Prepare the new HDD.
2. Power off the main unit.
3. Remove the VSSC card.
4. Fix the new HDD at the replacement HDD installation position with screws, and connect the connector cable to CN6.



5. Set SW2 on the VSSC card to OFFLINE.
6. Insert VSSC card to the cabinet.
7. Turn the power ON to start up the system. Wait about 45 seconds, and make sure that the LED on the VSSC card blinks faster.
8. Enter the Voice Mail program setup mode on the large-display telephone.
9. Press "9962" → HOLD to select the Disc Copy menu.
10. Press "0" → HOLD to instruct disc copy.
11. Press "0" → HOLD to instruct start of disc copy. Disc copy is started. Depending on memory size of voice data, copying time may take more than 20 minutes.

| |
|---|
| HDD COPY ! |
| HDD COPY |

Note:

- If a read error occurs during disc copy, the data on the source HDD may sometimes not be read. Some of the voice data cannot be copied.
- If a read error occurs during disc copy, copying of the remaining data is resumed by pressing HOLD again.

12. When disc copy ends (displaybelow), turn the system power OFF.

| |
|---|
| COMPLETED |
| HDD COPY |

● Replacement

1. Remove the CN2 connector cable and the four mounting screws to remove the old HDD.
2. Remove the CN6 connector cable and four mounting screws to remove the new HDD.
3. Fix the new HDD to the old HDD installation position using the four screws, and connect the connector cable to CN2.

● Checking Operation

1. Set SW2 on the VSSC card to ONLINE.
2. Turn the power ON to start up the system. Wait about 45 seconds, and check that the LED on the VSSC card blinks faster.

# 4. Replacing the Fuse

This item describes how to replace the fuses of the power supply unit, switch box and -48V power supply.

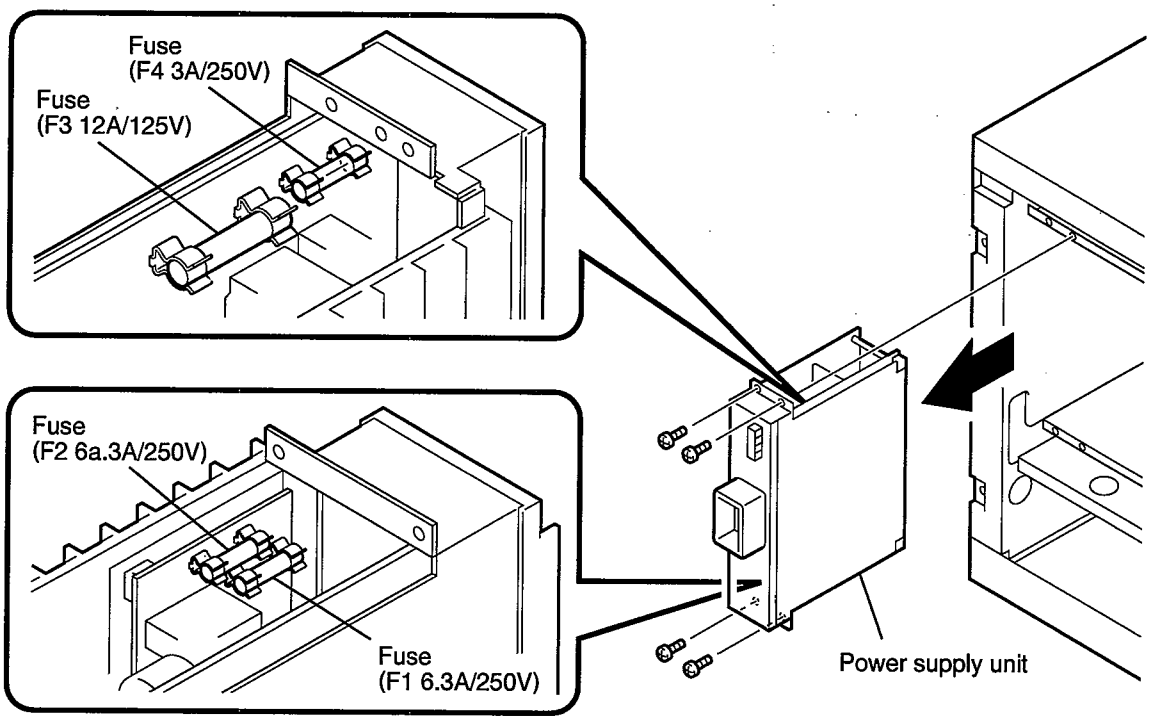
## (1) Power Supply Unit

Four fuses are used for the power supply unit (two at top, two at bottom). Follow the procedure below to replace blown fuses.

> ⚠ **CAUTION:**
> · Please use only manufacture's specified parts when you replace the fuse.

1.Turn the power switch OFF.
2.Disconnect the AC power cable from the power outlet.
3.Disconnect all cables connected to the power supply unit.
4.Remove the two screws each at the top and bottom of the power supply unit that are fixed to the CCU.
5.Remove the power supply unit from the CCU.
6.Remove the blown fuse.
7.Insert the new fuse.
8.Install the power supply unit into the CCU in the reverse order of steps 1 to 5.

| Fuse | Application |
|---|---|
| F1 (250V 6.3A), F2 (250V 6.3A) | These fuses protect the inside of the CCU when an abnormal voltage due to lightning, etc. is applied from the AC 240V line. |
| F3 (125V 12A) | This fuse protects back-up batteries from false connection and short-circuit. |
| F4 (250V 3A) | This fuse protects peripheral devices from false connection and short-circuit. |


Fuse
(F4 3A/250V)
Fuse
(F3 12A/125V)
Fuse
(F2 6a.3A/250V)
Fuse
(F1 6.3A/250V)
Power supply unit

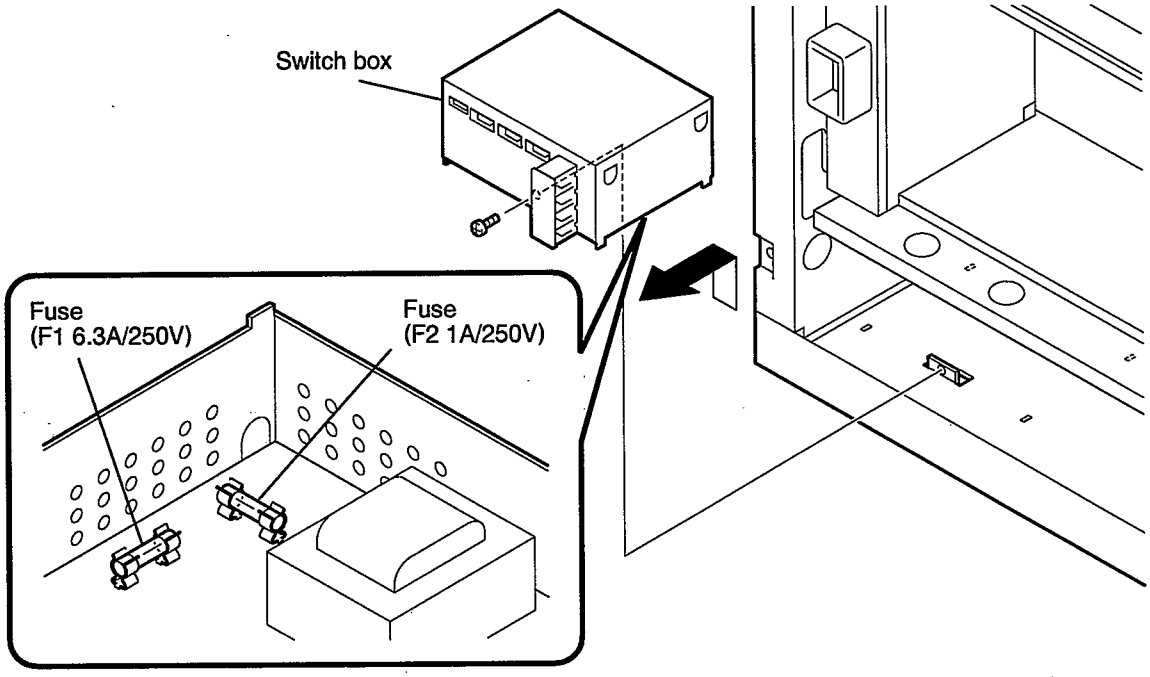
## (2) SWBOX (VB-44023UK/HK) : Switch Box

Two fuses are used for the switch box. Follow the procedure below to replace blown fuses.

**CAUTION:**

· Please use only manufacture's specified parts when you replace the fuse.

1.Turn the power switch OFF.
2.Disconnect the AC power cable from the power outlet.
3.Disconnect all cables connected to the switch box.
4.Remove the screw at the right of the switch box that is fixed to the CCU.
5.Remove the switch box from the CCU.
6.Remove the blown fuse.
7.Insert the new fuse.
8.Install the switch box into the CCU in the reverse order of steps 1 to 5.



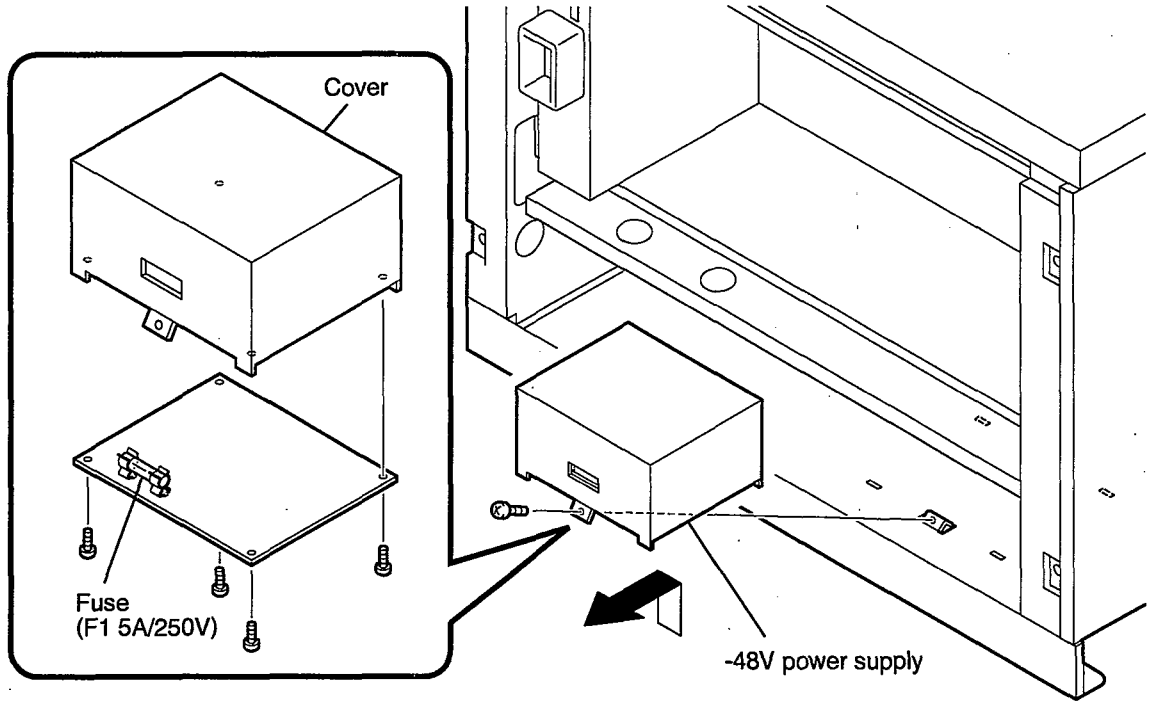
## (3) POW-48 (VB-44022) : -48 V Power Supply

One fuse is used for the -48V power supply. Follow the procedure below to replace blown fuses.

**CAUTION:**

· Please use only manufacture's specified parts when you replace the fuse.

1.Turn the power switch OFF.
2.Disconnect the AC cable from the power outlet.
3.Disconnect the cable connected to the -48V power supply.
4.Remove the screw at the lower bottom of the -48V power supply that is fixed to the CCU.
5.Remove the -48V power supply from the CCU.
6.Remove the four screws that are fixing the printed circuit board.
7.Remove the cover.
8.Remove the blown fuse.
9.Insert the new fuse.
10.Install the power supply unit into the CCU in the reverse order of steps 1 to 5.



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