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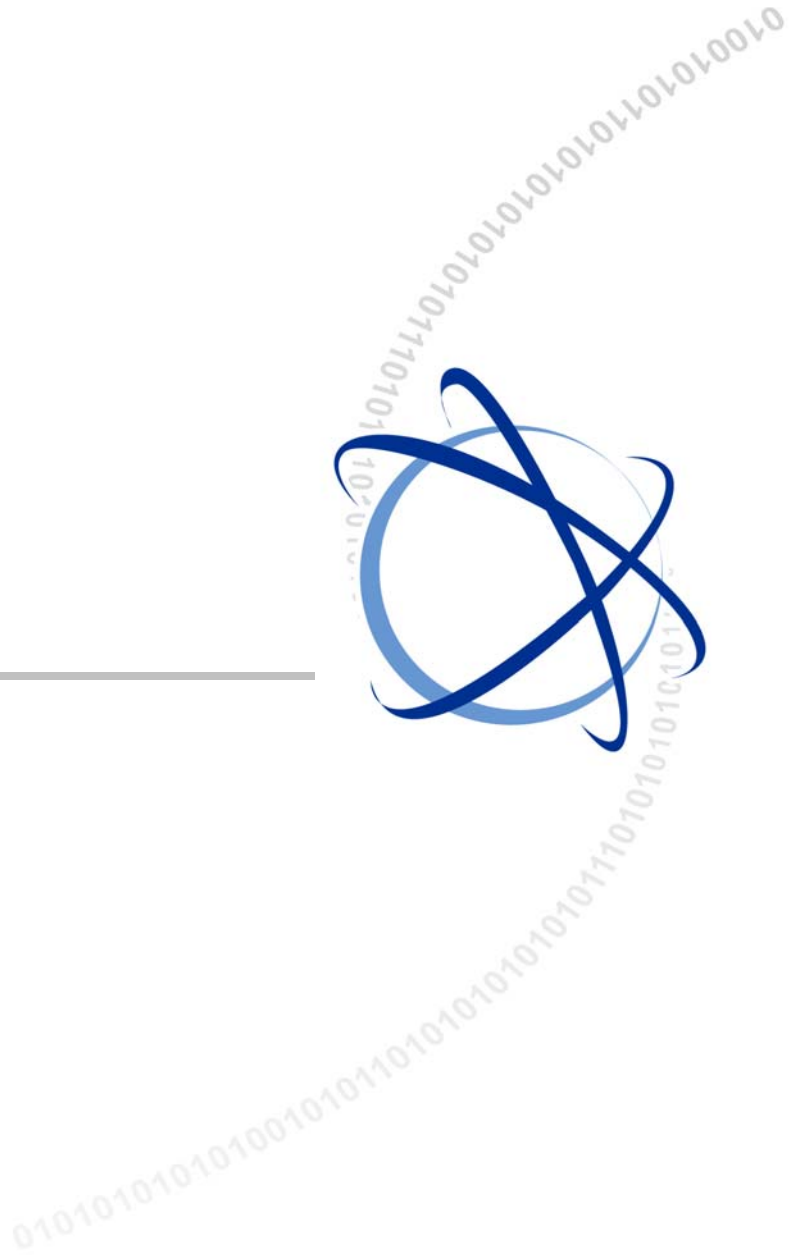

OfficeServ 7200

Service Manual

SAMSUNG ELECTRONICS

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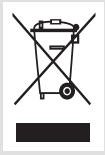

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INTRODUCTION

Purpose

This manual provides an overview of OfficeServ 7200 system and its specifications. Also, this manual describes the configuration and features of each hardware circuit, troubleshooting potential problems while using the system, and the methods of programming for maintenance.

Audience

This manual is intended for engineers who maintain the OfficeServ 7200 system.

Document Content and Organization

This manual consists of seven Chapters and Abbreviation as follows:

CHAPTER 1. System Overview

Describes the major features, configuration, and specifications of the OfficeServ 7200 system.

CHAPTER 2. Circuit Description

Describes the configuration and characteristics of each module in the OfficeServ 7200 system.

CHAPTER 3. Troubleshooting

Describes potential problems and troubleshooting when using the OfficeServ 7200 system.

CHAPTER 4. Programming for Maintenance

Describes the methods of SmartMedia, Complex Programmable Logic Devices(CPLD), and offline programming for maintaining the OfficeServ 7200 system.

CHAPTER 5. Component Layout

Displays the parts layout of the OfficeServ 7200 system.

CHAPTER 6. Part List

Displays the list of all OfficeServ 7200 parts.

CHAPTER 7. Exploded View

Displays the device parts diagrams of the OfficeServ 7200 system and the parts material list of each device.

ABBREVIATION

Describes the acronyms used in this manual.

Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.

WARNING

Provides information or instructions that the reader should follow in order to avoid personal injury or fatality.

CAUTION

Provides information or instructions that the reader should follow in order to avoid a service failure or damage to the system.

CHECKPOINT

Provides the operator with checkpoints for stable system operation.

NOTE

Indicates additional information as a reference.

Reference

OfficeServ 7200 General Description Guide

The OfficeServ 7200 System Description provides an overview of the OfficeServ 7200 system and describes system data required to understand this system such as hardware configuration, specifications, and features.

OfficeServ 7200 Installation Manual

The OfficeServ 7200 Installation Manual describes conditions for installation and the methods of installing, maintaining and operating the system.

OfficeServ 7200 Call Server Programming Manual

The OfficeServ 7200 Call Server Programming Manual describes the method of using the Man Machine Communication(MMC) program that changes system settings by using phones.

OfficeServ 7200 Feature Server User's Manual

The OfficeServ 7200 Feature Server User's Manual introduces Feature Server, which is OfficeServ 7200 application software and describes installation procedures and the method of using the system.

OfficeServ 7200 Data Server User's Manual

The OfficeServ 7200 Data Server User's Manual introduces Data Server, which is OfficeServ 7200 application software and describes installation procedures and the method of using the system.

Revision History

EDITION	DATE OF ISSUE	REMARKS
00	04. 2004.	Original
01	08. 2005	8HYB → 8 COMBO modified 16DLI → 16DLI2 modified System capacity edited (4BRI added) Contents of 16MWSLI added Contents of LIM-P added Component Layout modified Part List modified

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SAFETY CONCERNS

For product safety and correct operation, the following information must be given to the operator/user and shall be read before the installation and operation.

Symbols

Caution

Indication of a general caution

Restriction

Indication for prohibiting an action for a product

Instruction

Indication for commanding a specifically required action

WARNING

Caution Before Repairing a Product

Disconnect cables before repairing a product. This may cause fire or an electric shock.

CAUTION

Caution After Repairing a Product

Metals should not be inserted into a product after repair. Unless foreign substance is not removed, it may cause fire or broken parts.

Using Standard Parts When Repairing a Product

If non-standard parts are used, the product might not operate properly.

Caution Against Assembly

Connects all connectors and screws for assembly after repairing the product to prevent a gap between the housing and base.

Caution Against Using the SmartMedia Card

Only the SmartMedia card supplied along with the system should be used. If another product is used and the system has an error, Samsung Electronics shall not be responsible for the consequence and shall not provide after-sales services.

Caution when the PC is connected to the target board

When PC and the target board are connected, the power should be off. If the connection is made while the power is supplied, the parallel port or target board of PC can be damaged.

Caution Against Keeping Boards

Note that boards should not be put at areas where metals or conductive materials exist.

Caution Against Using the KDB-D/KDB-S

The KDB-D/KDB-S can be used for only a digital phone connected to the 8DLI board. The KDB-D/KDB-S cannot be used for a digital phone connected to the 16DLI2 board.

Caution Against Handling Electric Devices

Wear a strap for preventing static electricity to prevent parts from being damaged.

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CHAPTER 1. System Overview

This chapter provides an overview of the characteristics and major features of OfficeServ 7200 system, system and slot configurations, and system specifications.

1.1 Major Features

The OfficeServ 7200 is a product for communications, which is the most suitable for small offices where less than 50 subscriber lines are used and provides voice, data, and Internet functions. The major features of the OfficeServ 7200 system are as follows:

Cutting-Edge Digital Switching System

The OfficeServ 7200 uses state-of-the-art technologies such as VoIP or LAN to connect a variety of multimedia devices at offices where data communications or Internet is used. Also, the OfficeServ 7200 is an integrated communications device that can be used as a phone system or PABX.

Expandable Line Capacity

The OfficeServ 7200 is classified into basic cabinet and expanded cabinet according to line capacity. The basic cabinet supports up to 80 lines. If the basic cabinet inter-works with the expanded cabinet, it can support up to 160 lines.

Integrated Communication Environment

The OfficeServ 7200 provides data transfer services in LAN or WAN as well as voice call services so that the users can make communications conveniently by using integrated(wire and wireless) platform(e.g., phones, PCs, servers, wireless phones, peripherals).

Next-Generation Platform

The OfficeServ 7200 provides IP solutions where the features of a mail server, Session Initiation Protocol(SIP) server, and Voice over IP Unified Messaging Service(VoIP UMS) are integrated through the IP-based Feature Server.
The OfficeServ 7200 Feature Server operates on the Linux platform and can be expanded continuously in the future.

High Quality Voice IP Phone

The OfficeServ 7200 differentiates the priority of data or voice packets from the grouping of data or voice packets to ensure Quality of Service(QoS) for voice calls.

- Layer 2 QoS: Priority Processing(802.1p), VLAN(802.1q)
- Layer 3 QoS: Class Based Queuing(CBQ), RTP Priority Queuing, On-Demand Bandwidth for Wide Area Network(WAN).

WAN/LAN Function

The WAN and LAN interface modules are installed into the OfficeServ 7200. Without a separate data device, data of 10/100 BASE-T interface can be exchanged on the external Internet network and internal Intranet network.

Text-To Speech (TTS) Response

The OfficeServ 7200 converts text messages from e-mails to voices and lets the user listen to the voices over the phone. This is called voice recognition response function.

Mail Server and Instant Message Processing

The OfficeServ 7200 sends or receives messages to or from the e-mail server that integrates voice messages and e-mails for customized conversion and re-forwarding.

Q-Sig Networking Support

The OfficeServ 7200 supports the Q-Sig networking so that call transfer, Do Not Disturb(DND), Call Completion to Busy Subscriber(CCBS), Call Completion on No Reply(CCNR) can be performed between the OfficeServ 7200 systems or between the OfficeServ 7200 system and iDCS 500 system irrespective of the physical location of the system.

Modularity Applied

Both of the hardware and software of the OfficeServ 7200 are designed in modularity. C.O. line or subscriber lines can be easily expanded or new software can be installed to add functions even during system operation depending on users' needs.

Terminals and Additional Devices Integrated

The OfficeServ 7200 connects terminals and additional devices to provide an integrated environment for efficient and various services.

Compatibility With the Existing System Ensured

The OfficeServ 7200 uses the MCP to provide the IP UMS, wireless LAN, and perfect media gateway functions. Also, the digital phone of the existing phone system can be connected with the IP phone in the cabinet of the OfficeServ 7200, which can be inter-worked with the iDCS 500 system.

New Technologies Applied

The digital switching system of the OfficeServ 7200 has been upgraded by using the new technologies below:

- Router(WIM)
- 16-port LAN switch(LIM)
- Security functions such as VPN, Firewall, and IDS
- VoIP QoS
- IP-based UMS
- E-mail server
- SIP server
- VDSL DSLAM
- Voice over Internet Protocol(VoIP)
- LAN port of 10/100 Mbps provided
- Q-Sig networking support
- Various high-integrated boards(8COMBO, WIM, 4DSL) support
- Powerful system diagnosis and maintenance program provided
- New terminals(large LCD digital phone, IP phone, wireless LAN phone) supported

Easy System Setup

The OfficeServ 7200 system is designed in modularity so that hardware such as boards or cabinets or software can be installed easily. C.O. line boards, station boards, ISDN boards, and boards for special services can be mounted on the universal slot of the cabinet. System programming can be made through the terminal or PC connected to the system or system configuration can be easily changed depending on users' needs.

Easy System Expansion

The OfficeServ 7200 system allows the user to add new features.

- The system can be configured with up to two cabinets.
- In the 8DLI board, KDB-S or KDB-D is installed into a digital phone without separate wiring to expand a single line easily.

Caution Against Using the KDB-D/KDB-S

The KDB-D/KDB-S can be used for only a digital phone connected to the 8DLI board. The KDB-D/KDB-S cannot be used for a digital phone connected to the 16DLI2 board.

Convenient Maintenance

System functions can be used conveniently through the following:

- PC for MMC Programming(PCMMC)
  The PCMMC is used for maintaining the OfficeServ 7200 system. The PCMMC allows the user to retrieve, change, or control system data by using the program menus.
- Web Management Program
  The web management program allows the user to maintain the OfficeServ 7200 system conveniently. Use the web menus to retrieve, change, or control system data.

1.2 System Configuration

This section provides an overview of the front and back of the OfficeServ 7200 cabinet and slot configuration.

1.2.1 Front Side

The OfficeServ 7200 is configured with two cabinets(default/expanded cabinet) installed into a rack of 19-inch width and an external functional server. The MCP board is installed into the basic cabinet to manage the entire OfficeServ 7200 and perform switching, process calls, or manage subscriber terminals. The LCP board is installed into the expanded cabinet to control various line boards and transfer or receive data to or from MCP. In addition, the LCP board is configured with line boards, power, and fan.

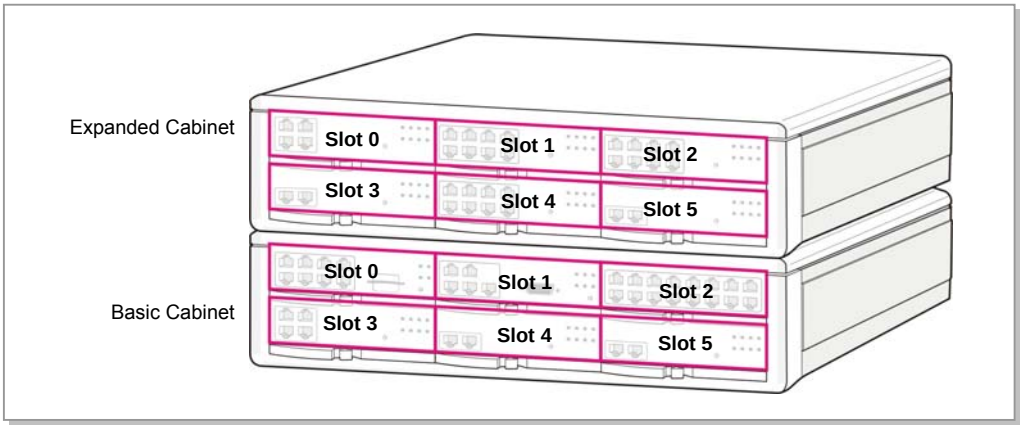

Figure 1.1 Front Side of the OfficeServ 7200 Cabinet

The boards below can be mounted on the slot according to the configuration of the OfficeServ 7200 system:

Cabinet	Slot	Mountable Board
Basic Cabinet (OfficeServ Access)	Slot 0	Only MCP board
	Slot 1	Boards except for MCP, LCP, TEPRI, and LIM
	Slot 2	Boards except for MCP, LCP, TEPRI, and WIM
	Slot 3, 4, 5	Boards except for MCP, LCP, and WIM
Expanded Cabinet (OfficeServ Expansion)	Slot 0	Only LCP board
	Slot 1, 2	Boards except for MCP, LCP, TEPRI, and LIM
	Slot 3	Boards except for MCP, LCP, and WIM
	Slot 4, 5	Boards except for MCP, LCP, TEPRI, and WIM

CHECK

Checking the Board Location

The WIM board can be mounted on Slot 1 of the default and expanded cabinets. The TEPRI board can be mounted on Slots 3, 4 and 5 of the basic cabinet and Slot 3 of the expanded cabinet. The LIM board can be mounted on Slot 1 of the default/expanded cabinet.

NOTE

Managed LIM Function

The Managed LIM is controlled by the WIM board. The Managed LIM provides expanded functions on Layer2 QoS management such as 802.1p(packet priority), 802.1q(VLAN), IGMP Snooping as well as general Layer 2 switching.

NOTE

Blank Board

The Blank board is a dummy board that functions as a partition that prevents foreign substance from entering into the system when a board is not mounted on the universal slot.

1.2.2 Back Side

The back side of the OfficeServ 7200 system is shown in the figure below:

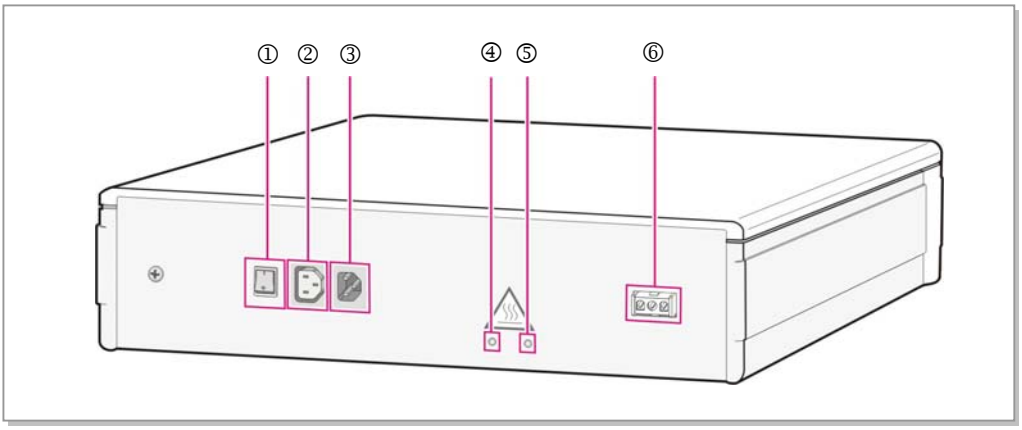

Figure 1.2 Back Side of the OfficeServ 7200 Cabinet

Table 1.1 Components on the Back Side of the Cabinet

Component	Description
① Power Switch	Power on/off the OfficeServ 7200.
② Power Supply Connector Between the Basic cabinet and Expanded Cabinet	This connector supplies the power supplied to the basic cabinet to the expanded cabinet.
③ Power Input/Output Connector	This connector connects power cables configured with three inlets/outlets.
④ AC LED	This LED turns on once the AC power is supplied.
⑤ DC LED	This LED turns on once the DC power is supplied.
⑥ Socket for Backup	This socket connects external batteries.

1.3 System Specifications

This section describes the capacity of the OfficeServ 7200, signal specification, ring and tone, compatible boards and terminals, and device specifications.

1.3.1 System Capacity

Up to 160 lines can be installed and operate in the OfficeServ 7200 system. The ratio of station to C.O. line can be adjusted to the limit of capacity in accordance with users' needs. The table below shows the maximum line capacity that can be accommodated by the OfficeServ 7200 system.

Table 1.2 Entire Line Capacity

System Configuration	Maximum Accommodation Line
Basic cabinet	E1: 90 4BRI: 20 8TRK: 40 Station: 80 Maximum: 122(voice) LAN switch: 80 VDSL: 20 WLAN: 120
Basic cabinet + Expanded Cabinet	E1: 120 4BRI: 40 8TRK: 80 Station: 96 Maximum: 216(voice) LAN switch: 160 VDSL: 40 WLAN: 120

C.O. Line Capacity

The maximum C.O. line capacity that can be accommodated according to the configuration of the OfficeServ 7200 system is as follows:

Table 1.3 C.O. Line Capacity

System Configuration	Analog	Digital			
	LOOP TRK	BRI	T1 TRK	E1 TRK	PRI TRK
Basic cabinet	40	20	72	90	T1: 72 E1: 90
Basic cabinet + Expanded Cabinet	80	40	96	120	T1: 96 E1: 120

Station Capacity

The maximum station capacity that can accommodate regular and digital phones according to the configuration of the OfficeServ 7200 system is as follows:

Table 1.4 Station Capacity

System Configuration	Regular Phone	Digital Phone
Basic cabinet	80	80(DS-5012L: 24)
Basic cabinet + Expanded Cabinet	160	160(DS-5012L: 48)

Channel Number

The numbers of channels in each slot, CID Receivers, and DTMF Receivers in the OfficeServ 7200 system are as follows:

Table 1.5 Channel Capacity in Each Slot

Category	Slot	Channel Number
Basic cabinet	Slots 1, 2	16
	Slots 3, 4, 5	32
Expanded Cabinet	Slots 1, 2, 4, 5	16
	Slot 3	32
CID Receiver	-	14
DTMF Receiver	-	4(12: optional)

1.3.2 Electric Specifications

Signal processing protocol refers to the methods of access signalling between the C.O. line/station and system and of providing status data.

Loop Start C.O. line Signalling

On-hook and off-hook status is controlled by electric current flows. The closed loop trunk circuit or standard 2500 set loop is used.

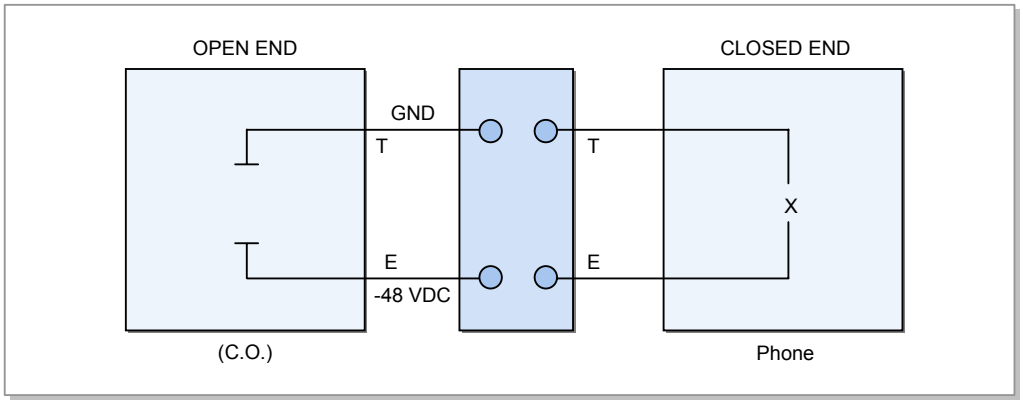

Figure 1.3 C.O. line Loop Start Signalling

T1 C.O. line Signalling

The electric characteristics of the T1 conform to the ITU G.703 and G.704 standards.

Table 1.6 Electric Characteristics of the T1

Item	Specification
Transmission Speed	1544 kbit/s ± 50 ppm
Code	Alternative Marking Inversion(AMI) or B8ZS
Pulse Type	Mask characteristics meet the ITU G.703.
Signalling Specification/Method	The ITU G.703 and G.704 standards are met.
Transmission Media	A twisted pair
Load Resistance	100 Ω
Display(Pulse) Nominal Peak Voltage	3.00 V

E1 C.O. line Signalling

The electric characteristics of the E1 conform to the ITU G.703 and G.704 standards.

Table 1.7 Electric Characteristics of the E1

Item	Specification
Transmission Speed	2048 kbit/s ± 50 ppm
Code	High Density Bipolar of Order 3(HDB3)
Pulse Type	Regular square wave: Valid signals are displayed in accordance with the mask(G.703) irrespective of codes.
Signalling Specification/ Method	The ITU G.703 and G.704 standards are met.
Nominal Value and Pulse	244ns
Jitter of the Input/Output Terminal	The ITU G.823 standard is met.
Transmission Media	A twisted pair
Load Resistance	120 Ω
Display(Pulse) Nominal Peak Voltage	3.00 V
Blank(Non-Pulse) Peak Voltage	0 ± 0.300 V

ISDN Interface Transmittance Signalling

The electric characteristics of the ISDN(BRI) interface conform to the ITU I.430 and ETS 300 012 standards.

Table 1.8 Electric Characteristics of the BRI C.O. line

Item	Specification
Transmission Speed	192 kbit/s ± 100 ppm
Code	AMI
Pulse Type	The mask characteristics meet the ITU I.403.
Transmission Media	A twisted pair
Load Resistance	120 Ω
Display(Pulse) Nominal Peak Voltage	2.75 V

The electric characteristics of the ISDN(PRI) interface conform to the ITU I.431 and ETS 300 011 standards.

Table 1.9 Electric Characteristics of the PRI C.O. line

Item	Specification
Transmission Speed	2048 kbits/s ± 50 ppm
Code	High Density Bipolar of Order 3(HDB3)
Pulse Type	The mask characteristics meet the ITU I.403.
Nominal Value and Pulse	244 ns
Transmission Media	A twisted pair
Load Resistance	120 Ω
Display(Pulse) Nominal Peak Voltage	3.00 V
Blank(Non-Pulse) Peak Voltage	0 ±0.300 V

The electric characteristics of the Digital Line Interface(DLI) are as follows:

Table 1.10 Electric Characteristics of the DLI

Item	Specification
Transmission Speed	144 kbits/s
Code	AMI
Pulse Type	Typical AMI Waveform

Electric Characteristics of the WIM Interface

The electric characteristics of the V.35 interface are as follows:

Table 1.11 Electric Characteristics of the WIM Interface (V.35 Interface)

Item	Specification
Maximum Transmission Speed	10 Mbits/s
Transmission Code	V.35 driver
Number of Transmission Lines	18
Characteristic Resistance	100 Ω
Display(Pulse) Nominal Peak Voltage	±2 V
Input Differential Threshold	±80 mV

The electric characteristics of the RS-232C(V.28) interface are as follows:

Table 1.12 Electric Characteristics of the WIM Interface (RS-232C Interface)

Item	Specification
Maximum Transmission Speed	230 kbits/s
Transmission Code	V.28 driver
Number of Transmission Lines	14
Display(Pulse) Nominal Peak Voltage	±15 V
Input Threshold	+1.21.7 V

The electric characteristics of the RS-449(V.11) interface are as follows:

Table 1.13 Electric Characteristics of the WIM Interface (RS-499 Interface)

Item	Specification
Maximum Transmission Speed	10 Mbits/s
Transmission Code	V.11 driver
Number of Transmission Lines	24
Characteristic Resistance	100 Ω
Display(Pulse) Nominal Peak Voltage	±10 V
Input Differential Threshold	±0.3 V

LAN Signalling

The 10 BASE-T conforms to the IEEE802.3 standard and its electric characteristics are as follows:

Table 1.14 Electric Characteristics of the LAN Interface (10 BASE-T)

Item	Specification
Transmission Speed	10 Mbits/s ±50 ppm
Transmission Code	Manchester coding
Access Control Method	CSMA/CD
Transmission Media	UTP CAT3, CAT4, CAT5, STP
Number of UTP pairs	2
Characteristic Resistance	100 Ω
Cable Thickness	Radius 0.51 mm(24 AWG), Outer radius 5 mm

The 10 BASE-T conforms to the IEEE802.3u standard and its electric characteristics are as follows:

Table 1.15 Electric Characteristics of the LAN Interface (10 BASE-T)

Item	Specification
Transmission Speed	100 Mbit/s ± 50 ppm
Transmission Code	4B/5B+MLT-3v(4 bit/5bit) converts data of 4 bits into 5 bits in a physical layer and encodes the data. Multi Level Transmission-3(MLT-3) encodes transferring data into three levels(high, medium, low).
Access Control Method	CSMA/CD
Transmission Media	UTP CAT5, STP
Number of UTP Pairs	2
Characteristic Resistance	100 Ω
Cable Thickness	Radius 0.51 mm(24 AWG), Outer radius 6 mm

UTP Cable Type

UTP cables are classified into straight-through UTP cable and crossover UTP cable. The Straight-through UTP cable is used for connecting the LIM module to other modules(MCP, MGI, WIM, 4DSL) of the OfficeServ 7200 system. The crossover UTP cable is used for connecting a LIM module to another LIM module.

Dial Pulse Station Signalling

- Rate: 10 PPS(Pulse Per Second)
- Make/Break(M/B) ratio -33 %: 66 %(adjustable based on software)
- Minimum time between digits: 20 ms(adjustable based on software)

DTMF Push Button Dialling Station Signalling

The DTMF signal processing conforms to the ITU standard for processing the transmission of digital phone signals to the C.O. line and processing terminating/originating phone signals from the C.O. line.

VDSL Signalling

The electric characteristics of the VDSL are as follows:

Table 1.16 Electric Characteristics of the VDSL Interface

Item	Specification
Transmission Speed	1~16 Mbps
Modulation Code	Quadrate Amplitude Modulation(QAM)
Error Detection	Reed Solomon Coding
Transmission Distance	1.2 km
Transmission Media	A twisted pair
Frequency	138~12 MHz
Link Speed	Down link: 47 Mbps(300 m), Up link: 8 Mbps(300 m)

Transmission Characteristics

- Attenuation volume
  - Attenuation volume between subscribers: Less than 6 dB
  - Attenuation volume between a subscriber and local trunk: Less than 0.5 dB
- Line characteristic Resistance: 600 Ω
- Valuation Noise: Less than -65 dBm
- Crosstalk attenuation volume: Less than -68 dBm
- Frequency bandwidth: 300 to 3400 Hz
- Insulation resistance: More than 1 MΩ

Line Conditions

- Installation distance
  - Regular phone: Up to 1 km(when AWG #24 cable is used)
  - Digital phone: Up to 400 m(when AWG #24 cable is used)
  - Door phone: Up to 400 m(when AWG #24 cable is used)
  - Button Expansion Box(AOM): Up to 400 m(when AWG #24 cable is used)
- Leakage resistance between lines: More than 20 kΩ
- Leakage resistance between earths: More than 20 kΩ

1.3.3 Power Specifications

The OfficeServ 7200 system operates by the AC input power or battery power, and supplies the backup power of -48 V5 V, +5 V, +3.3 V, or +12 V56 V to the system cabinet.

Table 1.17 Specification of the Power Supply Board

Category	Power Specification
Input Conditions	AC 110 V/220 V
Output Conditions	-48 V DC, 2.2 A +5 V DC, 8.0 A -5 V DC, 1.0 A +3.3 V DC, 10 A +12 V DC, 0.4 A -56 V DC, 0.4 A(for backup)

1.3.4 Ring and Tone

Ring Cycle

The OfficeServ 7200 system provides a C.O. line ring, station ring, door ring, and alarm ring. On/off cycles of each ring type are as follows:

Table 1.18 System Ring Cycle

Ring	ON/OFF Cycle
C.O. line Ring	1000/2000 ms
Station Ring	400/200/400/3000 ms
Door Ring	400/200/400/200/400/2000 ms
Alarm Ring	400/200/400/200/400/200/400/1000 ms


NOTE

Ring ON/OFF Cycle

An ON/OFF cycle can be adjusted by changing the database value of the system.

Tone

The ring signal output voltage and frequency of the OfficeServ 7200 system are as follows:

- Output voltage: 75 V
- Frequency: 20/25 Hz (Selectable)

The OfficeServ 7200 provides tones to guide the user through the process of functional operation and give feedback to the user. The ON/OFF cycles of each tone type are as follows:

Table 1.19 System Tone Cycle

Tone	ON/OFF Cycle
Origination	1000/250 ms
Busy	500/500 ms
DND	250/250 ms
Ring Back	1000/2000 ms
Call Park	Continuous
Check/Caution/Forced Override	50/50 ms
Call Back/Hold	500/3500 ms
Connection	1000/2000 ms
Error/Unobtainable Tone	250/250 ms
Message Park Tone of Regular Phones	Continuous


NOTE

Tone ON/OFF Cycle

An ON/OFF cycle can be adjusted by changing a database value.

1.3.5 Available Terminals

The OfficeServ 7200 can be connected to the terminals below:

Table 1.20 OfficeServ 7200 Compatible Terminals

Type	Terminal
DS-5000 Series Digital Phone	DS-5014D, DS-5021D, DS-5038D, DS-5012L
ITP-5000 Series IP Phone	ITP-5014D, ITP-5021D, ITP-5012L
Wireless LAN(WLAN)	WIP-5000M(mobile phone), WBS24(Access Point device)
DSS	DS-64B
Digital Phone	DS-4000 series, DS-24E, DS-24D series, DS-2024E, DS-2024E, DS-2021E, DS-3020 series
AOM	DS-5064BAOM, DS-4014AOM, DS-4064AOM, DS-24SE AOM, DS-2024EAOM, DS-3020SAOM - Up to 16 AOMs can inter-work with the 16DLI2 of the OfficeServ 7200 system. Up to 8 AOMs with both of the 8DLI and 8COMBO.
Others	KDB-S, KDB-D, DPIM, door phone

Compatible Terminals

All compatible terminals of the iDCS 500 Premium system can be used for the OfficeServ 7200. For compatible terminals, contact the system operator because a compatible terminal is subject to change according to system settings.

1.3.6 Device Specifications

The OfficeServ 7200 is configured with two cabinets with the specification below:

- For the system configured with one cabinet(basic cabinet):
  440(W) × 123.8(H) × 410(D) mm
- For the system configured with two cabinets(basic cabinet + expanded cabinet):
  440(W) × 247.6(H) × 410(D) mm

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CHAPTER 2. Circuit Description

This chapter describes the circuit configuration and major features of each component of the OfficeServ 7200 system.

2.1 System Architecture

This section describes the physical architecture and communication architecture between the cabinets of the OfficeServ 7200 system.

2.1.1 Block Diagram

The physical architecture of the OfficeServ 7200 system is shown in the figure below:

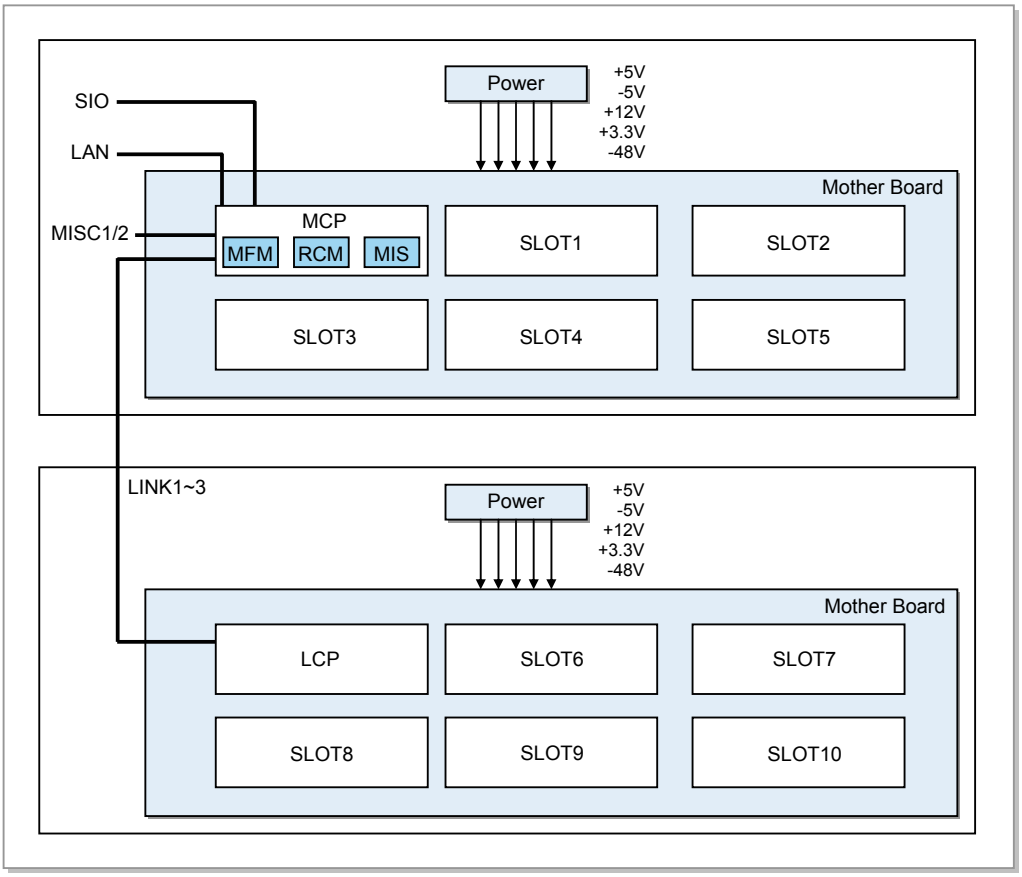

Figure 2.1 Physical Architecture of the OfficeServ 7200 System

The communication architecture between the cabinets of the OfficeServ 7200 system is shown in the figure below:

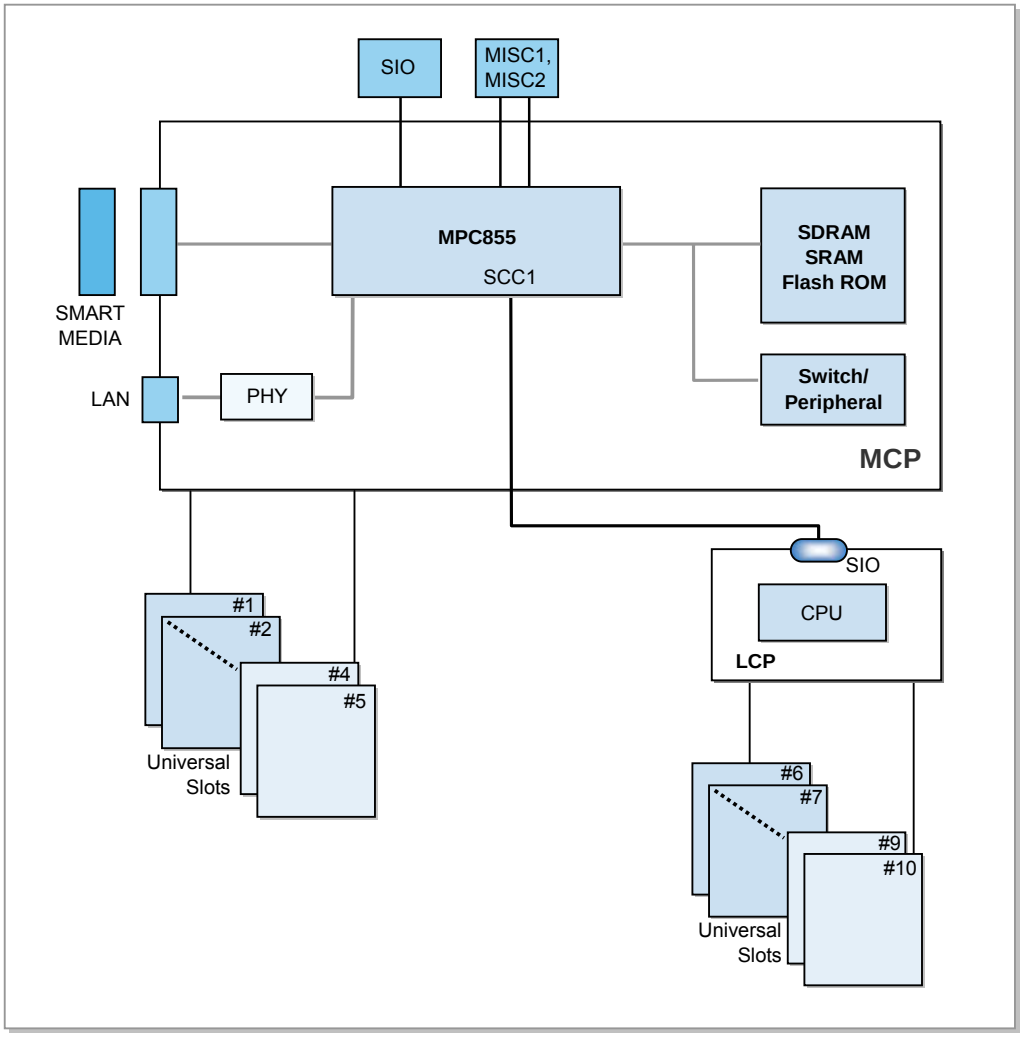

Figure 2.2 Physical Architecture Between the Cabinets of the OfficeServ 7200 System

2.1.2 Features of the Communication System Between Modules

The features of the communication system between the modules installed into the OfficeServ 7200 system are as follows:

SmartMedia Card Applied

- The CPU and SmartMedia Card of the MCP board are connected in a 8 bit parallel bus.
- Since the standard SmartMedia interface is used in the OfficeServ 7200 system, the SmartMedia card can be easily upgraded to a higher-capacity Smart Card.
- The power of 3.3 V is used for the SmartMedia card of the OfficeServ 7200.
- The SmartMedia card can be mounted on the front panel of the MCP board.

Caution Against Using the SmartMedia Card

Only the SmartMedia card supplied along with the system should be used.
If another product is used and the system has an error, Samsung Electronics shall not be responsible for the consequence and shall not provide after-sales services.

CPU Interface

- The CPU, SRAM, and SDRAM of the MCP board are connected in a 32 bit bus.
- One system SIO is provided in the MCP board.

Ethernet Access

By default, Ethernet access can be made.

Use for the SIO Port

A debugger port is supported so that the system engineer can check the system status.

HDLC Communication Protocol

- The frame architecture of the HDLC communication protocol is as follows:
  - Opening Flag
  - Address Field
  - Control Field
  - Information Field
  - Frame Check Code(CRC-CCITT) Field
  - Closing Flag
- HDLC communication signals are converted in a RS-422 method and transmitted for stable operation.

Modularity Applied

Each cabinet operates separately and the operator of a cabinet does not affect that of another cabinet. Even if a cabinet does not operate, another cabinet provides services properly.

2.2 Main Board

The main board receives the power of -48 V, +5.5 V, +3.3 V, or +12 V from the power supply module and distributes the power to each slot. The main board serves as a path for transmitting the bus signals of MCP or LCP, clock signals, or PCM conversion voice signals.

Power Distribution

Each slot of the OfficeServ 7200 receives power from the power supply module installed into the cabinet and distributes the power to each slot.

Slot Mounted

The boards mounted on each slot receive power and signals through the 30-pin connector from the main board and exchanges data with other boards.

2.3 Power Supply Module

The power supply module supplies power to the cabinet of the OfficeServ 7200.
This module operates by AC input power or battery power, and supplies the power of -48.5 V, +5 V, +3.3 V, or +12 V to the cabinet.
If the module operates the system by receiving AC power, the module supplies the power of 0.4A for battery charge when there is no remaining current due to battery discharge.

2.4 Controller Board

A controller board that controls the entire system operation, basic cabinet, and expanded cabinet must be mounted on the control board mounting slot of the OfficeServ 7200 system. The controller boards below are used in the OfficeServ 7200 system:

- MCP board
- LCP board

2.4.1 MCP Board

The MCP board controls the entire operation of the OfficeServ 7200 system. The MCP board is mounted on the MCP dedicated slot of the basic cabinet.

2.4.1.1 Block Diagram

The block diagram of the MCP board is shown in the figure below:

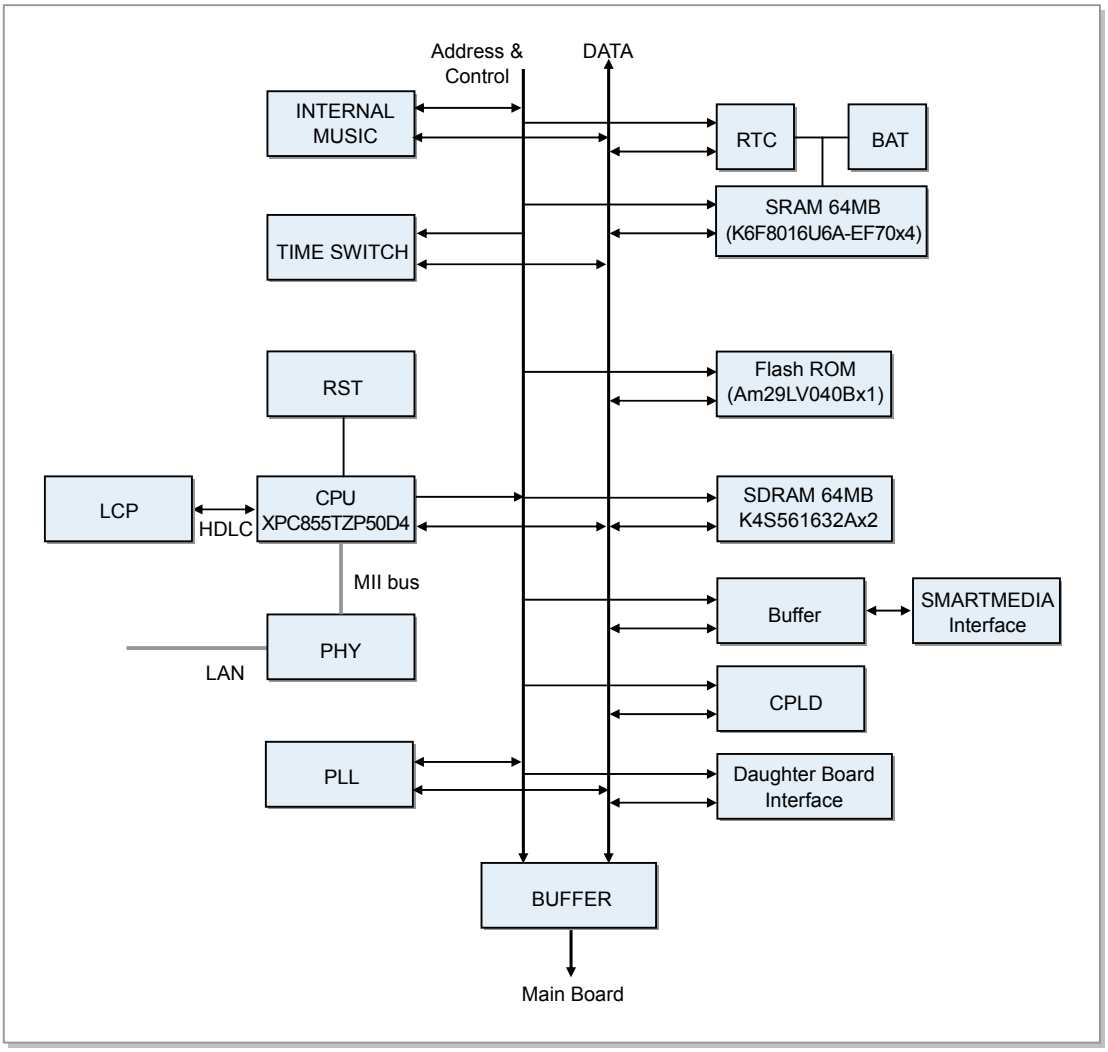

Figure 2.3 Block Diagram of the MCP Board

2.4.1.2 Major Features

The major features of the MCP board are as follows:

CPU (XPC855T)

This is a main processor for which one XPC855T of Motorola is used. This CPU is a data bus and operates in 32 bit mode.

The major specifications of the XPC855T are as follows:

- Embedded Power PC core
- Data cache of 4 Kbytes and Instruction cache of 4 Kbytes
- Memory Management Unit(MMU) support
- 32 bit dynamic bus controller
- 32 bit address lines
- Memory controller(8 banks)
- Four 16 bit timers and two 32 bit timers
- System integration unit installed
- Eight external interrupt and 23 internal interrupt
- On-chip 16 x 16 Multiply Accumulate Controller
- 4 baud rate Generator
- One SCC where HDLC communications can be made support
- One SMC where asynchronous communications can be made support
- MAC where the LAN of 10/100 Mbps can be made installed

SCC

- SCC1: This operates as a HDLC communication port for exchanging messages with the LCP.
- SMC1: This is a debugger port and is intended for system engineers.

System Clock

The MCP board of 50 MHz is used as the main clock oscillator.

Boot ROM (Flash ROM)

Flash ROM of 512 Kbytes is used as the Boot ROM. The Boot ROM downloads the STARTUP.PRS program(system operation program) required to operate the system from the SmartMedia to the SDRAM. Once the STARTUP.PRS program is executed, the Boot ROM downloads the main program from the SmartMedia and the system operates properly.

SDRAM

The SDRAM of 64 Mbytes is provided and is configured with two elements of 32 Mbytes. The main program is resident and operates in the SDRAM, and stores the data required for system processing. Also, the time of an access to the SDRAM is set to a short time for the highest-quality system performance.

SRAM

The SRAM of 4 Mbytes is provided and is configured with four elements of 1 Mbytes. The memory backup of the SRAM can be made and the SRAM stores various DB data. Various DB data required for system operation should be always stored in the SmartMedia as well as in the SRAM for safe data archive. Even if the system is damaged fatally from outside, the DB data can be archived safely.

Real Time Clock

The real time clock uses the RTC72423 of Seiko to operate the system.

SmartMedia

The SmartMedia is a NAND flash memory board and is used as the secondary memory device of the OfficeServ 7200. The SmartMedia of 16 Mbytes is currently used. Since the system is accessed in a 8 bit parallel bus method, the SmartMedia can be used without changing hardware even if capacity is expanded(provided that software is required to be changed). The SmartMedia should be always installed into the system for operation.
The board should be wrapped in vinyl used for the shipment of the board.

Internal Music

One channel is provided for the internal music of the system. CODEC supports both of an A-LAW way and U-LAW way and is designed so that the CODEC can operate automatically by hardware logic. To enable music additionally, mount the MIS board and apply external music to the board.

Analog Phase Locked Loop (APLL)

Analog PLL is used in the OfficeServ 7200. The reference clock of 8 kHz is set by software. If the external reference clock source of 8 kHz is not set, the internal clock will be used. The external reference clock of 8 kHz is automatically set in the system. If required, the reference clock might be set to a specific board by the MMC. In this case, set the reference clock to the board slot whose operation is the most stable.

Watch Dog

The Watch Dog restarts the failed system automatically. The Watch Dog is designed to restart the system if the system operates abnormally for a certain time.

Time Switch

The time switch of 256 x 256 channel is used in the MCP board. Three 32-channel slots and two 16-channel slots are provided for the basic cabinet. One 32-channel slot and four 16-channel slots are provided for the expanded cabinet.

Complex Programmable Logic Devices (CPLD)

The CPLD of Lattice is used. The CPLD configures the most of the logics used in the MCP board. The logics can be changed externally by using a PC through the JTAG bus.

Optional Board (Daughter Board)

Three optional boards(MFM, RCM, MIS) are mounted on the given location of the MCP.

LAN Interface

The MCP board can be connected to the LAN without a separate LAN board. 10/100 PHY MAC is installed into the CPU, and the maximum connection speed is 100 Mbps. Once the system is connected to the LAN, the system detects speed automatically and operates.

Universal Asynchronous Receiver & Transmitter (UART)

The UART enables asynchronous parallel communications and is used as a system input/output port(SMDR or PCMMC). The UART is connected to outside through the RJ-45 connector on the front of the cabinet, and the connection speed is 19.2 kbps.

2.4.2 LCP Board

The LCP board controls the universal boards mounted on the expanded cabinet and use the High-level Data Link Control(HDLC) protocol to make an Inter Process Communication (IPC) with the MCP board.

2.4.2.1 Block Diagram

The block diagram of the LCP board is shown in the figure below:

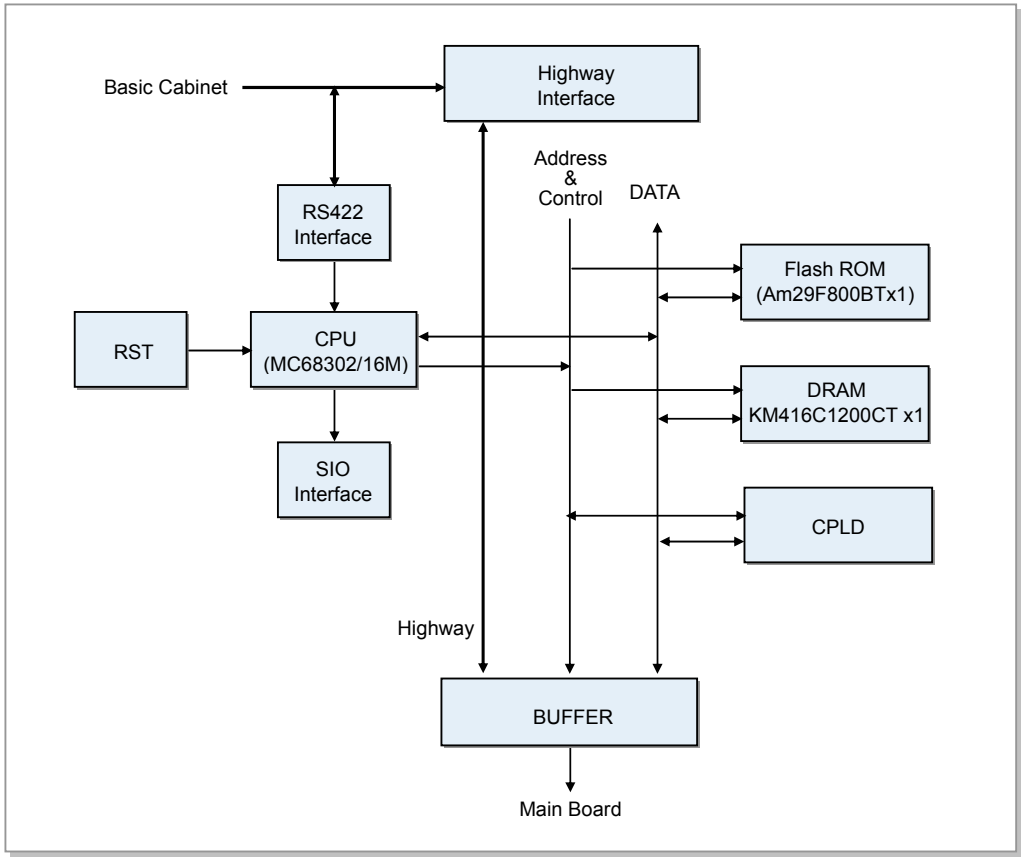

Figure 2.4 Block Diagram of the LCP Board

2.4.2.2 Major Features

The major features of the LCP board are described below:

Boot ROM (Flash ROM)

The flash ROM of 1 Mbytes is used for the Boot ROM. The Boot ROM is a memory where a program for system starts and operation is saved. The saved program can be upgraded by using the SmartMedia. To upgrade a program, save the program to be downloaded into the SmartMedia and install the program into the MCP board. Use a phone to upgrade the program of the LCP board.

DRAM

The DRAM of the LCP board is 2 Mbytes. Once the system operates, the program of the Boot ROM operates and the main program saved in the Boot ROM is moved to the DRAM. Then, a program is executed in the DRAM.

PLD

Logics such as decoding, DTACK Generation, and DRAM Controller are embedded into Programmable Logic Device(PLD) of the LCP board.

RS-422 Interface

Important signals from the signals transmitted between the cabinets are transmitted or received in a RS-422 method.

- Receiver: Clock for system resetting, HDLC receipt, or HDLC communications
- Sender: Reference clock of 8 kHz, HDLC transmittance

2.5 Universal Board

Boards that provide a variety of services can be mounted on the universal slot of the OfficeServ 7200 system. The universal board is classified into a C.O. line board, station board, service board, and data service board depending on provided services.

Table 2.1 Types of the Universal Board

Board Type	Board Name
C.O. line Board	8TRK, TEPRI, 4BRI
Station Board	8SLI, 16SLI2, 16MWSLI, 8DLI, 16DLI2, 8COMBO
Service Board	MGI, 4WLI
Data Service Board	WIM, LIM, 4DSL,LIM-P

2.5.1 8TRK Board

The 8TRK board is an 8-port C.O. line board and is mounted on the universal slot of the cabinet. Regular C.O. lines, PBXs, or regular phone lines of another phone system can be connected to each port. Real driver, Ring detection, TSAC, and CODEC control are performed by the TMC ASIC.

2.5.1.1 Block Diagram

The block diagram of the 8TRK board is shown in the figure below:

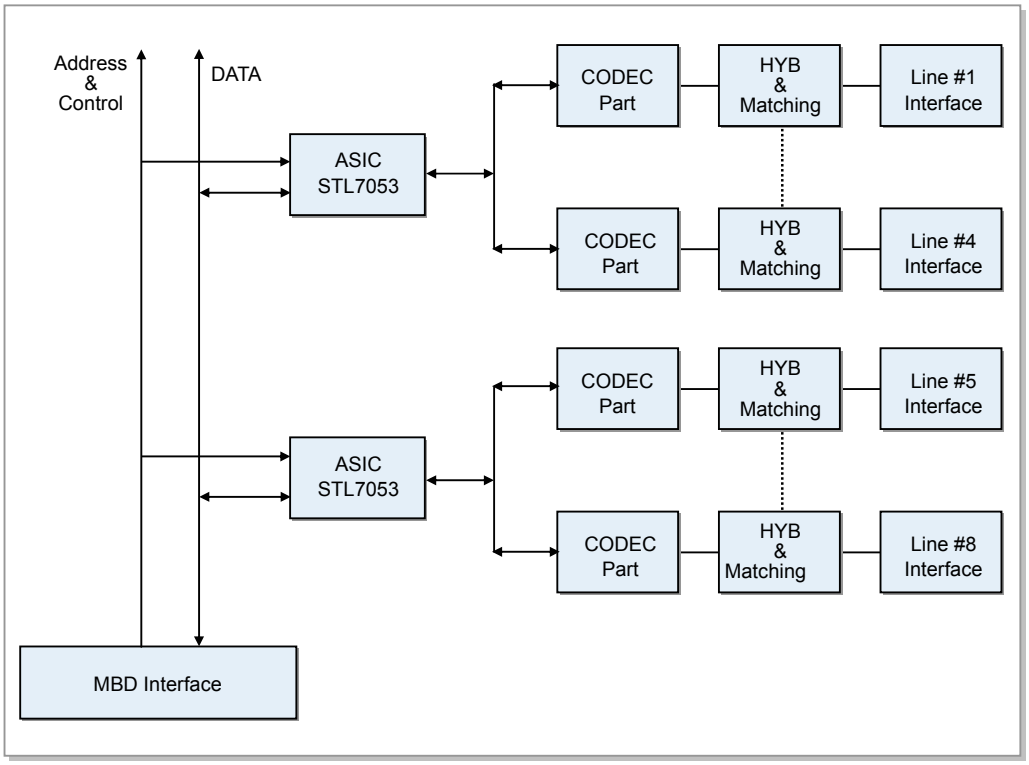

Figure 2.5 Block Diagram of the 8TRK Board

2.5.1.2 Major Features

The major features of the 8TRK board are described below:

Configuration

The detail block diagram of the C.O. line interface circuits is shown in the figure below:

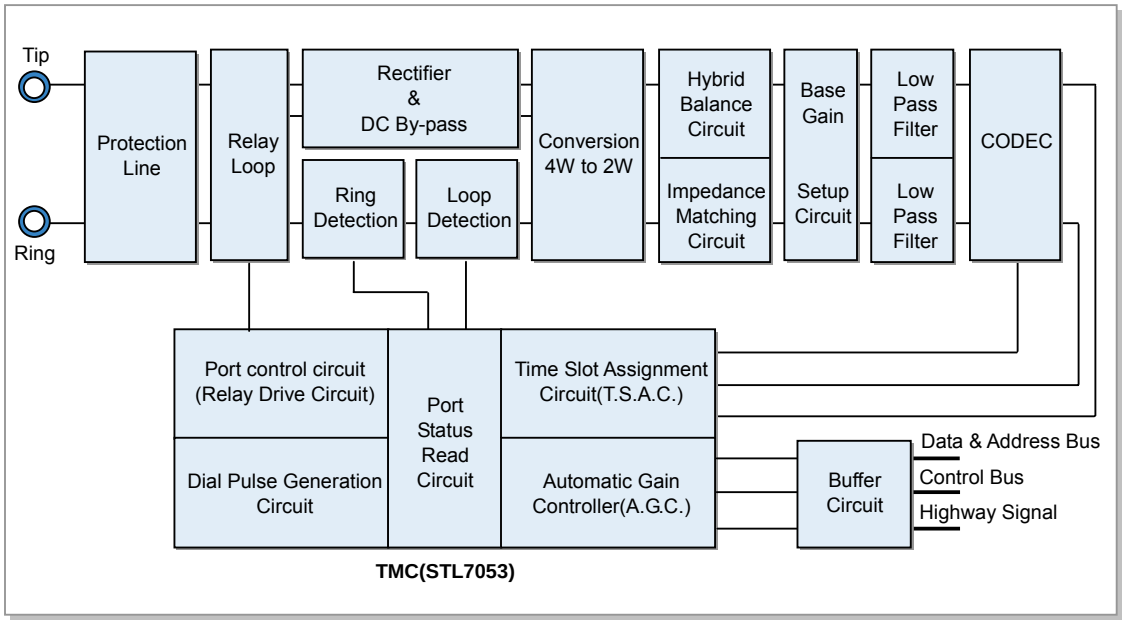

Figure 2.6 Block Diagram of the C.O. line Interface Circuits

The C.O. line interface circuits are configured with DC current by-pass circuit, Matching Trans, Balance Network, hybrid circuit, Channel Assign Timing Control, PCM CODEC, and Digital Gain Circuit Logic to exchange voice frequencies(300~3400 Hz) with C.O. line. Also, a separate DC by-pass circuit is configured to miniaturize the Trans for a voice path.

The HOS and Ring Signal Detection circuit are installed into the C.O. line interface circuits and the TSAC Enable signal generated from the inside of the TMC is used to control the highway buffer(74ABT125) of the Time Slot Assign circuit. The hybrid circuit for impedance matching is designed to accommodate the line impedance of 600 Ω.

Voice Sending/Receiving Part

The tip lid and ring lid perform surge protection to prevent against high-voltage supply. Also, the third protection circuit is configured with zener diode inside of the circuit for impedance matching in the c The two-way voices sent from the C.O. line are separated from line loop feeding power and entered to the Trans for voice signals via the coupling capacitor. The voice signals transmitted to the second stage of the Trans are divided into the Tx path and Rx path in the impedance matching & balance circuit. Also, the impedance is set to 600 Ω in impedance matching and balance circuit of low frequency and the low frequency compensation function is provided. The voice sending/receiving part is designed in a long loop impedance matching method.

The converted Tx voice signal is converted into digital coding by CODEC through Pulse Code Modulation(PCM) and a channel is allocated to the voice signal. Then, the signal is transmitted to the time switch via the PCM highway and then the Digital Gain Control circuit.

The Rx PCM data, which are Rx voice signals, are converted into analog signals by CODEC. The converted voice signals are transmitted to the balancing circuit through the impedance matching circuit and only Rx voice signals are transmitted to the second stage of the Trans again and then to the line feeding power.
This signal matches with the voice path of the C.O. line interface. Voice signals are transmitted to a different path.

Ring Reception Detection Circuit

The ring reception signals are transmitted from the Central Office(C.O.) when the C.O. line interface hooks on. Ring signals cut off DC voltage through the poly-capacitor of 0.47 uF/250 V via the normal contact of the loop relay and pass only ring signals of higher than a certain level by passing bridge diode. The signals are entered to the photo-coupler through resistance and generates ring detection signals. In a normal status, 'L' signals are generated. When rings are transmitted, 'H' signals are generated.

DC Current By-Pass Circuit

The DC current by-pass circuit occupies DC loop from C.O. line circuits and passes AC signals. The circuit is configured with hybrid IC to minimize the occupied area. If both ends of tip and ring create loop at the voltage of -48 V, a DC path will be created and resistance will be set to 33 Ω to meet the specified specification, which is 30 mA/6 V.
In addition, Hook-Off Sensing(HOS) output, which is a loop detection function, is supplied to the system by the photo-coupler until the loop is occupied. 'H', which is general status of HOS, is changed to 'L'. Then, this is reversed and 'L' is transmitted to the CPU data bus.

2.5.2 TEPRI Board

The TEPRI board connects the E1 or ISDN PRI with the OfficeServ 7200 system. This board can be mounted on only slot 3, 4, and 5 of the basic cabinet and slot 3 of the expanded cabinet, which support 32 channels from the universal slots of each cabinet.

2.5.2.1 Block Diagram

The block diagram of the TEPRI board is shown in the figure below:

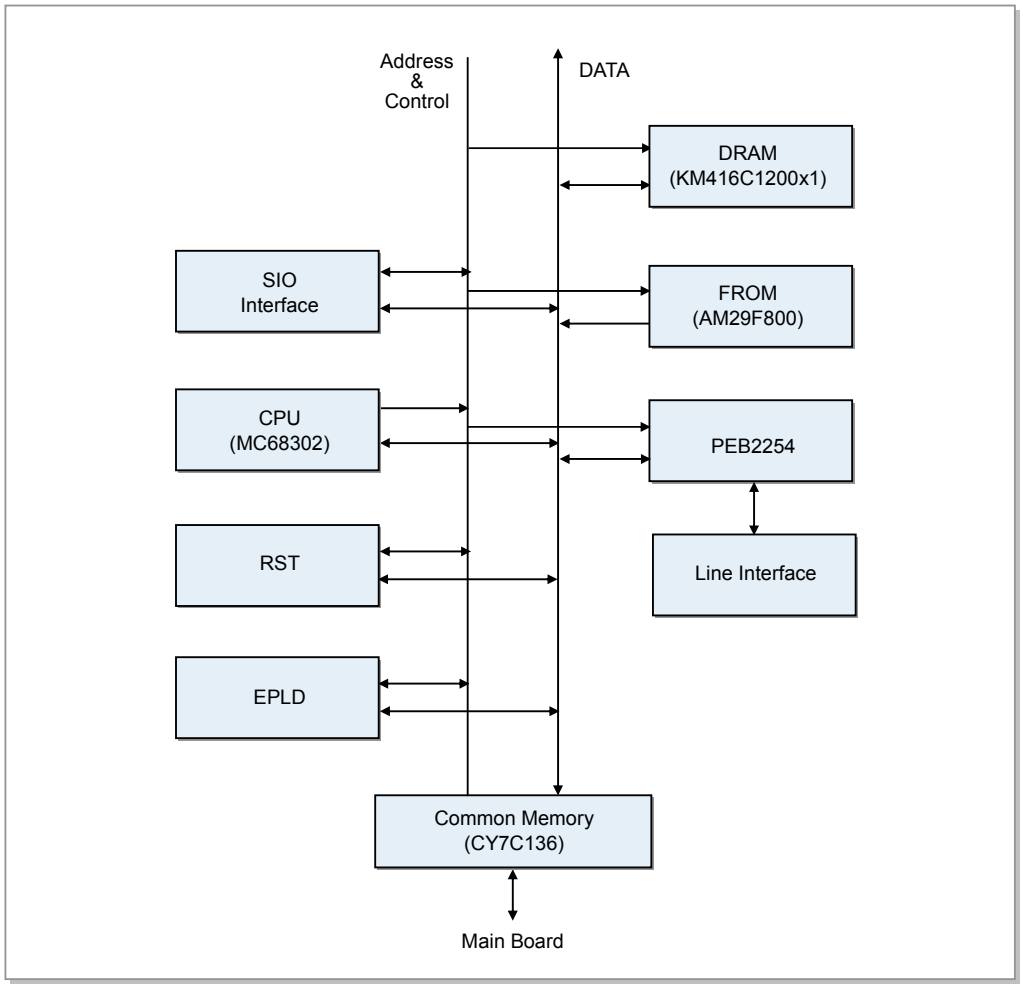

Figure 2.7 Block Diagram of the TEPRI Board

2.5.2.2 Major Features

The major features of the TEPRI board are as follows:

Line Interface

- Enables T1/E1 signalling selectively by programming.
- Enables resistance circuits that accommodate T1(100 Ω) and E1(120 Ω) simultaneously.
- Provides surge protection recommended by the ITU.
- Protects output ports by a line monitor.
- Provides jitter characteristic that meets the ITU-T I.431 and G703 standard.
- The line coding method can be selected(HDB3, AMI).
- The Loss Of Signal(LOS) threshold can be set.
- Provides local loop and remote loop.
- Supports HDLC or Channel Associated Signalling(CAS) through Common Channel Signalling(CCS).

CPU (MC68302)

- Enables 68302FN16.
- The CPU clock of 16.384 MHz is used CPU. Also, the data bus of 16bit is used.
- The ROM of 1 Mbytes(AM29F800B) is used.
- The DRAM(KM416C1200) of 2 Mbytes is used for RAM and RAM backup is not performed.
- Two timers for general purposes inside of CPU is used for interrupt for timing reference.
- DS-1706 is used for resetting and a reset button for a test is installed into the CPU.
- CPLD MACH4-64/32 is used for accommodating peripheral CPU circuits.
- DPRAM(71C132Y) is used for IPC with the MCP or LCP board. When making an IPC in an interrupt method, the CPU is connected to the MCP/LCP board through the resistance of 0Ω. When making an IPC in a polling method, the resistance of 0 Ω is removed from the CPU and the CPU operates in a polling method.
- The CPU is connected with the CPU port to be able to read the RY/BY signal of flash ROM.

Clock

- Digital Phase Locked Loop(DPLL) exists in the PEB2254.
- The system clock is synchronized by the PLL circuit of the MCP board.
- 4.096 MHz, CLKX, and FSX are provided by the main board.
- The SCLKX/SCLKR of PEB2254 is converted into 8.192 MHz by using the delay line of 4.096 MHz and then is supplied.
- Active signals displaying a valid reference clock are transmitted from the CPU port.

SIO

- Serial ports for tests are provided by using the serial communication controller 3 of CPU.
- The RJ-45 connector can be connected to the front of the cabinet.
- The Baud rate source clock of up to 19200 bps is used as the CPU master clock.
- Its speed is determined by software.

2.5.3 4BRI Board

4BRI board is a board that provides the digital C.O. line and can connect BRI C.O. line or ISDN telephones. The board is mounted on all universal slots of each cabinet. It is recommended to mount the board on slot 3, 4 and 5 of the basic cabinet and solt 3 of the expansion cabinet.

2.5.3.1 Block Diagram

The block diagram of the 4BRI board is as follows:

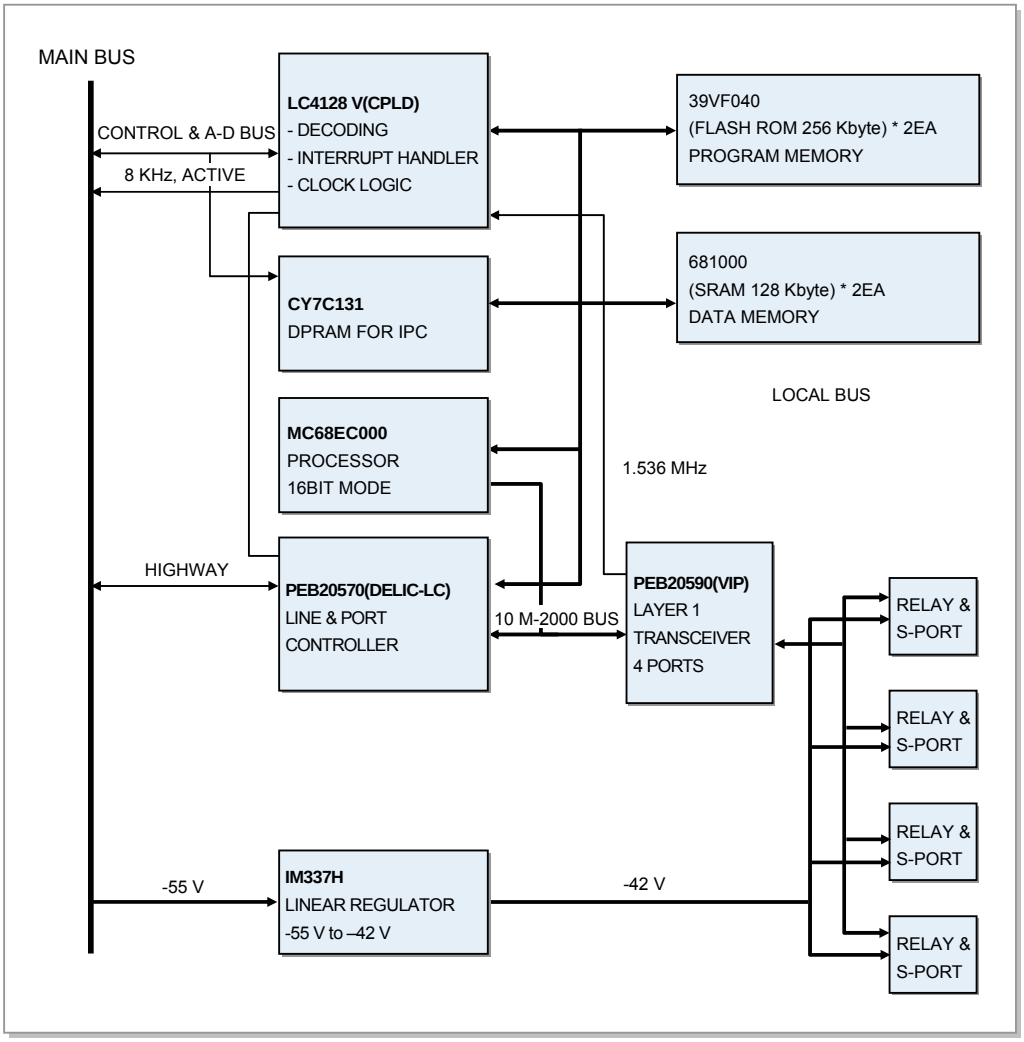

Figure 2.8 Block Diagram of 4BRI Board

2.5.3.2 Major Features

The main functions of the 4BRI board are as foloows:

CPU(MC68EC000)

68EC000, one of the processors in MOTOROLA 68 series, is a product that strengthens economical efficiency and operates as 16 bit and at the clock speed of 16.384 MHz. Only 68EC000 can operate a control bus and other external processsors can not operate the control bus.

DPRAM (DUAL PORT RAM)

DPRAM is a memory for processor communication between SP and BRI. The DPRAM has 1024 byte size and use CY7C131 of Cypress. The DPRAM can perform Port-to-Port communication by means of abbitration and interrupt logic included in 1K X 8 Dual Port RAM.

CPLD

CPLD is, also, used. The function of the CPLD circuit is as follows:

- Address decoding for the generation of memory chip-select siginals
- Address decoding for the generation of I/O chip-select siginals
- Interrupt control and priority encoding for CPU
- DPRAM chip select signal for the communication between the Siginaling processor and an internal processor.
- System clock interface circuit

VIP(PEB 20590,Versatile ISDN Port)

VIP is a layer-1 transceiver that can connect Upn subscriber line interface (2-wire), S/T subscriber or trunk line interface (4-wire). The VIP should be used with DELIC-LC and communicates control/activation via Serial IOM-2000 I/F. The features of the VIP are as follows:

- Eight 2B + D line interfaces with full duplex transceivers.
  - S/T I/F at 192 kbit/s with line transceivers (ITU-T I.430,ETSI 300.012 and ANSI T1.605)
  - Upn I/F at 384 kbit/s with line transceivers(ZVEI standard)
  - Receive timing recovery
  - Conversion between pseudo-ternary and binary codes
  - Conversion between Upn or S/T frames and IOM-2000 frame structures
  - Excution of test loops
  - Frame alignment in trunk applications with maximum wander correction of ±25us
  - Upn interface compatible to OCTAT-P(PEB 2096)
  - S/T interface compatible to QUAT-S(PEB 2084)

- IOM-2000 interface to DELIC suppoting up to three VIPs(24channels)
  - Transceiver initialization and configuration
  - Control of layer-1 activation/deactivation
  - Exchange of command and status information
- Signalling control for all VIP channels by dedicated HDLC controllers in DELIC
- Single 3.3 V power supply
- JTAG IEEE1149.1-compliant test interface with dedicated reset input

DELIC-LC(PEB20570, DSP Embedded Line and Port Interface Controller)

DELIC-LC is an optimized chip for Line card application and performs Voice Channel Switching, Multiple HDLC and Layer-1 control (3VIPs) functions.
The functions of DELIC-LC Chip are as follows:

- One IOM-2000 I/F supporting three VIPs i.e up to 24 ISDN channels
- Two IOM-2 (GCI) ports (configuarable as PCM ports) supporting up to 16 ISDN channels or32 analog subscribers
- 4 PCM ports with up to 4 x 2.048 Mbit/s(4 x 32 TS) or 2 x 4.096 Mbit/s or 1 x 8.192 Mbit/s
- Switching matrix 256 x 256 TS(8 bit switching)
- 24 HDLC controllers assignable to any D- or B-channel(at 16 kbit/s or 64 kbit/s)
- Serial communication controller:high speed signaling channel for 2.048Mbit/s
- General purpose I/O ports
- Standard multiplexed and de-multiplexed uP I/F : Infineon,Intel,Motorola
- Programmable PLL based Master/Slave clock generator,providing all system clocks
- from a single 16.384 Mhz cristal source
- JTAG compliant test interface
- Single 3.3 V power supply,5 V tolerant inputs

2.5.4 8SLI Board

The 8SLI board is mounted on the universal slot of the OfficeServ 7200 and processes voices of 8 channels simultaneously. Regular phones can be connected to the 8SLI board. Entire data created in the 8SLI board are transferred to the MCP or LCP board through data bus.

2.5.4.1 Block Diagram

The block diagram of the 8SLI board is shown in the figure below:

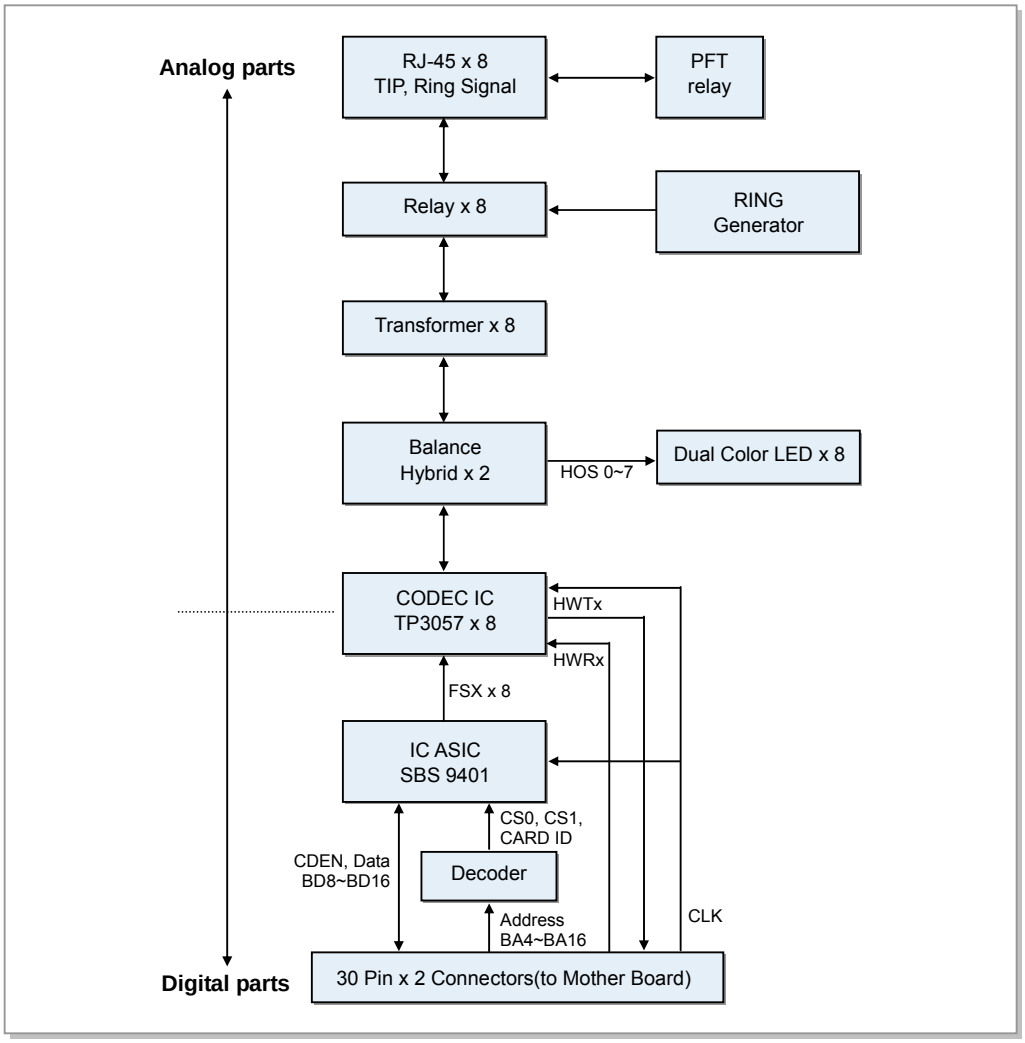

Figure 2.9 Block Diagram of the 8SLI Board

2.5.4.2 Major Features

The major features of the 8SLI board are as follows:

ASIC SBS9401

The SBS9401 controls Time Slot Assignment Control(TSAC) of 8 ports, UART of 4 ports, Digital Adaptor for Subscriber Loops(DASL) of 4 ports through micro channel control and generates dial pulse of 4 ports. The board provides additional features, however this section describes modes for using SLI. The features for SLI are TSAC for 8 channels and battery on/off control port, Ringing Relay control port, and hook-off detection port.

Voice Path

Only voice signals(300~3400 Hz) transmitted from subscribers are transmitted to the second stage, are converted into PCM codes through CODEC, and then transmitted to the highway while DC is supplied to the first stage of TRANS(T5692). For the gain between the balance logic and CODEC, the output signal of CODEC is adjusted to +2.0 dBm and the reception signal of CODEC is adjusted by -7.0 dBm to the direction of the subscriber.

The transformer of T5692(600 Ω) and hybrid IC developed by Samsung Electronics are used in the board. The board has feedback circuits that remove echoes, which are generated during conversion from 2 lines to 4 lines.
A resistance value of the termination network is set to match pure R components of 600 Ω as well as complex resistance. In Korea, KP0078SA is used as hybrid IC. For reference, the following hybrid ICs are used in countries:

Table 2.2 Hybrid Types Used for Countries

Hybrid IC Name	Country
KP0072SA	UK, New Zealand
KP0075SA	The Netherlands
KP0078SA	Korea, USA
KP0071SA	Italy
KP0073SA	Germany, Australia
KP0077SA	China

-48 V Supply

The power of -48 V is supplied to the subscriber's phone through the TIP via the Loop Disconnect circuit, feeding resistor, and power TR. The power is supplied to the GND through the Power TR and feeding resistor.

Loop Disconnection

The power of -48 V supplied to each port is switched by the TR. If the LD signal is low, TR will turn on. If power is supplied and the LD signal is high, TR will turn off and power supply will stop.

Ring Trip

Ring trip refers to a function, which stops transmitting ring signals by operating the relay of the subscriber phone circuit when the subscriber hooks off while a ring is sending to the phone. Ring signals are on for a second and are off for two seconds. If the subscriber hooks off for a second when the ring relay is attached to the tip and ring end of the subscriber, the ring path will be ground through the relay.

Ring Emission

If the operator wants to ring from the phone, relay will operate by the relay control signal generated from SBS9401 and the ring of 80 Vrms/20~30 mA and 20/25 Hz will be sent to the subscriber lines.
Sources for the ring are the square wave generated circuit within the 8SLI board and sine wave ringer that can be installed externally. A board specified in each country is used.

CODEC

3054/3057 mounted on the existing 8SLI board is used as CODEC.

Balance Hybrid

Balance hybrid is already implemented inside of Hybrid. Since the balance hybrid is implemented into 600 Ω, a circuit for complex resistance is installed as a separate hybrid along with CODEC.

Protection

Protection is classified into the first protection and second protection.

- First protection
  The varistor connects the tip with the ring and protects the element connected between the tip and ring.
- Second protection
  The zener diode is connected to the second stage of the tTrans for protection.

Ring Generator

- DC-DC converter
  This converter converts the DC of -48 V to the DC of 75~80 V. If the electric noises generated from the ring generator are entered along with the DC of -48 V, the RC filter is used in the input part to remove noises.

2.5.5 16SLI2/16MWSLI Board

The 16SLI2/16MWSLI board is mounted on the universal slot of the OfficeServ 7200.
The 16SLI2 is a board that provides analog extension 16-port and supports the voice communication function by inrworking with a telephone.
The 16MWSLI board has the message waiting function, besides the same functions as the 16SLI2 board.

2.5.5.1 Block Diagram

The block diagram of the 16SLI2/16MWSLI board is shown in the figure below:

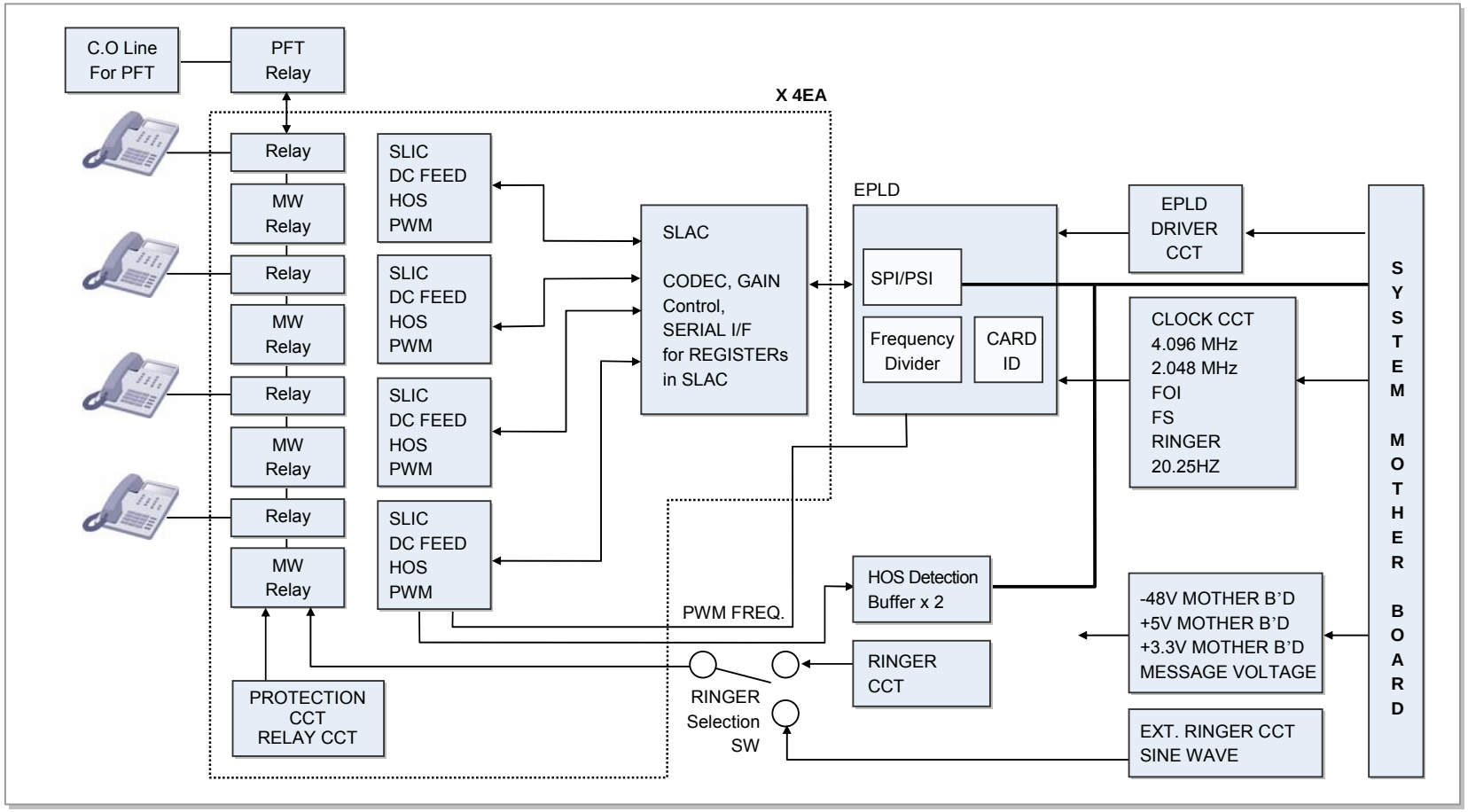

Figure 2.10 16SLI2/16MWSLI Block Diagram

2.5.5.2 Major Features

The major features of the 16SLI2/16MWSLI board are described below:

Line Interface

Line Interface includes message-waiting lamp on, battery feeding, ringing relay, hook-off and the protection against surge that abandoned from a line.

Ring Generator

Ring-Generator creates square-wave ring signals by the square wave input of 20/25Hz provided from the mother board and proveds the created signals to SLT. In addition, the generator orivides the Ring singal comming from separate external sine ringer to the line.

Message Waiting Function

The MW function periodically or always turns on the lamp of a MW telephone with the MW lamp when messages remain in the relevant extension.
The MW voltage is shared with the internal ringer circuit, and the output voltage is 100 V or higher. MWSLI should have the internal ringer circuit for the MW circuit even when the external circuit is used.
The cycle of the MW lamp is adjusted by KMMC #511.
The setup of [Contiuous LED] makes the lamp always turned on.
The periodical On/Off switching method is described below.

1) Select [INTERRUPT LED], and press the [right] soft button.
2) With the [Right] soft button, move to time period.
3) Input the ring cycle data in turns of On time and Off time. .

Le79555 -2QC

Le79555 is Subscriber Line Interface Circuit I.C made by Legerity Company.
Its package type is 32-pin QFN and it has the polarity reverse function.
The Le79555 -2QC performs main functions of subscriber interface by interworking with Le58QL021 QSLAC I.C.

Le58QL021

Le58QL021 is Quad Low Voltage Subscriber Line Audio Processing Circuit I.C made by Legerity Company. An I.C has 4-codec and 4-filter so that it is connected to 4-SLIC and 4-SPI Bus.
The Le58QL021 can program the following functions with internal filters.

- SLIC device input impedance
- Transhybrid balance
- Transmit and receive gains
- Equalization (frequency response)
- Digital I/O pins
- Programmable debouncing on one input
- Time slot assigner
- Programmable clock slot and PCM transmit clock edge options

2.5.6 8COMBO Board

The 8COMBO board provides the functions of the 8SLI and 8DLI boards and is mounted on the universal slot of the OfficeServ 7200.

2.5.6.1 Block Diagram-DLI

The block diagram of the DLI in the 8COMBO board is shown in the figure below:

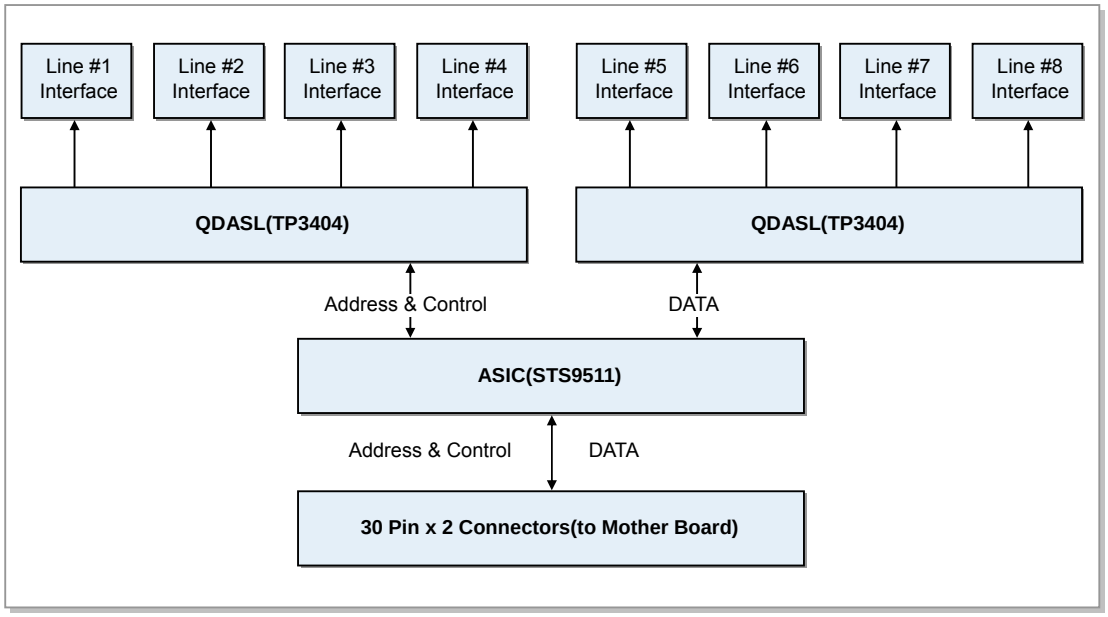

Figure 2.11 Block Diagram of the DLI in the 8COMBO Board

2.5.6.2 Block Diagram-SLI

The block diagram of the SLI in the 8COMBO board is shown in the figure below:

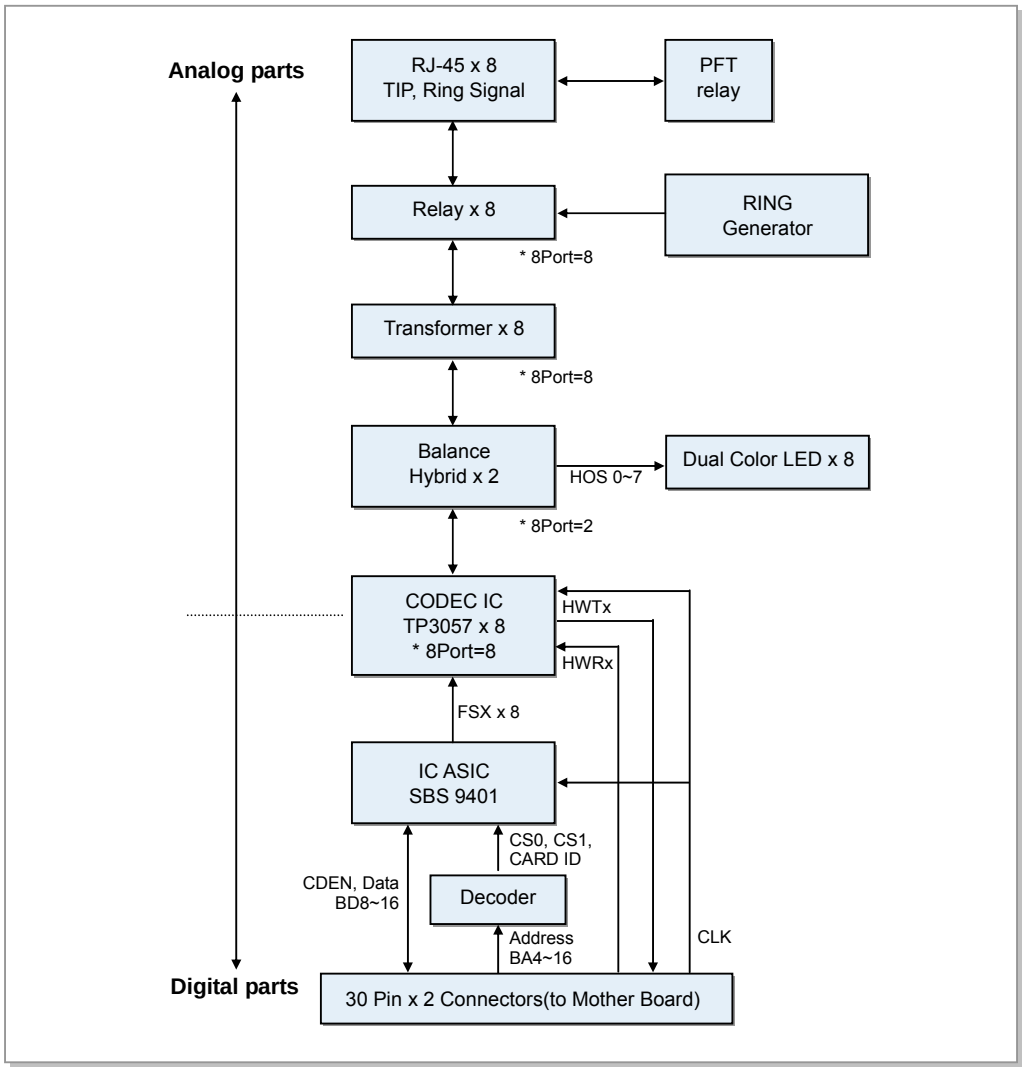

Figure 2.12 Block Diagram of the SLI in the 8COMBO Board

2.5.6.3 Major Features

The major features of the 8COMBO board are as follows:

- Provides both of analog and digital stations.
- Provides voices of regular and digital phones through stations.
- Generates rings of 20/25 Hz.
- Detects DTMF/Dial pulses.
- Detects Hook-off/on.
- Generates tone.
- Provides analog stations of 8 ports and digital stations of 8 ports.
- One board assembly provides the SLI of 8 ports and the DLI of 8 ports.
- Configures 16 ports by using the RJ-45 8 port. Pins 4 and 5 are used as SLI ports and Pins 7 and 8 are used as DLI ports.

2.5.7 8DLI Board

The 8DLI board provides 8 ports and can be connected to digital phones. One port uses a transmittance element that enables interfacing of 2B+D(two voice channels of 64 kbps and one signal channel of 16 kbps).
For signal transmittance, the code transmittance method of Alternative Marking Inversion (AMI) in a full-duplex method of 144 kbps is used. Voice and data channels are available for end-to-end communications. The actual transmittance rate from the 8DLI board to the digital phone is 192 kbps. 16 kbps from 48 kbps where 144 kbps of 2B+D above is excluded is used for synchronization and remaining 32 kbps is used for transferring null data.
Lines of AWG 26 thick are used as transmittance lines between the DLI board and digital phone and maximum transmittance distance is 400 m. The DLI board supplies the power of -48 V to the phone and is configured with the poly switch that disconnects over-current and circuits for digital interfaces. This board controls -48 V of power on or off through the FET inside of the 8DLI board.

2.5.7.1 Block Diagram

The block diagram of the 8DLI board is shown in the figure below:

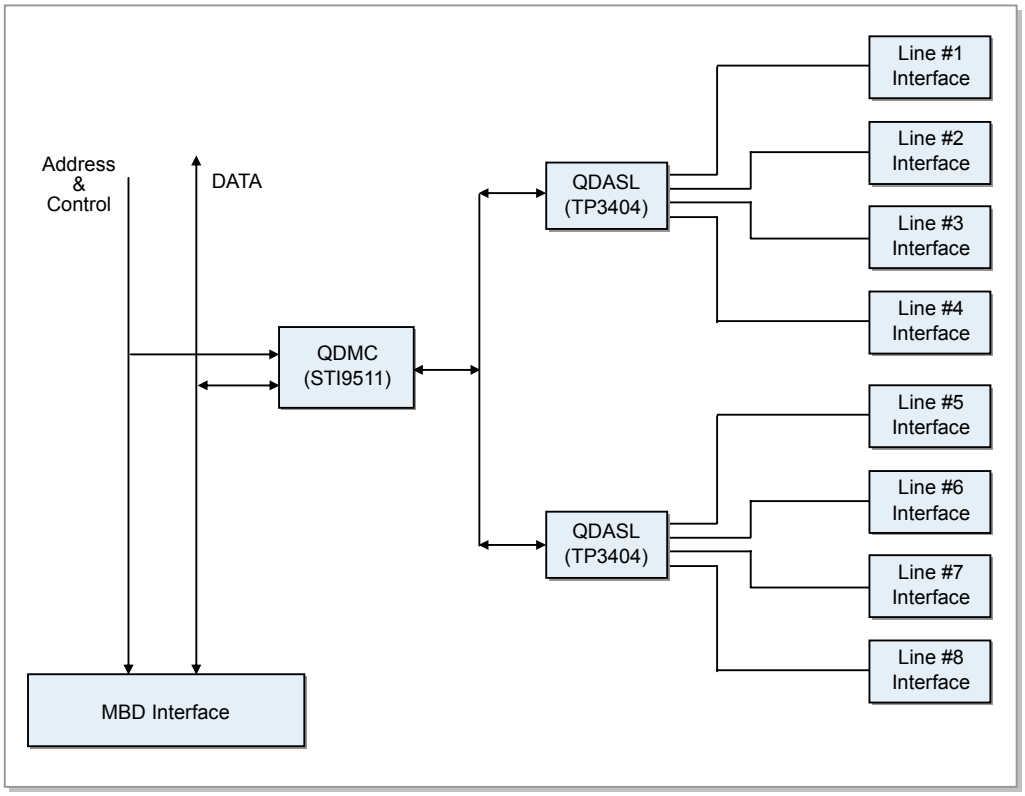

Figure 2.13 Block Diagram of the 8DLI Board

2.5.7.2 Major Features

The major features of the 8DLI board are as follows:

QDMC (STI9511)

The QDMC(STI9511) is a special ASIC for controlling TP3404, which is the Quad Digital Adapter for Subscriber Loops(QDASL) chip of National Semiconductor. The TP3404 controlled by this chip is an expanded form of the existing TP3401/3402/3403. This chip is made in the following procedures: The transceiver in a single channel TCM transmission method is expanded to 4 ports and micro wired control and other control structures are changed.

The functional features of the QDMC are as follows:

- Transfers/receives data in a UART format for D channels.
- A UART speed(2/4/8/16 kbps) can be selected.
- The B channel functions as a by-pass interface.
- Inter-works with micro wired serial control(16 bit).
- Controls two TP3404 chips.(A total of 16 channels are available.)

- Recognizes the used board and ID.
- A master clock of 4.096 MHz is used.
- Operates at 5 V.
- 60-pin Quad Flat Pack(QFP) is used.

QDASL Interface

This interface is a D channel of each port, and RxD and TxD exist for serial data transfer. AMI codes created along with B channels are transmitted to the line and the D-channel data are used for controlling phones. The B-channel data are used for generating voice signals. /INTD processes the micro-channel interrupt of QDASL in each port. The INT of the QDASL is generated only when accessing the micro channel and initializing the QDASL. The INT is generated in the event of NO SIGNAL(CO), OUT OF SYNC(C1), and BIPOLAR VIOLATION(C7).

The INT is bundled up of UART Tx INT and AND GATE only when power is on for the first time and the QDASL status is changed by an error in the phone. The INT is a clock in the μ-CH controlling part that sets the initial QDASL status of the port and is configured with CCLK(1 MHz), CI for entering controlling data, and CO for displaying status. Also, B channel is synchronized into hardware frame allocated to itself and is transmitted to the QDASL by opening the hardware buffer. The control data are transferred to the sub-time slot, which is D-channel where 256 channels of 2 bit are allocated. The sub-time slot means that the B channel of 8 bit is divided into four. To receive D channel data of 1 byte from the QDASL, the data of 4 frames should be received first.

QDMC provides 128 sub-time slots.

Digital Phone Interface

The AMI code is created from the QDASL(TP3404) and is transmitted to regular phones through the Trans. The serial data are transferred to the QDMC by demodulating the AMI code received from the phone through the Trans. The QDMC converts the entered serial data to parallel data through the UART and transfers the data to the CPU. Also, /TSB of the QDASL transfers the voice data of DASL to the highway.

Since one QDMC controls two QDASLs(a total of 8 ports), the /TSB signals generated from each QDASL are added for use.

DLT-1 is used for a Trans for matching, and resistance of 100 Ω in the QDASL LO adjusts impedance. 2μ F reduces noises. Two zener diodes(3.6 V) in the Trans input part prevent hazard. The power of -56V is supplied to the phone through the Poly switch to prevent over-current from flowing to the phone. The varistor in the Trans input part prevents hazard.

Transmission Part

This part is a circuit part through which data(D-channel) and voices(B-channel) are transferred between the digital phone and 8DLI board in a full-duplex method. The 8DLI board operates in master mode and digital phones operate in slave mode. Once data are transferred in master mode, the data are received and then, are transferred in a guard time in slave mode.

The data are received in master mode. This is called a ping-pong phenomenon.

The voltage of -48 V DC is supplied to the Trans through the Poly switch. The Poly switch cuts off currents once a short circuit is created in the line, and the zener diode prevents against external high voltage.

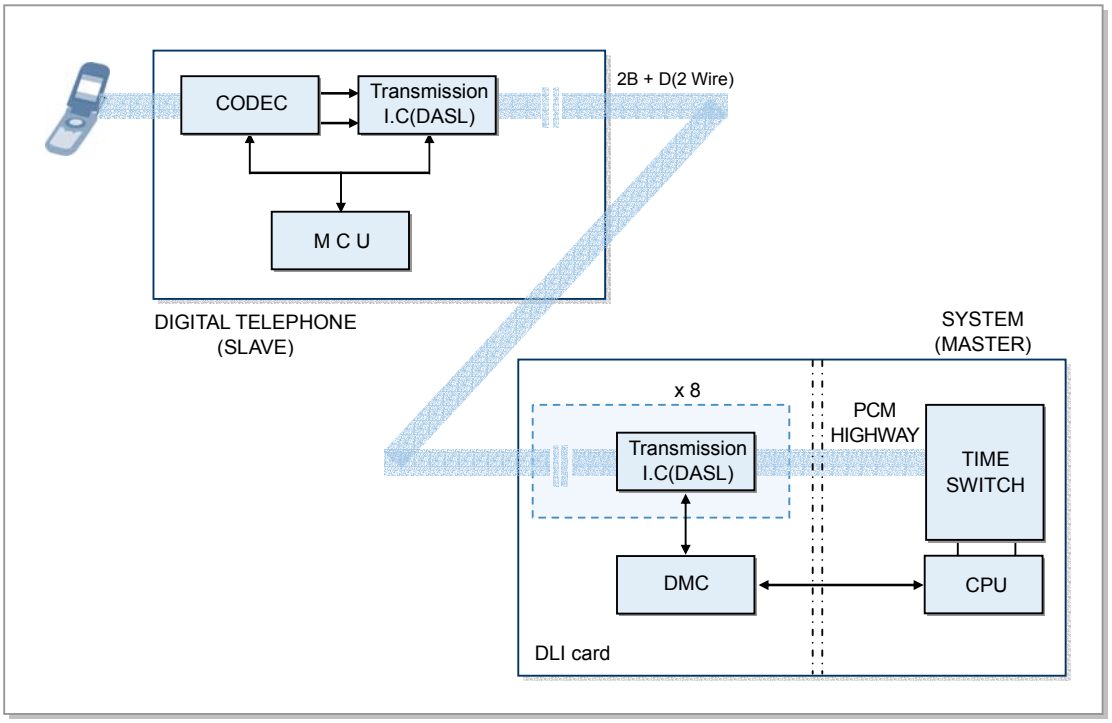

Figure 2.14 Default Configuration Diagram Between the Digital Phone and System

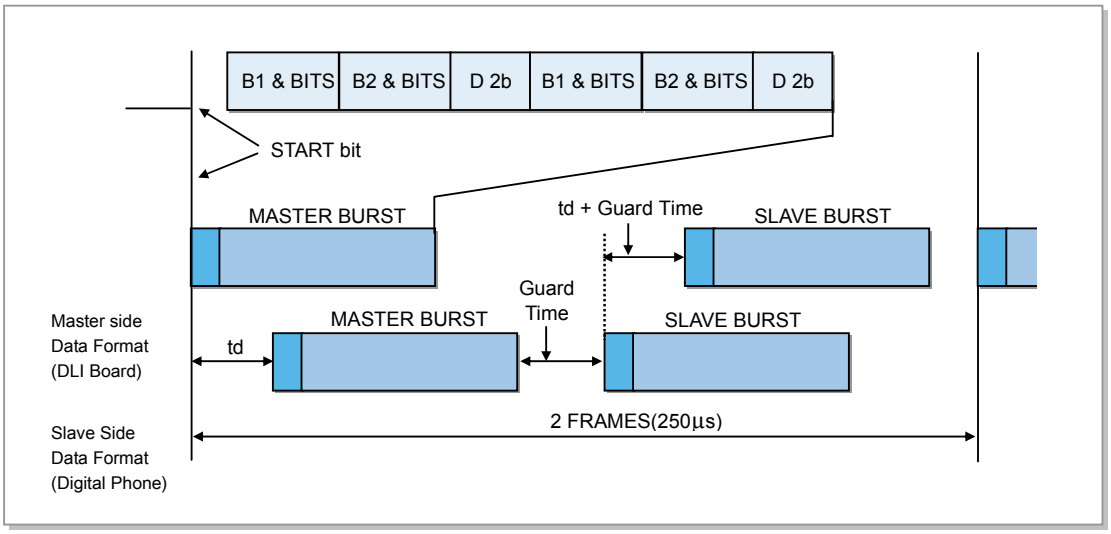

Figure 2.15 Data Transfer Transmittance Format Diagram

2.5.8 16DLI2 Board

The 16DLI2 board provides the interface circuit of 16 ports digital phones or DPIMs, which are the terminals for the OfficeServ 7200 system. QDASL that enables interfacing of four 2B+1D(two voice channels of 64 kbps and one signal channel of 16 kbps) is used for each port of the board.

A full-duplex AMI coding method is used for signal forwarding. End-to-end communications support two voice channels of B1 and B2 so that two stations can be connected with one port.

Transmission between the 16DLI2 board and digital phone is made at 192 kbps. 16 kbps from 48 kbps where 144 kbps of 2B+1D is excluded is used for synchronization and remaining 32 kbps is used for transferring null data. Lines of AWG 26 thick are used as transmittance lines between the 16DLI2 board and digital phone and maximum transmittance distance is 400 m.

The DLI board supplies the power of -48 V to the phone and is configured with the poly switch that disconnects over-current and circuits for digital interfaces. This board controls -48 V of power on or off through the FET inside of the 8DLI board.

The UART inside of QDMC has three Rx and Tx buffers of 1 byte. If more than two buffers are used, data will have problems. Therefore, check the status of the buffers before transferring the data. Once the QDMC converts parallel data to serial data and transfers the converted data to QDASL, the QDASL converts the data into the AMI code and transfers the data to the digital phone. The signalling data created from the digital phone convert serial data to parallel data in the UART Rx buffer of the QDMC through the QDASL and transfer the converted data to the CPU.

-48 V of power on/off is controlled through the FET in the 16DLI2 board.

2.5.8.1 Block Diagram

The block diagram of the 16DLI2 board is shown in the figure below:

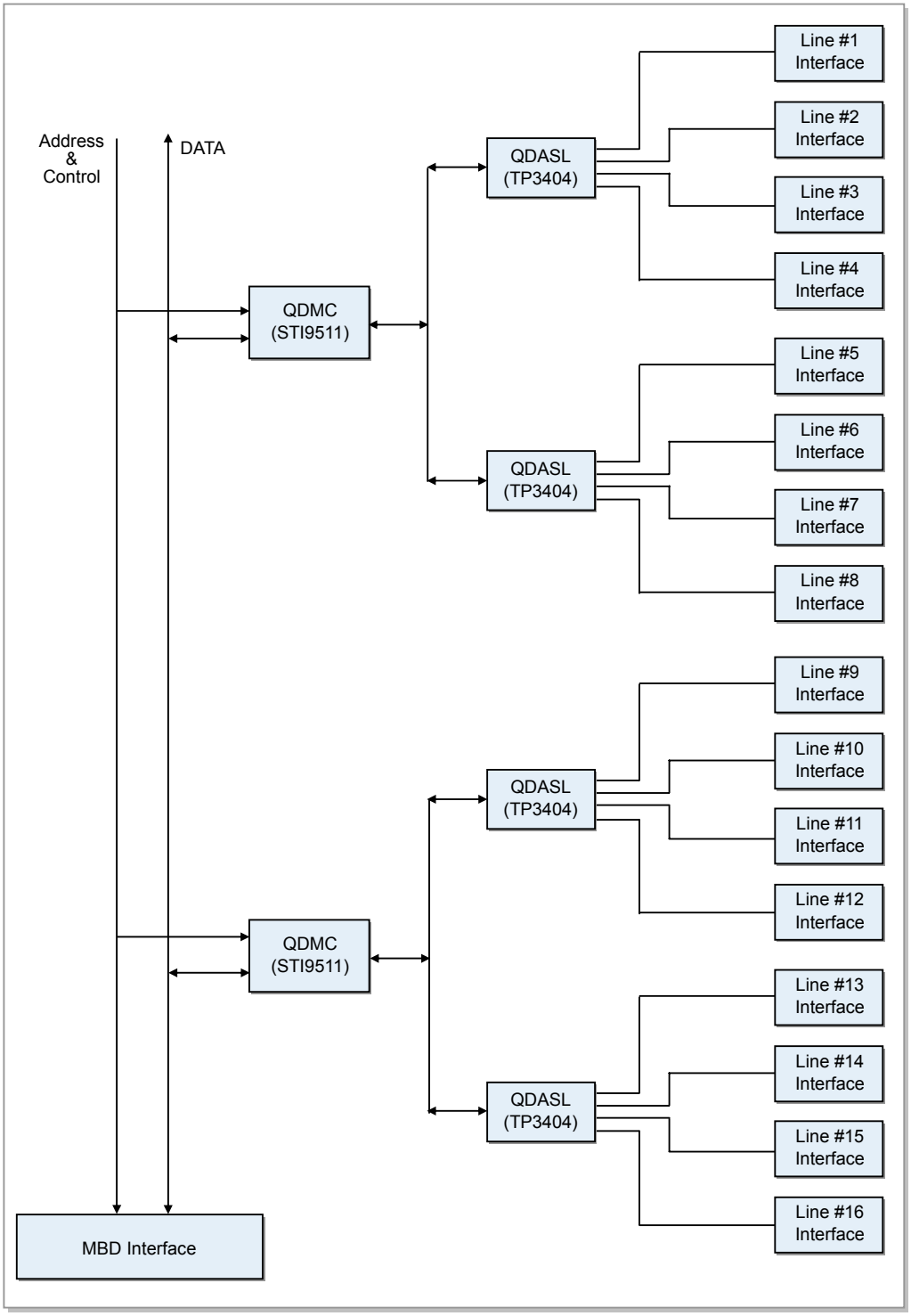

Figure 2.16 Block Diagram of the 16DLI2 Board

2.5.8.2 Major Features

The major features of the 16DLI2 board are as follows:

QDMC (STI9511)

The QDMC(STI9511) is a special ASIC for controlling TP3404, which is the QDASL chip of National Semiconductor. The TP3404 is made in the following procedures: The transceiver in a single channel TCM transmission method is expanded to 4 ports and micro wired control and other control structures are changed.

The functional features of the QDMC are as follows:

- Transfers/receives data in a UART format for D channels.
- A UART speed(2/4/8/16 kbps) can be selected.
- The B channel functions as a by-pass interface.
- Inter-works with micro wired serial control(16 bit).
- Controls two TP3404 chips.(A total of 16 channels are available.)
- Recognizes the used board and ID.
- Master clock of 4.096 MHz
- Operates at 5 V
- 60 QFP

QDASL Interface

This interface is a D channel of each port, and RxD and TxD exist for serial data transfer. AMI codes created along with B channels are transmitted to the line and the D-channel data are used for controlling phones. The B-channel data are used for generating voice signals. /INTD processes the micro-channel interrupt of QDASL in each port. The INT of the QDASL is generated only when accessing the micro channel and initializing the QDASL. The INT is generated in the event of NO SIGNAL(CO), OUT OF SYNC(C1), and BIPOLAR VIOLATION(C7).
The INT is bundled up of UART Tx INT and AND GATE only when power is on for the first time and the QDASL status is changed by an error in the phone. The INT is a clock in the μ-CH controlling part that sets the initial QDASL status of the port and is configured with CCLK(1 MHz), CI for entering controlling data, and CO for displaying status. Also, B channel is synchronized into hardware frame allocated to itself and is transmitted to the QDASL by opening the hardware buffer. The control data are transferred to the sub-time slot, which is D-channel where 256 channels of 2 bit are allocated. The sub-time slot means that the B channel of 8 bit is divided into four. To receive D channel data of 1 byte from the QDASL, the data of 4 frames should be received first.
QDMC provides 128 sub-time slots.

Digital Phone Interface

The AMI code is created from the QDASL(TP3404) and is transmitted to regular phones through the Trans. The serial data are transferred to the QDMC by demodulating the AMI code received from the phone through the Trans. The QDMC converts the entered serial data to parallel data through the UART and transfers the data to the CPU. Also, /TSB of the QDASL transfers the voice data of DASL to the highway.
Since one QDMC controls two QDASLs(a total of 8 ports), the /TSB signals generated from each QDASL are added for use.
DLT-1 is used for a Trans for matching, and resistance of 100 Ω in the QDASL LO adjusts impedance. 2μ F reduces noises. Two zener diodes(3.6 V) in the Trans input part prevent hazard. The power of -48V is supplied to the phone through the Poly switch to prevent over-current from flowing to the phone. The varistor in the Trans input part prevents hazard.

2.5.9 MGI Board

The MGI board is mounted on the universal slot of the OfficeServ 7200 system and enables voice calls on the IP network. The MGI board is connected to Ethernet of 10/100 Mbps and encodes or decodes voice data into G.723.1 or G.729 of the ITU-T.

2.5.9.1 Block Diagram

The block diagram of the MGI board is shown in the figure below:

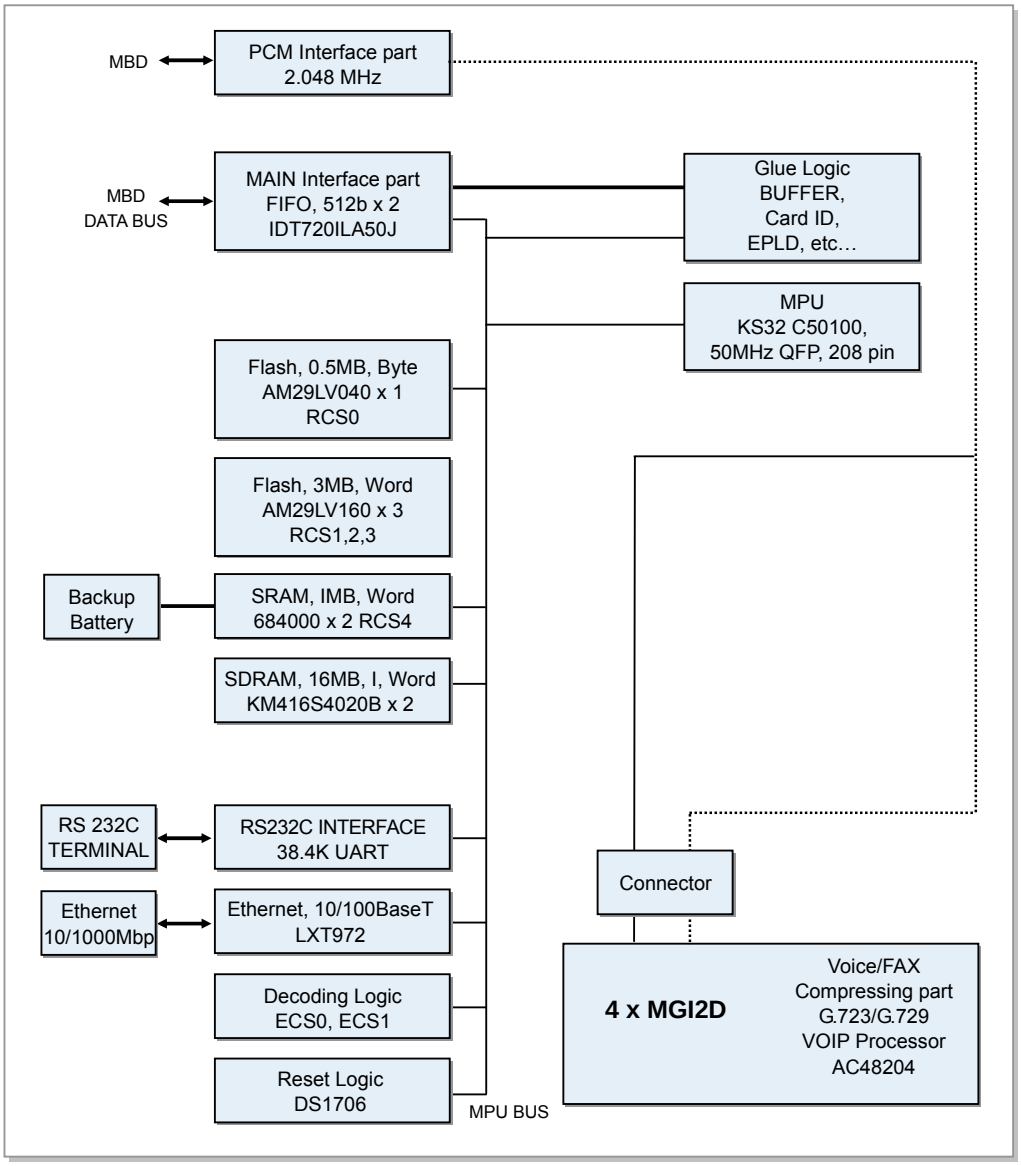

Figure 2.17 Block Diagram of the MGI Board

2.5.9.2 Major Features

Up to four MGI2Ds, which are optional boards configured with VoIP CODEC AC48204 and SRAM, are mounted on the MGI board. The major features of the MGI board are as follows:

CODEC AC48204

- Up to 16 channels can be accommodated(four 4CH/Chip x).
- An interface between the CODEC and host is implemented into Erasable Programming Logic Device(EPLD).
- Products of AudioCodes Co., Ltd. are used as CODEC.
- One chip supports four independent voice and fax channels.
- The voice coder of H.323 that the users can configure is used.
- 'Soft', field-upgradeable functionality
- Roburst Bad Frame Interpolation(BFI)
- G.165/G.168 adaptive echo canceller
- Toll quality voice that speeds down the bit rate to an average of 3.2 kbps by using silence suppression.
- Detects or generates TIA 464A DTMF.
- Detects or generates MF.
- Parallel host processor interface
- Host-programmable tone signals
- Configurable PCM interface: PCM highway or parallel interface
- On-chip PCM highway interface(that allocates time slots for host configuration and selectable G.711 μ-law/A-law PCM interface)
- Gain control

RS-232C Interface

- UART0 in KS32C50100 is used.
- UART of up to 38.4 kbps
- Updates or tests debugging, flash memory, or DSP programs.

MCP Interface

- Two FIFO IDT7201LA50Js are used.
- Both Tx and Rx of 512 bytes
- Card ID: 7D(8 CH): 7C(16 CH)
- A card ID is automatically changed to 7C(16 CH) by being connected to the optional board.

Power

- 3.3 V(Power of 1.8 V is generated at the voltage of 3.3 V.)
- 5 V
- Circuits for supplying the power of 2.5 V are already designed.
- A connection between the device of 5 V and that of 3.3 V is implemented by inserting a dedicated buffer to ensure reliability.

Ethernet Interface

- LXT972: Ethernet interface PHY transceiver
- RJ-45 connector

Reset Logic

- Power On Reset
  - The DS1706 power monitoring chip is used and the system will be reset if the power is less than 3.0 V.
  - Once the power turns on, a reset signal is generated for a certain time until the power is stable. In a certain time, the reset signal stops and the system operate properly.
  - /RESET of KS32C50100 is reset.

- DS1706 Watchdog Timer Reset
  - The Watchdog timer is reset when the timer does not change for 1 or 2 seconds. (A TD pin is connected to the VCC.)
  - /RESET is reset.
  - A test might be performed while /AS is not being generated. Therefore, it is designed that WDT or CPUCLK can be selected as a jumper in the Status input part of DS1706.

- Manual Reset
  - Detects pressing the reset switch and the system operates.
  - The reset switch is connected to /RESET of KS32C50100 through the detection logic of the EPLD by using the SR flip flop.
  - The reset switch is connected to the Push button of DS1706. The DS1706 is connected to /RESET of KS32C50100.

- DSP Reset
  - The DSP software should be able to control or maintain resetting to download the kernel program during initialization. The system is designed to be reset when entering a specific address area in each DSP.
  - The main software should reset each DSP when booting after powering on reset.

2.5.10 WIM Board

The WIM board provides the WAN interface for supporting the data network in the OfficeServ 7200 system. Also, this board is mounted on the universal slot of the OfficeServ 7200 system.

2.5.10.1 Block Diagram

The block diagram of the WIM board is shown in the figure below:

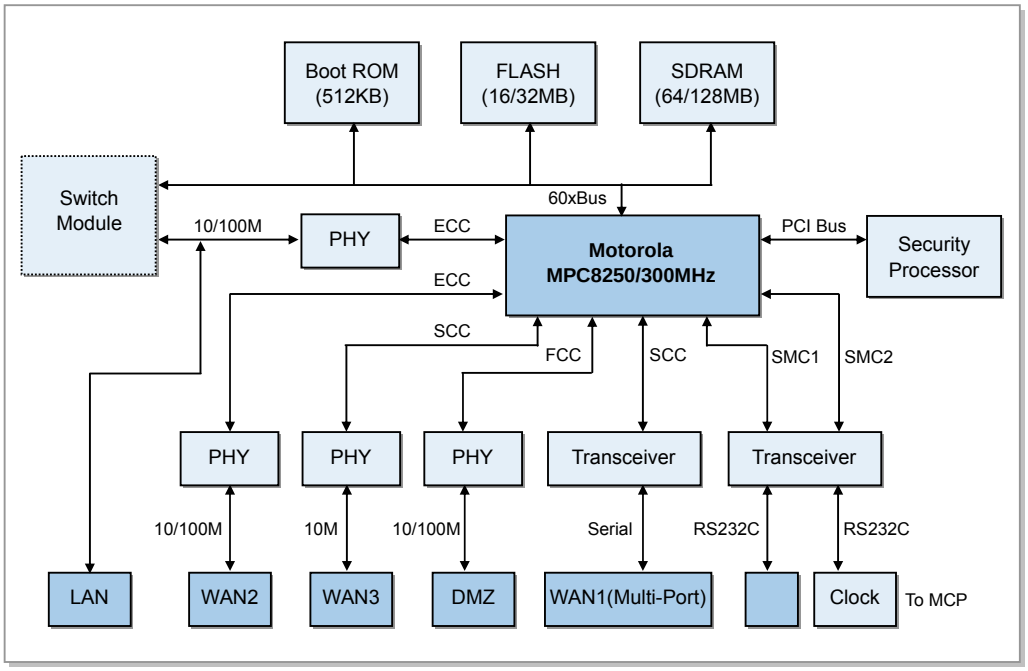

Figure 2.18 Block Diagram of the WIM Board

2.5.10.2 Major Features

The WIM board provides leased lines for data communications between the OfficeServ 7200 system and Internet network, interface connection of xDSL/cable modem, VPN, QoS, and firewall functions. The leased line port can be connected at the maximum E1 speed. The main line of the xDSL/cable modem port supports up to 100 Mbps and the auxiliary line of the port supports up to 10 Mbps. This board has a separate DMZ port for easy firewall configuration. Also, the WIM board manages the LAN Interface Module(LIM).

Main Processor

The MPC8250 used as the main processor of the WIM board is 64 bit high performance RISC processor where communications can be made in the Power PC Core. Also, the MPC8250 has a memory controller and functions as a PCI bridge. The main processor has the following features:

- Power PC dual-issue integer core(EC603e micro-processor)
- Separate power supply(2.0 V), I/O(3.3 V)
- 64 bit data, 32 bit address 60x bus
- 32 bit data, 18 bit address local bus
- 12 bank memory controller(CS0*~CS11*)
- Communications Processor Module(CPM)
- PCI Bridge(PCI Specification Revision 2.2 compliant, 32 bit, Up to 66 MHz)
- 66MHz system frequency
- TBGA 480-pin package
- Version: A(MPC8250AZUPIBB, 300/200/66)

Optional WIMD Board

This board is optional and implements the VPN function. For detailed information about the optional WIMD board, refer to ‘2.6 Optional Board’.

2.5.11 LIM Board

The LIM board provides the LAN interface function for supporting the data network in the OfficeServ 7200 system. This board is mounted on the universal slot of the OfficeServ 7200 system.

2.5.11.1 Block Diagram

The block diagram of the LIM board is shown in the figure below:

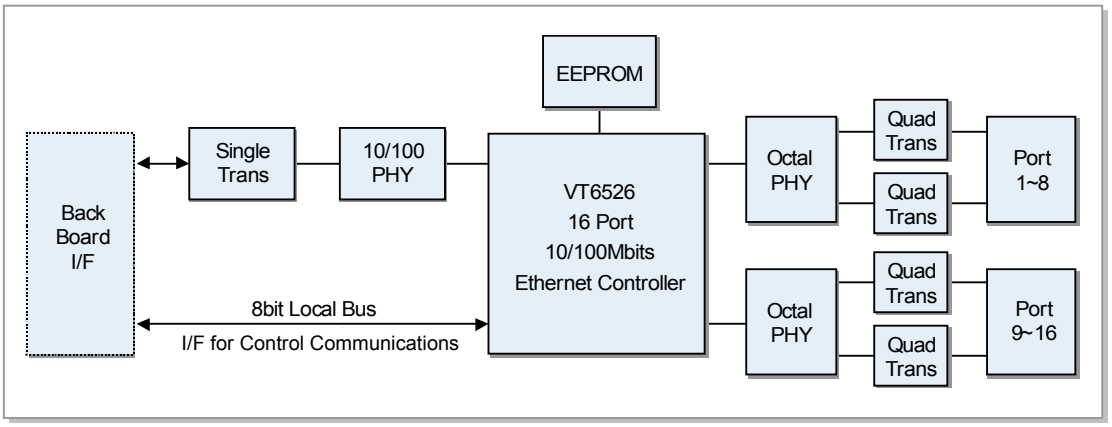

Figure 2.19 Block Diagram of the LIM Board

2.5.11.2 Major Features

The major features of the LIM board are as follows:

- Functions as a 16-port Ethernet switch of 10/100 Mbps.
- Functions as a layer 2 level management Ethernet switch inter-working with the WIM board.
- Manages or does not manage the layer 2 level.
- Functions as VLAN of layer 2 level, 802.1D, and 802.1s.

The LIM board is classified into the EEPROM where data required to boot the system are stored by the Viatech VT6526 Ethernet switch chipset, the PHY where digital data are encoded or decoded by 4B5B and are processed by analog signals, the IDE bus of 8bit that performs management switching by inter-working with the WIM or MCP, and 1-port Ethernet of 10/100 Mbps for speeding up the data traffic when working with the WIM.

By default, VT6526, which is a chipset that can or cannot perform management, has been selected. The VT6526 is configured with the Bootstrap mode, EEPROM mode, and Intelligent CPU mode. The Bootstrap mode sets a physical mode depending on whether specific pins of the chipset are set to high or low at initial boot in non-management switch mode. The EEPROM mode sets chipset configuration by getting register settings from the NM24C08 connected to the VT6526 at initial boot. The Intelligent CPU mode is used when inter-working with the WIM board. This mode obtains VT6526 switch chipset register settings from the WIM board through 8 bit IDE bus and configures the settings. The LIM board can be any of the three modes.

The Viatech VT6108 chipset used as the Octal PHY of 10/100 Mbps supports the SMII, S3MII, or RMII interface. The quality of RXCLK is improved in the S3MII interface compared with SMII and its reliability is enhanced. Therefore, the S3MII interface has been adopted. Also, the VT6108 supports Auto MDI/MDIX and is available to both straight and cross-over cables. A LED on each port shows links and speed.

When inter-working with the WIM board, 8 bit IDE bus and control signals are connected to the back-plane connector through the buffer to enable the management function. Also, a separate Ethernet port is configured to prevent against blocking when exchanging data with the WIM board.

2.5.12 LIM-P Board

The LIM-P board provides the LAN interface function and Power over Ethernet (PoE) function for supporting the data network in the OfficeServ 7200 system. This board is mounted on the universal slot of the OfficeServ 7200 system.

2.5.12.1 Block Diagram

The block diagram of the LIM-P board is shown in the figure below:

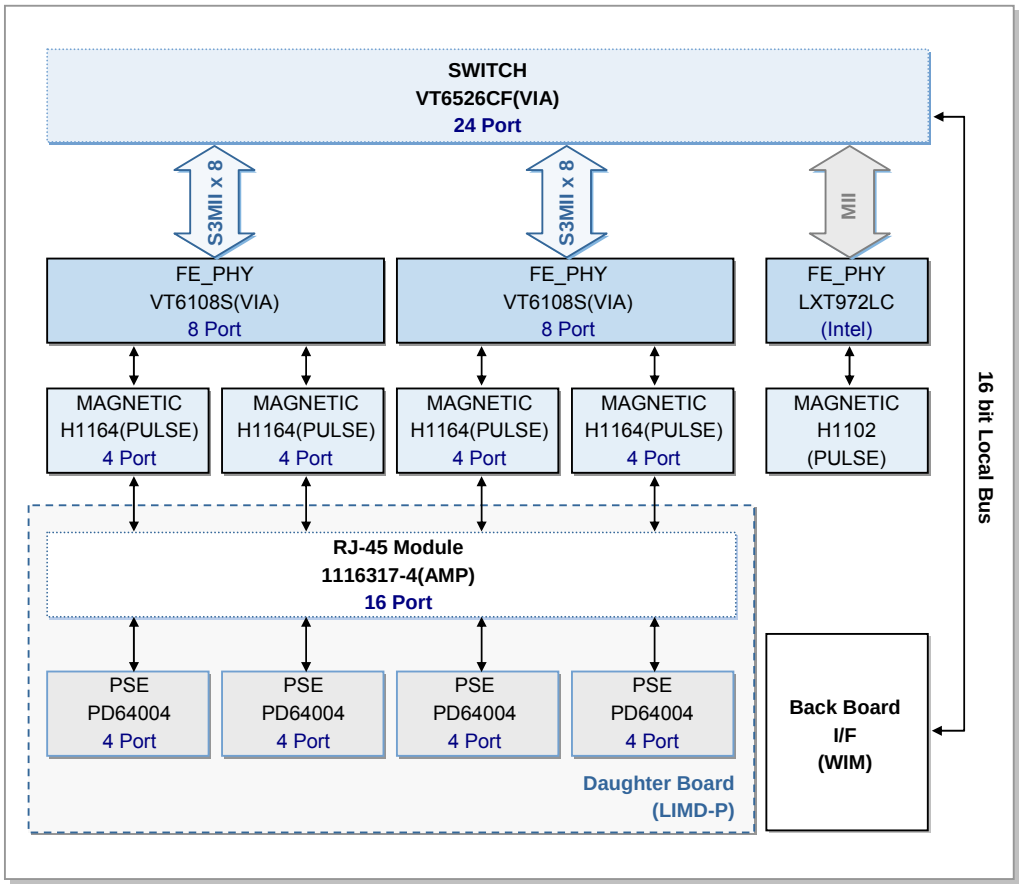

Figure 2.20 Block Diagram of the LIM-P Board

2.5.12.2 Major Features

The major features of the LIM-P board are as follows:

- Functions as a 16-port Ethernet switch of 10/100 Mbps.
- Functions as a layer 2 level management Ethernet switch inter-working with the WIM board.
- Manages or does not manage the layer 2 level.
- Functions as VLAN of layer 2 level, 802.1D, and 802.1s.
- Function as PSE(Power Sourcing Equipment) for PoE

The LIM-P board is classified into the Viatech VT6526 Ethernet switch chipset, the PHY where digital data are encoded or decoded by 4B5B and are processed by analog signals, the IDE bus of 8bit that performs management switching by inter-working with the WIM or MCP, and 1-port Ethernet of 10/100 Mbps for speeding up the data traffic when working with the WIM.

By default, VT6526, which is a chipset that can or cannot perform management, has been selected. The VT6526 is configured with the Bootstrap mode and Intelligent CPU mode. The Bootstrap mode sets a physical mode depending on whether specific pins of the chipset are set to high or low at initial boot in non-management switch mode. The Intelligent CPU mode is used when inter-working with the WIM board. This mode obtains VT6526 switch chipset register settings from the WIM board through 8 bit IDE bus and configures the settings. The LIM-P board can be any of the three modes.

The Viatech VT6108 chipset used as the Octal PHY of 10/100 Mbps supports the SMII, S3MII, or RMII interface. The quality of RXCLK is improved in the S3MII interface compared with SMII and its reliability is enhanced. Therefore, the S3MII interface has been adopted. A LED on each port shows links and speed.

When inter-working with the WIM board, 8 bit IDE bus and control signals are connected to the back-plane connector through the buffer to enable the management function. Also, a separate Ethernet port is configured to prevent against blocking when exchanging data with the WIM board.

The actual PoE function of LIM-P is embodied by the circuit of LIMD-P, which is a daughter board, and PD64004 of PowerDsine Company is used as the PSE chip. The PD64004 supplies the power for 4-port in each device and uses 4-PD64004 chips to provide the PoE function for 16-port.

In addition, PoE consists of Power Sourcing Equipment (PSE) that supplies the power and Powered Devices (PD) that receive the power from the PSE. Therefore, the LIM-P takes a role of PSE to provide the power in the PoE component.

PoE is embodied in two ways: Alternative A that supplies DC power to the data signal of

Ethernet cable and Alternative B that supplies DC power to the spare signal of Ethernet cable.

The LIM-P board requires a power source to provide the PoE function. Even if the internal Power Supply Unit(PSU) of OfficeServ 7200 supplies the power of - 48V, the board is designed to attach external rectifier for PoE (-48 V ~ -54 V) to increase the capacity of the power because other boards as well as the LIM-P board use the power of the PSU according to the property of the system.

Therefore, the LIM-P board is designed to enable a user to freely select the power of the PSU or the power of an external rectifier to supply the power for PoE in the LIM-P board. In addition, a user can manipulate the shunt in the upper right of the board.
In case of the use of the PSU: Shunt connection of J1/J2/J3 P1-P2
In case of the use of an external rectifier: Shunt connection of J1/J2/J3 P2-P3
※ If the shunt is built in, Ji, J2 and J3 should be connection in the same direction for the power stability.
If, for example, J1 is connected in shunt with pin 1 and pin 2, J2 and J3 should be, also, connected in shunt.
(If J1 is connected in shunt with pin 1 and pin 2, J2 and J3 should not be connected in shunt with pin 2 and pin 3.

Each jumper is named as 1, 2 and 3 from the pin with the mark of '1' in turn.

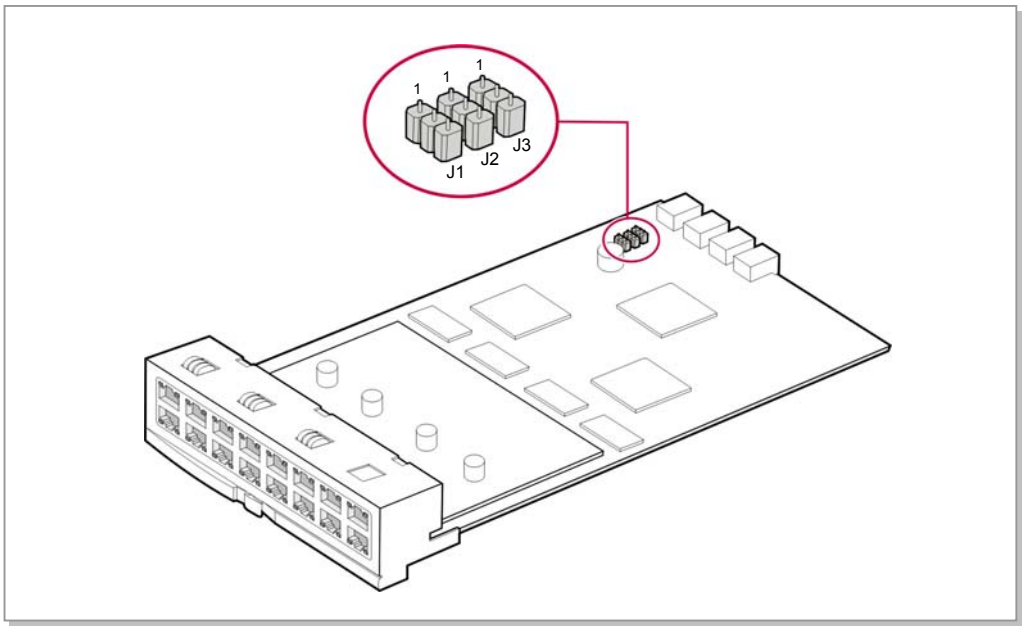

Figure 2.21 Power Selection Strap Option for PoE

2.5.13 4DSL Board

The 4DSL board transfers or receives data to or from the IP device, which is located far away from the Intranet by using VDSL. This board is mounted on the universal slot of the OfficeServ 7200 system.

2.5.13.1 Block Diagram

The block diagram of the 4DSL board is shown in the figure below:

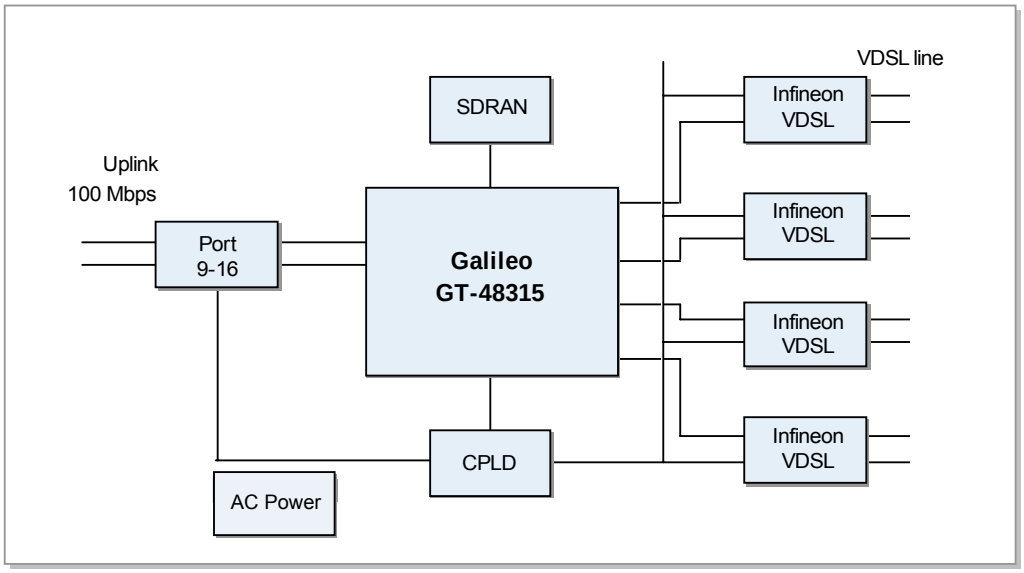

Figure 2.22 Block Diagram of the 4DSL Board

2.5.13.2 Major Features

The features of each block in the 4DSL board are as follows:

Digital Transceiver (DSP)

- PEF 22818 Ethernet, ATM single port chipset, P-TQFP-144-10 package
- 10/100 BASE-T Ethernet interface
- 2 ATM UTOPIA level 2 PHYs(slave) or dual master interface
  - 2 Mbit/s PCM interface(on the non-interleaved(fast) channel)
- External host parallel port
- Serial UART interface
- EEPROM interface(I2C)
- Modem initialization, monitoring, and firmware upgrade through the RS-232 port
- Reed Solomon Forward Error Correction(FEC) coding
- Power: Core 1.2V, I/O 3.3 V

Analog Front End (AFE)

- PEF 22815, 64-pin P-TQFP package
- 12 MHz analog bandwidth
- 13 bit DAC/12 bit ADC
- Automatic Gain Control(AGC)
- Clock Source: 38.88 MHz
- Power: Analog, digital 1.8 V, digital I/O 3.3 V

VDSL Line Driver

- PEF 22810, P-DSO-8-3 package
- Line driver for VDSL
- 14Vp-p differential voltage swing at supply voltage of +/-5 V
- 10 dBm transmit power on the line at supply voltage of +/-5 V
- Power: +/-5 V

2.5.14 4WLI Board

The 4WLI board is a board for the system connected to the WBS24 to provide the wireless LAN function, and the WBS24 (to be released) is used for the Access Point(AP). One 4WLI provides services for up to four APs. Maximum number of channels where a call can be made simultaneously is 16. 48 terminals can be registered with a channel.

2.5.14.1 Block Diagram

The block diagram of the 4WLI board is shown in the figure below:

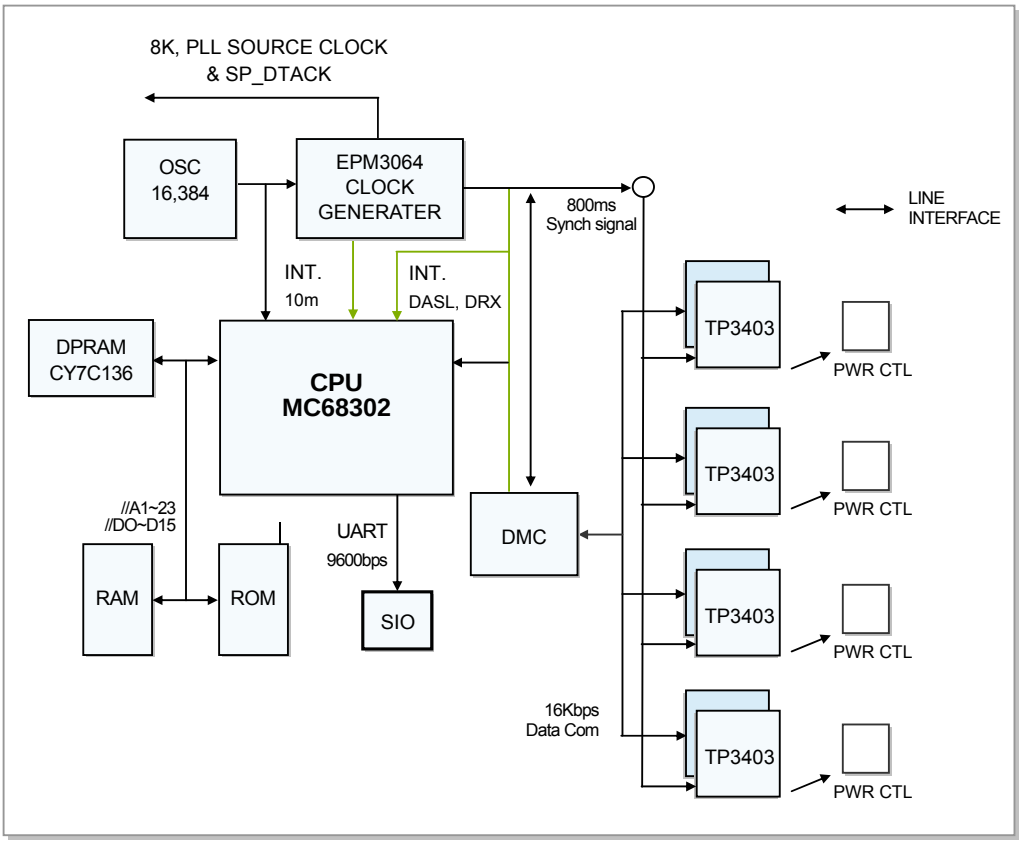

Figure 2.23 Block Diagram of the 4WLI Board

2.5.14.2 Major Features

The major features of the 4WLI board are as follows:

CPU

- MC68302 of Motorola is used as a processor. 16 bit word operation can speed up operation.
- The Dedicate mode is set for interrupt.
  ABORT is used for LEVEL7,
  DASL INT is used for LEVEL6,
  DASL UART Rx, Tx, 10 ms INT is used for LEVEL4, and 800 ms INT is used for LEVEL1.
- Adjusts the time to transfer the DASL SYNCH data by using the I/O port.
- SCC3 is used for the I/O user interface and its transfer rate is 9600 bps. The flash memory of 8 Mbits(1 Mbytes) is used as a program memory and the program directly modified in the PC can be upgraded.
- Two RAMs(Total: 1 Mbytes) of 4 Mbits are used for word operation.

AP Connection Part

- The DMC ASIC chip allocates time slots to eight DASL transmittance chips, makes UART data communications, or controls micro.
- The DASL transmittance chip receives the frame signal transmitted at the same interval from the AP connected to each port in MBS mode. Also, two DASLs are connected to each AP and the first DASL supports the UART interface between the AP and 4WLI board for data communications of 16 kbps. The second DASL uses the DEN mode to correctly transmit the multi-frame signals of 800 ms to all the connected APs within the cycle of two 2.048 MHz B clocks.
- EPLD is used to secure space in the PCB of the board. A connection with the CMOS device is implemented by saving PULL_UP of 1.2 kΩ in the output part of a TTL level.
- Each port uses MOSFET to control power feeding by software.

Resetting Part

The resetting part uses a Watchdog chip to prevent the system from operating improperly due to voltage change and secure power on reset timing margin. Monitoring on system operation is enhanced by applying a manual reset switch and NMI switch.

2.5.15 WBS24 (to be Released)

The Wireless Base Station of 2.4 GHz(WBS24) is a wireless LAN access point with the system.

2.5.15.1 Block Diagram

The block diagram of the WBS24 is shown in the figure below:

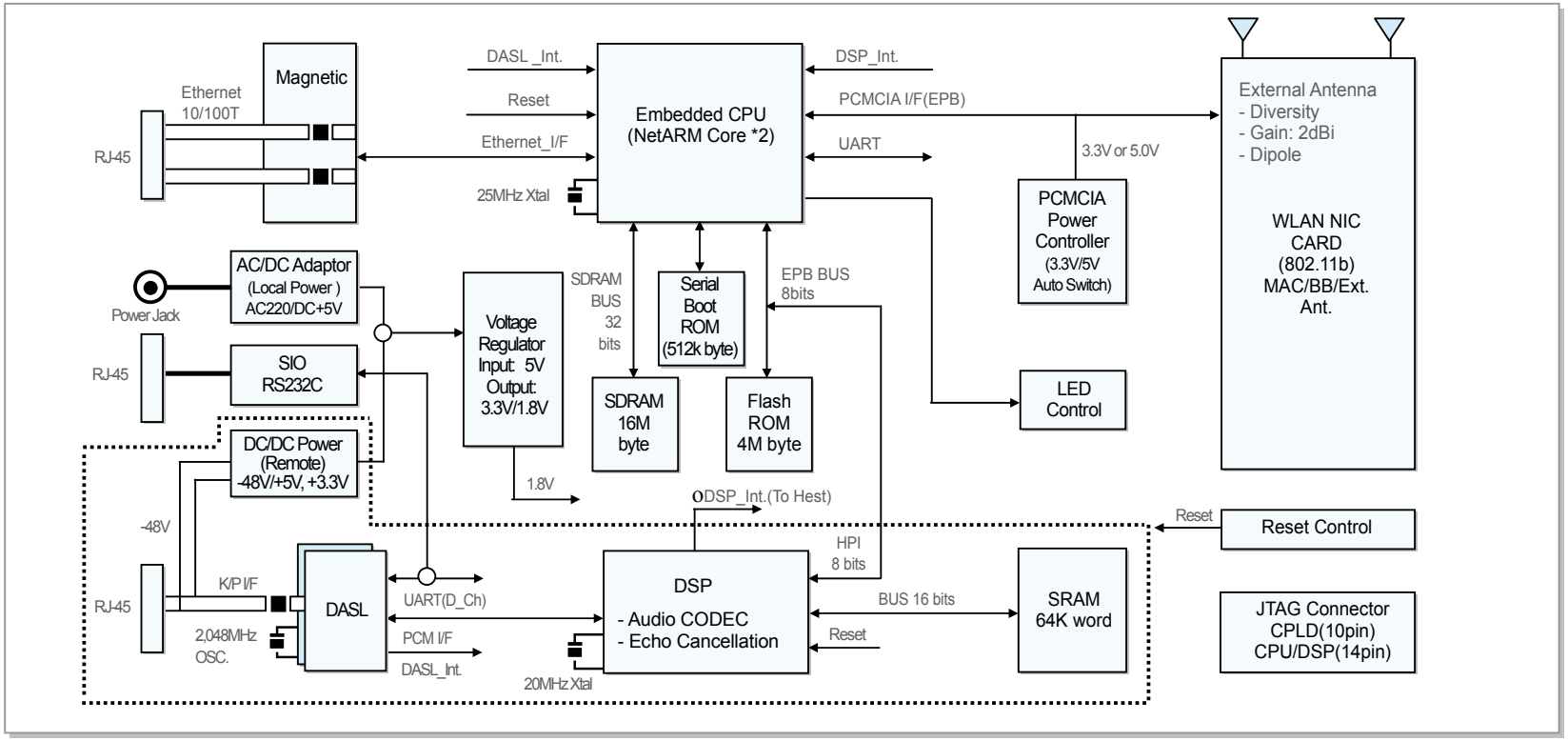

Figure 2.24 Block Diagram of the WBS24

2.5.15.2 Major Features

The WBS24 inter-works with the system through the 4WLI board installed into the OfficeServ 7200 system as shown in the figure below to provide wireless, voice, and data services: Also, the voices received from the WIP-5000M, which is a wireless terminal for voices only, are sent to the system. The data received from wireless data terminals such as laptops and PCs are transferred to the LAN.

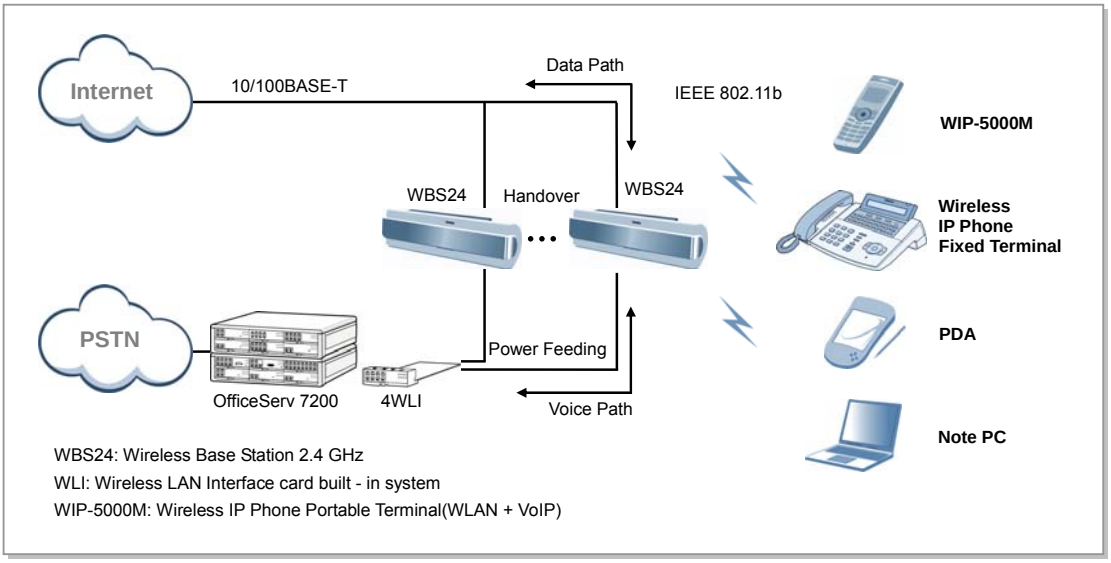

Figure 2.25 WLAN Configuration Diagram

The major features and characteristics of the WBS24 that make effect by inter-working with the system are as follows:

- Up to one 4WLI board is installed into the OfficeServ 7200 system.
- One 4WLI board can inter-work with up to four WBS24s.
- Calls can be made simultaneously through up to four voice channels per WBS24.
- A frequency can reach to 50 m indoor(the distance depends on communication jamming objects at the office.) and 200 m outdoor(when communication jamming is not made within the sight distance.)
- This board receives the power of -48 V from the system and the maximum wire extended distance is 500 m.
- Creates or maintains a speech channel and supports handover.
- Supports echo cancellation and voice CODEC(G.729, G.711).

Table 2.3 System Configuration Inter-Working With WBS24

Item	System Configuration	Remarks
RF Module	- Wireless Standard: IEEE 802.11b - Data Rate: Up to 11 Mbps - Security Function: WEB 64/128 bit encrypted - Output Power: Up to 100mW(NIC board 70mW) - Channel: 13(Non overlap channel: 3) - Interface: PCMCIA	-
Ethernet	- 10/100 BASE-T(IEEE802.3): RJ-45 connector	-
Power Feeding	- Local Power: AC/DC adapter(AC 220/DC 5V, 2A) - Remote Power: DC/DC converter(-48V/+5V, 3.3V1A)	-
Antenna(External)	- Frequency: 2400-2500 MHz - Antenna Gain: 2.0 dB - Beam-Width: Omni directional(Dipole) - Diversity supported	Directional antenna can be installed according to a site to be installed.
VoIP	- Audio CODEC: G.711, G.729 - Echo Cancellation: 8 ~16 msec - Voice channel: 4 channels supported	-
Phone Interface	- Digital interface of National Semiconductor (DASL): RJ-45 - Number of voice channels: 4(DASL x 2) - Power feeding through the DASL line can be made. (Remote power supplied) - DASL line extended: Up to 500 m	-
Others	- SIO for a monitor: RS-232C	-

The WBS24 has two types of interfaces: wire and wireless. The wire interface is classified into the interface that inter-works with the system and the interface that inter-works with the LAN. The wireless interface inter-works with air section and meets the IEEE802.11b standard.

Wire Interface Inter-Working With the System

This interface is connected with 4WLI by Digital Adapter Subscriber Loops(DASL), which enables digital transmittance of 144 kbps(2B+1D). One WBS24 supports two DASL lines and one DASL line provides two voice channels. One WBS24 can support a total of four voice channels simultaneously. Also, D channel data for making a voice call are transferred or received through the DASL line and its transfer rate is 16 kbps. This interface serves as a voice path that creates or maintains a speech channel by forwarding or receiving the voice packets exchanged with wireless interface to or from the system.

Wire Interface Inter-Working With the LAN

This interface is 10/100 BASE-T and an Ethernet RJ-45 interface that meets the IEEE 802.3 standard. This is a path that transfers the data transferred or received through the wireless interface to the LAN and processes required data transfer or receipt such as Internet access except for voices.

Wireless Interface

This interface uses the wireless frequency band of 2.400~2.4835 GHz and meets the IEEE 802.11b standard. A terminal for voices only(WIP-5000M) is used to forward or receive voice packets from the wireless section to VoWLAN. Data packets in a wireless section are forwarded or received by terminals such as laptops and PDAs.
Also, 13 wireless channels are used in Korea while 11 wireless channels are used in USA. The interfaces occupy bandwidth of 22 MHz per wireless channel. Since the interval between center frequencies is 5 MHz, any clear channels that do not interfere with wireless channels should be separated by more than four channels.

WLAN NIC (IEEE802.11b Wireless Board)

The commercial NIC in a PCMCIA interface type that has obtained a wifi cerfication certified by WECA is used for the wireless LAN RF WBS24.
The wireless LAN NIC board is configured with three chips of Prism3.0 manufactured by Intersil Co., Ltd. and external antennas can be installed into the board. If the voice or data packets forwarded or received in a wireless are occupied in the air section in a CSMA/CA method first, other APs will have opportunities of forwarding or receiving once the first AP completes forwarding or receiving. Thus, multiple terminals can forward or receive packets in a wireless section.
Since multiple terminals occupy the air section in this method, the more terminals are, the lower the occupancy of the air section for forwarding or receiving is. Thus, throughput in a wireless section is lowered. About 20 people can use data on a wireless LAN by using one AP where a wireless IEEE802.11b Direct Sequence Spread Spectrum(DSSS) method is used based on the users of Internet and e-mails at offices where wireless LAN is used.

The features of the WLAN NIC are as follows:

- Wireless standard: IEEE 802.11 b
- Data rate: 11/5.5/2/1 Mbps
- Modulation: CCK, BPSK, QPSK
- Network architecture: Ad-hoc, infrastructure
- Security function: WEB 64/128 bit encrypted
- Output power: Up to 100 mW(NIC board: 70 mW)
- Channel: 13(Non-overlap channels: 3)
- Interface: PCMCIA
- Frequency: 2400-2483.5 MHz
- Antenna gain: 2.0 dBi
- Beam-Width: Omni directional(Dipole)
- Diversity supported

2.6 Optional Board (Daughter Board)

Some specific boards of the OfficeServ 7200 system can be used, equipped with the optional board in the form of an optional board. The boards that can be mounted for each optional board, the location for equipment within the board and the function are introduced in the following table.

Table 2.4 Optional Board Type

Optional Board	Equipped Board	Equipped Location	Function
MIS	MCP	LOC 3	Provides the port to which various external devices can be connected. - Two reserve/background music ports - One external paging output port - One Loud Bell port - One common bell port - Two dry contact ports
MFM	MCP	LOC 1	Provides DTMF and 12 DSP circuits for detecting tones.
RCM	MCP	LOC 2	Provides the circuits for detecting the caller ID of 14 channels or R2 signalling circuits of 8 channels.
MGI2D	MGI	-	Provides the port of the internet phone of 8 channels(VoIP).
WIMD	WIM	-	Provides a network security processing function.

2.6.1 MIS Board

The MIS board provides the external music, paging, loud bell, and dry contact, with the location where it is mounted fixed. The frame synchronization signal for sending/receiving the PCM voice information and 2 MHz signals are generated in CPLD.

2.6.1.1 Block Diagram

The block diagram of the MIS board is shown below:

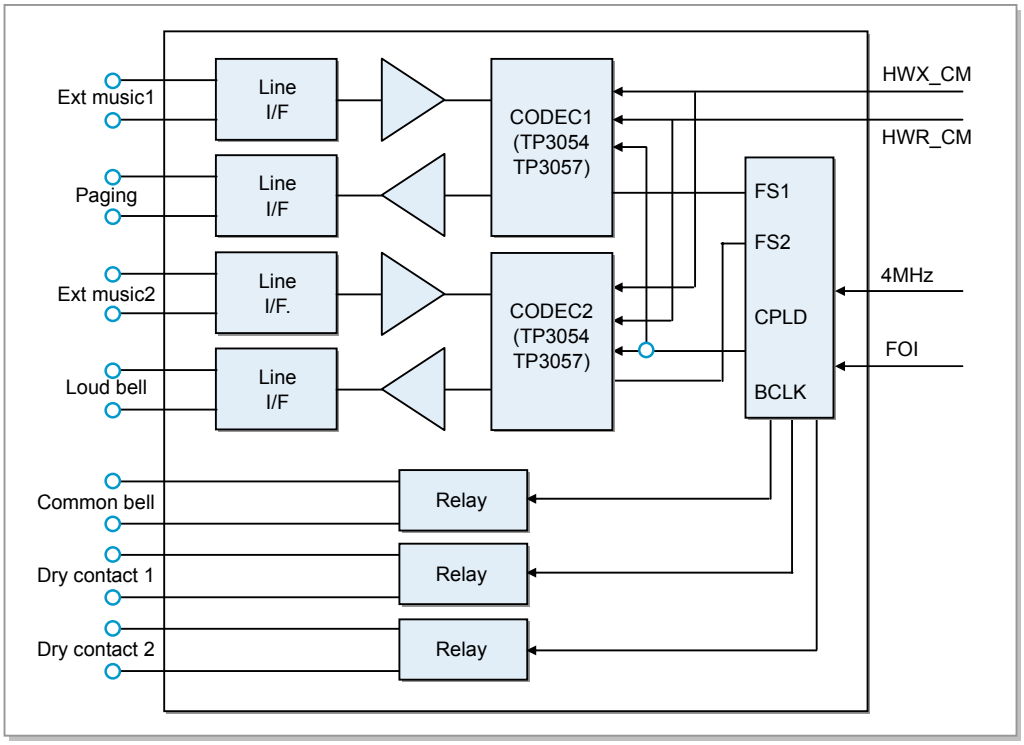

Figure 2.26 Block Diagram of MIS Board

2.6.1.2 Main Function

The Main functions of the MMIS board are as follows:

External Music

As for the external music, two ports are supported per MIS board. As for the CODEC, A-law CODEC and U-law CODEC are supported simultaneously and one of them is automatically selected to be used. Therefore, the user doesn't need to specify the CODEC according to the companding system.

Paging

This function is to page according to the group that was already specified.

Loud Bell

This function enables the terminating ring to sound to the outside.

Dry Contact

The dry contact is used to control the power of the external device. Up to three, the dry contacts are supported.

2.6.2 MFM Board

The MFM board is an optional board that provides the DTMF receiver function of the maximum 12 channels. The MFM board is mounted in the MCP board.
The configuration diagram of highway of the MFM board is shown below:

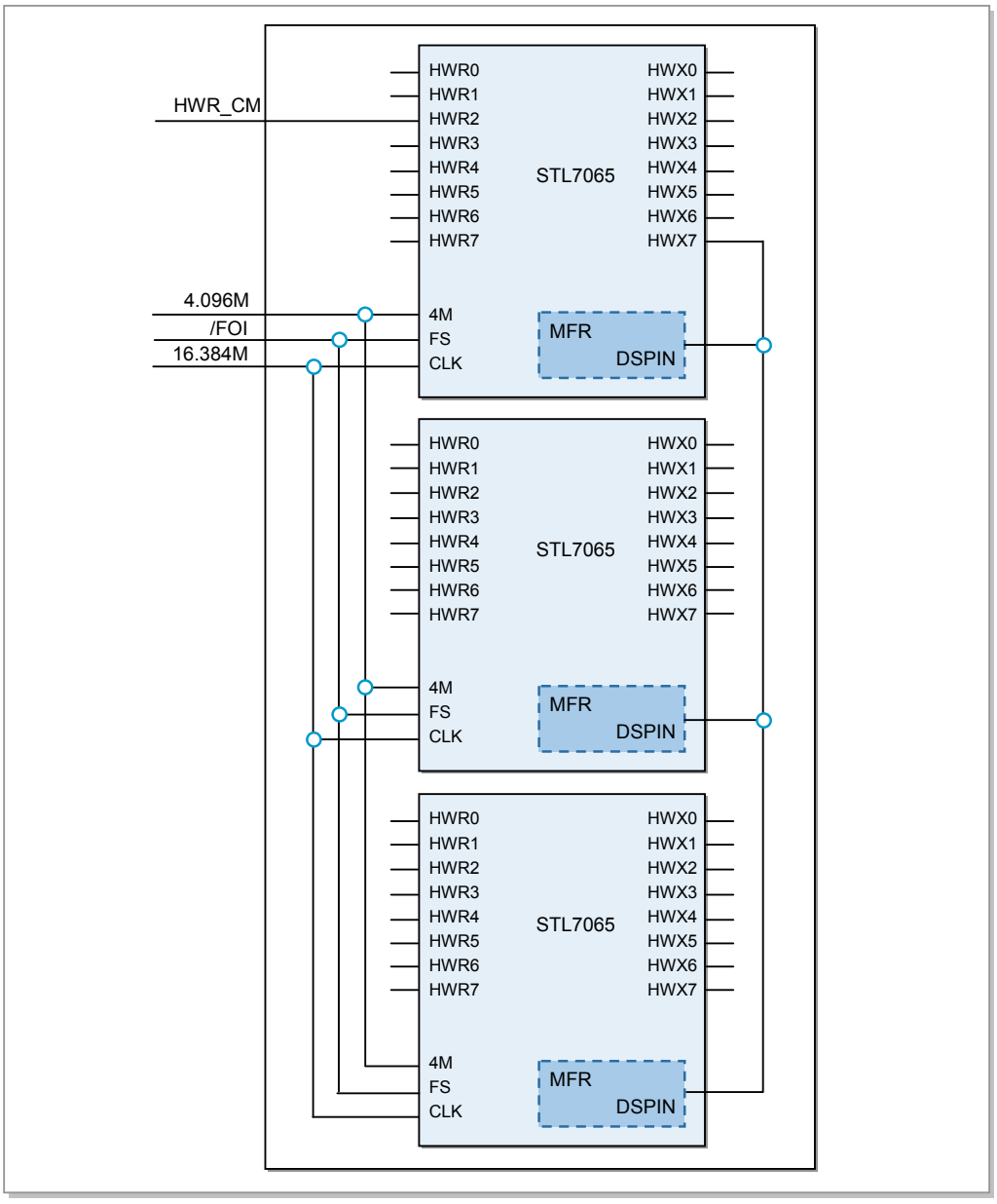

Figure 2.27 Configuration Diagram of Highway of MFM Board

2.6.3 RCM Board

The RCM board is an optional board that provides the R2 or CID(Caller ID) function. When R2 is used, the RCM board provides up to 8 channels, and when CID is used, it provides 14 channels. To select R2 and CID, a user should specify them by using the switch for selection on the RCM board and should check if the relevant resources are specified as many as a user wants by using the MMC on the phone.

2.6.3.1 Block Diagram

The block diagram of the RCM board is as follows. Here, STB9404 is the ASIC providing a function for detecting R2 or CID.

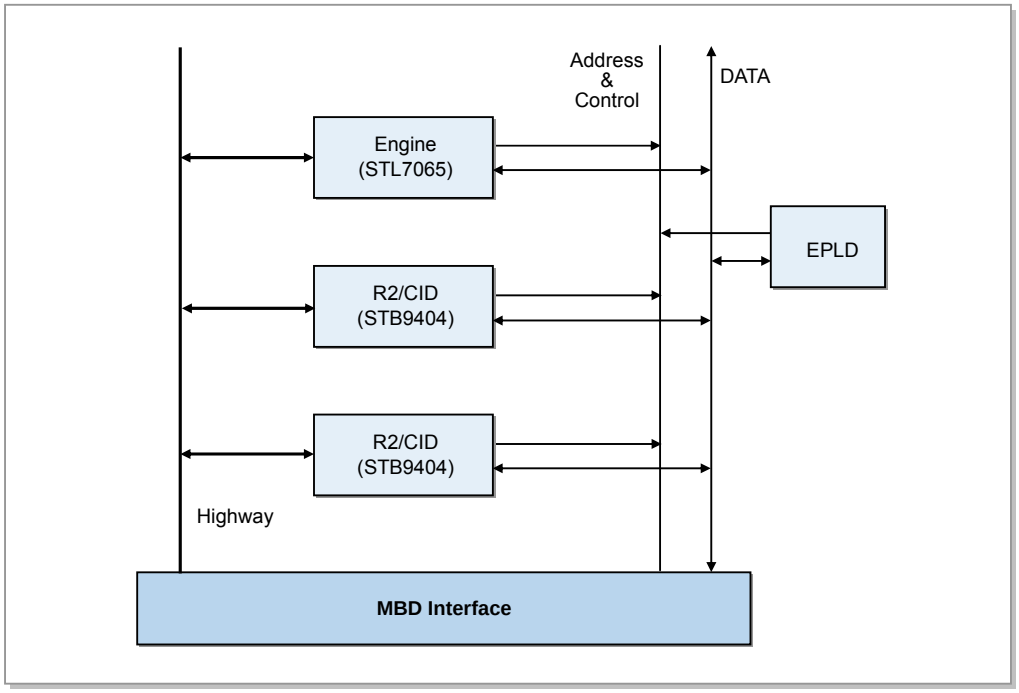

Figure 2.28 Block Diagram of RCM Board

2.6.3.2 Highway Configuration Diagram

The highway configuration diagram of the RCM board is shown below:

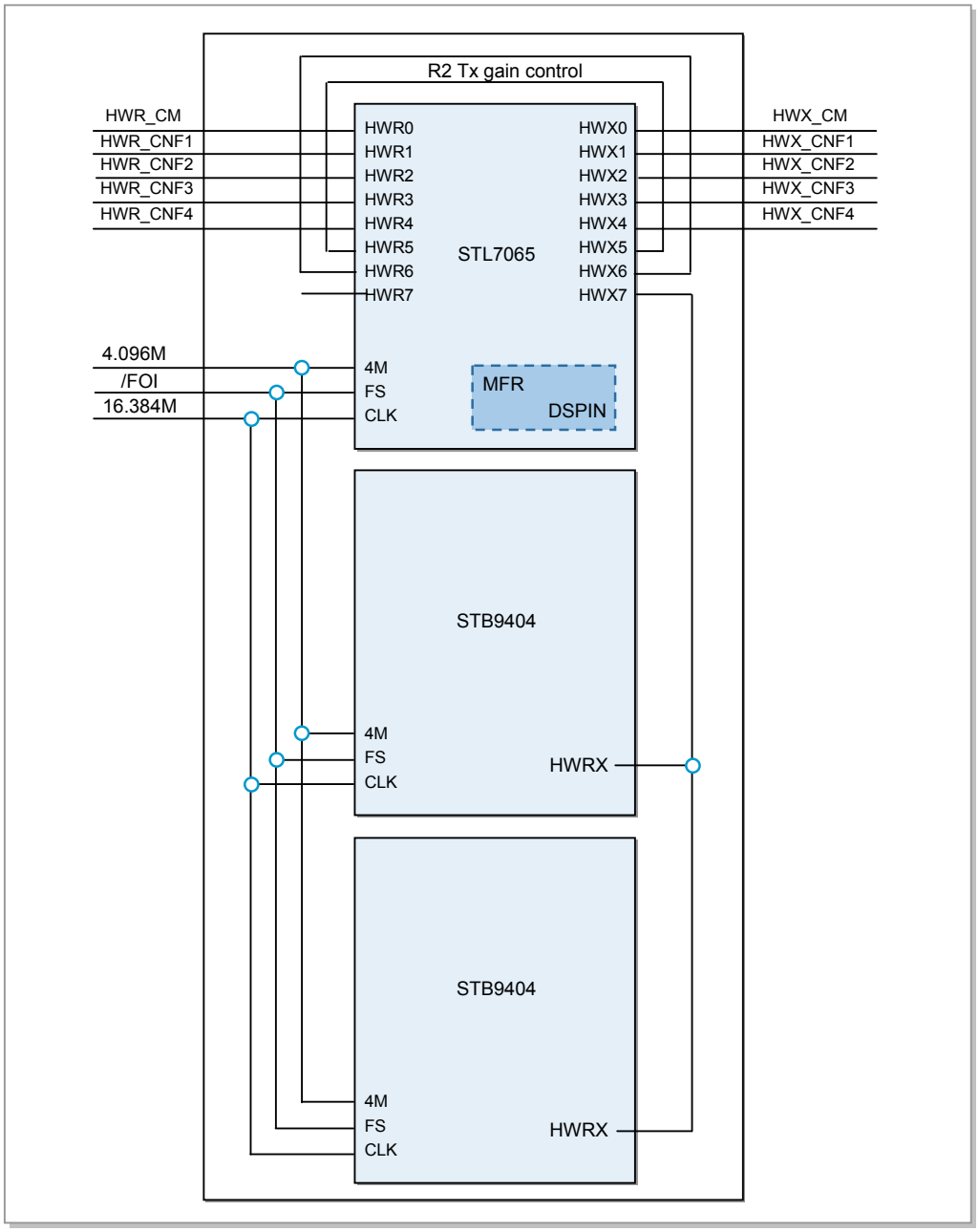

Figure 2.29 Highway Configuration Diagram of RCM Board

NOTE

Reference

HWR_CNF1.4 and HWX_CNF1.4 are reserved highways.

2.6.4 MGI2D Board

The MG12D board is the board for extending the VoIP channel that supports the VoIP port of four channels. It can be mounted in the MGI board.

2.6.4.1 Block Diagram

The block diagram of the MGI2D board is shown below:

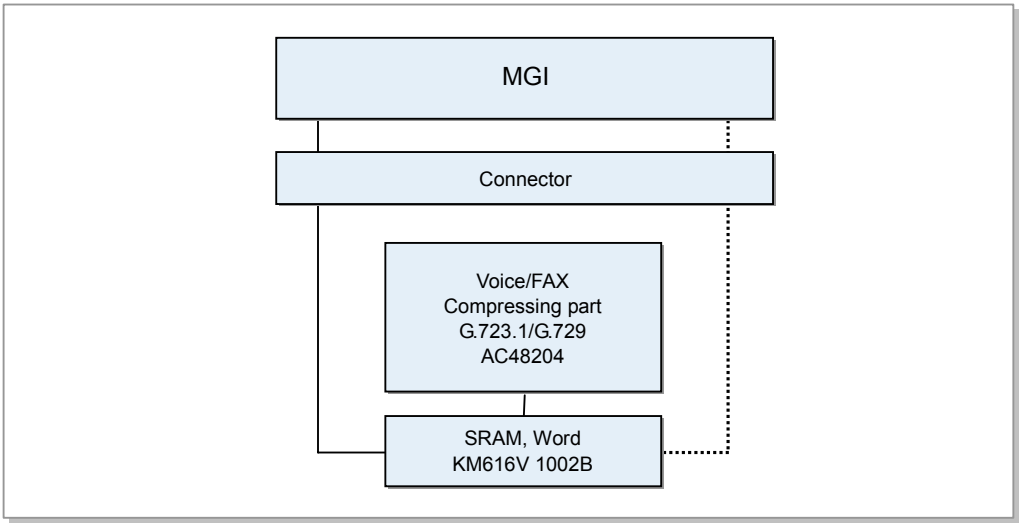

Figure 2.30 Block Diagram of MGI2D Board

2.6.4.2 Main Function

The function of the AC48204 CODEC, which is a main part of the MGI2D board, will be described.

CODEC AC48204

- Up to 16 channels can be accommodated.(4CH/Chip x 4)
- All of interfaces between the CODEC and the host are implemented by using EPLD
- CODEC uses the product made by AudioCodes co.
- Four independent voice and fax channels are supported per chip.
- The H.323 voice coder that a user can configure is used.
- 'Soft', Field-upgradeable Functionality
- Roburst Bad Frame Interpolation.(BFI)
- G.165/G.168 Adaptive Echo Canceller
- Toll quality voice that decreases the bit rate to the average 3.2 kbps by using the silence compression.
- Detecting/Generating TIA 464A DTMF
- Detecting/Generating MF

- Parallel host processor interface
- Host programmable tone signal
- PCM interface that can be configured: PCM highway or parallel interface
- On-chip PCM highway interface(assignment of the time slot for configuring the host, and G.711 mμ-law/A-law PCM interface that can be selected)
- Gain control

2.6.5 WIMD Board

In order to implement the VPN function of the WIM board, the tunneling through the data encryption, decryption, and authentication should be performed. The overall system performance is degraded if this tunneling is implemented in a software method. To solve this problem, the system performance should be enhanced by using the network security processor. If this VPN module is formed in the form of the PCI target card, various network security processors can be applied, therefore, the extensibility and flexibility of the system can be enhanced. The VPN function is implemented by using the WIND, which is the optional board of the WIM board. Also, when the board is used, two dual row 40 pin connectors are defined similarly to the standard PCI connector specification, in order to connect the WIM board to the WIND optional board. The traits of the network security processor(Hifn 7951) are as follows:

- Bus interface of 32 bit, 33 MHz compatible with PCI2.1
- Pin compatible with the Hifn7751 Compression Processor
- Symmetric key encryption(DES, Triple-DES, and RC4)
- Authentication(SHA-1, MD5)
- Compression(LZS, MPPC)
- Public Key processing unit
- Random digit generator
- No CPU intervention required between operations(no latency)
- JTAG
- DMA engine based on the descriptor(supporting the Data scattering/gathering)
- 3.3 V operation

2.7 Terminal

This chapter will describe the block diagram regarding each terminal connected to the OfficeServ 7200 system, and the main functions.

2.7.1 DPIM

Door Phone Interface Module(DPIM) is a conversion relay device that enables the inter communication by conversing the analogue signal of the door phone into the digital signal and digital signal of the system into the analogue signal, in order to use the analogue door phone, which was previously developed and is currently being used, by connecting it to the OfficeServ 7200 system. The longest available distance between the DPIM and the OfficeServ 7200 is 400 m, and the calling distance between the DPIM and the door phone is 200 m. The longest calling distance from the main door phone is 600 m.

2.7.1.1 Block Diagram of DPIM

The block diagram of the DPIM is described below. The DPIM uses the door box, which is used in the Samsung DCS-816 analogue key telephone system, as it is. The DPIM consists of the speaker, microphone, and the transfer part for sending/receiving the analogue signal.

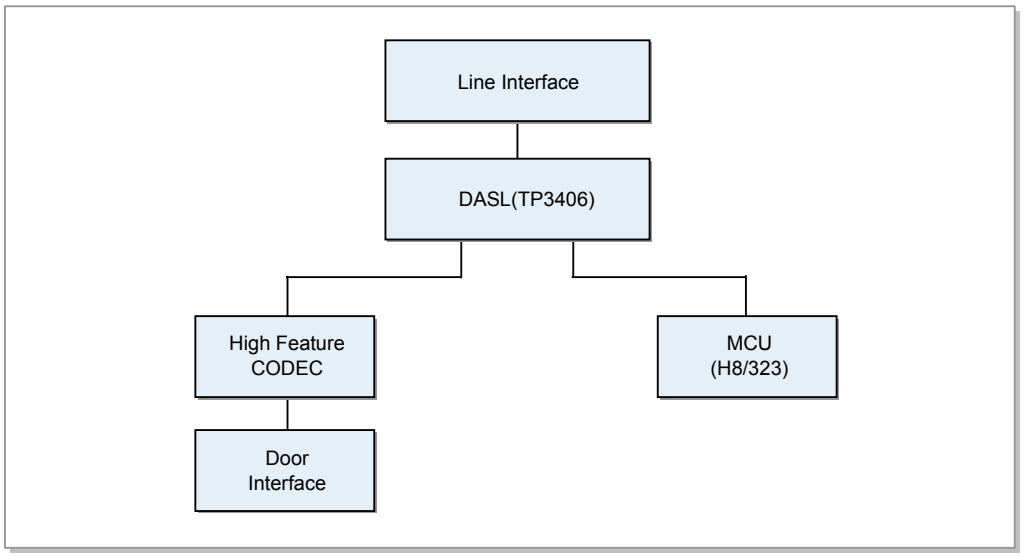

Figure 2.31 Block Diagram of DPIM

2.7.1.2 Block Diagram of Door Phone

The block diagram of the door phone, which is used, connected to the OfficeServ 7200 system, OfficeServ 7200, is as follows:

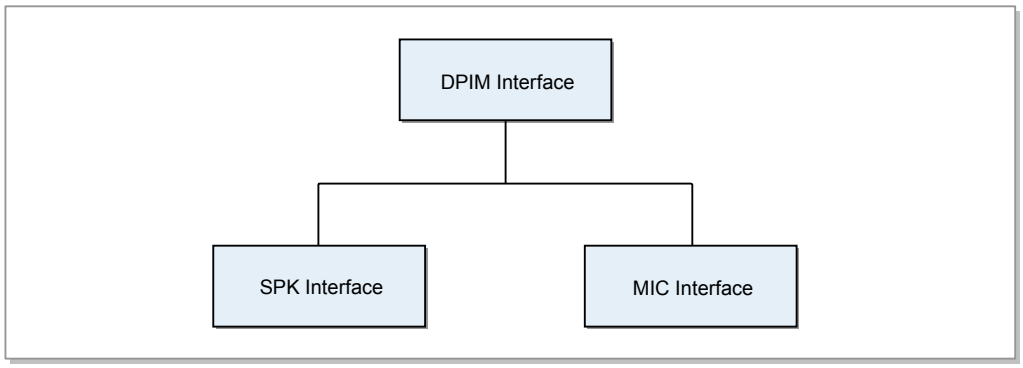

Figure 2.32 Block Diagram of Door Phone

2.7.1.3 Main Function

The main function of the DPIM is as follows:

Micro-controller Unit (MCU)

The signal transmitted from the DPIM PCM digital transfer part is conversed into the analogue signal in High Feature CODEC(HFC). At this time, TL084 whose audio quality is good is used as an amplifier to amplify the analogue signal, which was transmitted from the door box, and the displayed signal. Since the input resistance of TL084 should be great, 100 kΩ is used as an input resistance.

In the matching part, T5692 is used along with the trans of the door box. The resistance of 1 kΩ (R14) is the resistance value when two trans have the best quality of transfer. Also, since the resistance of 100 kΩ (R9, R10) uses the signals transmitted and received from/to the trans by mixing them, it is a balance resistance for decreasing the input of the signals, which are transmitted to the speaker, to the micro input of the HFC(NO. 19. pin)

Door Lock Control Part

In the DPIM, the locker, which provides a function to open the door to a visitor, can be mounted. The general locker uses AC 100 V, which is turned on/off by using a relay as a switch. At this time, the relay control port of the MCU is P10(No. 48 pin), and this port is the key scan port in a digital phone. The diode of the relay control TR.(MMBT 2222, Q1) output end(1N4148,D6) is used to clear the counter electro-motive force. The cap and the resistance of the both ends of the relay are for preventing the spark occurring at the relay contact.

Switch Detection Part

A visitor can call the person in the inside by pressing the switch on the door box.
The DPIM detects if this switch was pressed, with a photo coupler, and enters in the MCU port 46(No. 15 pin). At this time, the MCU sends the data to the D-channel of the PCM transfer chip(TP 3406, U5).
The system, which received this data, sends a signal to the port, which was already specified, to enable the calling.
This signal for detecting the switch can consist of two lines because it is sent through the center tap of the matching trans(T5692), and even though the power of +5 V is given to the trans, the trans is not damaged.

+12 V Generating Part

The DPIM uses the step up DC converter(LT1109, U11) that generates +12 V in the simple surrounding circuit by the +5 V power being entered. LT1109-12 displays
+12 V 60 mA by the input of +5 V.
The 33 uH(L2) inductor is for generating the switching, and the 47 uF/35 V(C7) capacitor is for the load of the switch, and the 33 uH(L1) inductor of the output end is for decreasing the switching ripple noise. Also, the poly switch of the +12 V output end is for prohibiting the overcurrent from flowing when the +12 V line, which is connected to the door box, is shortened.

Pin Connector

- Door Lock
  Modular pin(6P6C) 1, 6: Dry contact(relay), Normal Open.

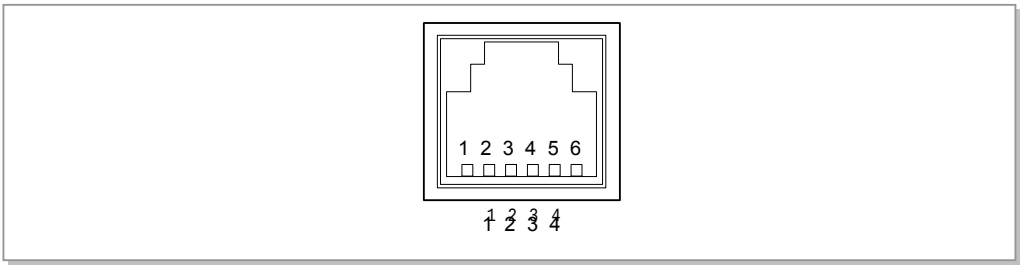

Figure 2.33 Pin Connection of DPIM

- Door Phone
  Modular pin(6P4C) 1: L1(The L1 and L2 line is limited to +5 V for detecting a switch contact.)
  - No. 2 pin: L2
  - No. 3 pin: P+(+12 V)
  - No. 4 pin: P-(GND)

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CHAPTER 3. Troubleshooting

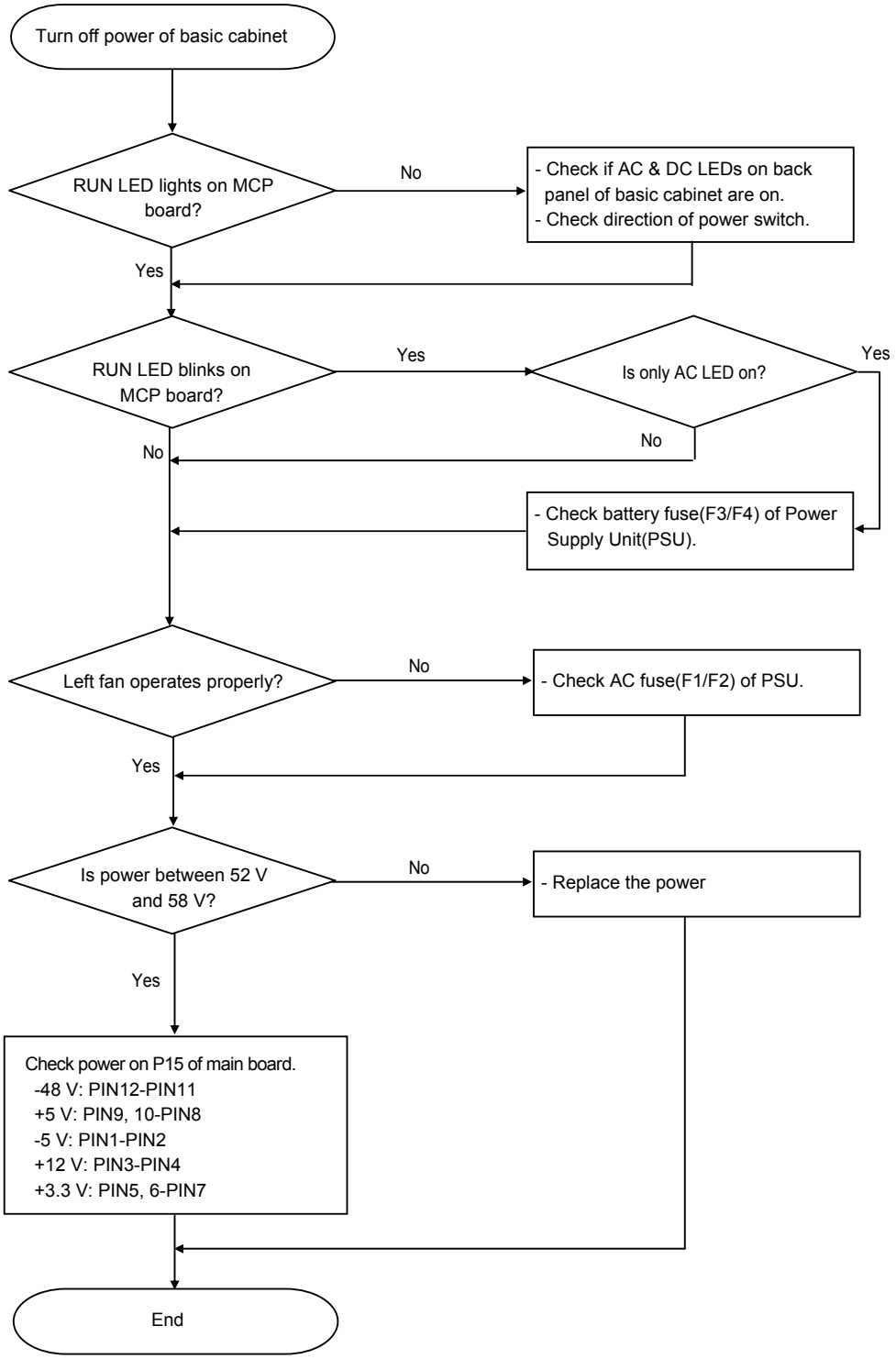
This chapter describes problems and troubleshooting the problems that might occur while operating the OfficeServ 7200 system.

3.1 Diagnosing System Operation

Describes troubleshooting potential problems that occur while operating the OfficeServ 7200 system.

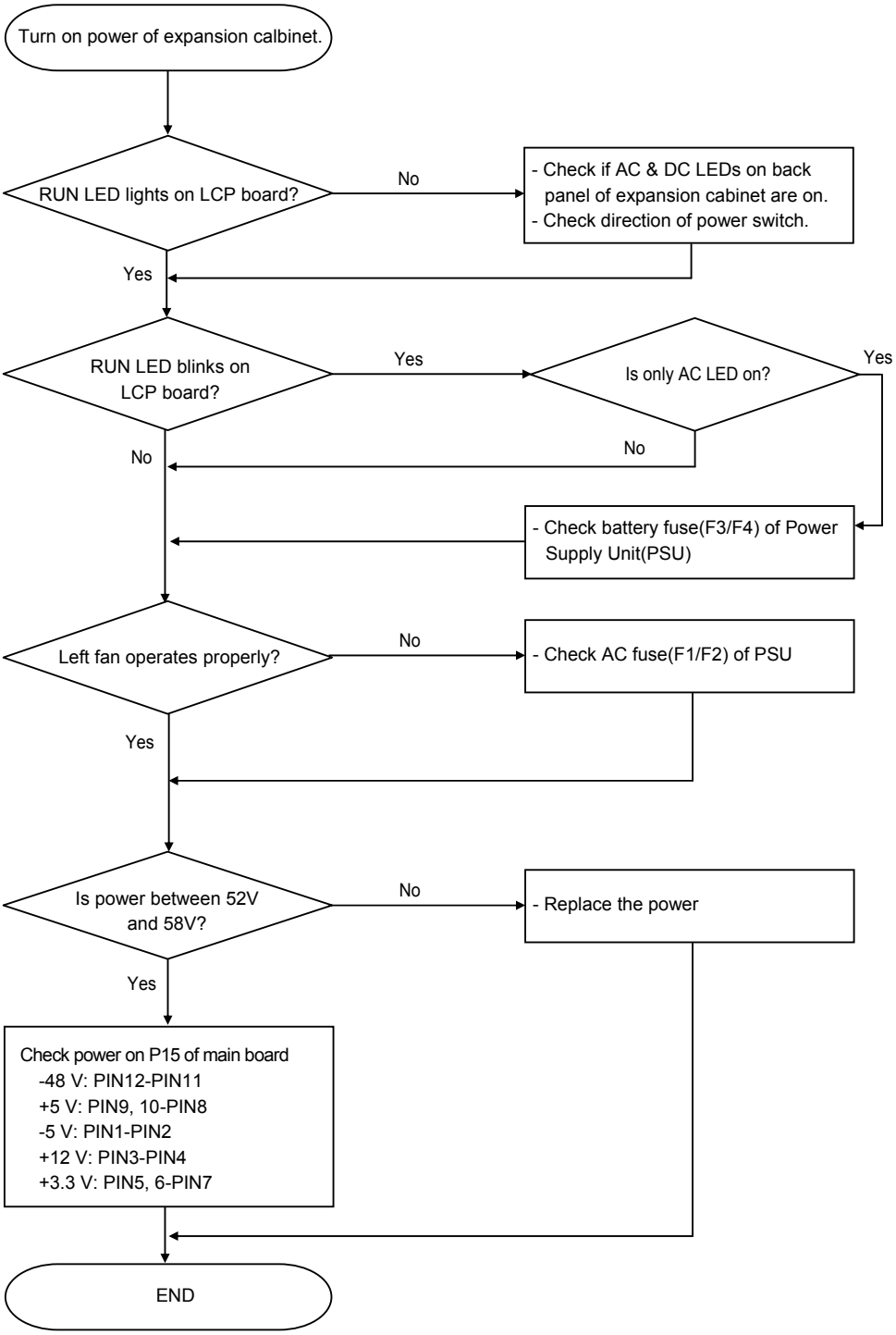
3.1.1 Checking Basic Cabinet Power

The procedure for checking if the power of Power Supply Unit(PSU) of basic cabinet is provided properly is as follows:



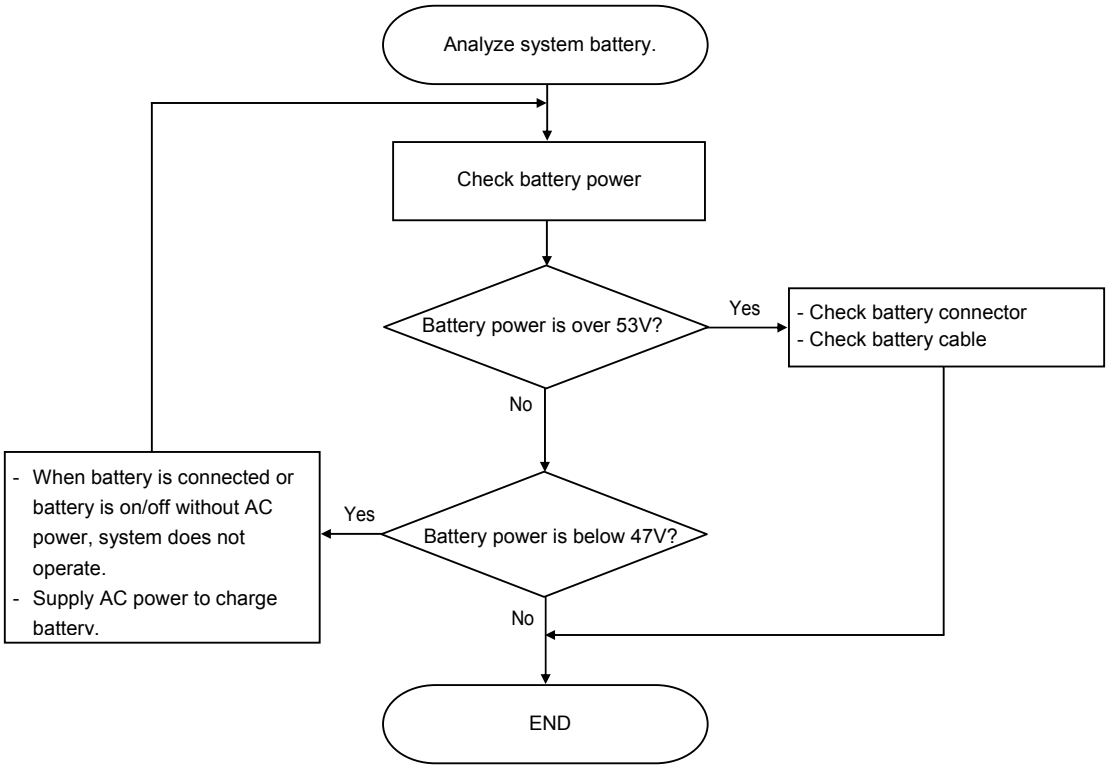
3.1.2 Checking Expansion Cabinet Power

The procedure for checking if the power of Power Supply Unit(PSU) of expansion cabinet is provided properly is as follows:



3.1.3 Abnormal Battery Backup (1)

The procedure for troubleshooting the problem that occurs when the battery of the OfficeServ 7200 system is backed up is as follows:



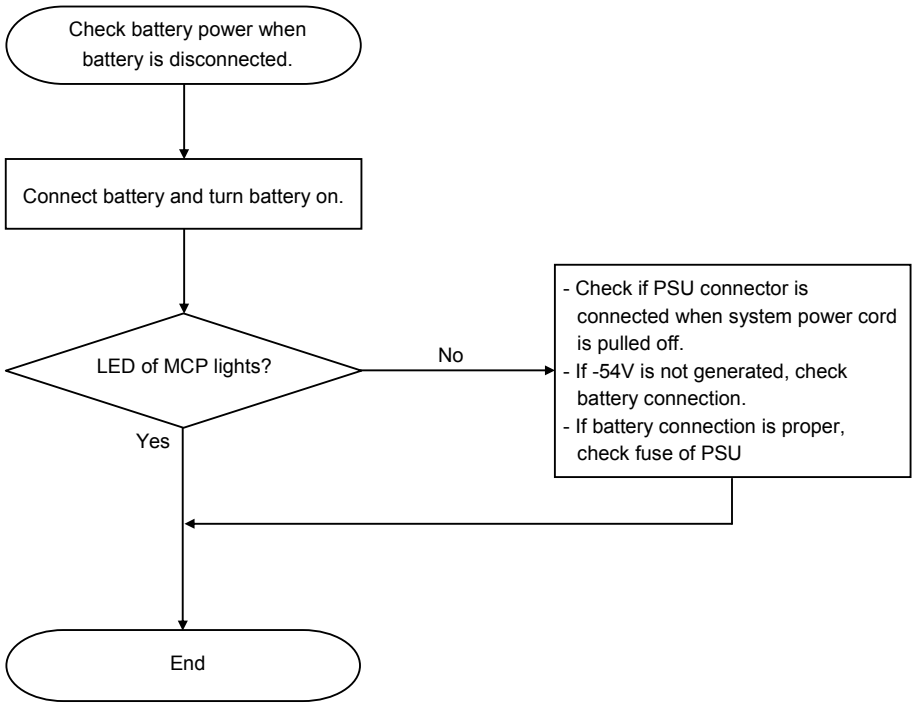
If the problem of battery backup is not resolved

If the problem of battery backup is not resolved, refer to '3.1.4 Abnormal Battery Backup(2)'.

NOTE

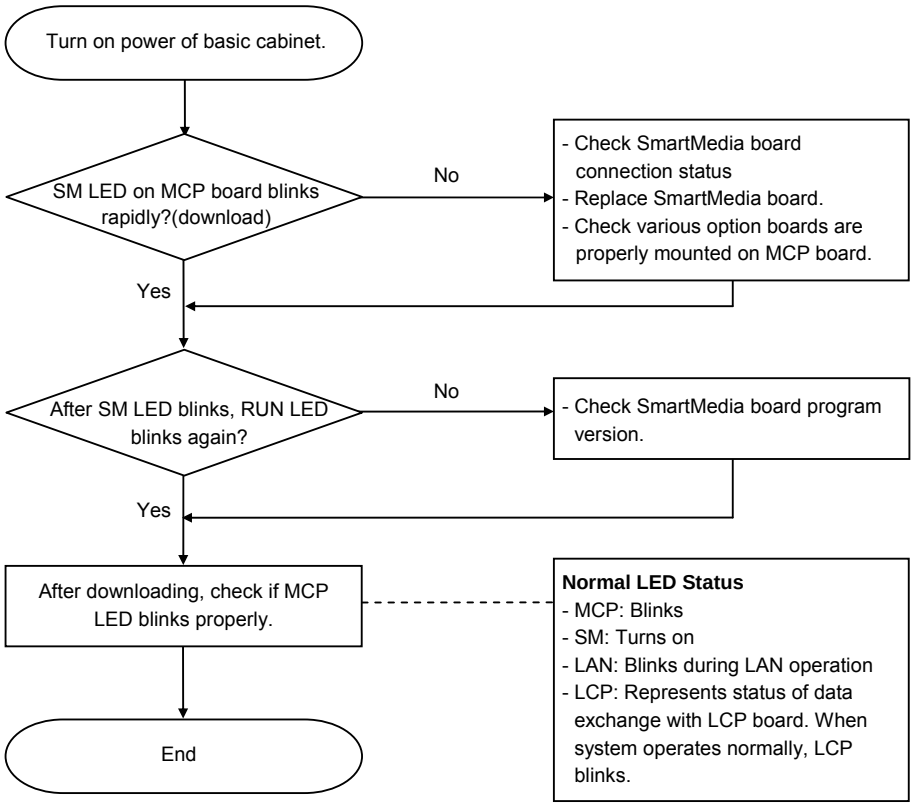
3.1.4 Abnormal Battery Backup (2)

If the problem with battery backup is not resolved even if the operator followed the '3.1.3 Abnormal Battery Backup(1)' procedure, check the following procedure:



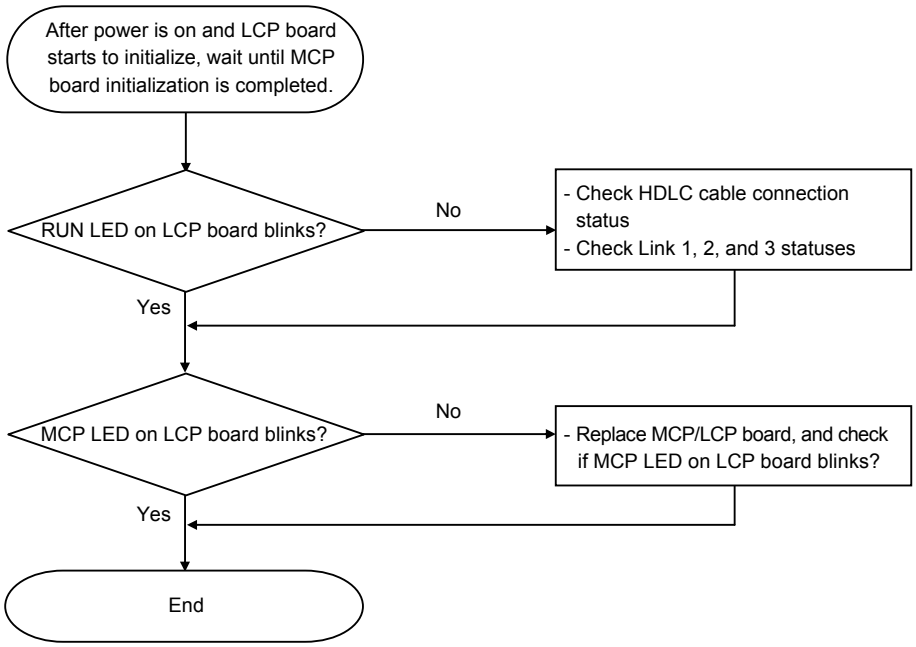
3.1.5 Checking MCP Board Operation

The procedure for checking if the MCP board controlling the OfficeServ 7200 system MCP operates properly is as follows:



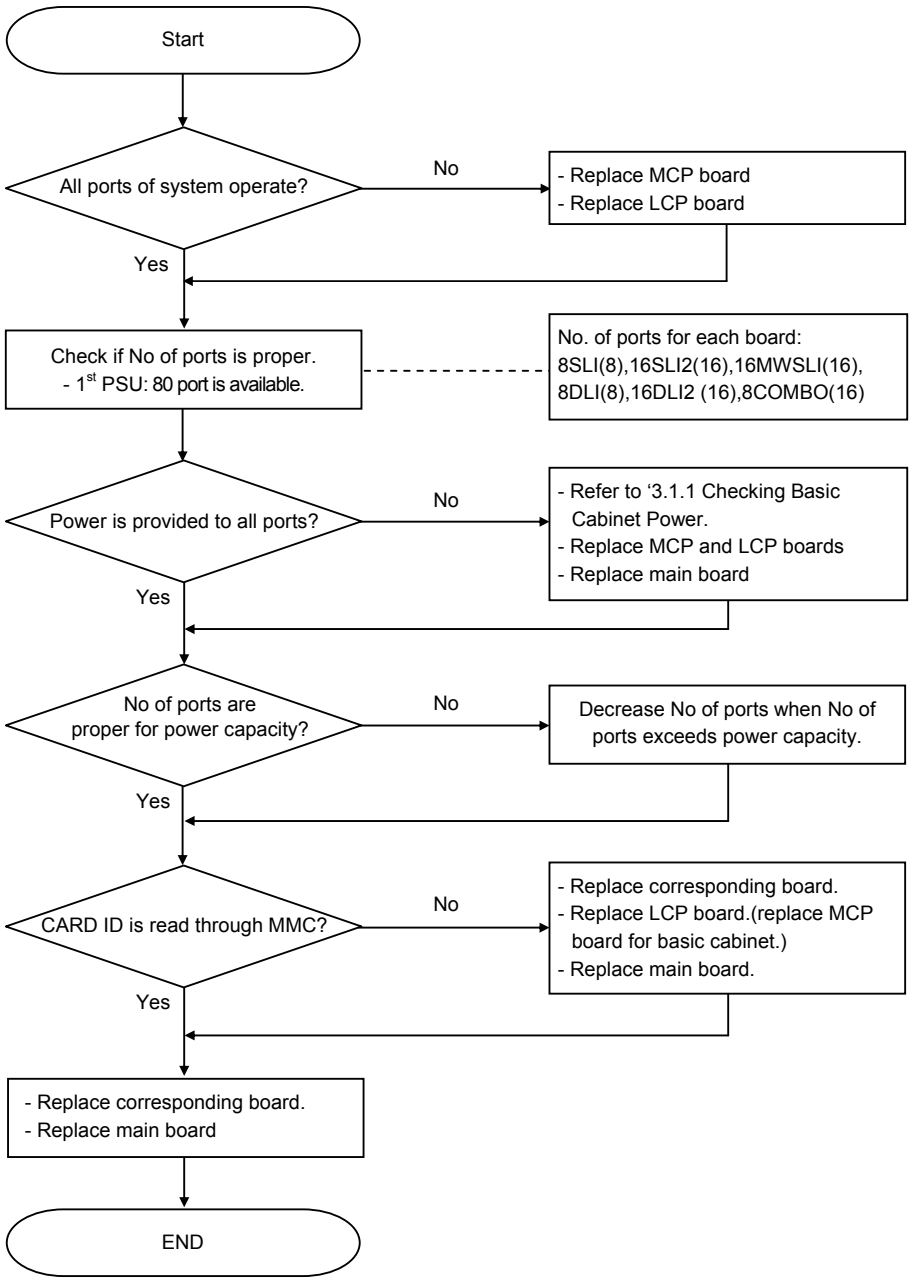
3.1.6 Checking LCP Board Operation

The procedure for checking if the LCP board controlling the expansion cabinet of the OfficeServ 7200 system operates properly is as follows:



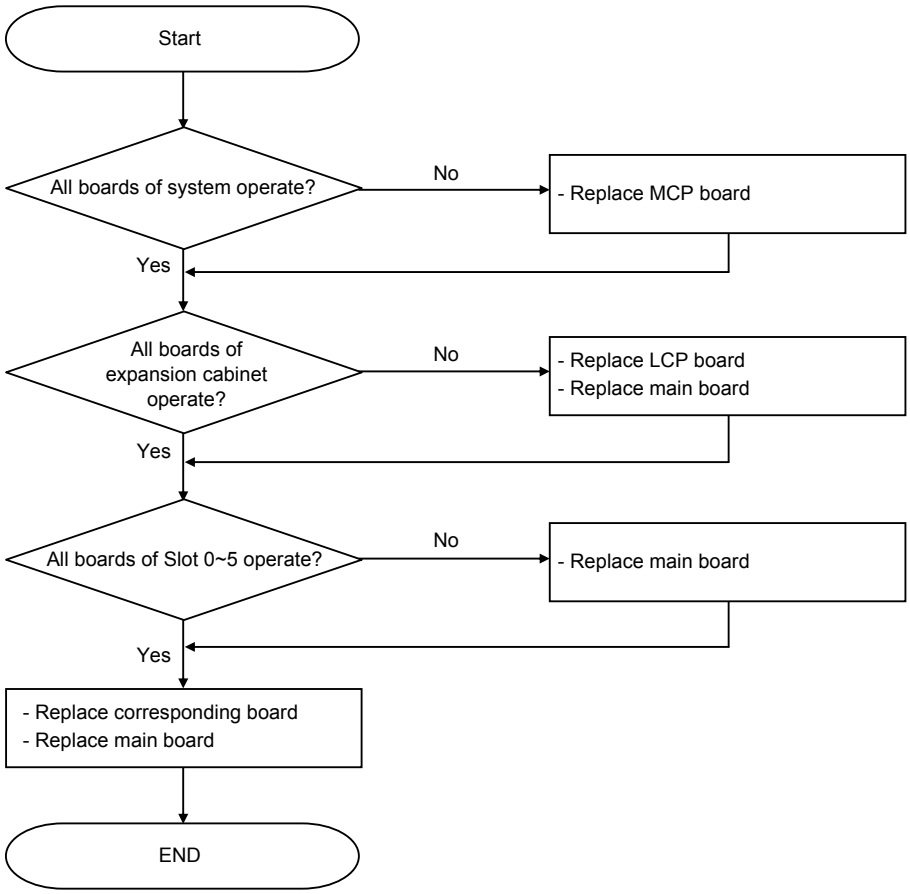
3.1.7 Power is not Supplied to Port of xSLI or xDLI Board

The procedure for resolving the problem that occurs when power is not supplied to the port of the 16SLI2, 16MWSLI, 8SLI, 8DLI, 16DLI2 or 8COMBO board is as follows:



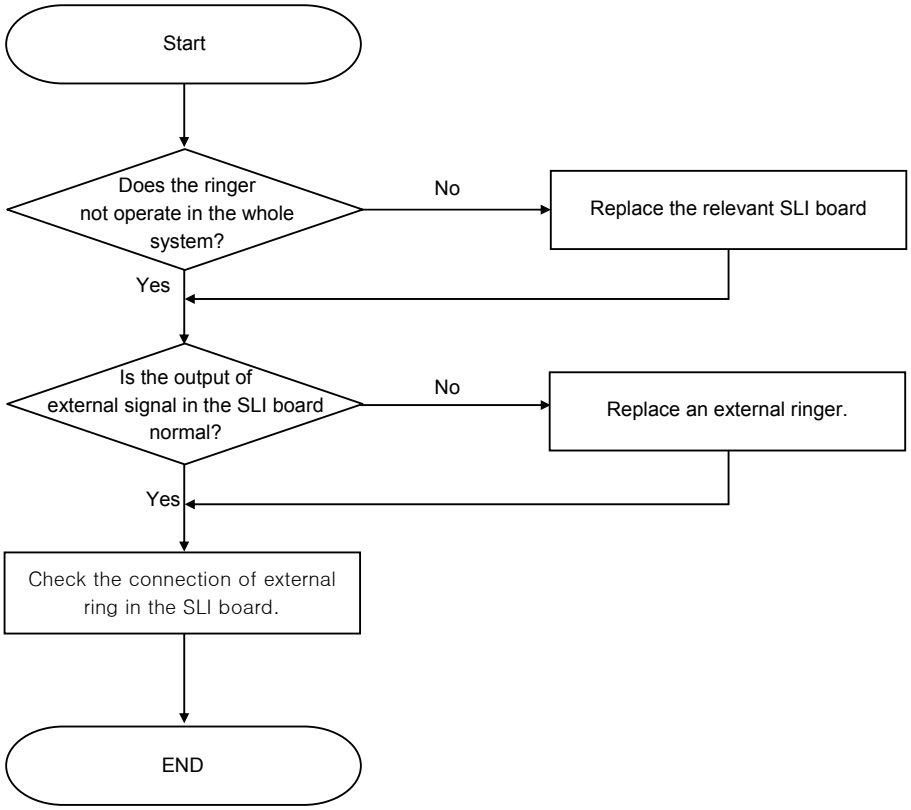
3.1.8 Board does not Operate

The procedure for resolving the problem that occurs when the boards mounted on each slot of the OfficeServ 7200 system does not operate is as follows:



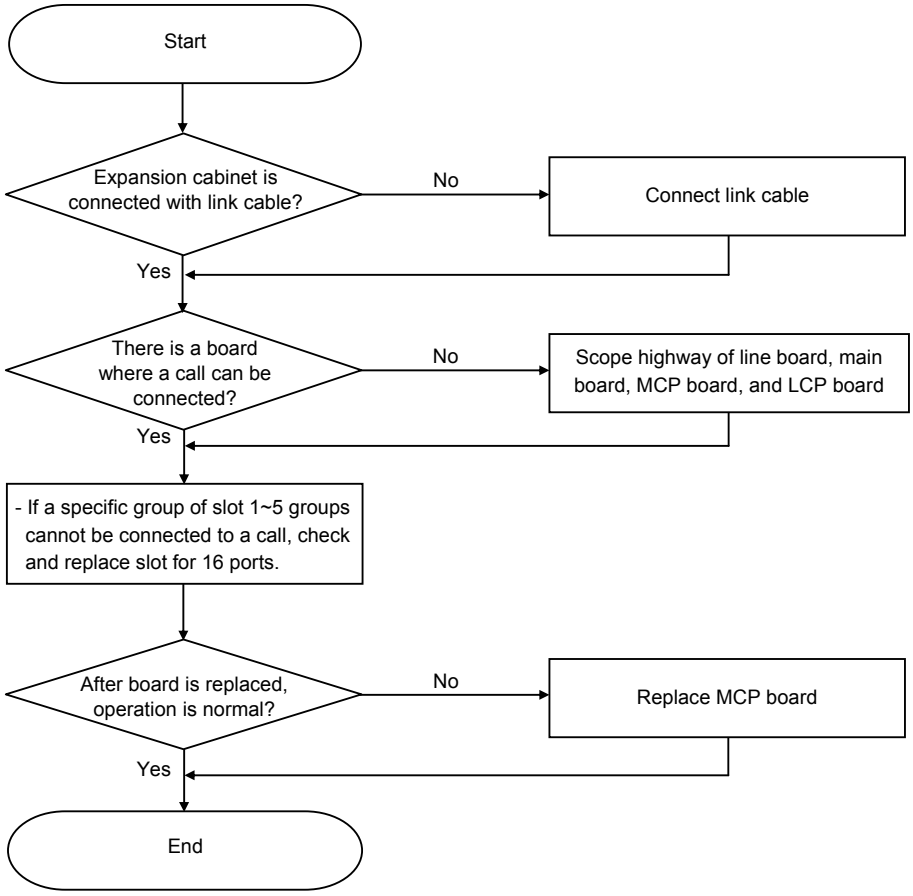
3.1.9 External Ringer does not Operate

The procedure for resolving the problem that occurs when the external ringer of the OfficeServ 7200 system does not operate is as follows:



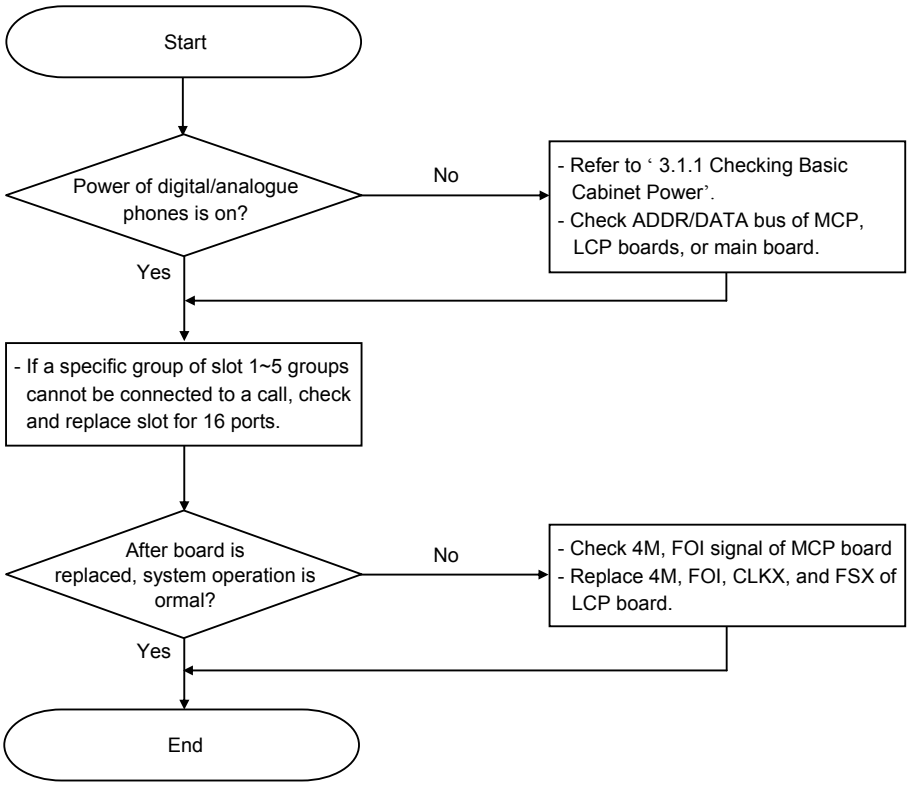
3.1.10 Any Calls are not Connected (Highway)

The procedure for resolving the problem that occurs when a call cannot be connected due to highway-related problem when the operator starts to make a call by the phone connected to the OfficeServ 7200 system.



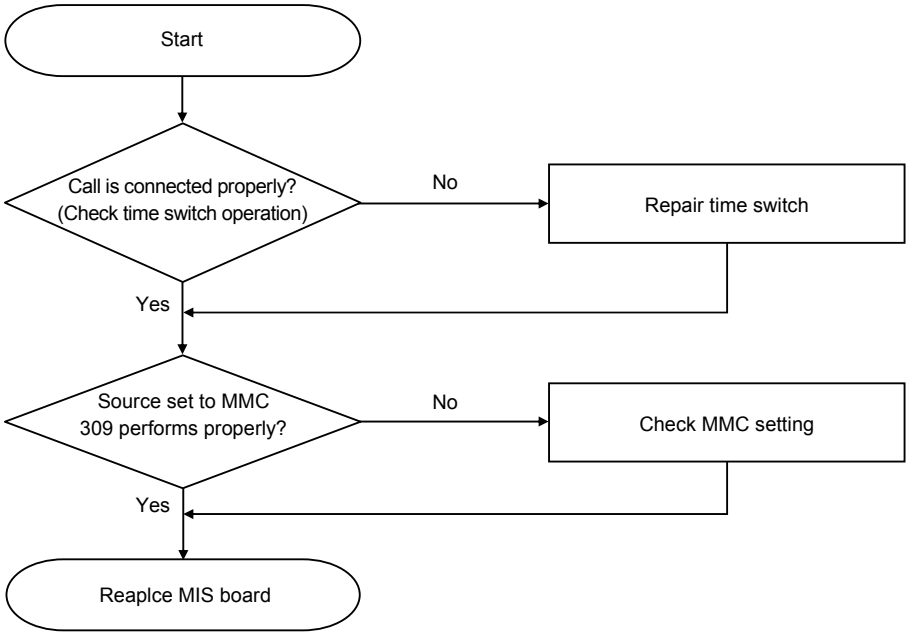
3.1.11 Any Calls are not Connected (Switching Clock)

The procedure for resolving the problem that occurs when a call cannot be connected due to switching clock-related problem when the operator starts to make a call by the phone connected to the OfficeServ 7200 system.



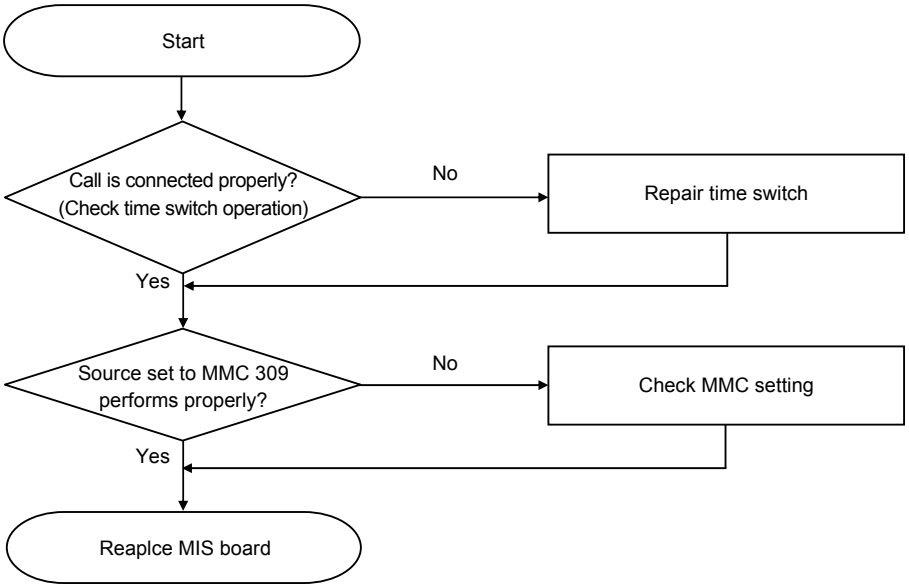
3.1.12 Music on Hold (MOH)/Background Music sources (BGM) is Abnormal

The procedure for resolving the problem that occurs when MOH/BGM of the OfficeServ 7200 system is abnormal is as follows:



3.1.13 External Page is Abnormal

The procedure for resolving the problem that occurs when external page is not available is as follows:

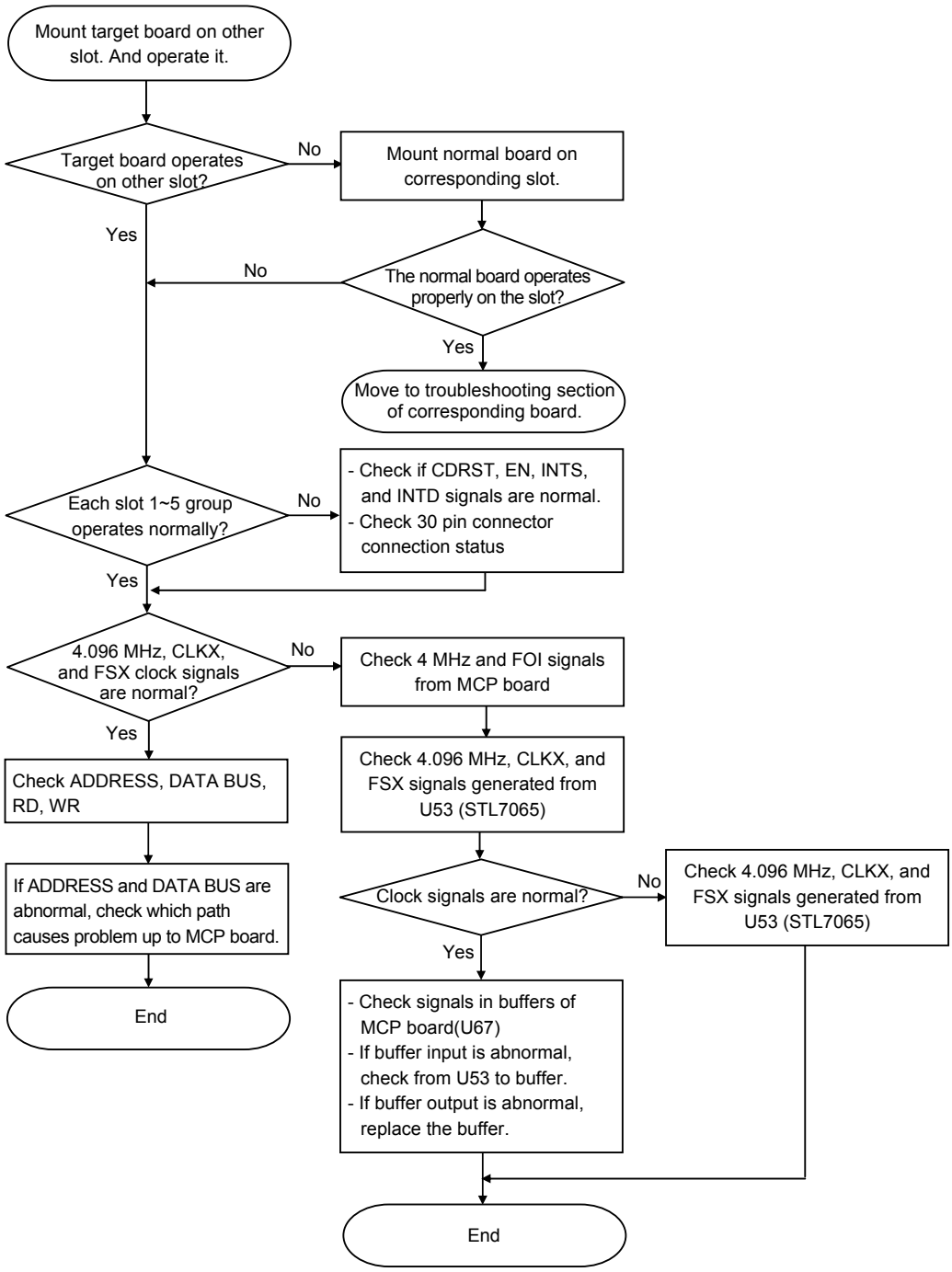


3.2 Motherboard

Describes the problems and troubleshooting the problems that occur on the motherboard.

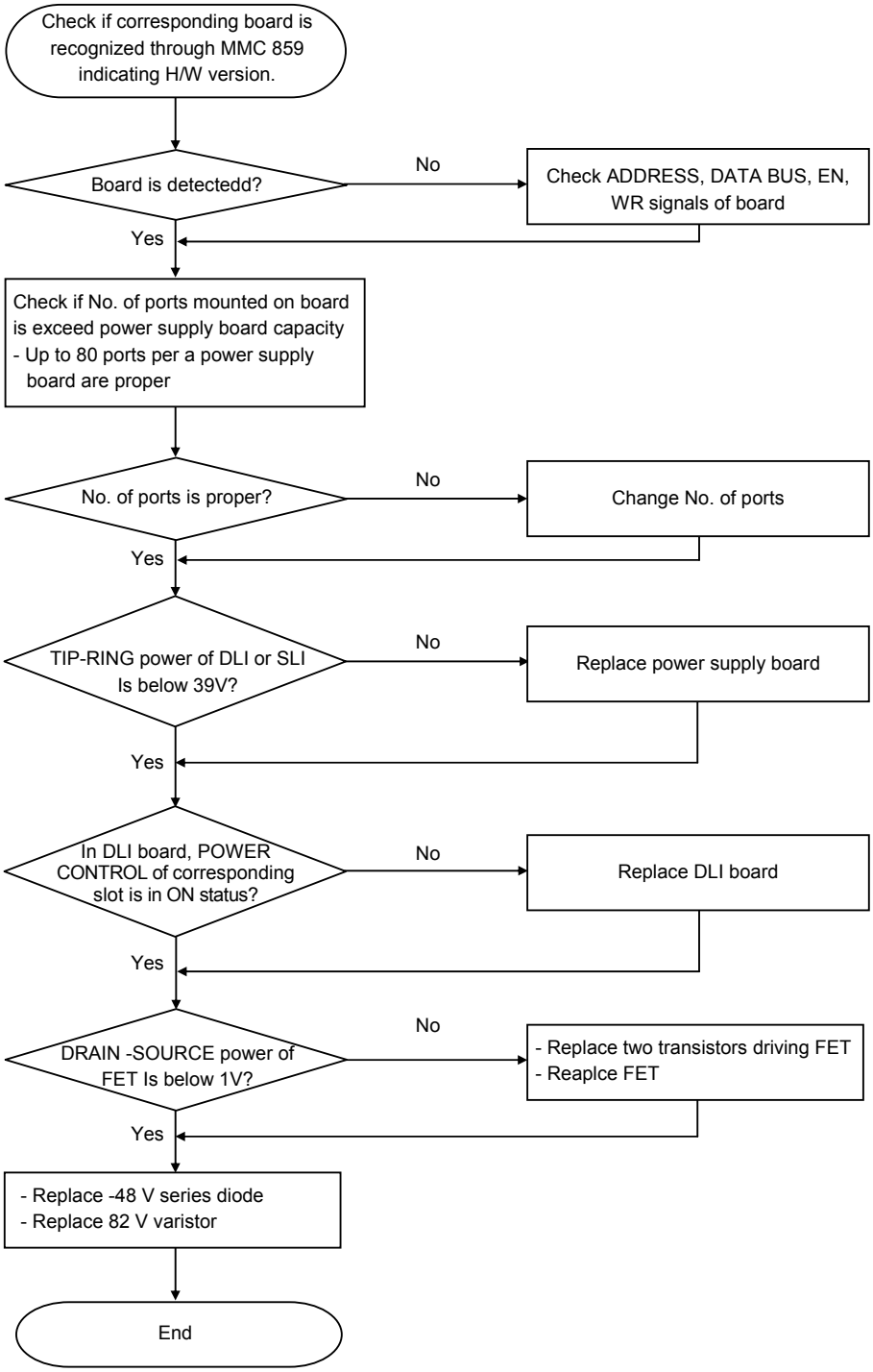
3.2.1 Motherboard is not Operating

The procedure for resolving the problem that occur when the motherboard does not operate is as follows:



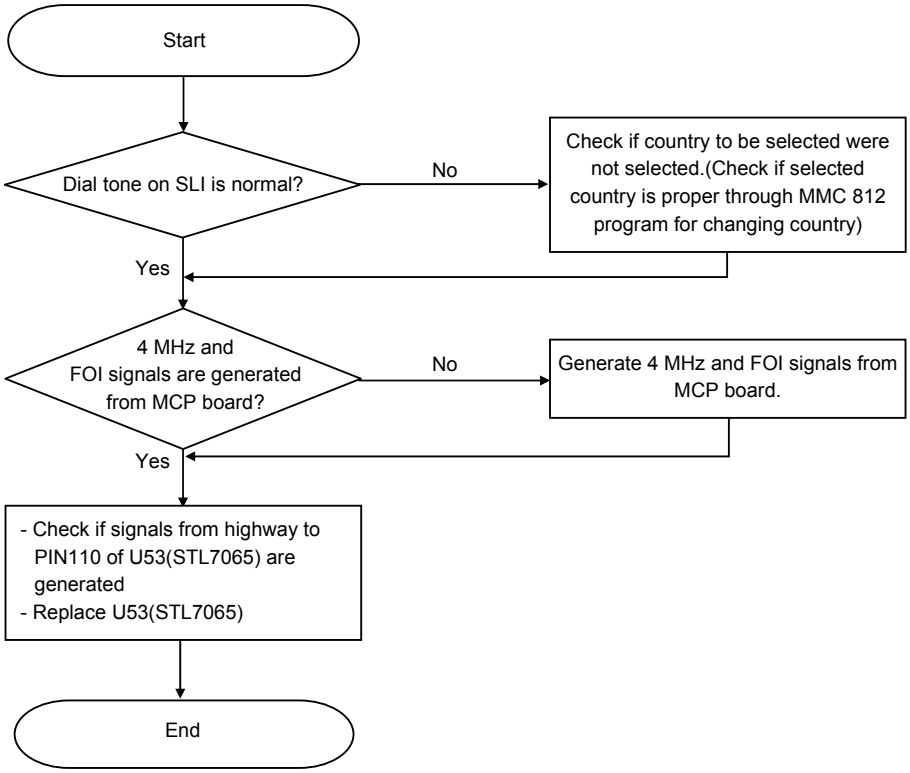
3.2.2 -48 V Power is not Supplied to Motherboard

The procedure for resolving the problem that occurs when -48 power is not supplied to the motherboard is as follows:



3.2.3 DTMF Receiver of Motherboard does not Operate

The procedure for resolving the problem that occurs when DTMF receiver of MCP board does not operate is as follows:



3.3 Control Board

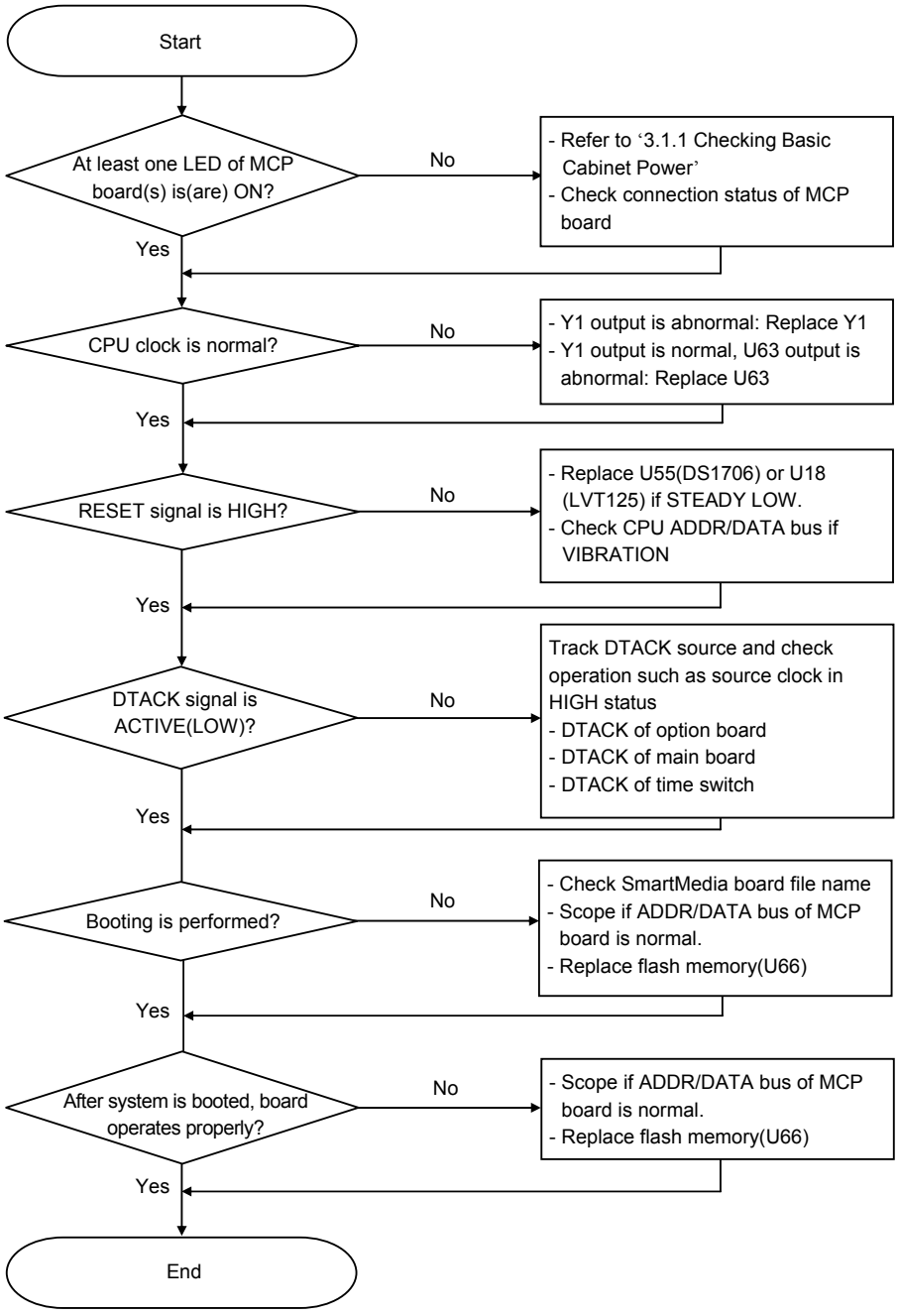
Describes the problems and troubleshooting the problems that occur on control boards such as MCP and LCP boards.

3.3.1 MCP Board

The procedure for resolving the problem that occurs on MCP board is as follows:

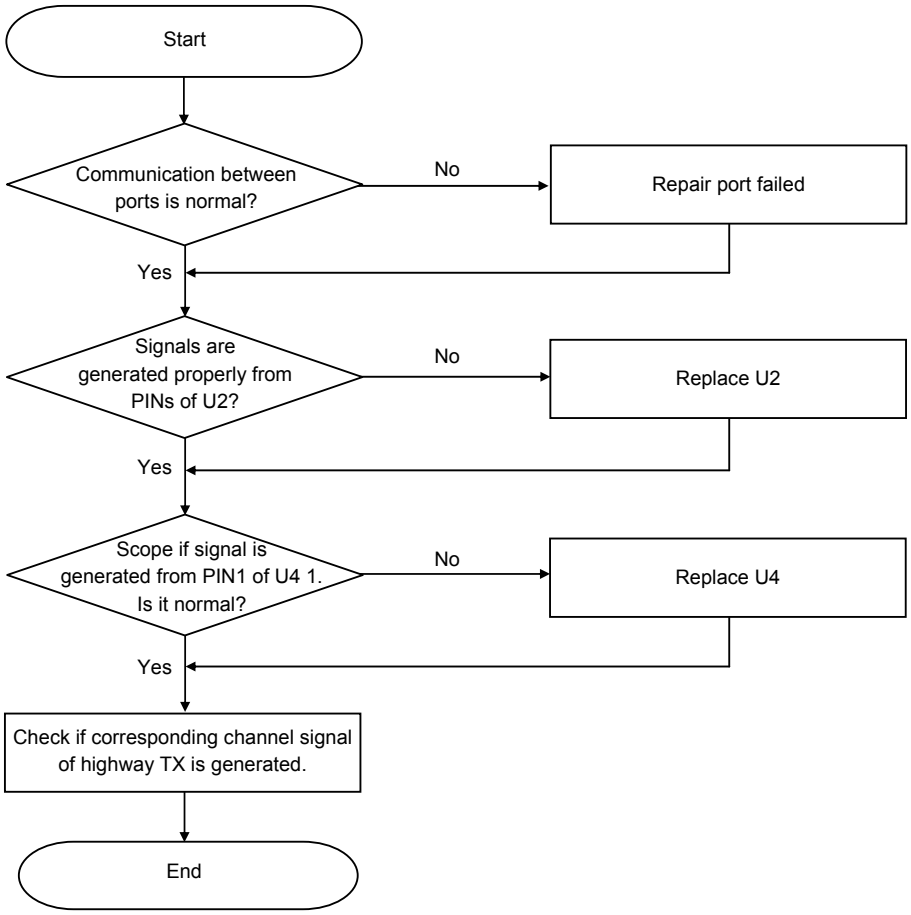
3.3.1.1 Processor operation is abnormal

The procedure for resolving the problem caused by abnormal MCP board operation is as follows:



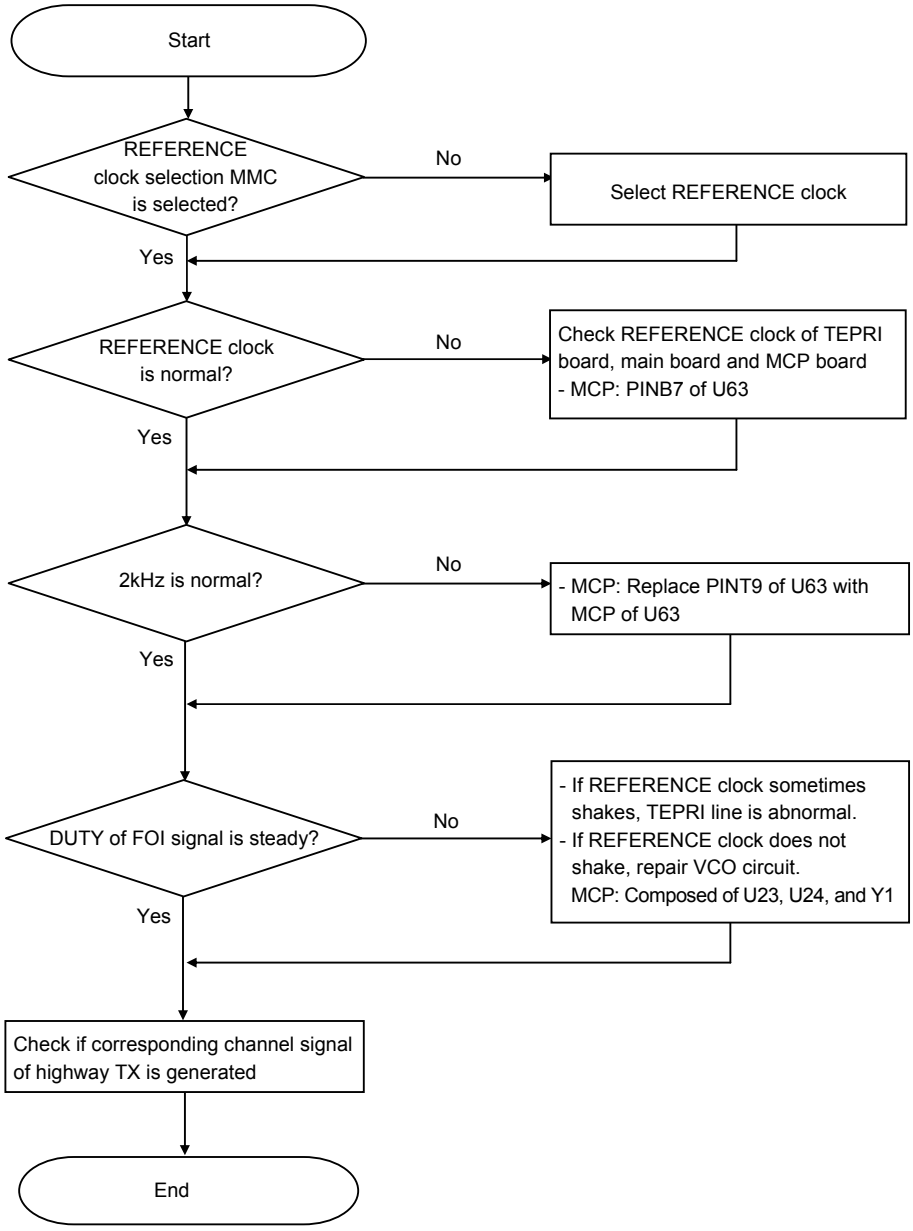
3.3.1.2 Internal Music On Hold (MOH)/Background Music (BGM) sources is abnormal

The procedure for resolving the problem that occurs when internal MOH/BGM is abnormal is as follows: In this case, MOH is set as internal MOH.



3.3.1.3 PLL operation is abnormal

The procedure for resolving the problem caused by Phase Locking Loop(PLL) operation is as follows:



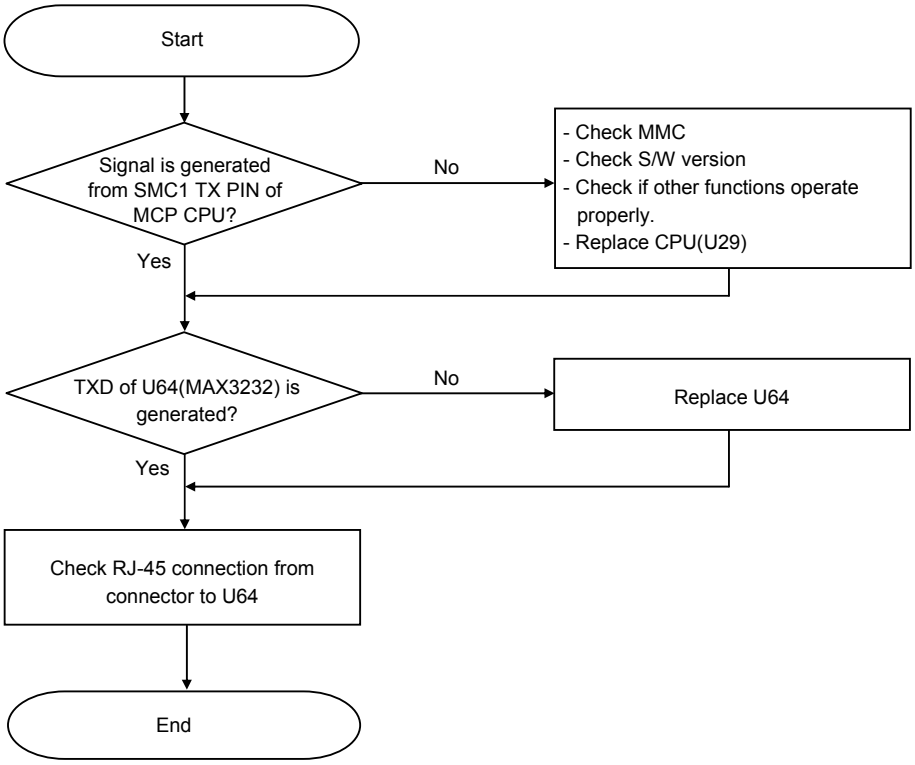
When PLL fails

If PLL fails, a call can be connected but there is noise while calling.

NOTE

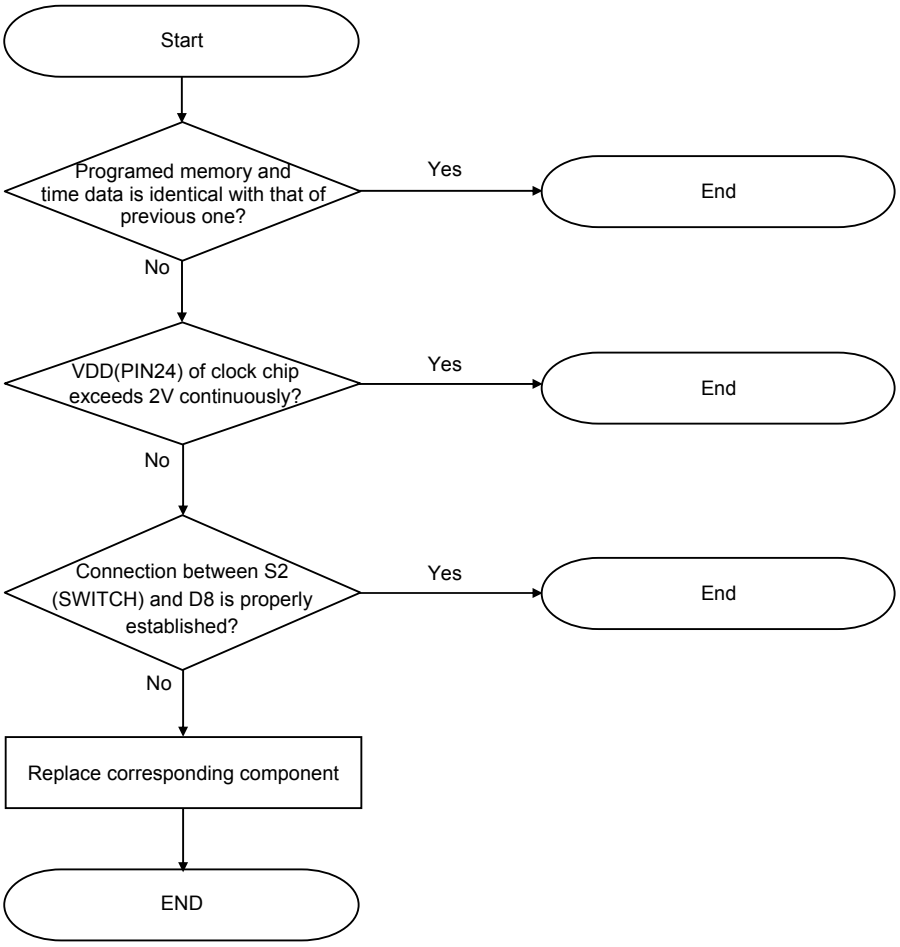
3.3.1.4 SIO Port operation is abnormal

The procedure for resolving the problem caused by system UART port operation of basic cabinet when MCP board is used is as follows:



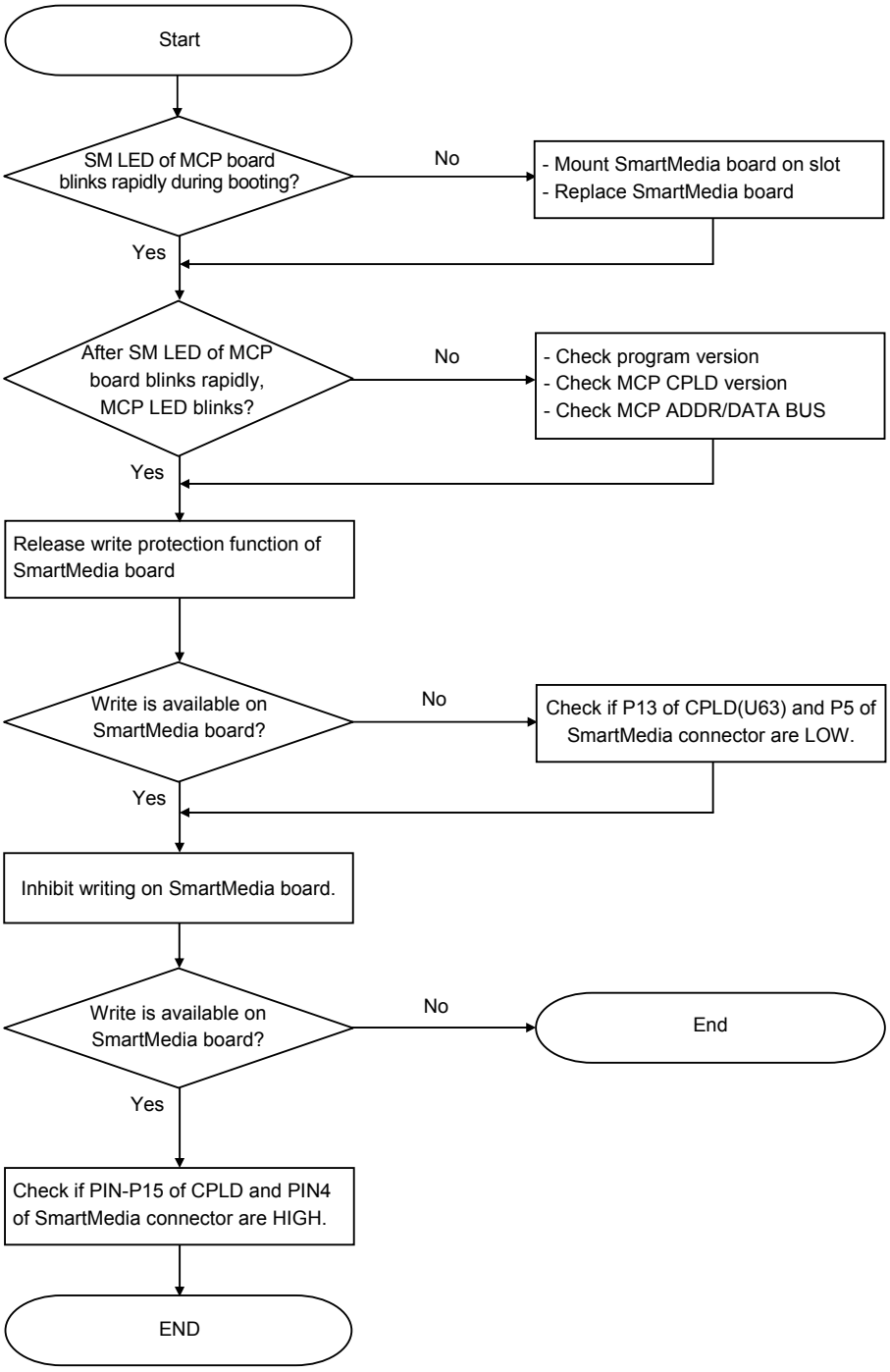
3.3.1.5 Backup of Memory/Time data is abnormal

The procedure for resolving the problem that occurs when memory and time data of the OfficeServ 7200 system is being backed up is as follows:



3.3.1.6 SmartMedia Board is abnormal

The procedure for resolving the problem caused by SmartMedia board is as follows:

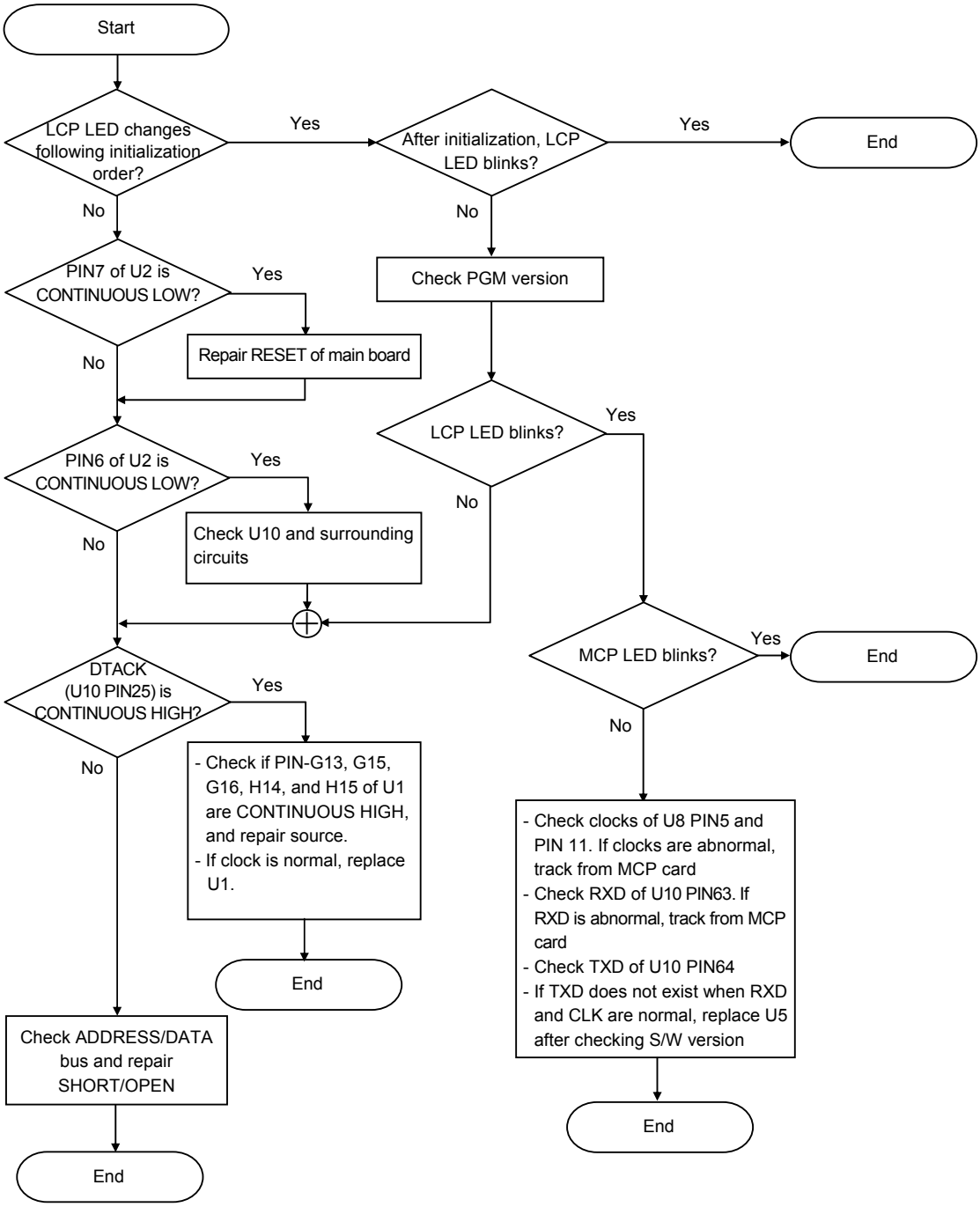


3.3.2 LCP Board

The procedure for resolving the problems that occur on LCP board is as follows:

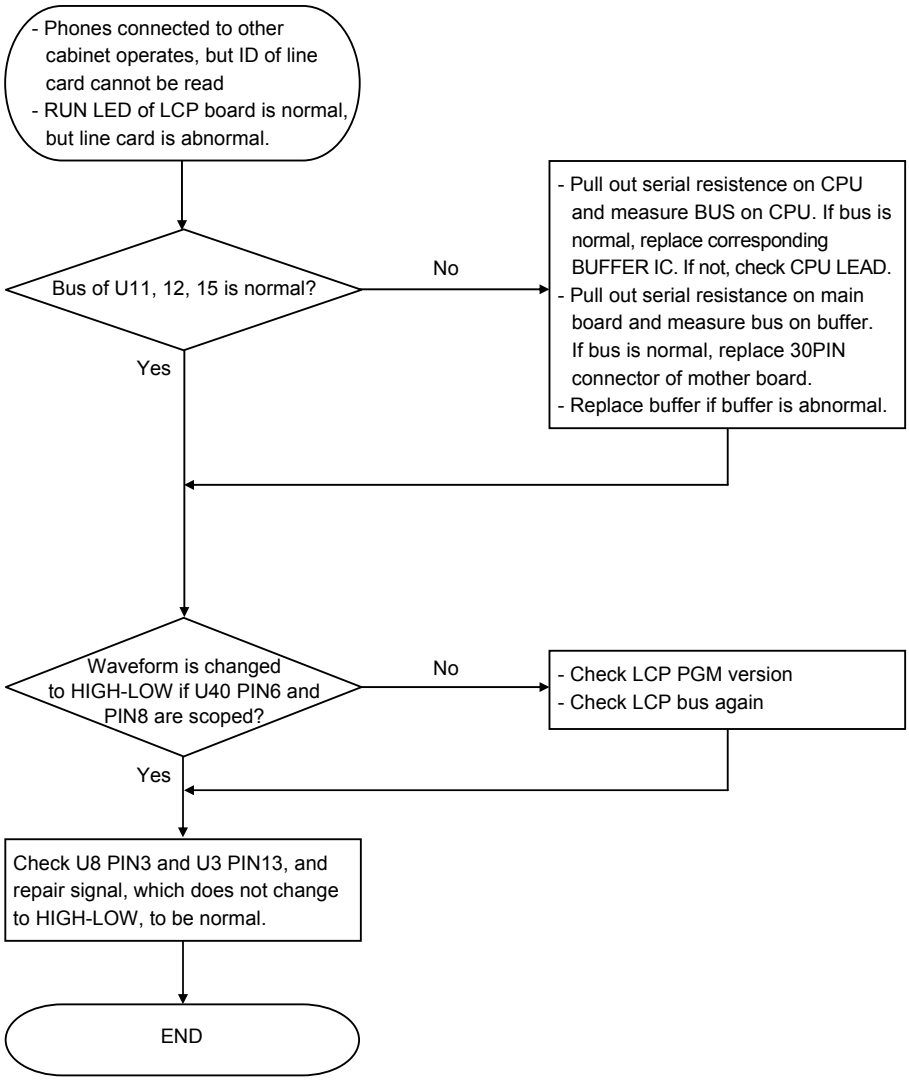
3.3.2.1 CPU operation is abnormal

The procedure for resolving the problem caused by LCP board operation is as follows:



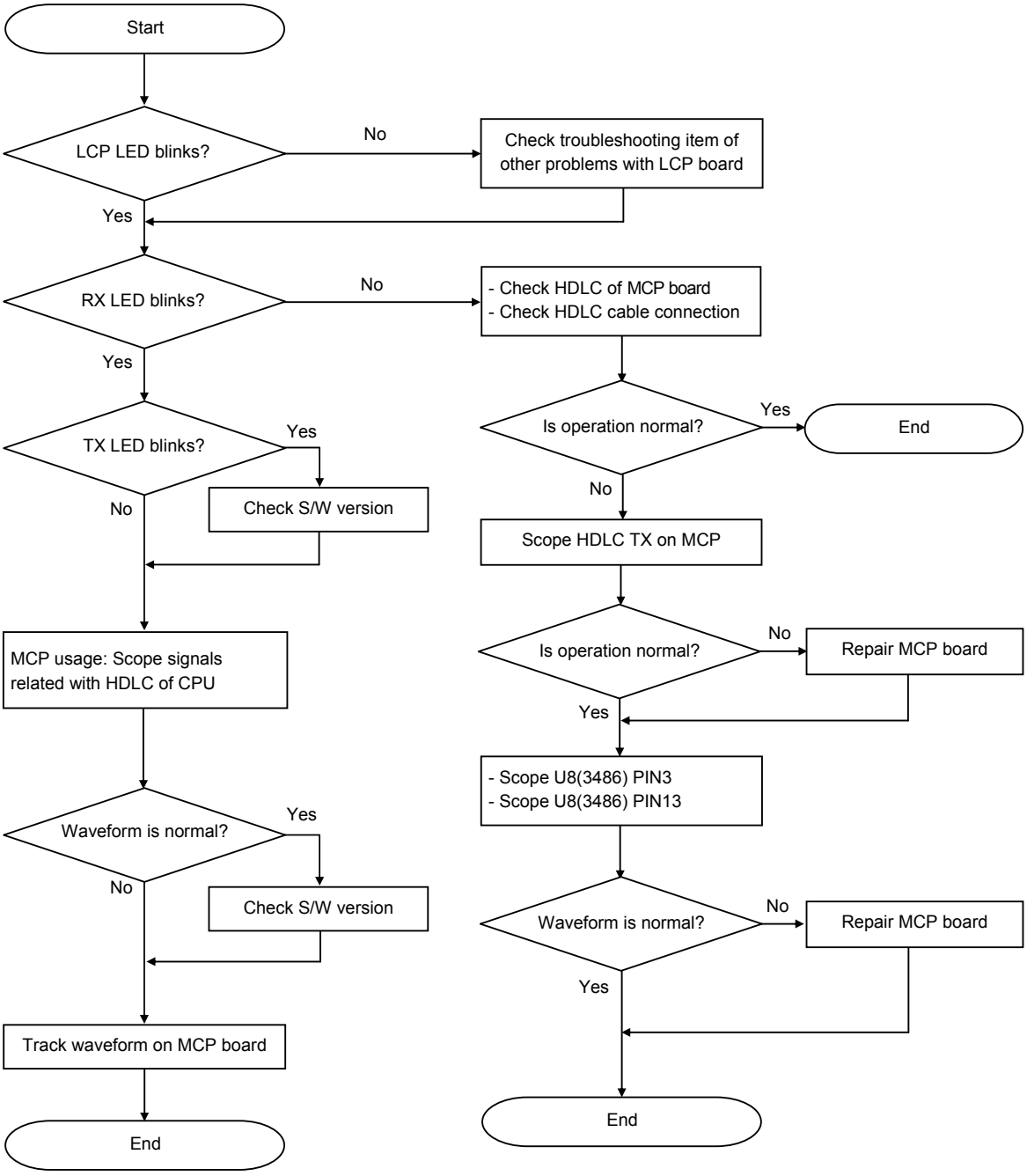
3.3.2.2 Address/Data buffer is abnormal

The procedure for resolving the problem that occurs when option board and main board do not operate properly is as follows:



3.3.2.3 HDLC communication is abnormal

The procedure for resolving the problem that occurs when High level Data Link Control (HDLC) of a specific LCP board does not operate is as follows:



3.4 Universal Board

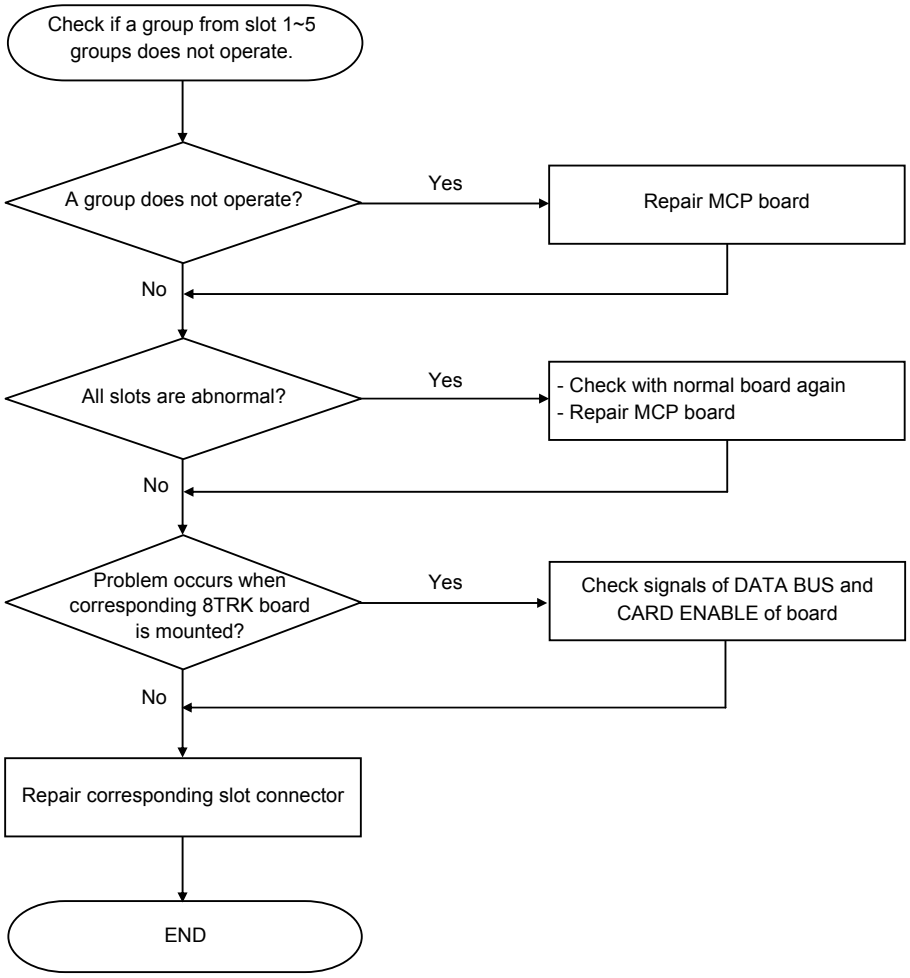
This section describes the problems and troubleshooting the problems that occur on various universal boards.

3.4.1 8TRK Board

The procedure for resolving the problem that occurs on 8TRK board is as follows:

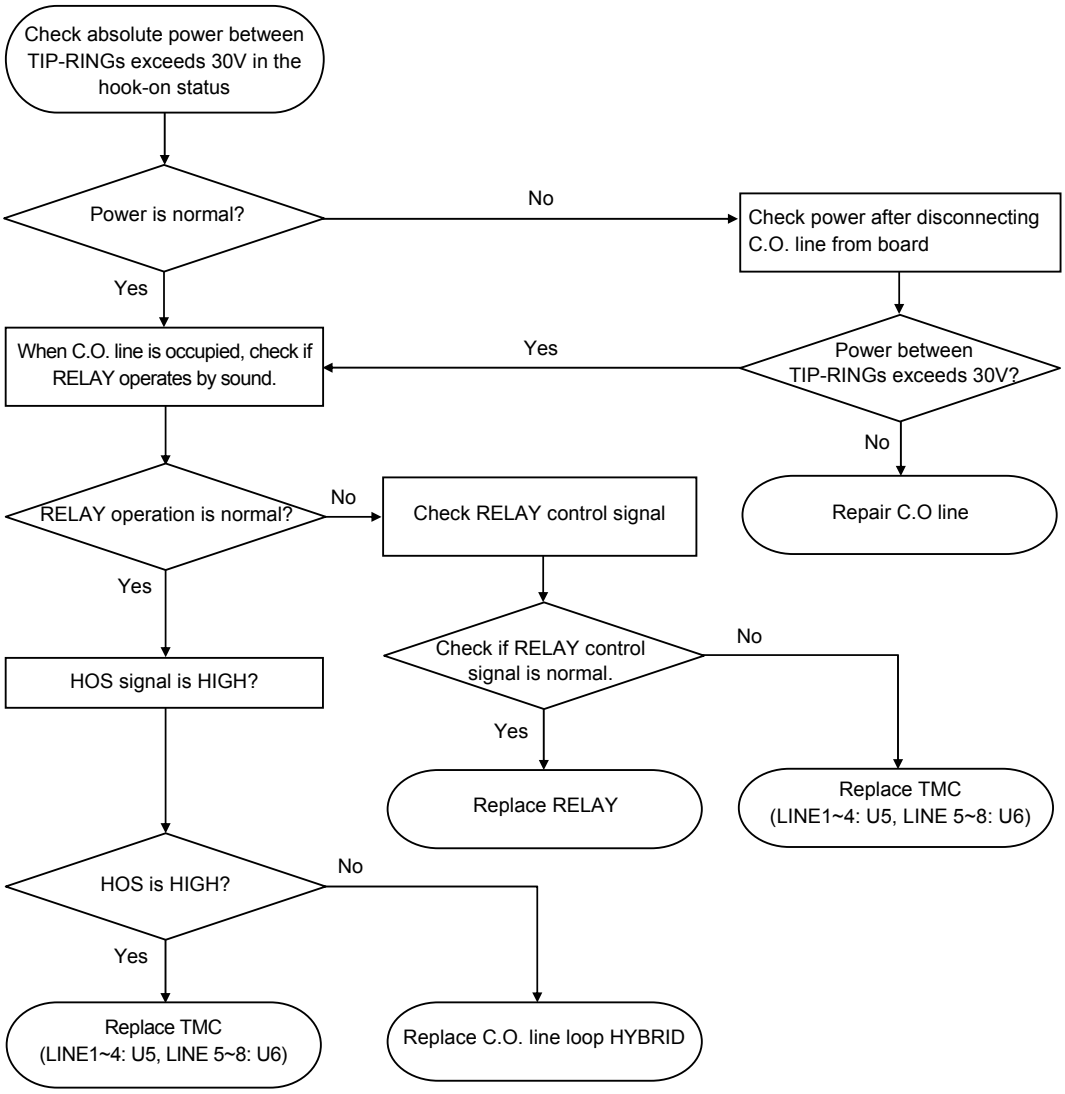
3.4.1.1 8TRK Board is not detected

The procedure for resolving the problem that occurs when 8TRK is not detected is as follows:



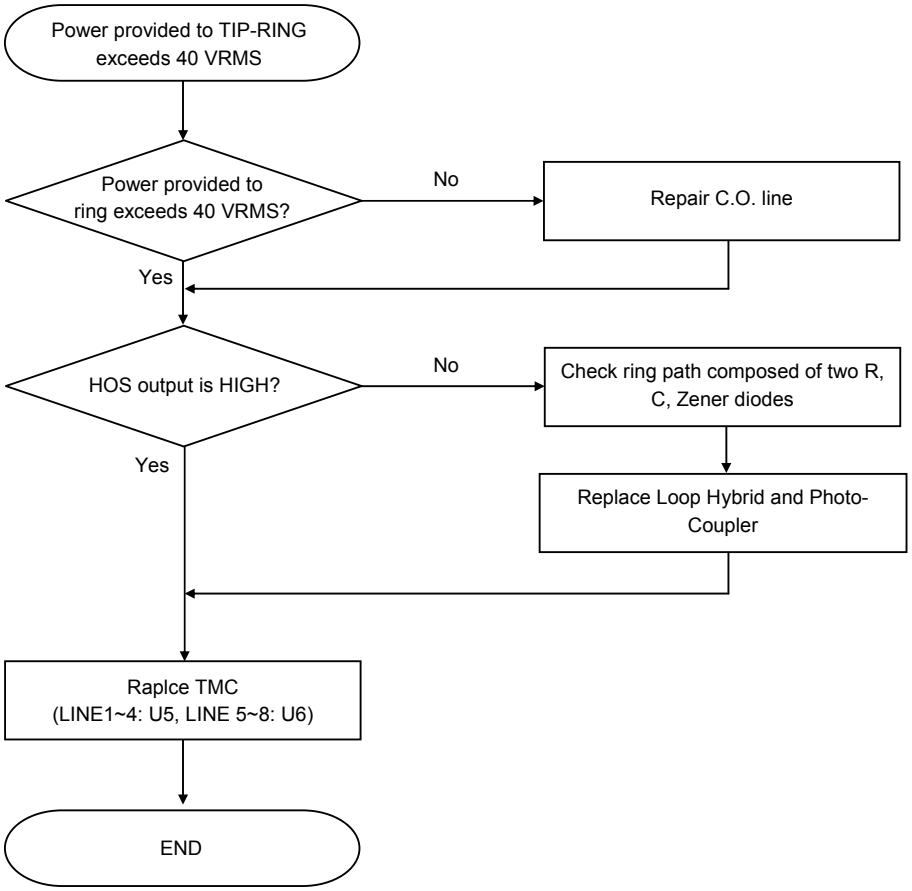
3.4.1.2 An External Call cannot be originated

The procedure for resolving the problem that occurs when external call cannot be originated because C.O. line is not detected is as follows:



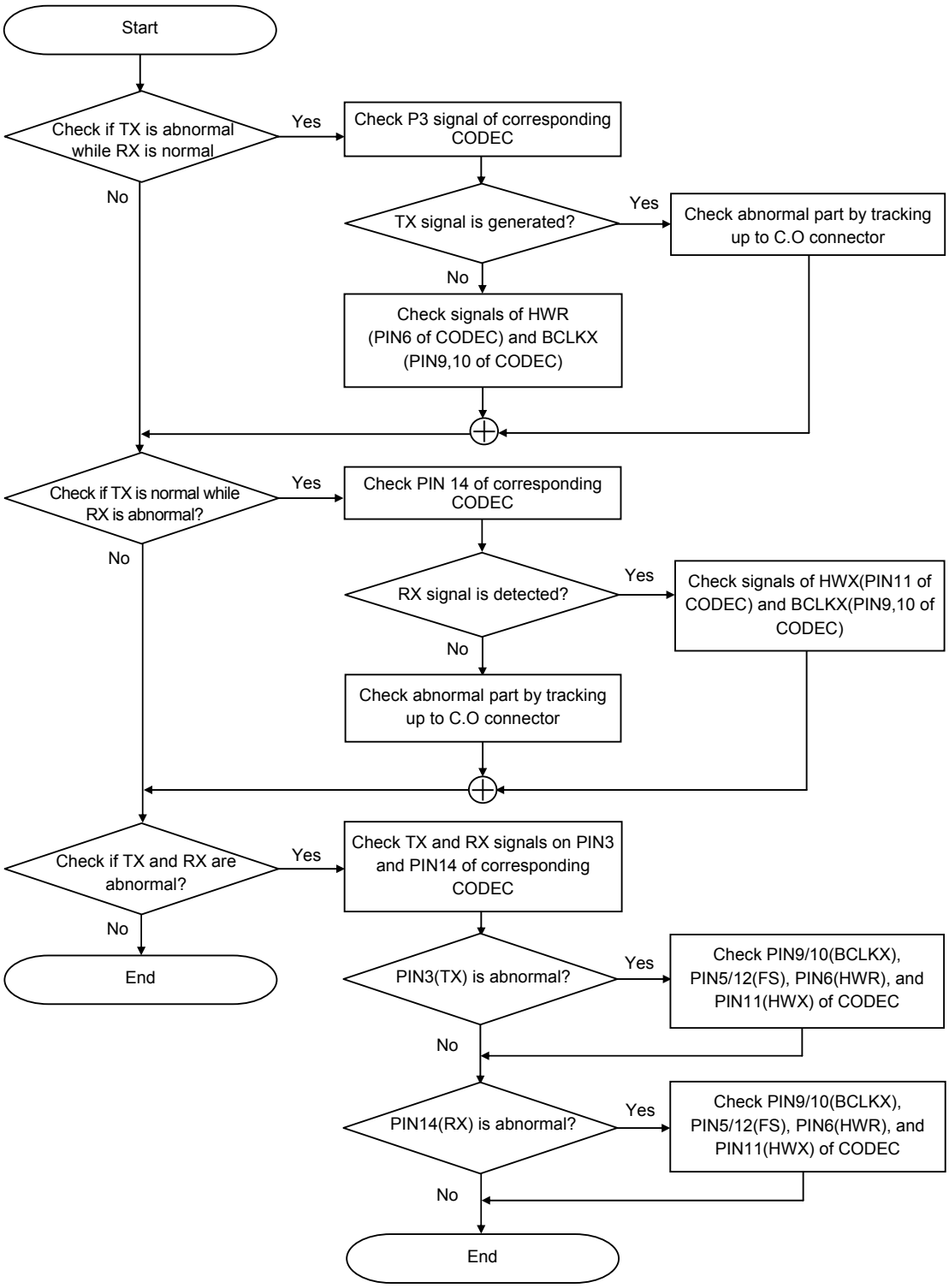
3.4.1.3 Ring is not terminated

The procedure for resolving the problem that occurs when C.O. line ring is not terminated is as follows:



3.4.1.4 An External Call cannot be connected

The procedure for resolving the problem that occurs when external call cannot be connected is as follows:

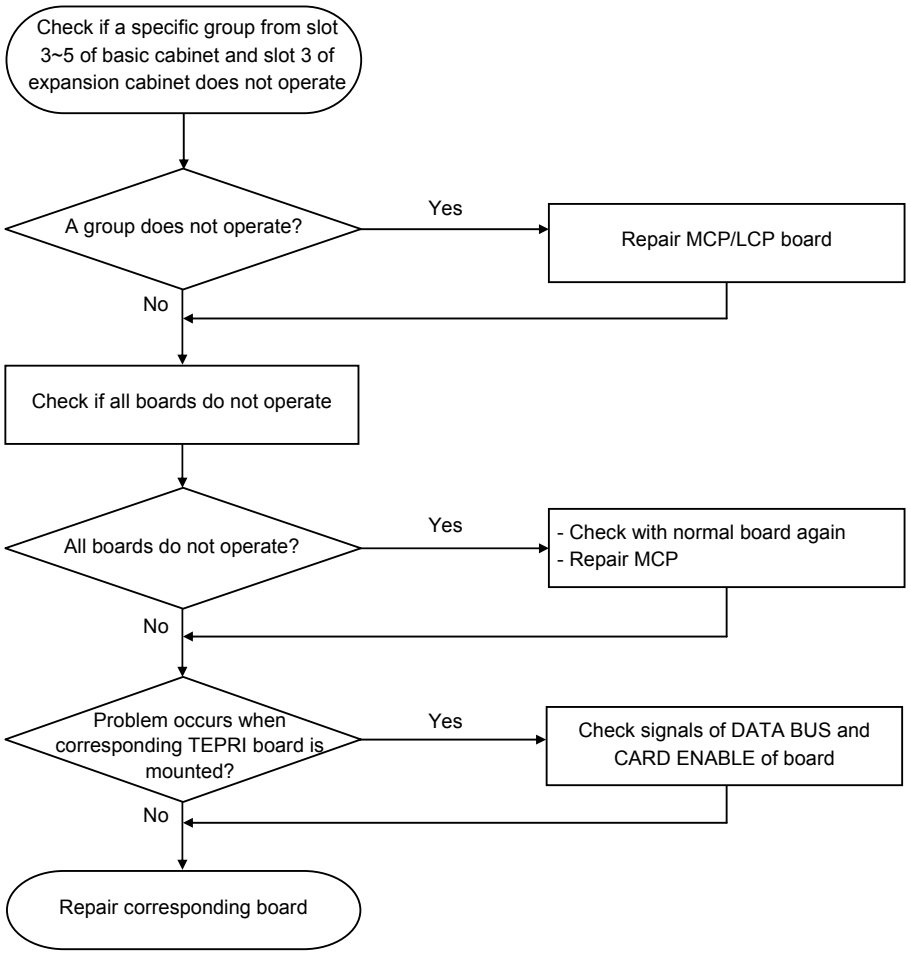


3.4.2 TEPRI Board

The procedure for resolving the problems that occur on TEPRI board is as follows:

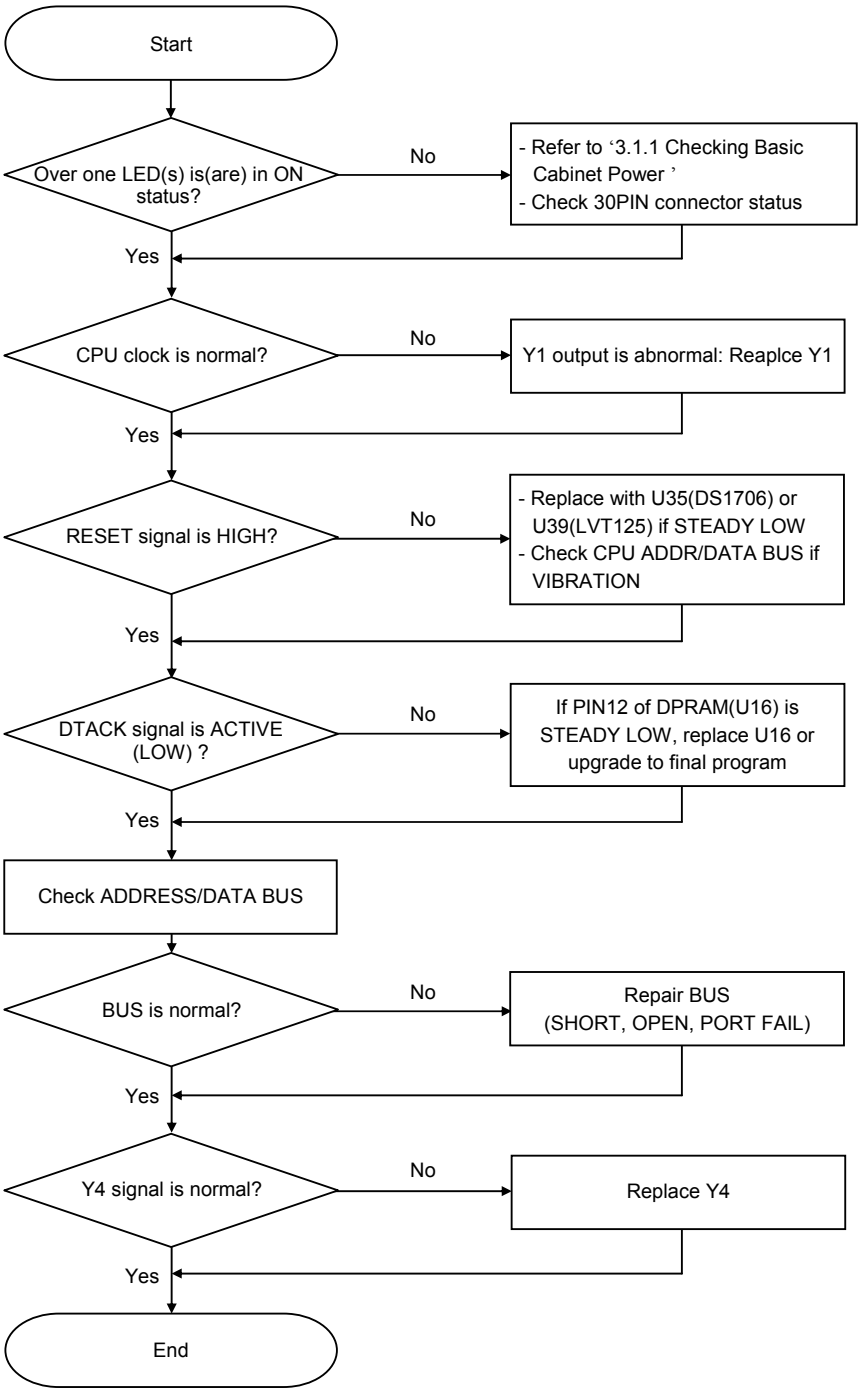
3.4.2.1 TEPRI Board is not detected

The procedure for resolving the problem occurs when TEPRI is not detected is as follows:



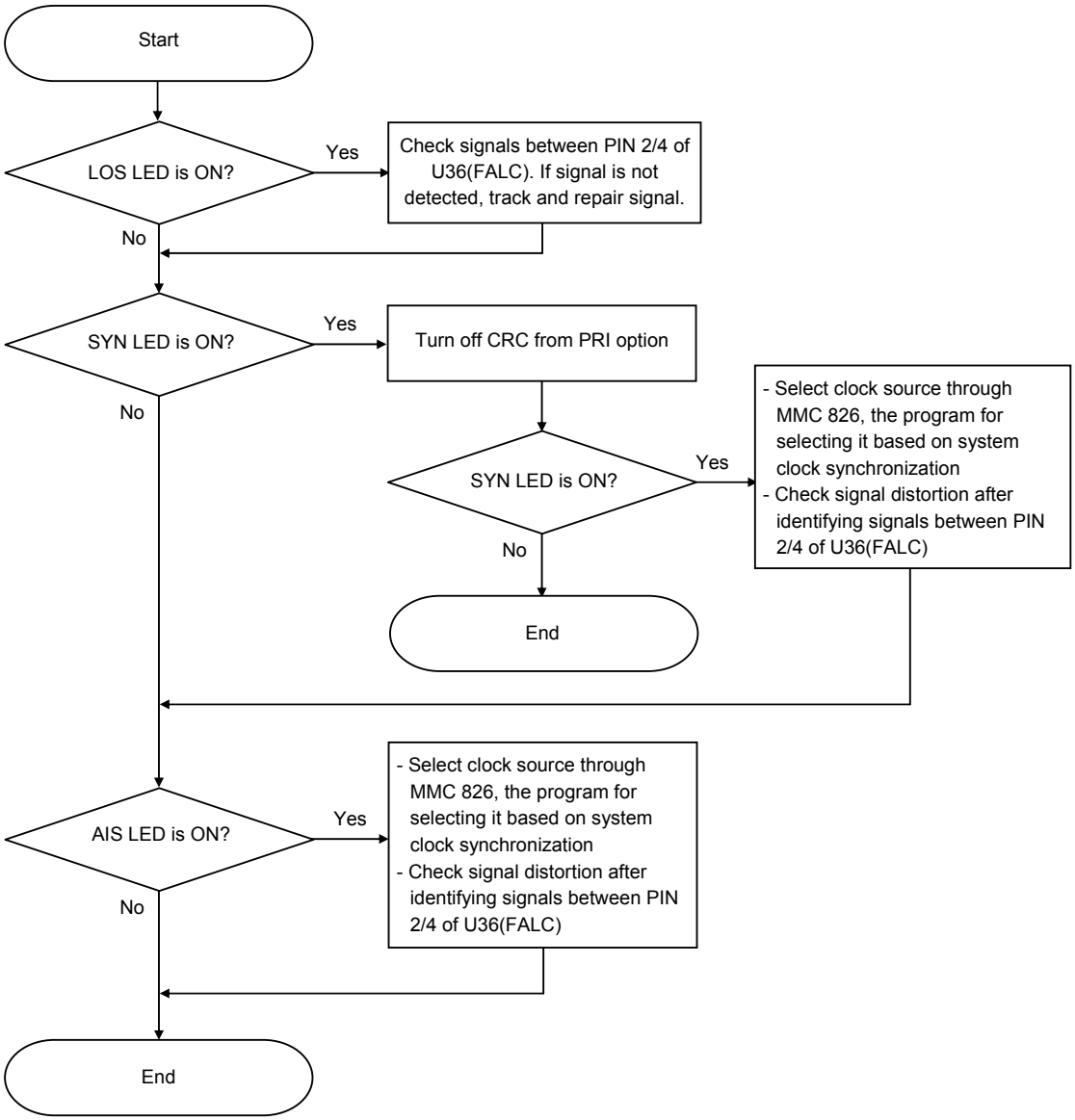
3.4.2.2 Processor operation is abnormal

The procedure for resolving the problem caused by abnormal processor operation of TEPRI board is as follows:



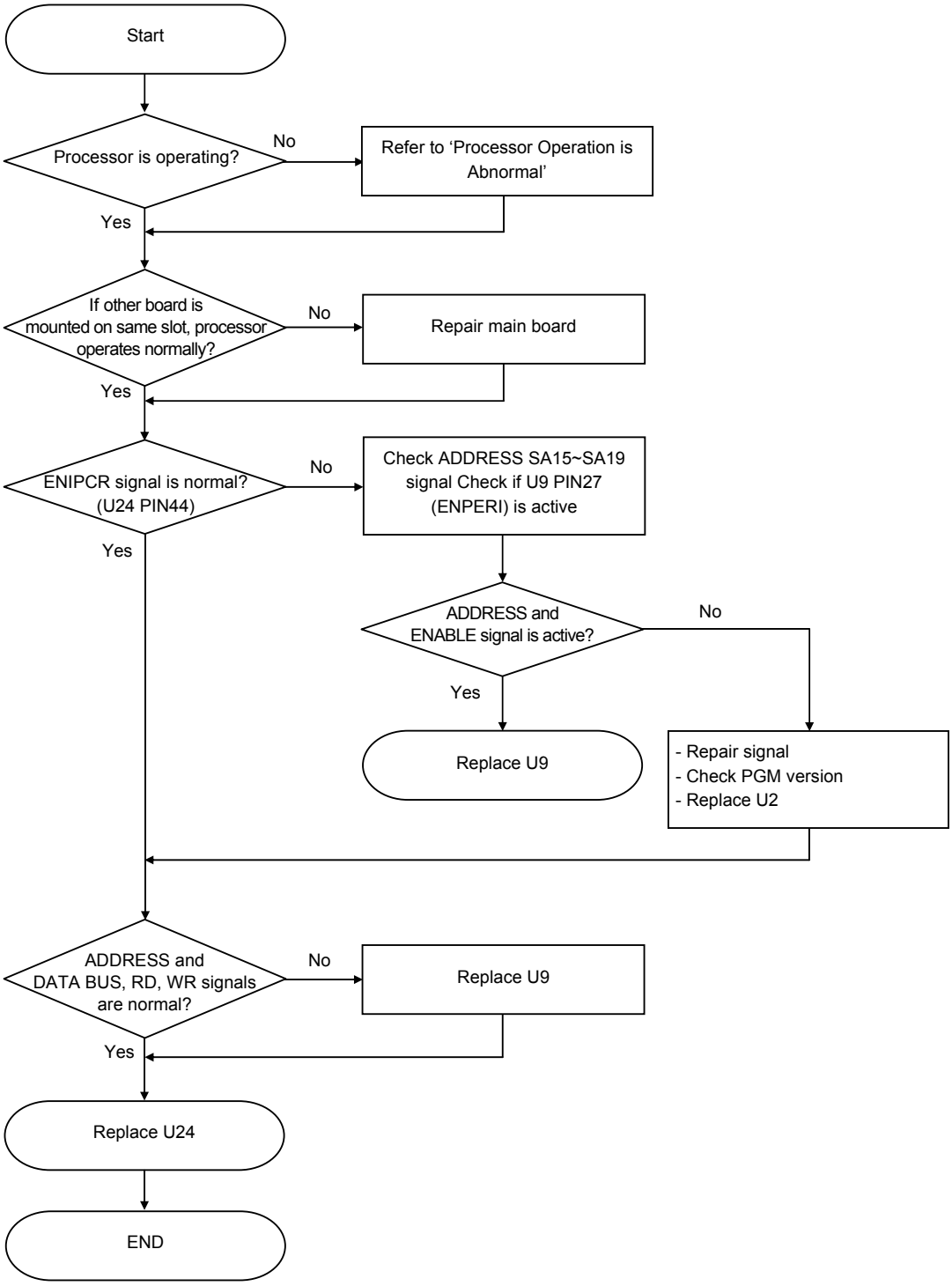
3.4.2.3 LED for Indicating Line is abnormal

The procedure for resolving the problem that occurs when the LED for indicating line of TEPRI board is as follows:



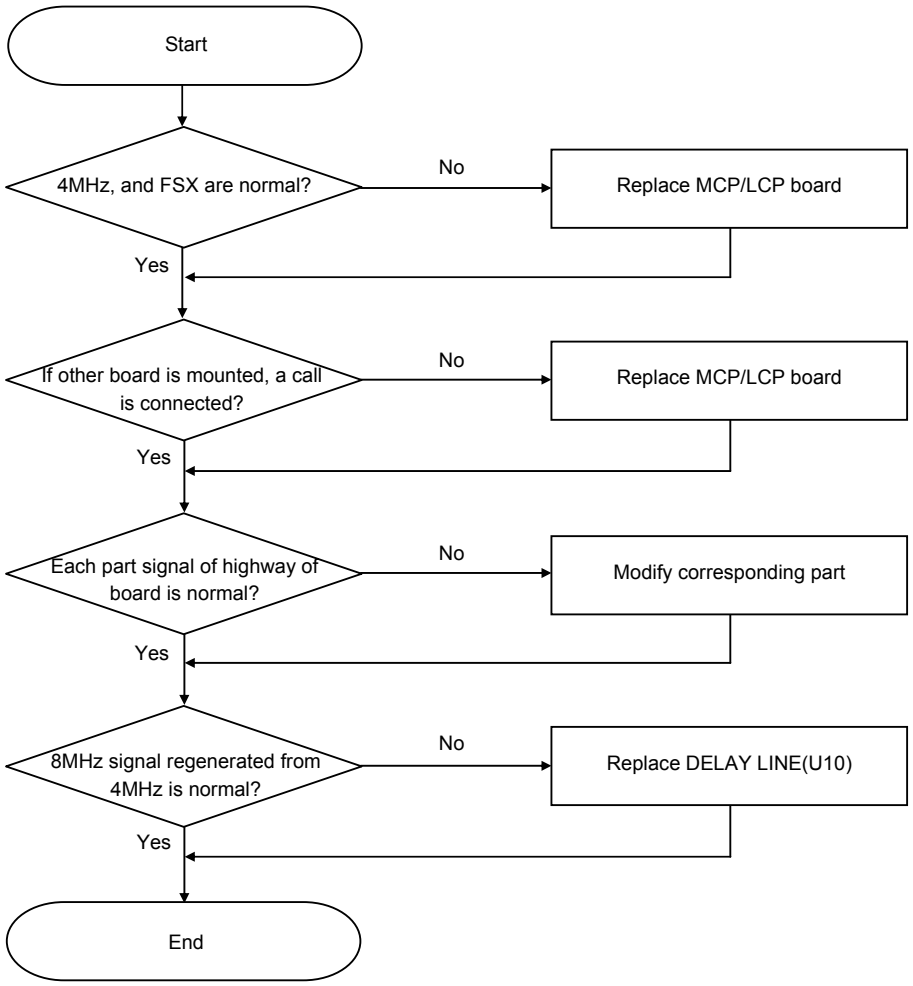
3.4.2.4 IPC LED is abnormal

If IPC LED of TEPRI board blinks, the TEPRI board is operating properly.
The procedure for resolving the problem that occurs when the IPC LED turns off is as follows:



3.4.2.5 Call cannot be connected or there is noise during a call

The procedure for resolving the problem that occurs when a call cannot be connected or there is noise during a call while the LED status of TEPRI board is normal is as follows:

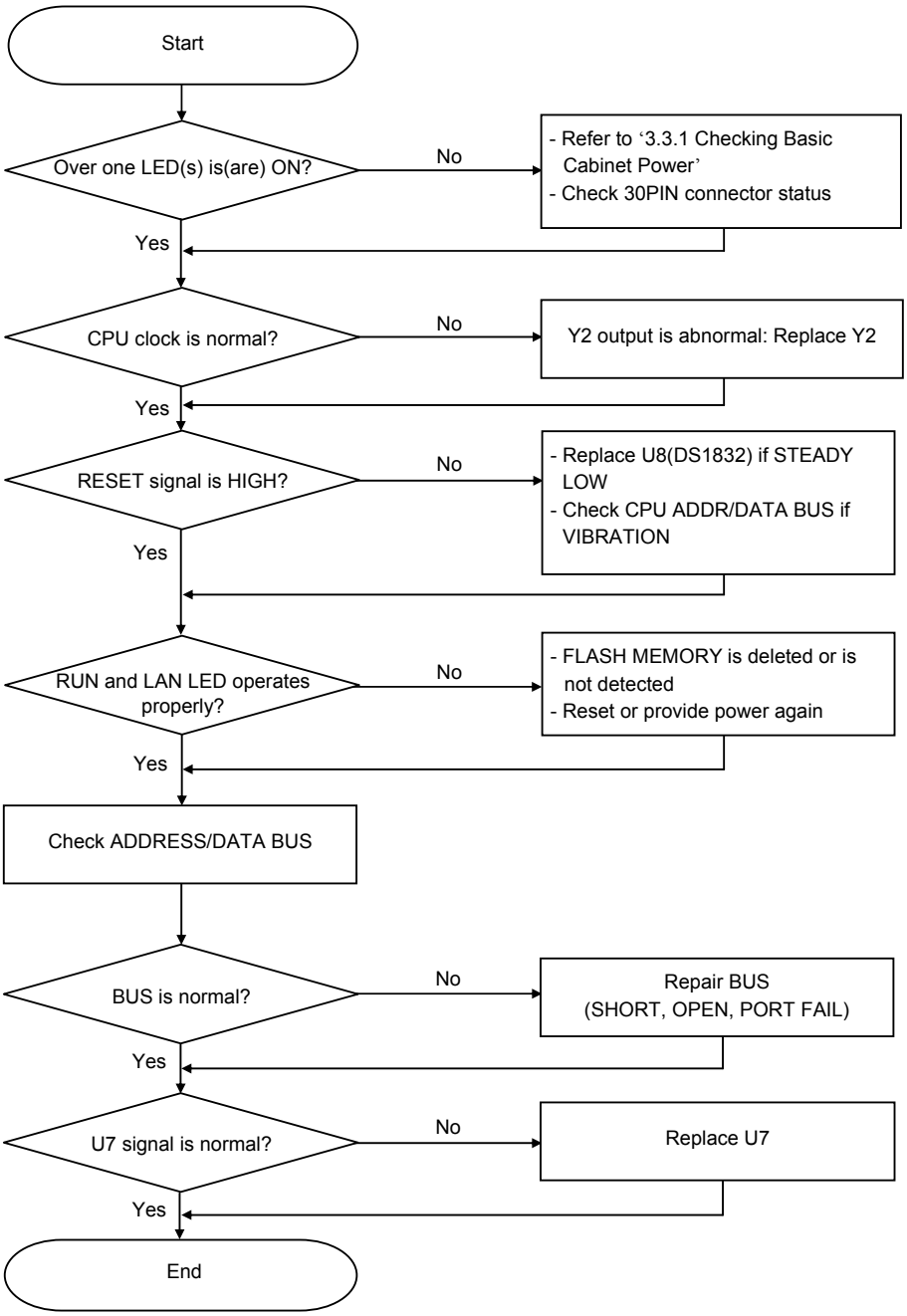


3.4.3 WIM Board

The procedure for resolving the problems that occur on WIM board is as follows:

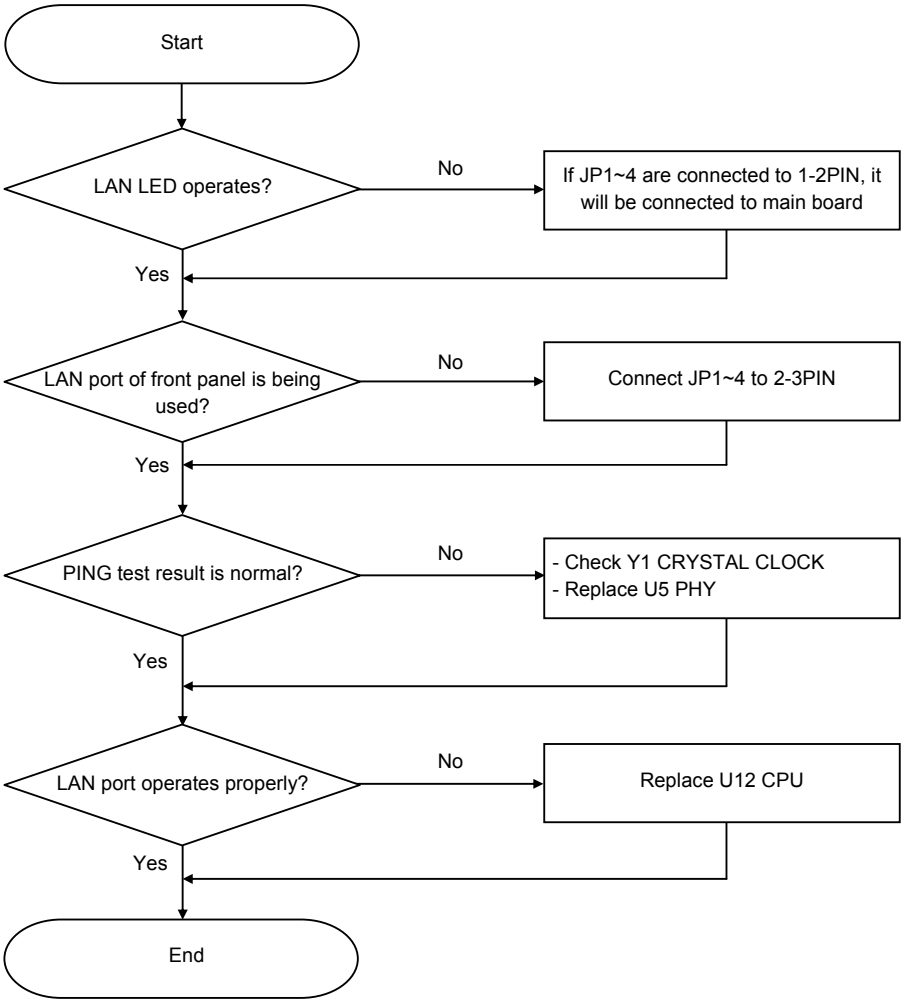
3.4.3.1 Processor operation is abnormal

The procedure for resolving the problem caused by WIM board processor is as follows:



3.4.3.2 LAN Port operation is abnormal

The procedure for resolving the problem that occurs on LAN port of WIM board is as follows:

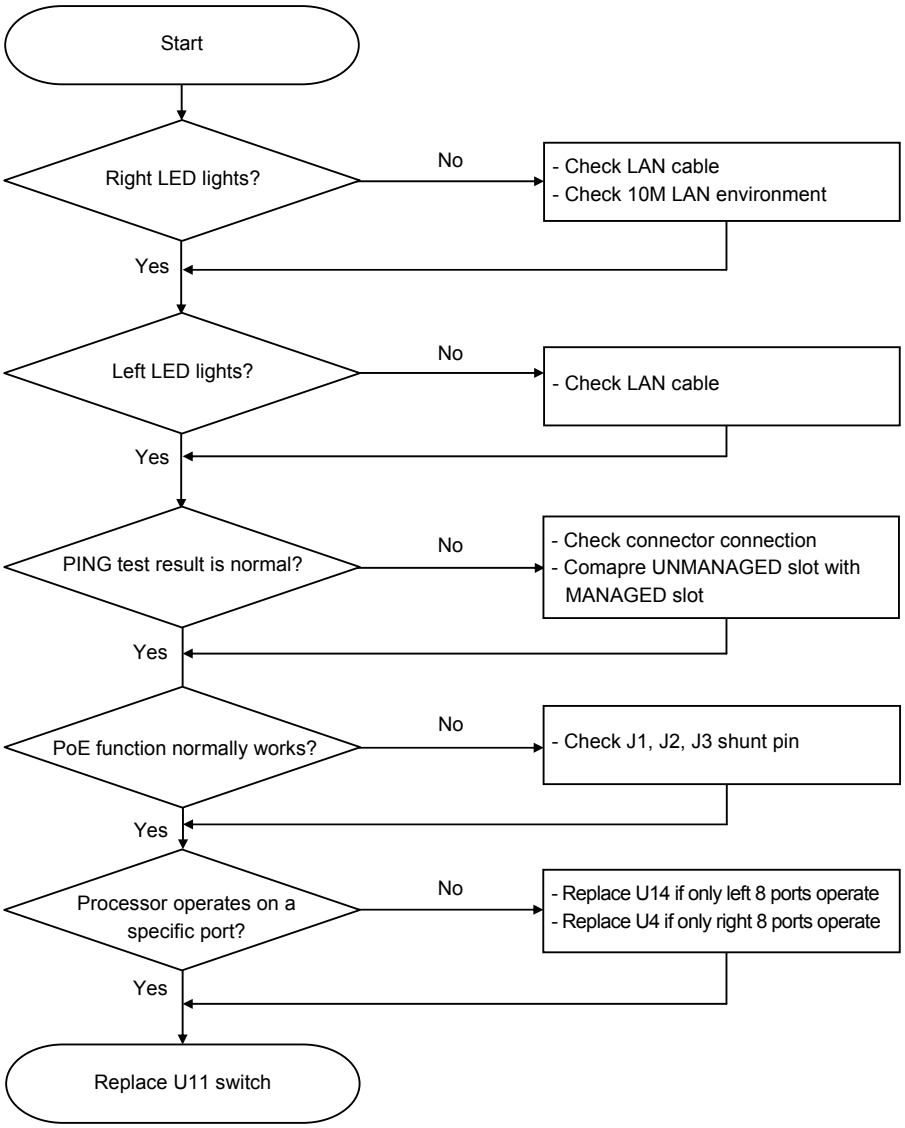


3.4.4 LIM Board /LIM-P Board

The procedure for resolving the problems that occur on LIM/LIM-P board is as follows:

3.4.4.1 Processor operation is abnormal

The procedure for resolving the problem caused by LIM/LIM-P board processor is as follows:

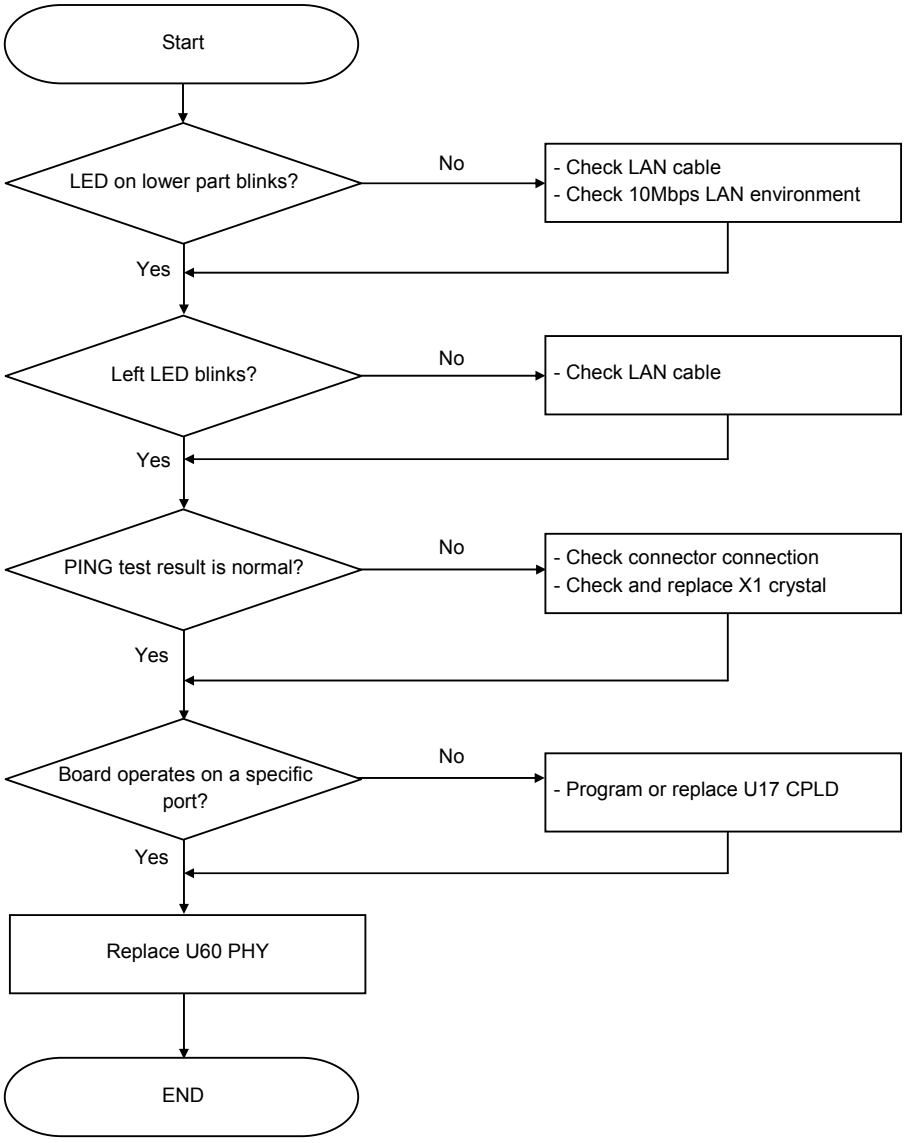


3.4.5 4DSL Board

The procedure for resolving the problems that occur on 4DSL board is as follows:

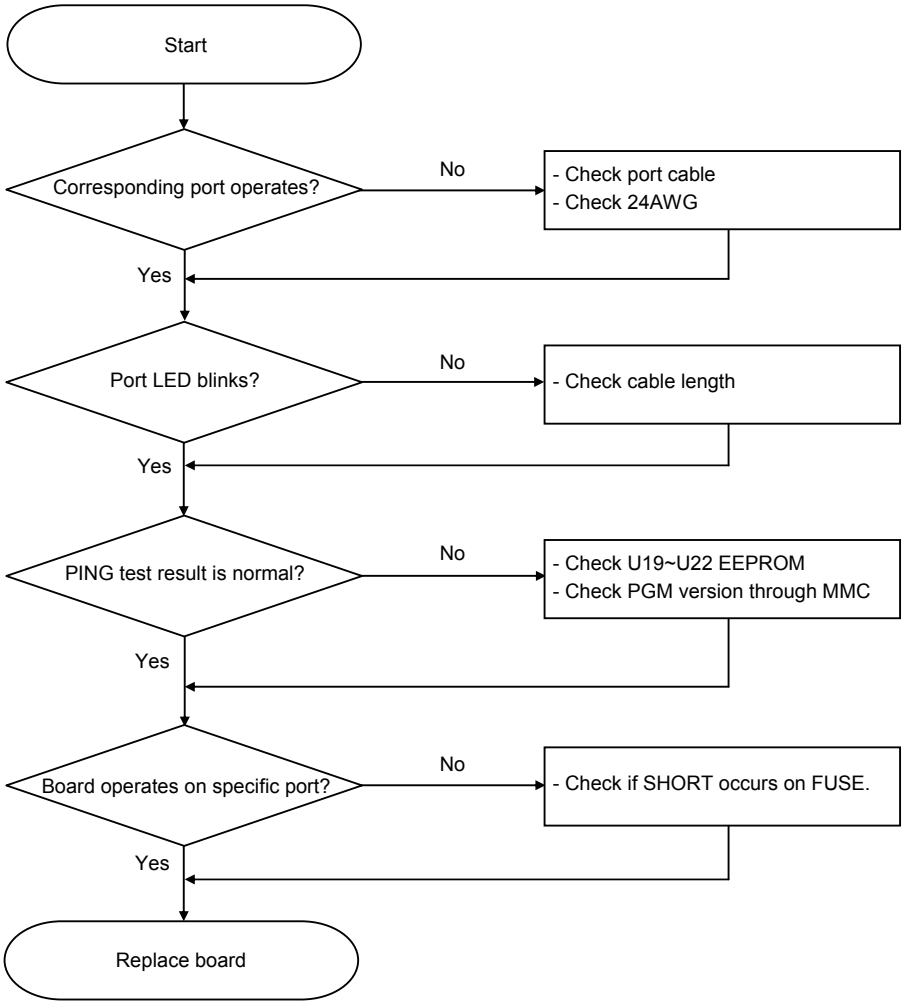
3.4.5.1 LAN Port operation is abnormal

The procedure for resolving the problem that occurs on LAN port of 4DSL board is as follows:



3.4.5.2 DSL operation is abnormal

The procedure for resolving the problem that occurs on Digital Subscriber Line(DSL) of 4DSL board is as follows:

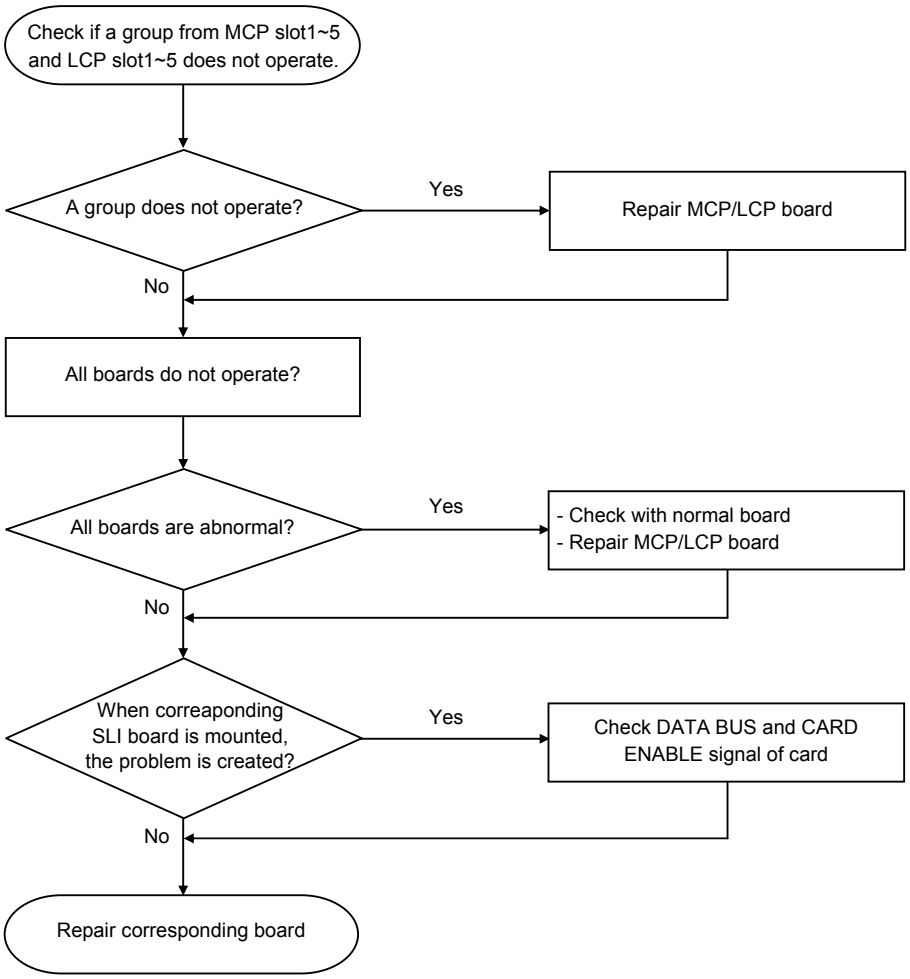


3.4.6 8SLI/8COMBO Board

The procedure for resolving the problems that occur on 8SLI/8COMBO board is as follows:

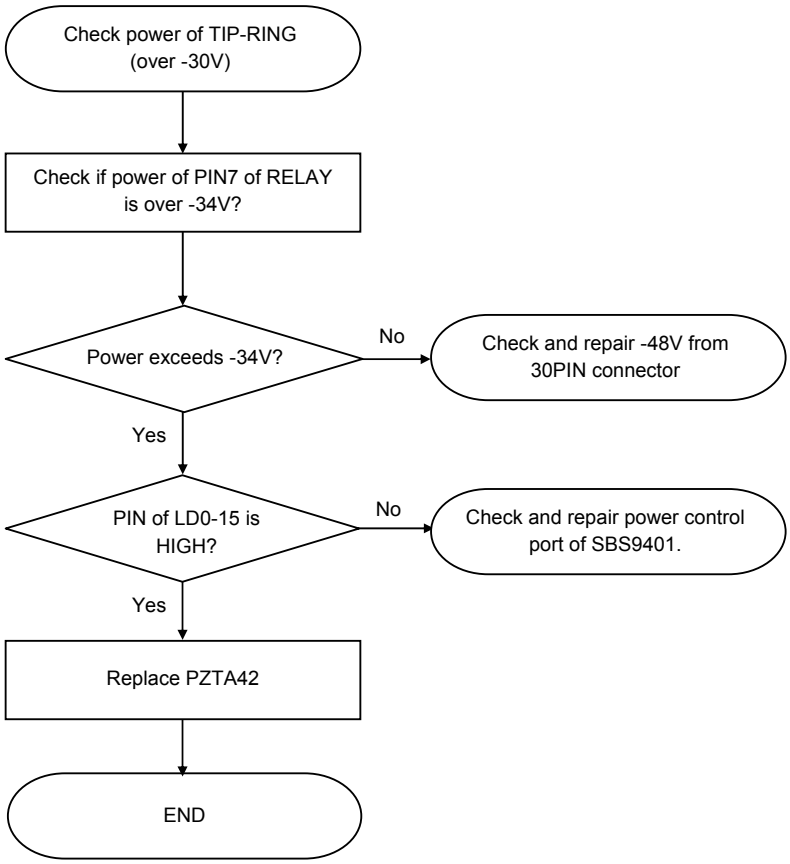
3.4.6.1 8SLI/8COMBO Board is not detected

The procedure for resolving the problem that occurs when 8SLI/8COMBO board is not detected is as follows:



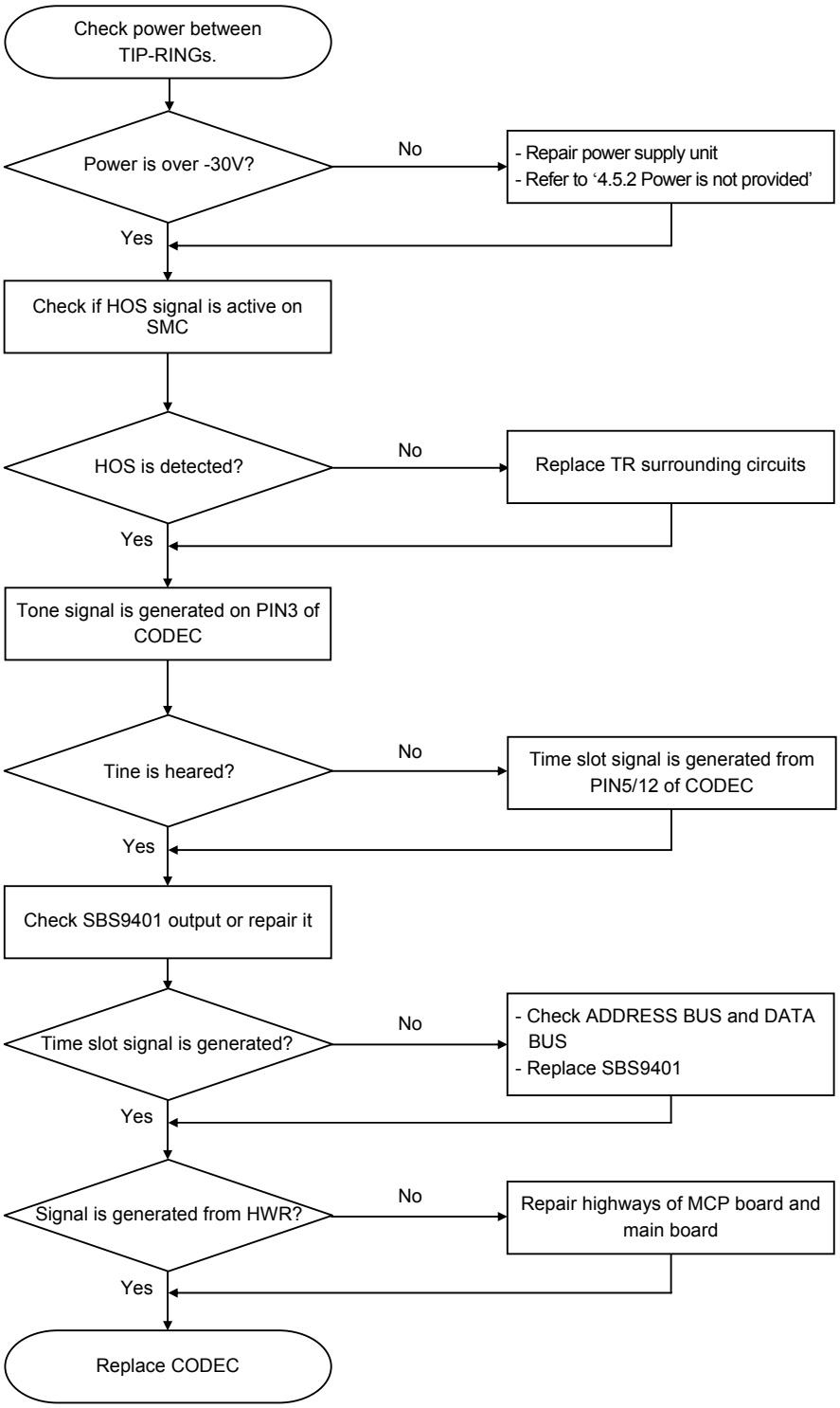
3.4.6.2 Power is not supplied

The procedure for resolving the problem that occurs when power is not supplied to 8SLI/8COMBO port is as follows:



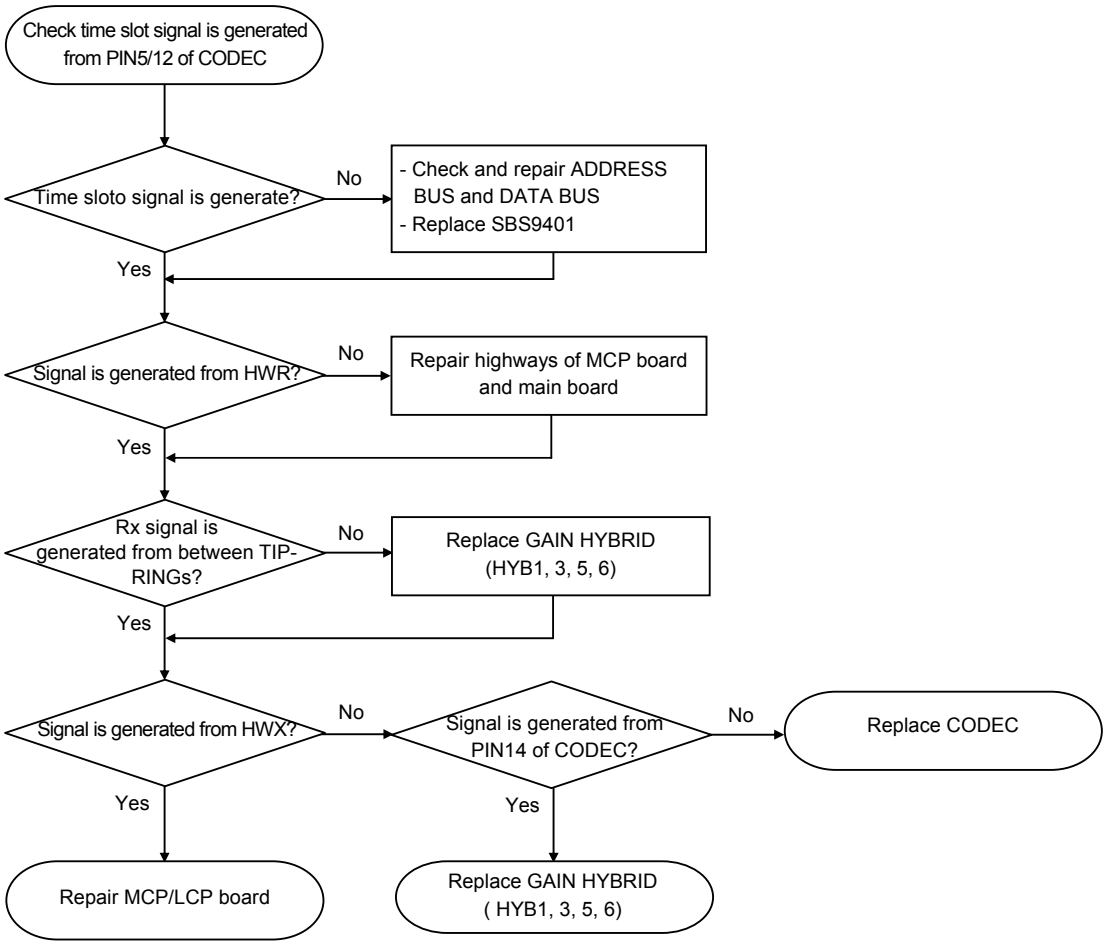
3.4.6.3 Any tones is not heard

The procedure for resolving the problem that occurs when tone is not heard through 8SLI/8COMBO port is as follows:



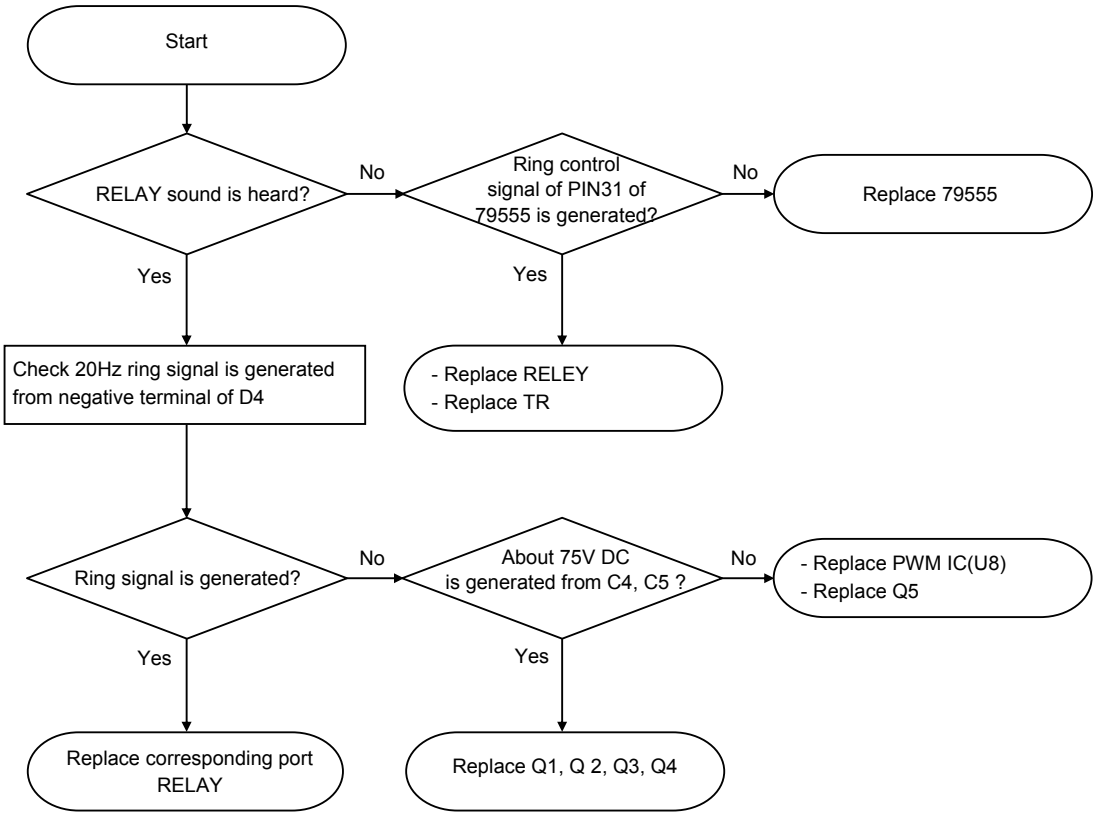
3.4.6.4 Any calls are not connected

The procedure for resolving the problem that occurs when a call is not connected through 8SLI/8COMBO port is as follows:



3.4.6.5 Port is not ringing

The procedure for resolving the problem that occurs when ring of 8SLI port is not ringing is as follows:

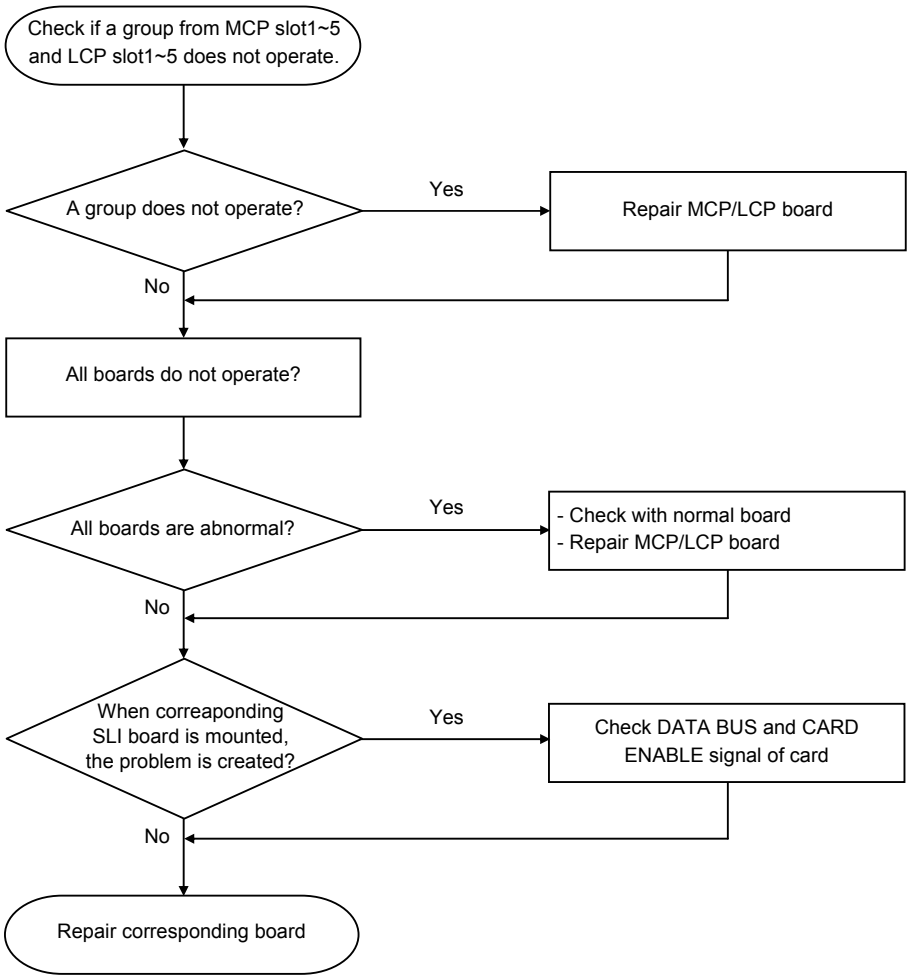


3.4.7 16SLI2/16MWSLI Board

The procedure for resolving the problems that occur on 16SLI2/16MWSLI board is as follows:

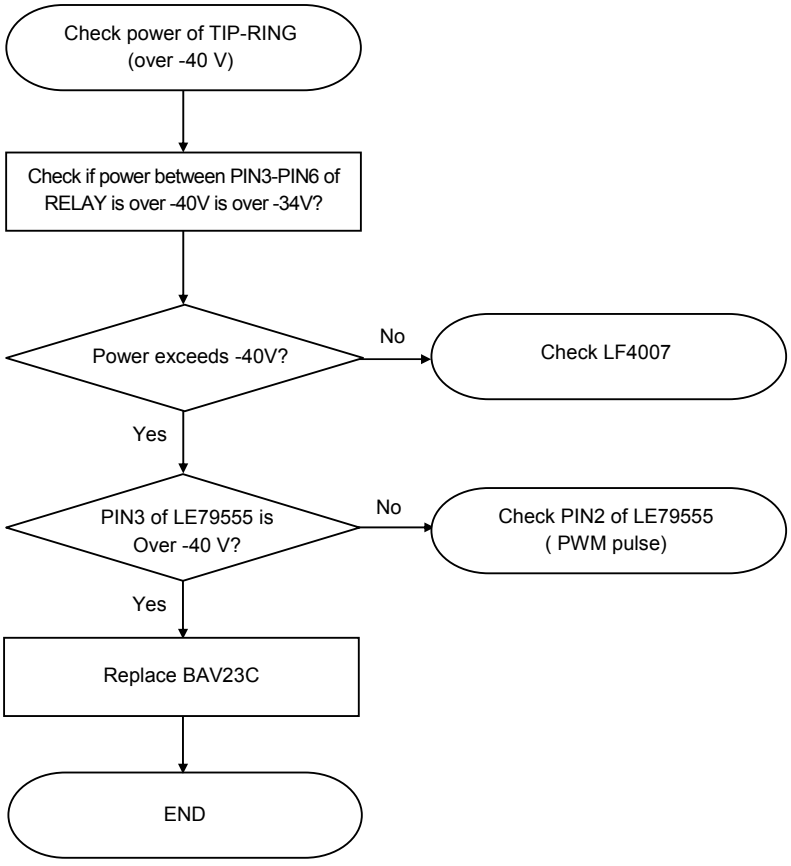
3.4.7.1 16SLI2/16MWSLI Board is not detected

The procedure for resolving the problem that occurs when 16SLI2/16MWSLI board is not detected is as follows:



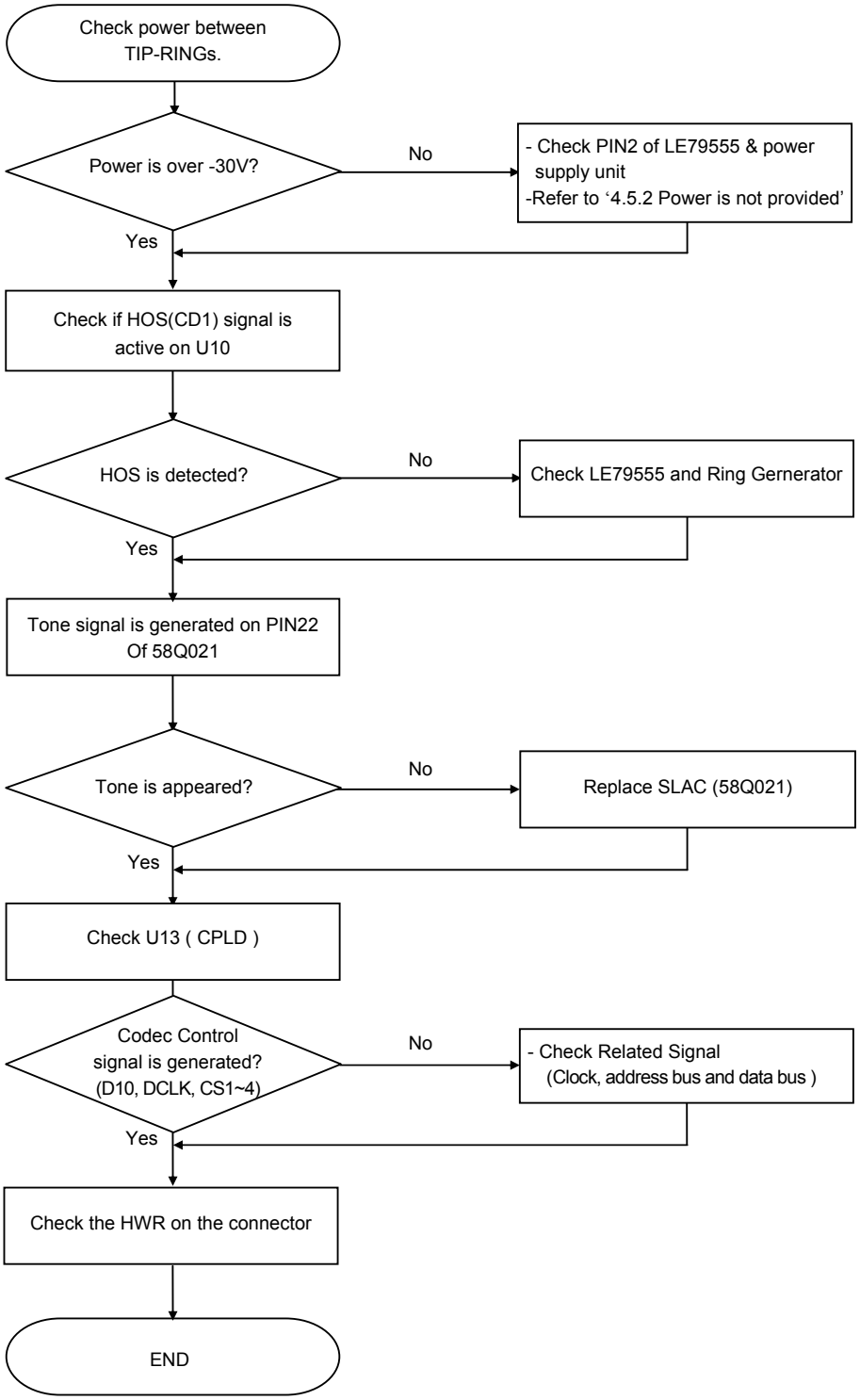
3.4.7.2 Power is not supplied

The procedure for resolving the problem that occurs when power is not supplied to 16SLI2/16MWSLI port is as follows:



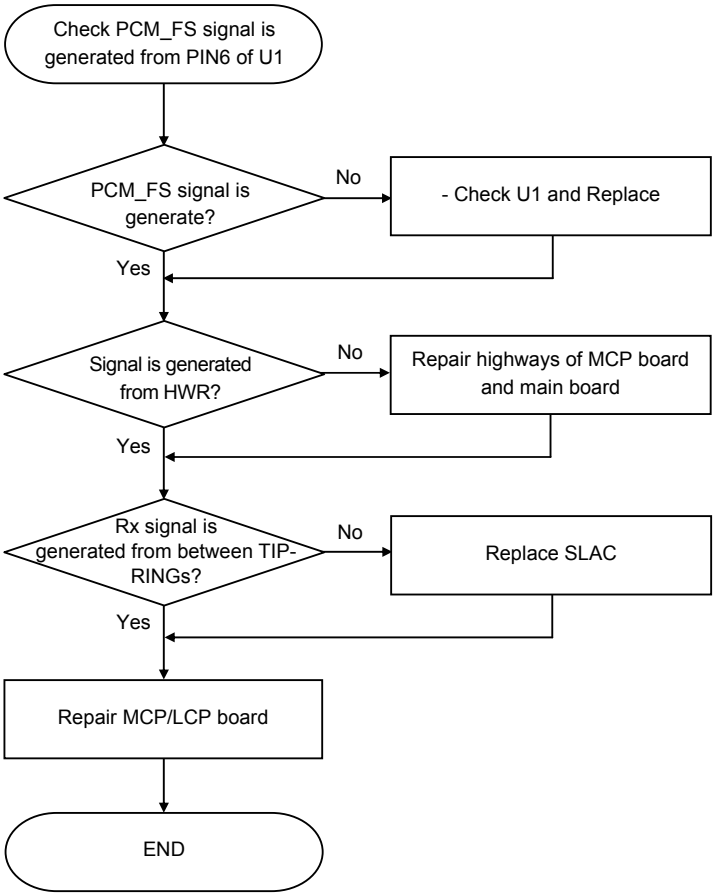
3.4.7.3 Any tones is not heard

The procedure for resolving the problem that occurs when tone is not heard through 16SLI2/16MWSLI port is as follows:



3.4.7.4 Any calls are not connected

The procedure for resolving the problem that occurs when a call is not connected through 16SLI2/16MWSLI port is as follows:

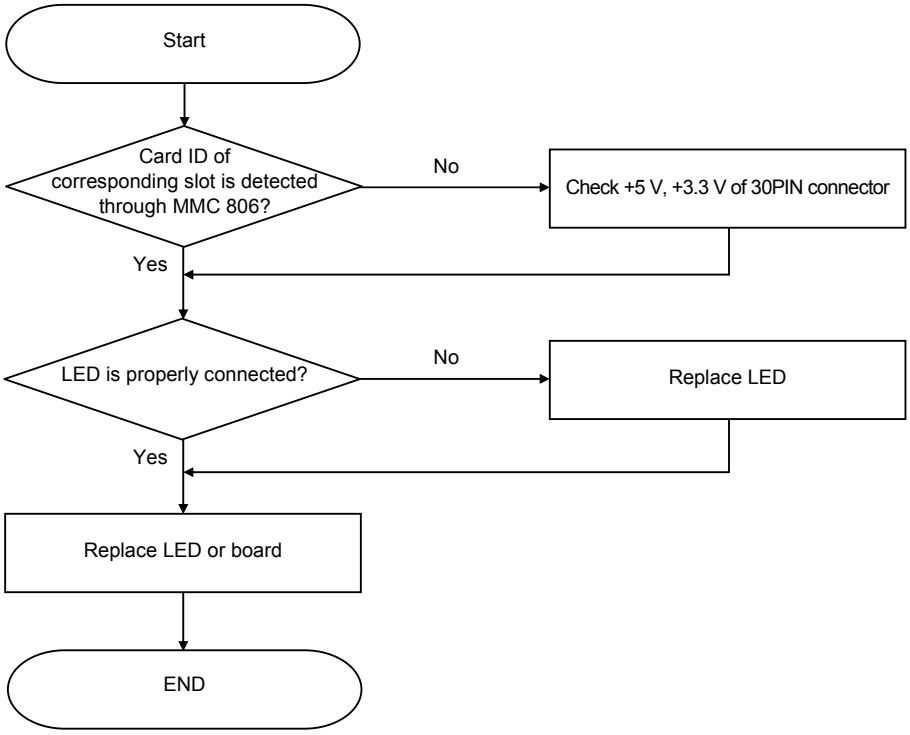


3.4.8 MGI Board

The procedure for resolving the problems that occur on MGI board is as follows:

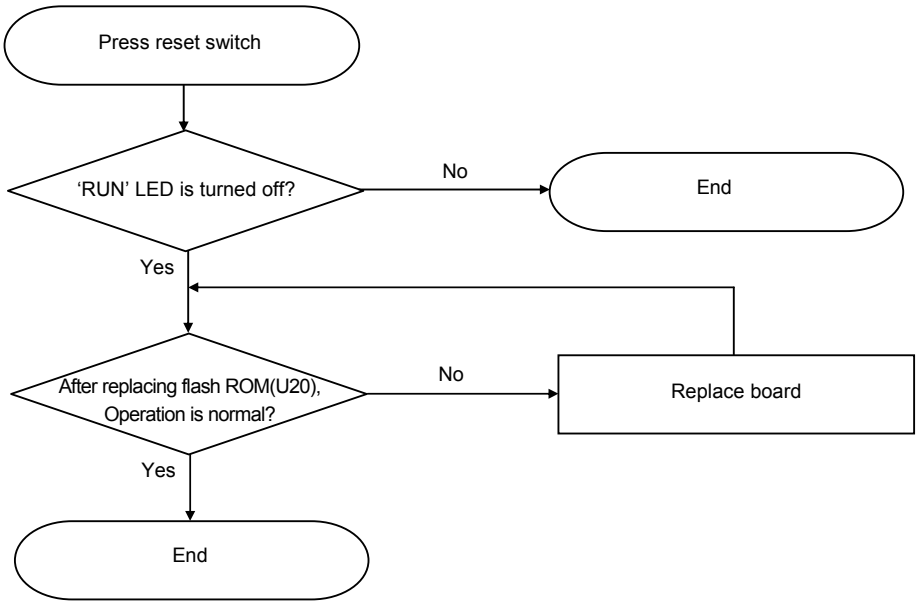
3.4.8.1 PWR LED turns off

All boards mounted on the OfficeServ 7200 system operates properly, and all terminals connected are operating properly while 'PWR' LED on the front panel of MGI board is turned off. Then, follow the procedures below:



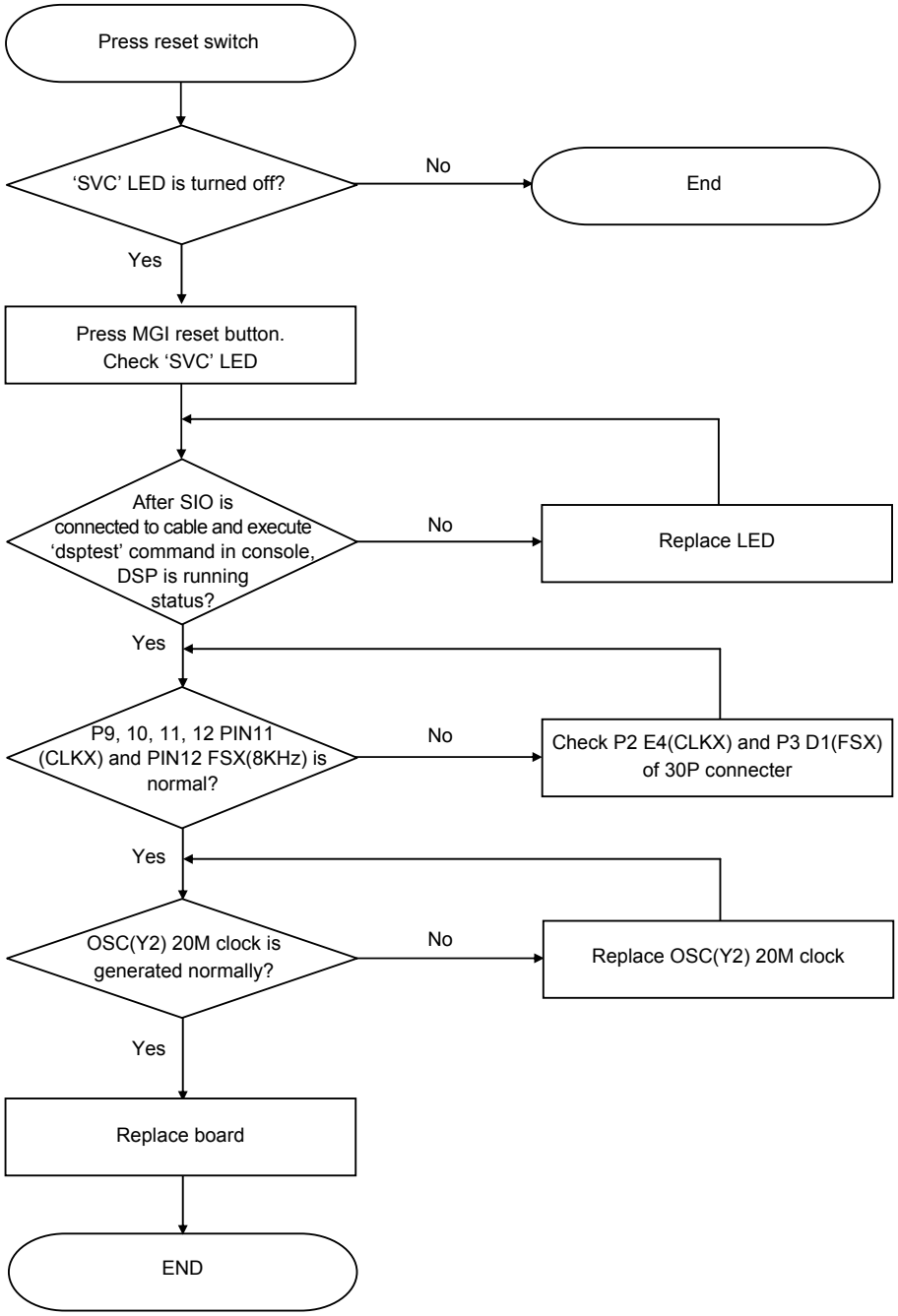
3.4.8.2 RUN LED turns off

All boards mounted on the OfficeServ 7200 system operates properly, and all terminals connected are operating properly while 'RUN' LED on the front panel of MGI board is turned off. Then, follow the procedures below:



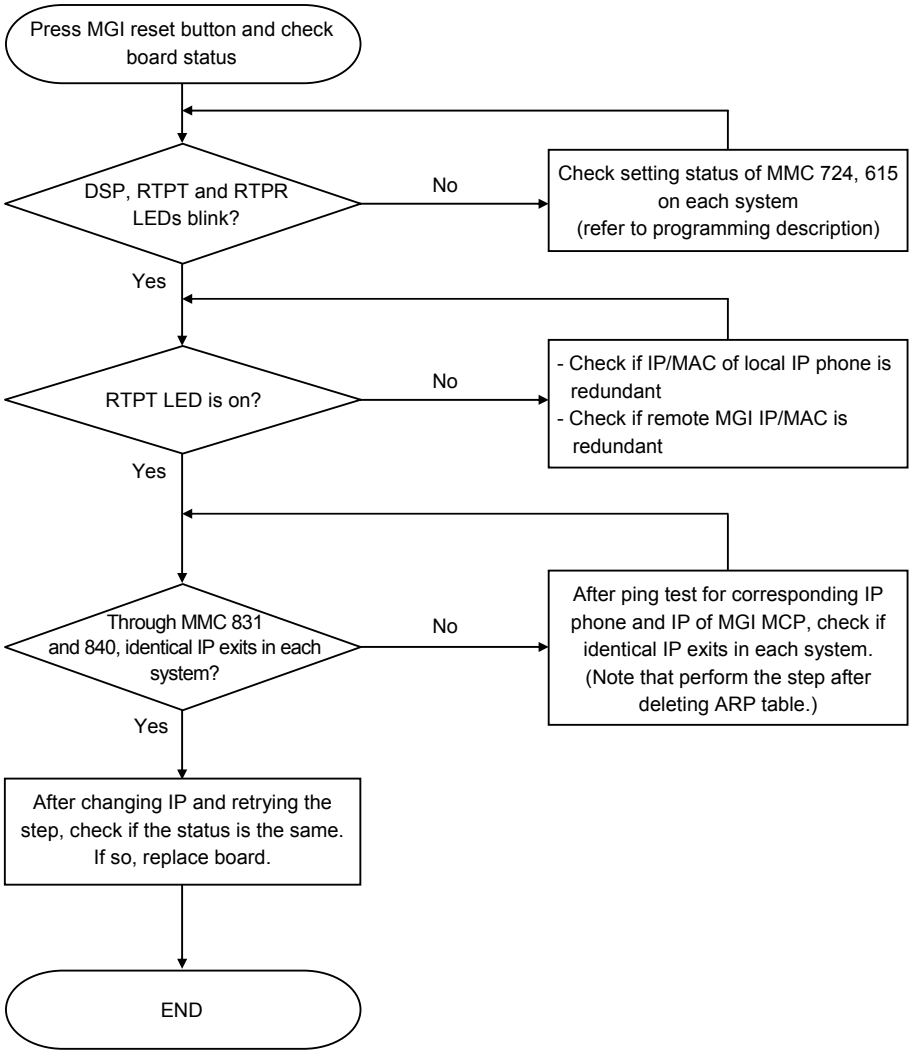
3.4.8.3 SVC LED cannot turn off

All boards mounted on the OfficeServ 7200 system operates properly, and all terminals connected are operating properly while 'SVC' LED on the front panel of MGI board does not blink. Then, follow the procedures below:



3.4.8.4 A Call between IP phone and digital phone cannot be connected

All boards mounted on the OfficeServ 7200 system operates properly, and all terminals connected are operating properly while a call between IP phone and digital phone is not connected.(A call between local IP phone and local digital phone and a call between local IP phone/digital phone and remote IP phone/digital phone is not connected.) Check the MGI board status and take actions following the procedure below:

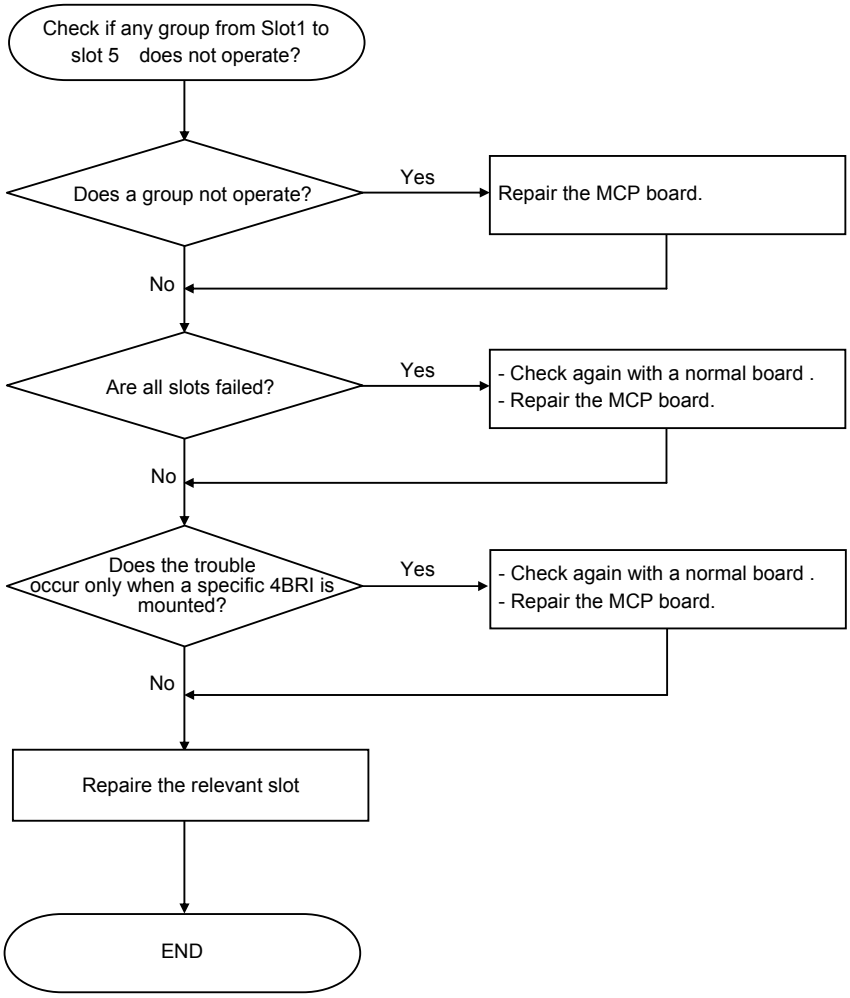


3.4.9 4BRI Board

The procedure for resolving the problems that occur on 4BRI board is as follows:

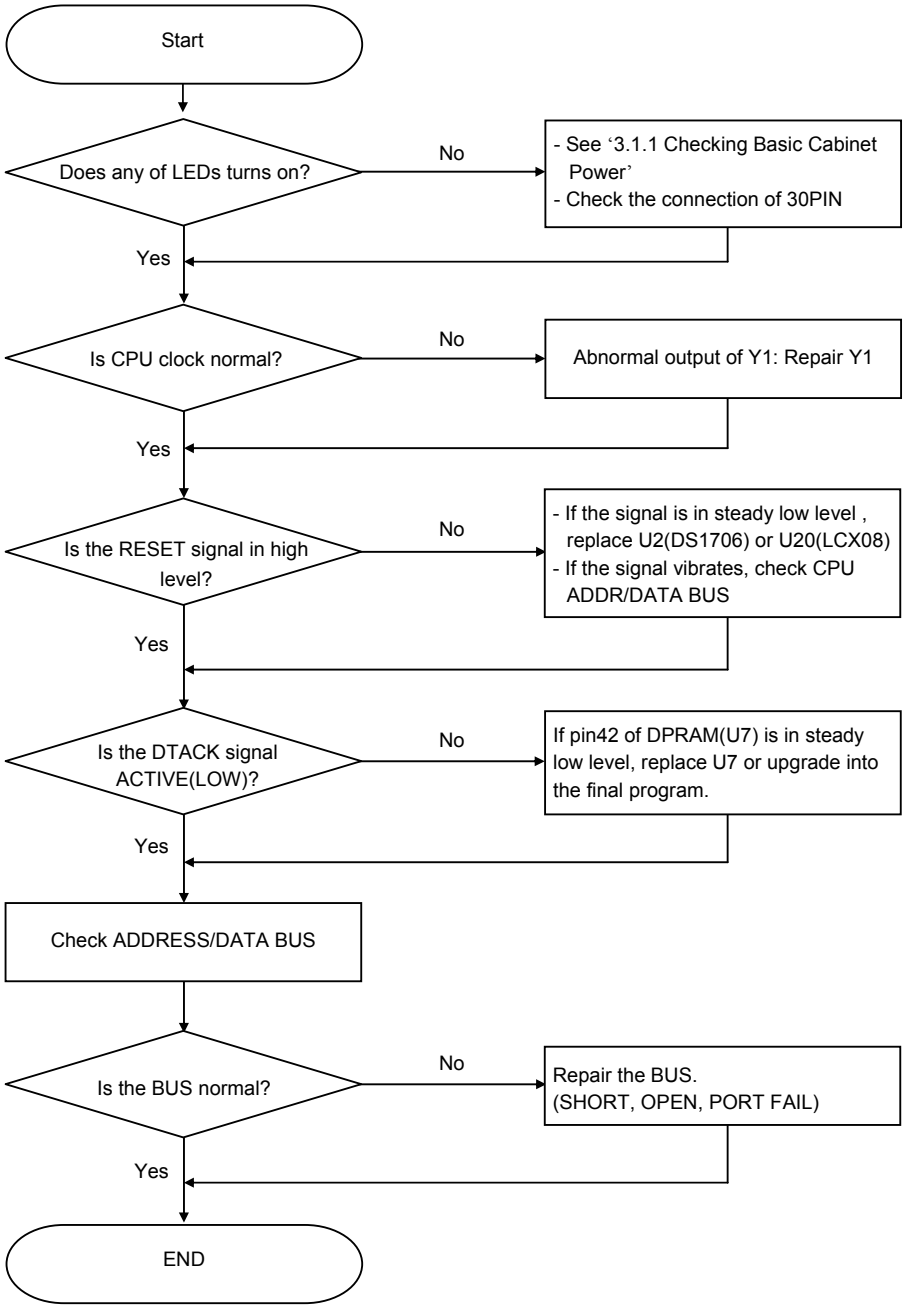
3.4.9.1 4BRI Board is not detected

The procedure for resolving the problem that occurs when 4BRI board is not detected is as follows:



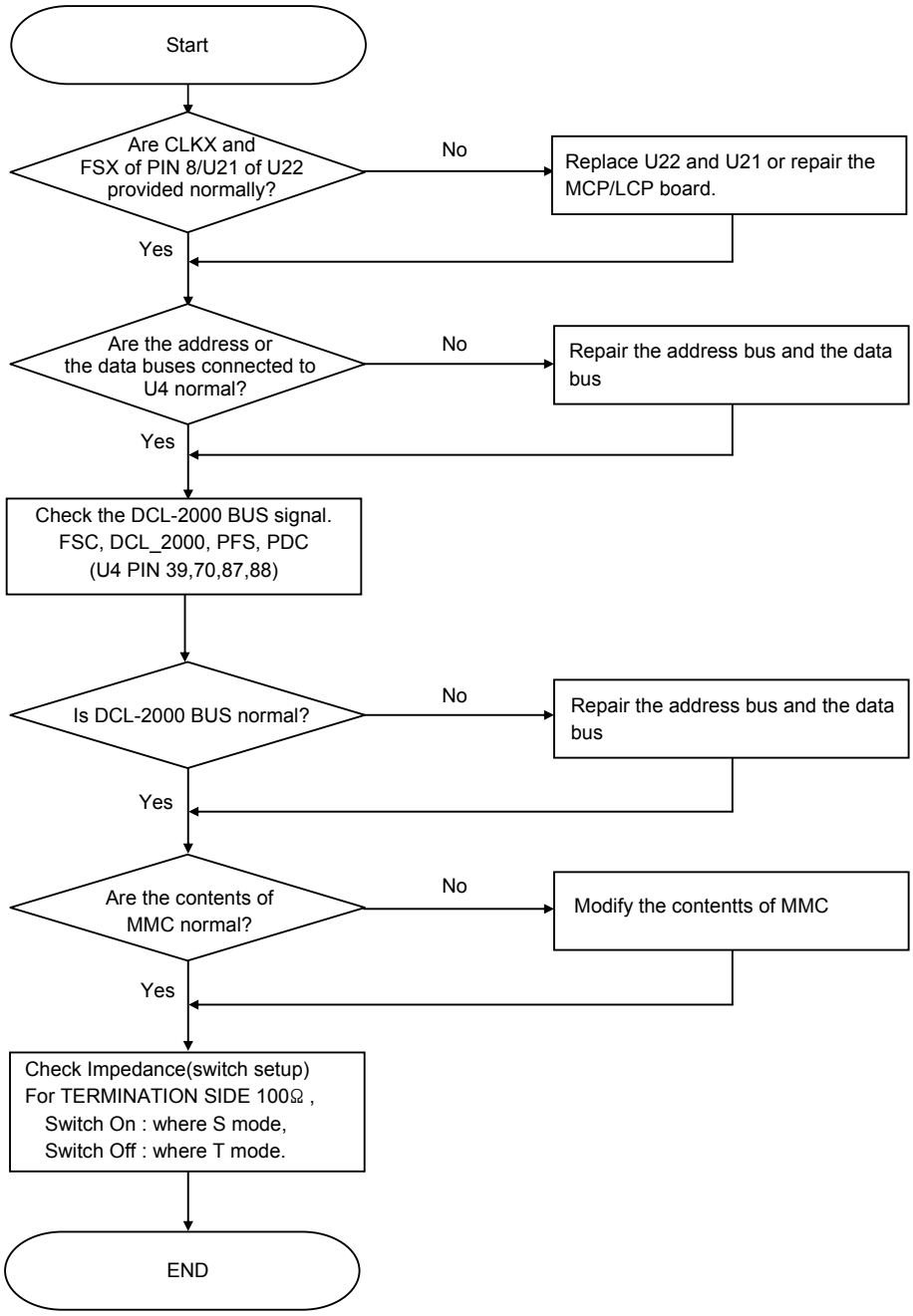
3.4.9.2 Processor operation is abnormal

The procedure for resolving the problem caused by 4BRI board processor is as follows:



3.4.9.3 4BRI Board operates, but any call is not made

The procedure for resolving the problem that 4BRI board operates but any call is not made is as follows:



3.5 Option Board (Daughter Board)

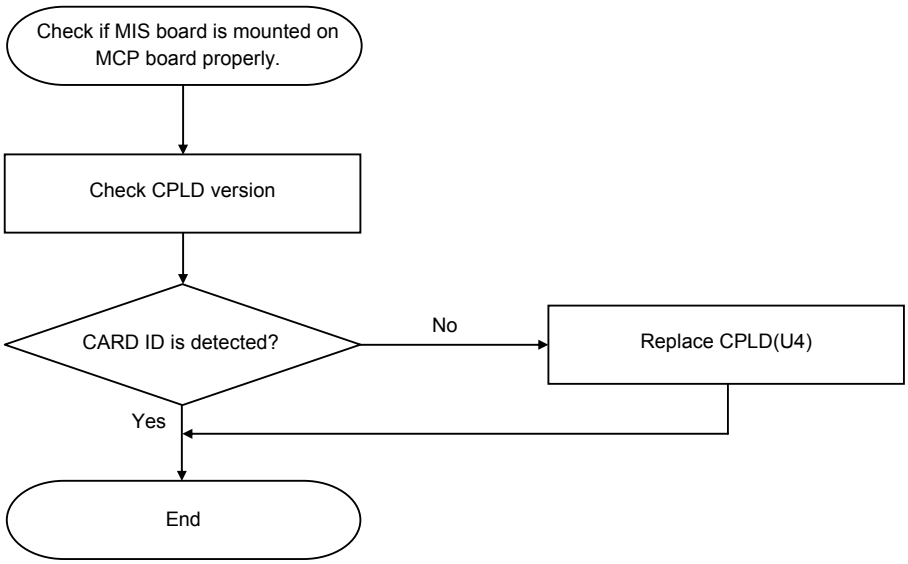
The procedure for resolving the problems that occur on various option boards is as follows:

3.5.1 MIS Board

The procedure for resolving the problems that occur on MIS board is as follows:

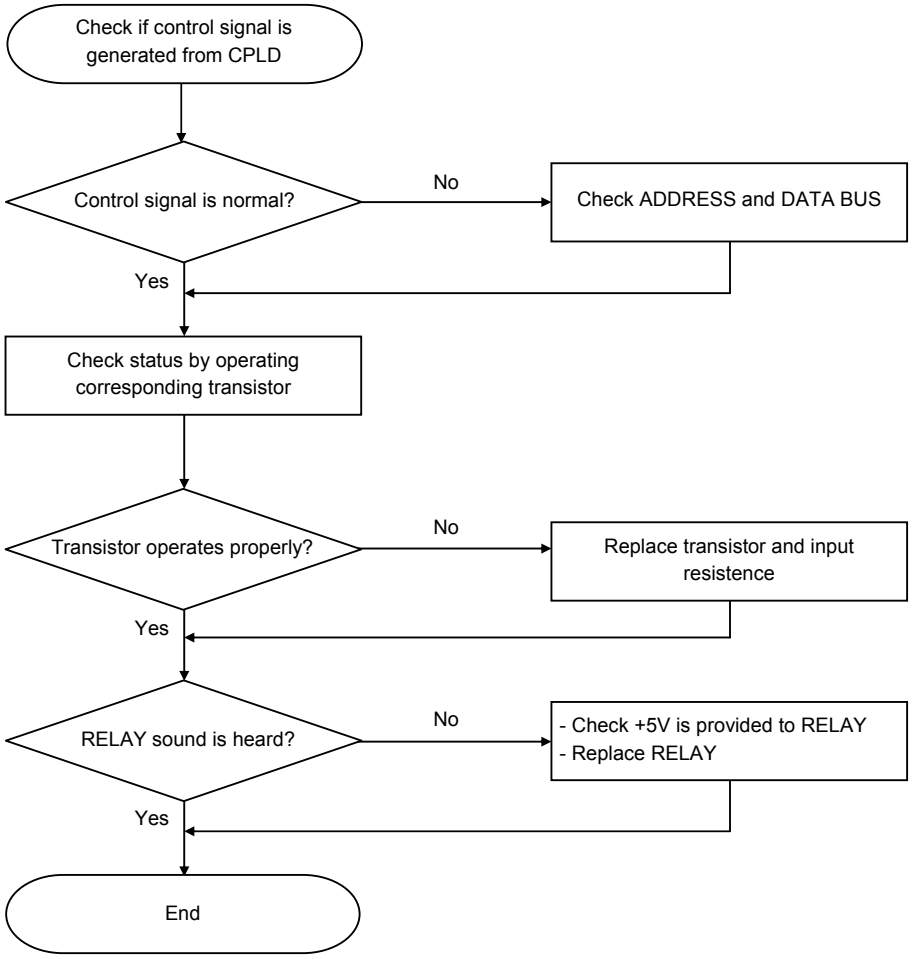
3.5.1.1 MIS Board is not detected

The procedure for resolving the problem that occurs when MIS board is not detected is as follows:



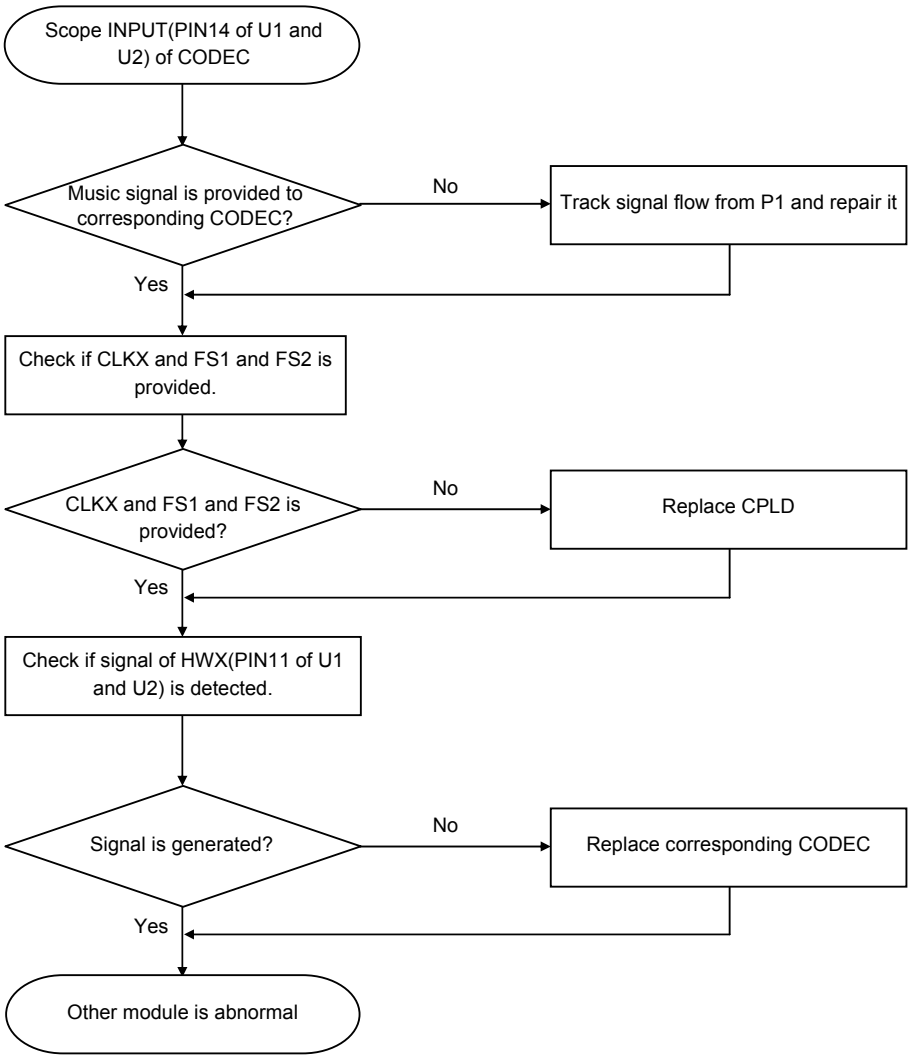
3.5.1.2 Relay cannot be controlled

The procedure for resolving the problem that occurs when RELAY cannot be controlled is as follows:



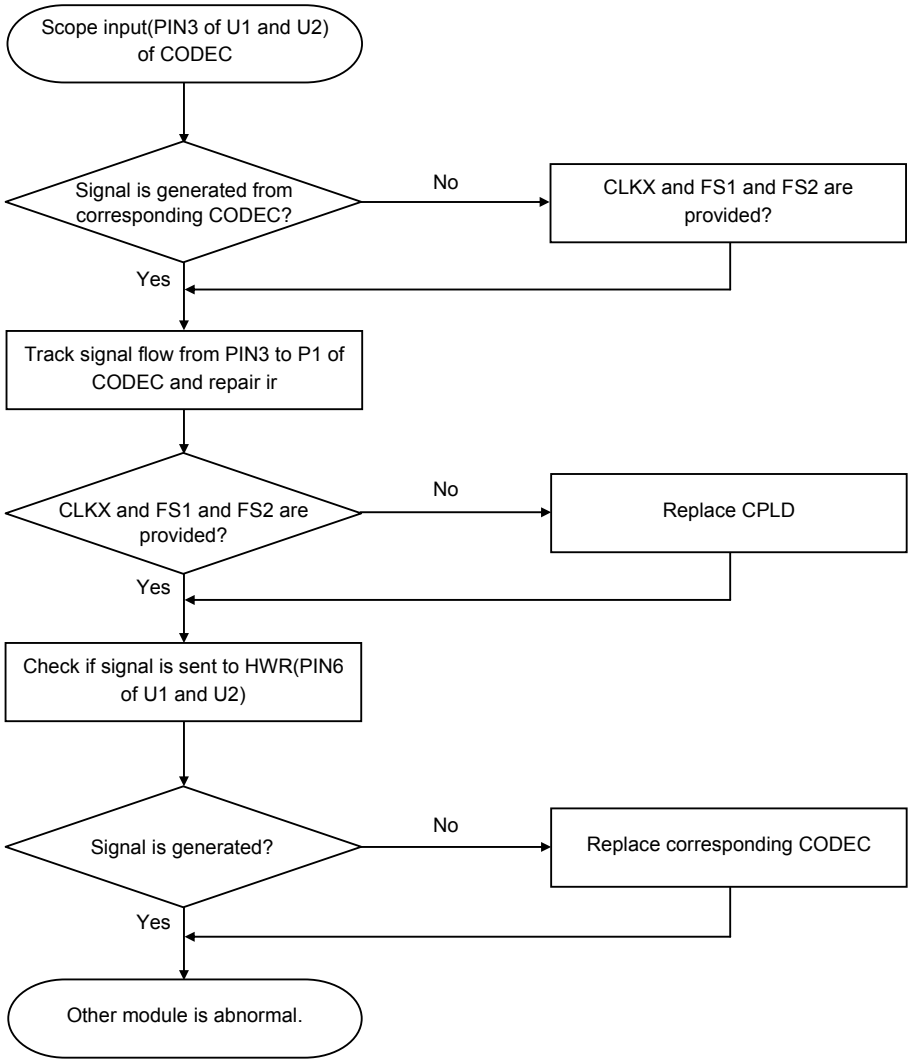
3.5.1.3 External sound source is not heard

The procedure for resolving the problem that occurs when external sound source is not heard is as follows:



3.5.1.4 External Page/Loud bell is not operating

The procedure for resolving the problem that occurs when external page/loud bell does not operate is as follows:

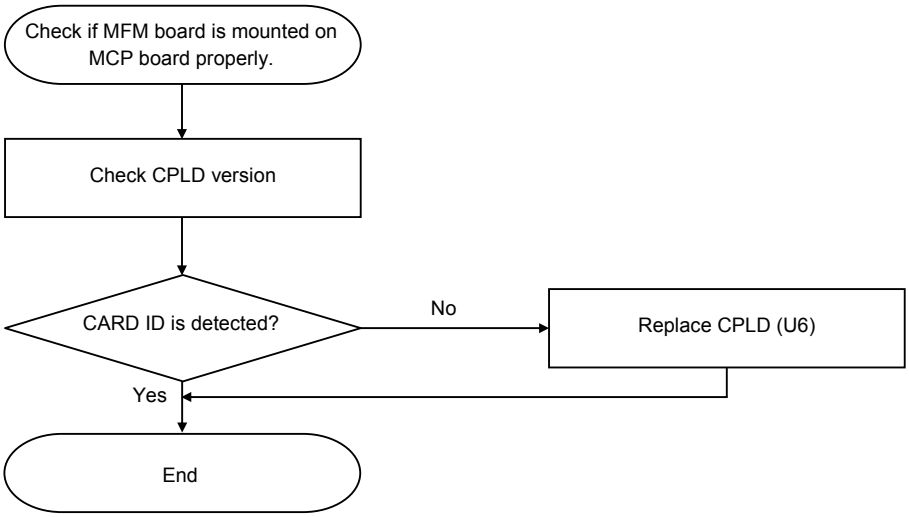


3.5.2 MFM Board

The procedure for resolving the problems that occur on MFM board is as follows:

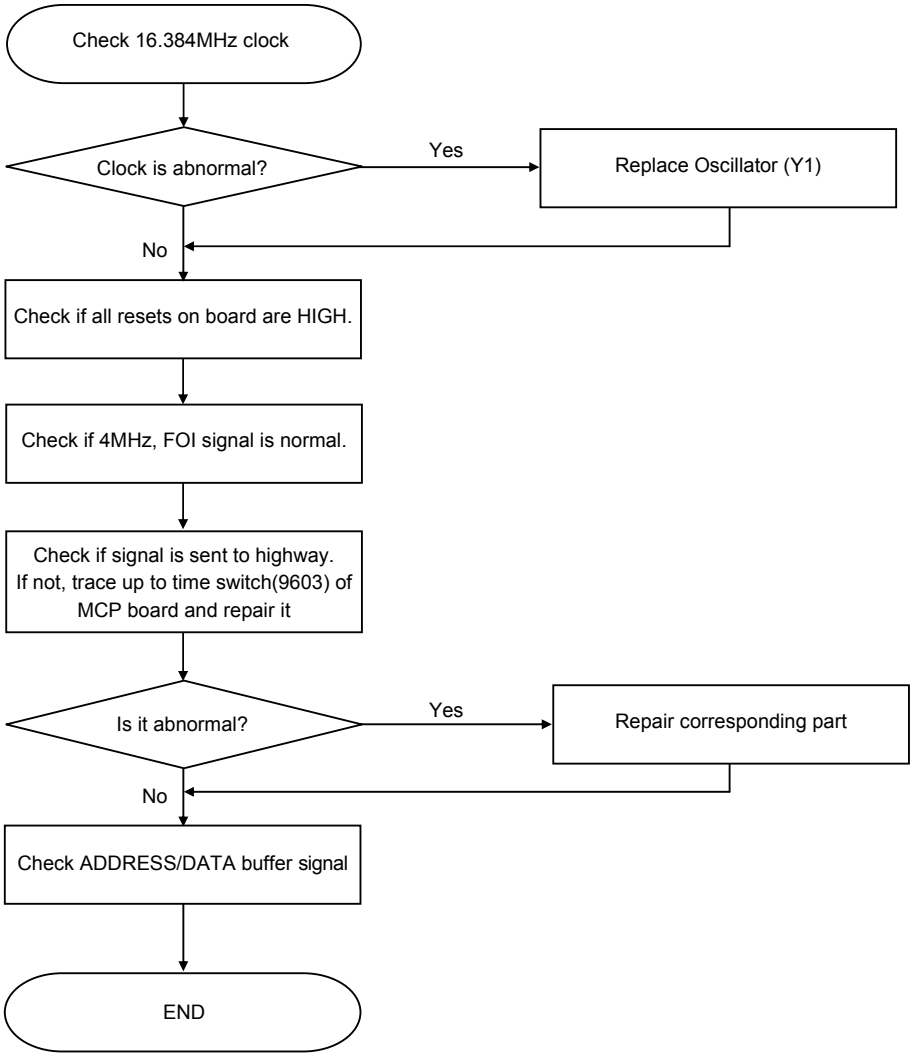
3.5.2.1 MFM Board is not detected

The procedure for resolving the problem that occurs when MFM board is not detected is as follows:



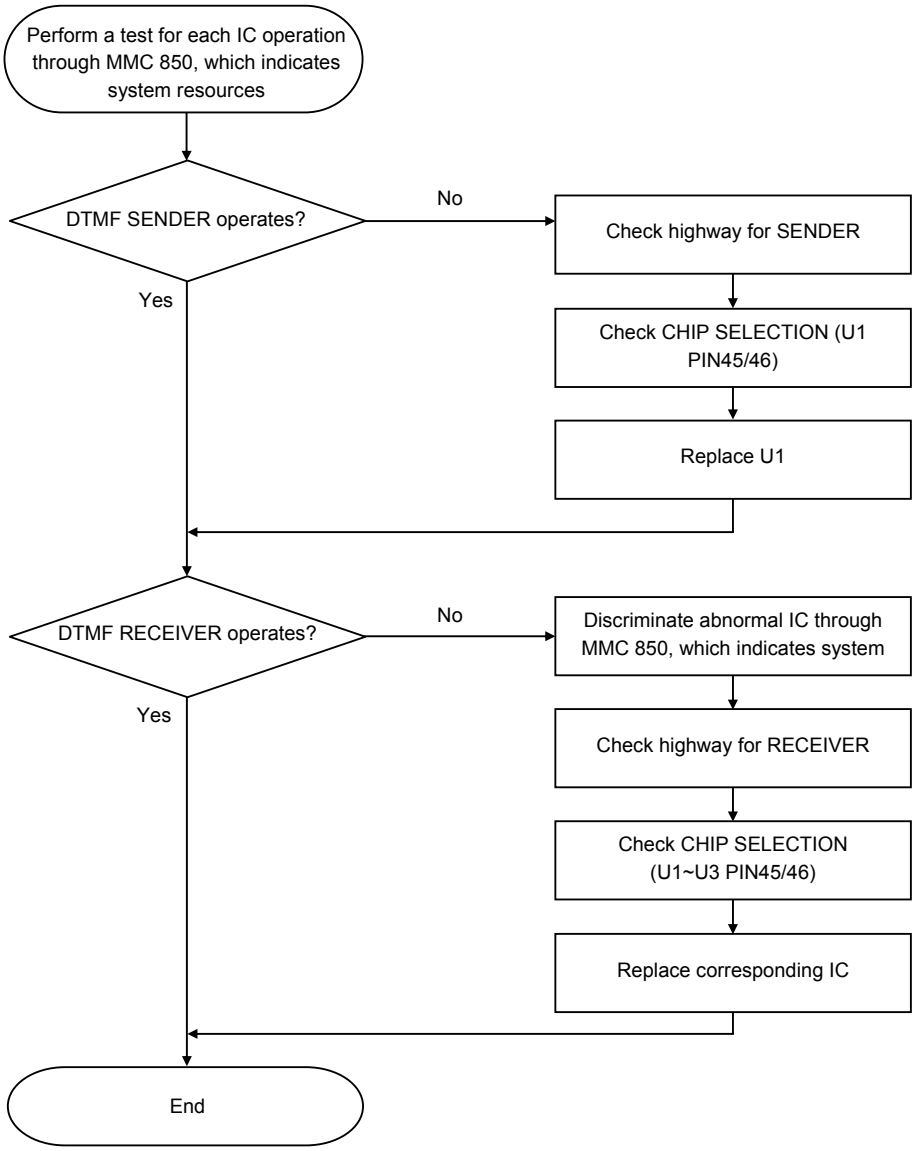
3.5.2.2 All DSP operation of MFM board is abnormal

The procedure for resolving the problem caused by all DSP operation of MFM board is as follows:



3.5.2.3 Some DSP operation of MFM Board is abnormal

The procedure for resolving the problem caused by some DSP of MFM board is as follows:

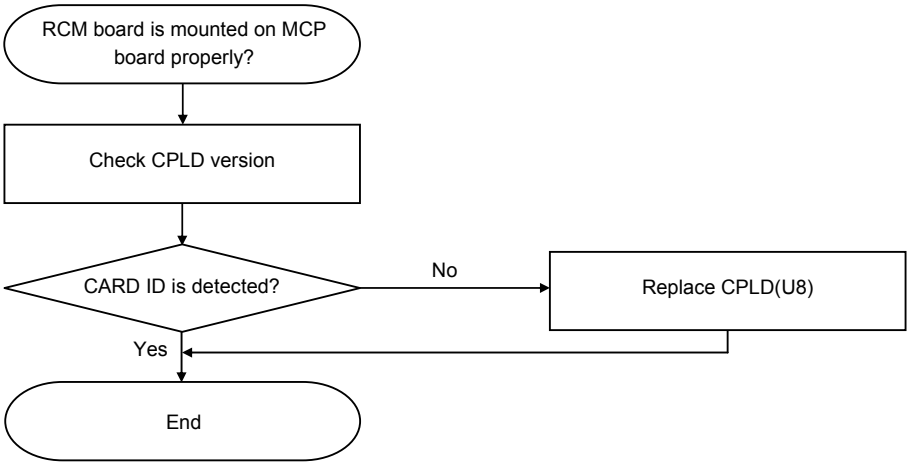


3.5.3 RCM Board

The procedure for resolving the problems that occur on RCM board is as follows:

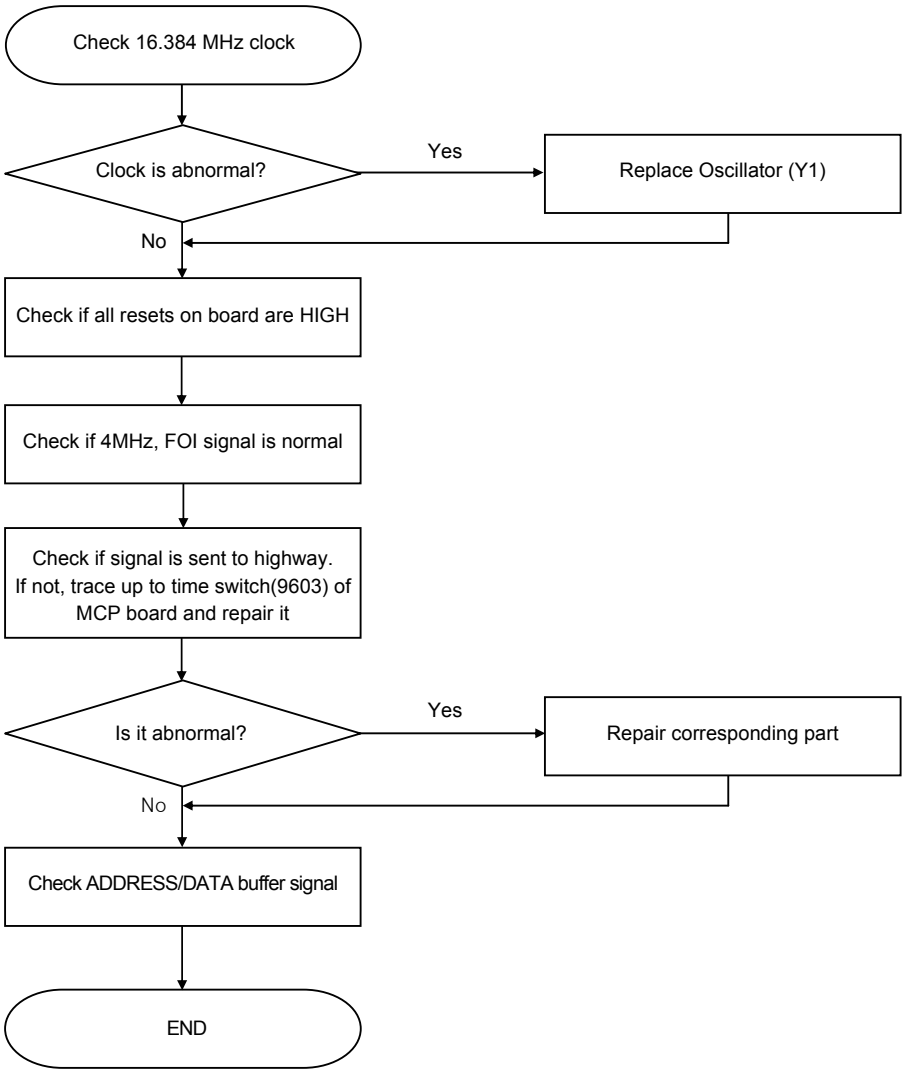
3.5.3.1 RCM Board is not detected

The procedure for resolving the problem that occurs when RCM board is not detected is as follows:



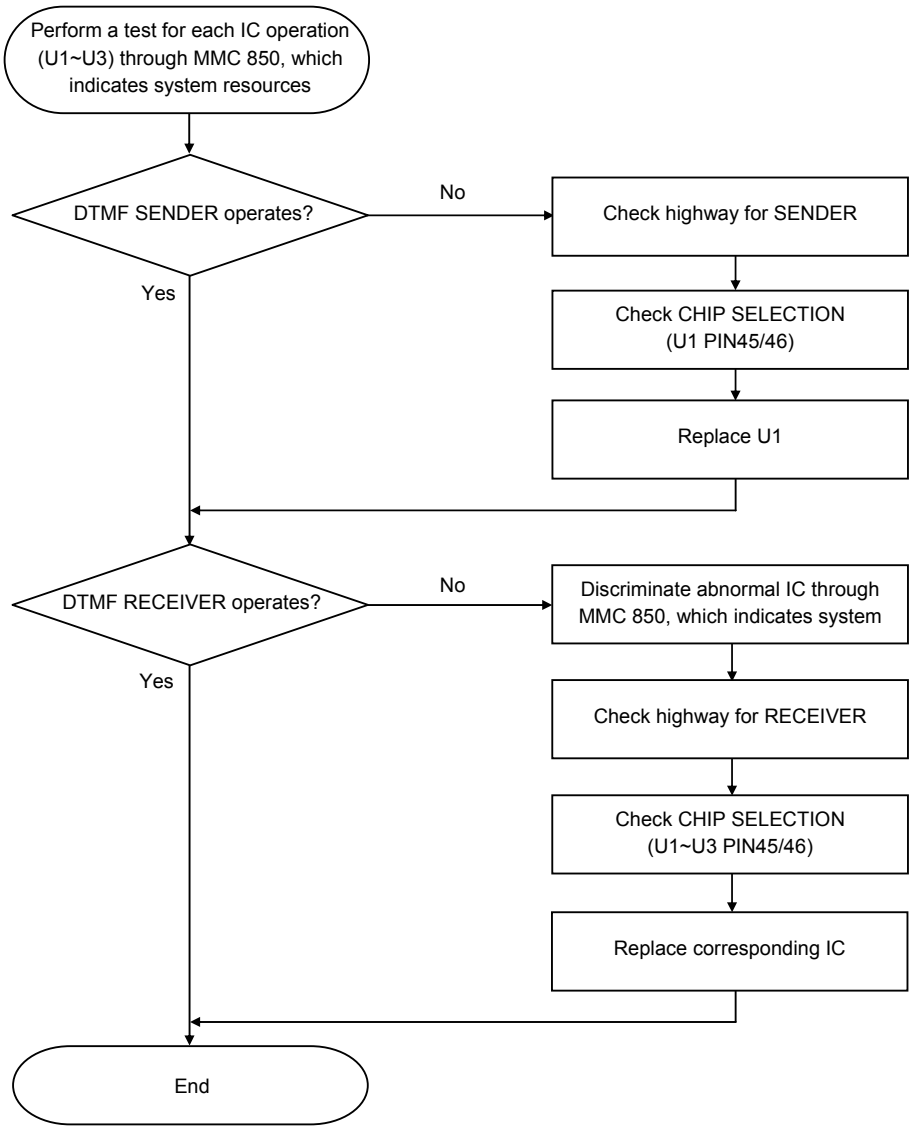
3.5.3.2 All DSP operation of RCM Board is abnormal

The procedure for resolving the problem caused by all DSP operation of RCM board is as follows:



3.5.3.3 Some DSP operation of RCM Board is abnormal (1)

The procedure for resolving the problem caused by some DSP operation of RCM board is as follows:



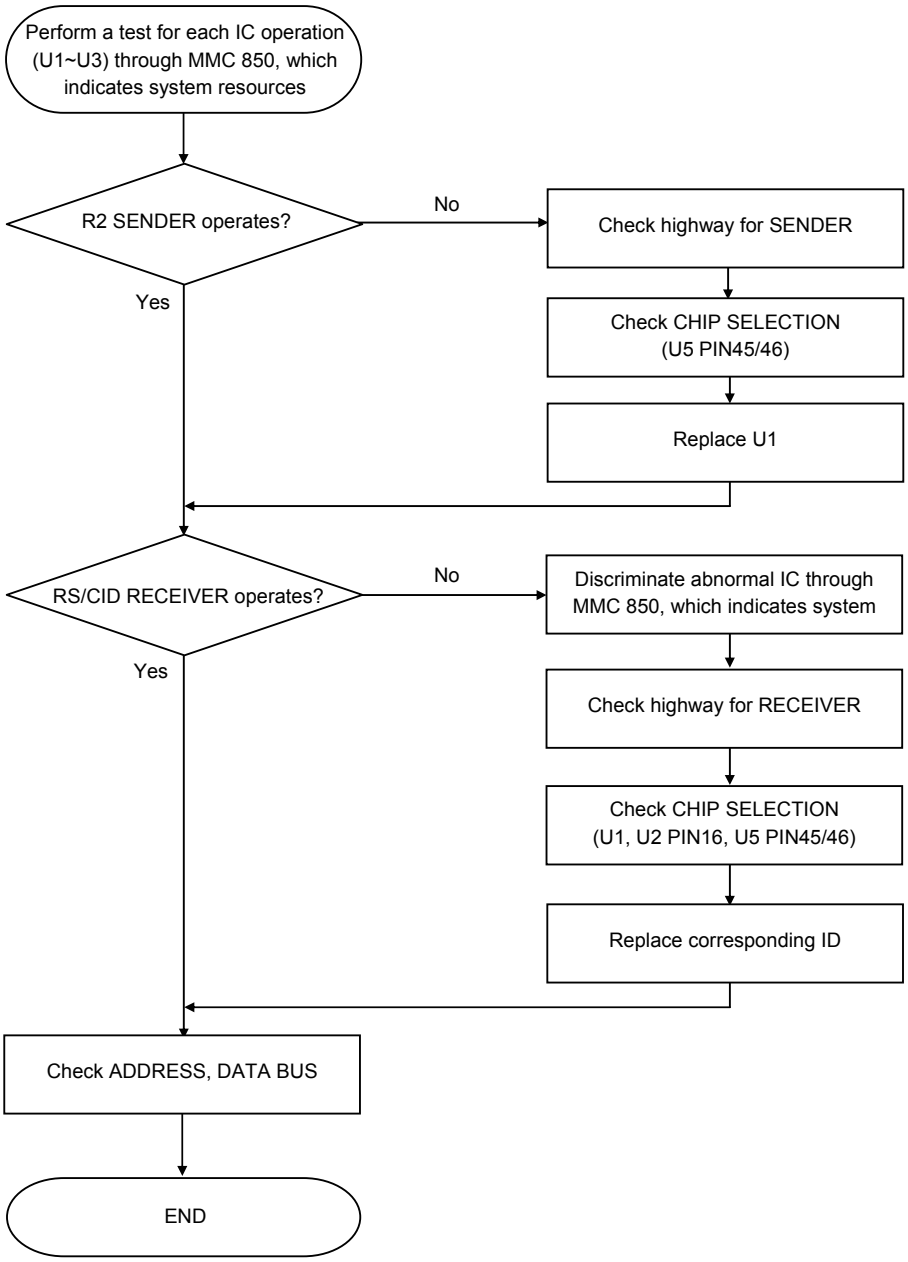
NOTE

If the problem of DSP operation of RCM board is not resolved

If the problem of DSP operation of RCM board is not resolved, refer to '3.5.3.4 Some DSP Operation of RCM Board is Abnormal(2)'.

3.5.3.4 Some DSP operation of RCM Board is abnormal (2)

If the problem with DSP operation of RCM board is not resolved even if the operator followed the '3.5.3.3 DSP Operation of RCM Board is Abnormal(1)' procedure, check the following procedure:



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CHAPTER 4. Programming for Maintenance

This chapter describes how to operate SmartMedia, Complex Programmable Logic Devices (CPLD), and off-line program.

4.1 SmartMedia Programming

As a NAND type flash memory, SmartMedia should be programmed before being mounted on the system.
Installation procedure and how to operate for each function are described as follows:

4.1.1 Installation

Describes how to install SmartMedia program.

4.1.1.1 Preparation

The items below should be prepared for installing SmartMedia program:

- SmartMedia writing board(SEC CODE: KP500DBSMW/EUS)
- Desktop PC(486 or higher)
- SmartMedia card(SMC, SmartMedia Memory Card)
- S/W(SM_NEW.EXE: Executes DOS mode, provided by Samsung Electronics)

4.1.1.2 Installation Procedure

Follow the steps below to install SmartMedia program:

1) After turning off PC power, install SmartMedia Writer(SMW) on ISA slot of the PC. Fasten SMW with screws of the PC tight.

2) After turning on the PC power, execute SM_NEW.EXE in DOS mode or Windows mode and mount SmartMedia Card(SMC) on SMW. Note that the program to be saved in SMC should be located at the directory(e.g., C:\idcs500\smart) where 'SM_NEW.EXE' is.

3) Enter [1] and the [ENTER] key on the following screen:

```
C:\idcs500\smart>SM_NEW
Choose ECC Methods (1. Software ECC  2. Hardware ECC)
(default is Software ECC)?
```

4) Installation is completed successfully when the screen below appears:

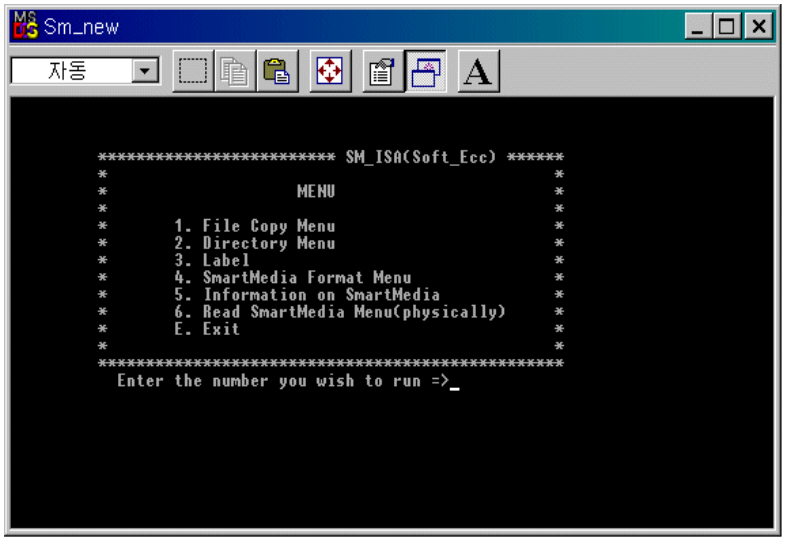


Figure 4.1 SmartMedia Program Initial Screen

4.1.2 Function Performance

The five functions below can be performed on the initial screen:

- Format
- File copy(PC to SMC, SMC to PC)
- Directory display(identical with DIR function in DOS mode)
- File deletion(deleting partially)
- SMC analysis

SMC can be successfully installed on the OfficeServ 7200 system with the five functions above. The following section describes how to perform the five functions as shown below:

4.1.2.1 Format

Follow the steps below to format of a new SMC to the OfficeServ 7200 system:

1) Enter [4] and the [ENTER] key to display the [Format Menu] window below: Then, enter [1] and the [ENTER] key.

Figure 4.2 [Format Menu] Screen

2) Enter [Y] and the [ENTER] key on the following window:

```
Manufacturer's code is    ec
Device code is    73
UID code is    a5
Fourth code is    bb
SAMSUNG 16 MB SmartMedia (3.3V)
Bad Block= 1(zone=0)
Do you want to re-test all block for recovering SmartMedia(y/n)? y?
```

3) Then, the format starts. Format process is indicated lower part of the screen.
The [Format Menu] screen appears when the format is completed successfully.
Enter [P] to go back to the initial screen.

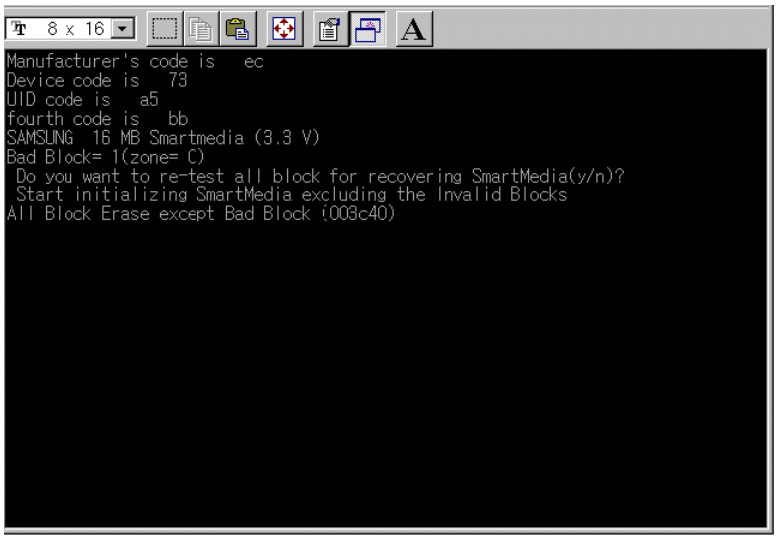


Figure 4.3 SMC Format

4.1.2.2 File Copy

This section describes file copy from PC to SMC or from SMC to PC.
Enter [1] and the [ENTER] key on the initial screen to display the [Copy Menu] screen as shown below:

Figure 4.4 [Copy Menu] Screen

File Copy from PC to SMC

Follow the steps below to copy files from PC to SMC:

1) Enter [1] and the [ENTER] key on the [Copy Menu] screen to display the screen below: Enter the target source file name behind [:] and enter the [ENTER] key.

```
Enter the source file name ((ex)mcp_l.pgm) : startup.sys
Enter the SmartMedia Path ((ex) temp\dsc) :  (just press "ENTER" key)
Enter the SmartMedia file name ((ex)young.txt) : startup.sys
```


NOTE

Required file
'startup.sys' file and 'MCP_MV106.PGM', 'MCP_LV106.PGM', 'XXX.PGM' file are required to program SMC of the OfficeServ 7200 system.

2) The file is successfully copied when the [Copy Menu] screen appears. Repeat the steps above to copy files to all SMC for the OfficeServ 7200 system.

File Copy from SMC to PC

Follow the steps below to copy files from SMC to PC:

1) Enter [2] and the [ENTER] key on the [Copy Menu] screen.

2) Then, the screen below appears: Enter the target source file name behind [:] and enter the [ENTER] key. Note that the target file name should be entered exactly. If the file name is not entered exactly, the operator will get out of the DOS mode.
For detailed information on file name, refer to '4.1.2.3 Directory Retrieval'.

```
Enter the source file name ((ex)mcp_l.pgm): just press "ENTER" key)
Enter the SmartMedia Path ((ex) temp\dsc): startup.sys
Enter the SmartMedia file name ((ex)young.txt):startup.sys
```

4.1.2.3 Retrieve Directory

This function searches the information on the SMC file. Through this function, the file name contained in the SMC can be checked, and if the file was copied, it can be also checked whether the file was correctly copied. When the file is overwritten from the SMC to the PC, this function is also used to check the file name. In addition, the subordinate directory can be created in the SMC.

1) Enter [2] in the initial window and press the [Enter] key. Then, the following [Directory Menu] window will appear. Enter [1] and press the [ENTER] key.

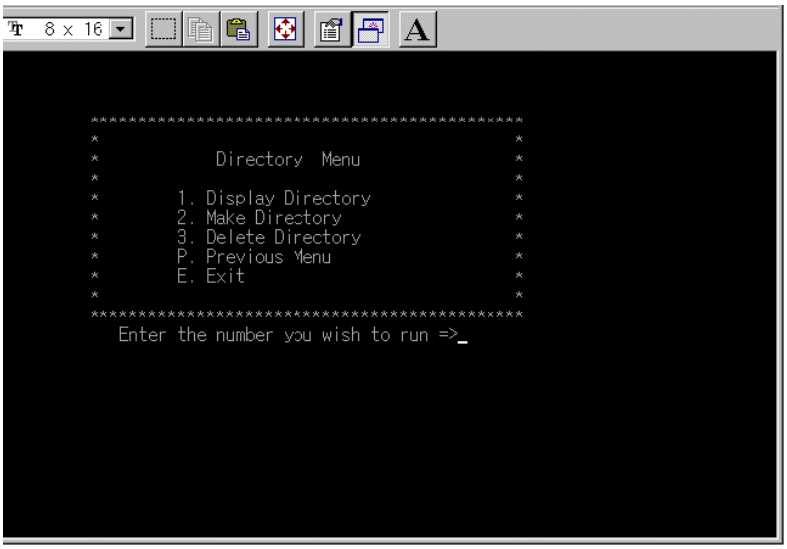


Figure 4.5 [Directory Menu] Screen

2) Then, the file list included in the SMC will be indicated. When the list is indicated, you move the cursor to the relevant item and press the [Enter] key to return to the window of the relevant item.
Enter [P] and press the [Enter] key, in order to go to the initial window.

4.1.2.4 Delete File

This function deletes specific files contained in the SMC.

1) Enter [1] and press the [Enter] key in the initial window, and the [Copy Menu] window will appear as shown below: Enter [3], and press the [Enter] key.

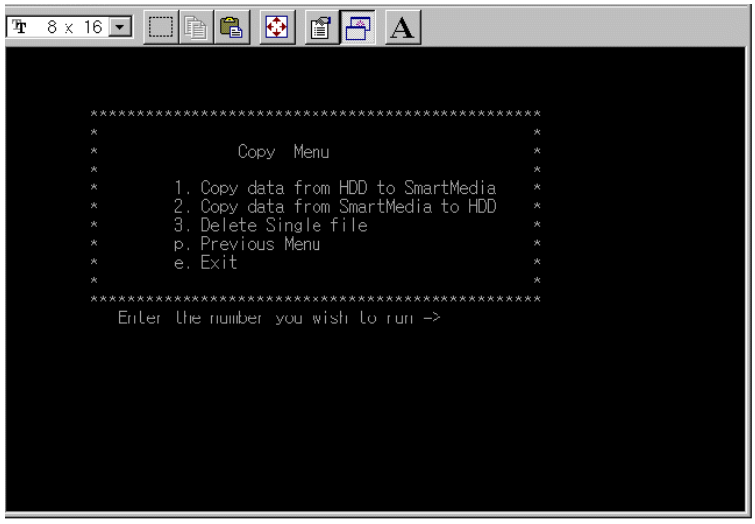


Figure 4.6 [Copy Menu] Screen

2) When the window appears as shown below, you enter the file name to be deleted(e.g., 'STARTUP.SYS') and press the [Enter] key:

```
Enter the SmartMedia Path ((ex) temp\dsc): SKIP
Enter the SmartMedia file name ((ex)young.txt): STARTUP.SYS
```

4.1.2.5 Analyze SMC

When you saved the program necessary for the SMC, enter [E] to exit the SM_NEW program.

If the system is operated by using the SMC where 'startup.sys' is not set up, the SM LED continues to flicker.

The SMC , which will be used, should contain 'startup.sys' and the main program(MCP PGM). If a user wants to upgrade the PBA program in MMC 818, the user should save the file to be upgraded in the SMC and insert it in the MCP, and the program should be upgraded in the target PBA by using MMC 818.

Enter as below, and check the file by using the directory menu.

```
Enter the SmartMedia Path ((ex) temp\dsc): SKIP
Enter the SmartMedia file name ((ex)young.txt): STARTUP.SYS
```

4.2 CPLD Programming

Complex Programmable Logic Devices(CPLD) is programmed as a final configuration when it is shipped. After shipping, the details of CPLD can be changed.

The parts of Lattice Co.(CPLD) and Altera Co,(EPLD) are used for OfficeServ. Since there are slight differences in each method of programming the parts, the user should be cautious.

- Lattice: CPLD(Complex Programmable Logic Devices)
- Altera: EPLD(Erasable Programmable Logic Devices)

4.2.1 Lattice CPLD Programming

The method of programming when CPLD of Lattice Co. is used will be described in this section.

4.2.1.1 Preparing

The items below should be prepared to install the CPLD program of Lattice Co.:

- Data to be programmed.(The data must have the file name in the form of *.JED)
- PC for which the parallel port is supported.
- Target board to be programmed.(This board should be connected by the 10-pin connector.)
- Cable kit for programming

4.2.1.2 Connect PC to target CPLD

The parallel port(LPT1) of PC and 10 pin connector are connected by using the programming cable kit that was especially produced.

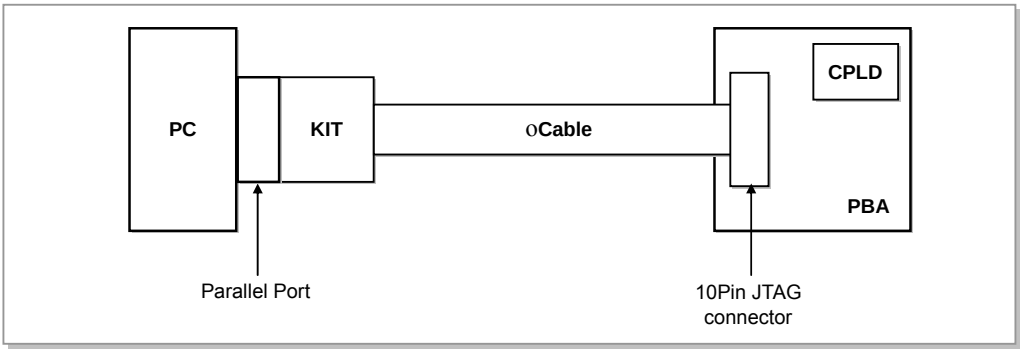


Figure 4.7 Figure for Connection between PC and Board

CAUTION

Caution When the PC is Connected to the Target Board

When PC and the target board are connected, the power should be off. If the connection is made while the power is supplied, the parallel port or target board of PC can be damaged.

4.2.1.3 Execute CPLD Programming Tool

The procedure for executing the CPLD programming tool will be described in sequences.

1) Execute the 'ispVM' program in the window of PC according to the following order.
[Start] → [Program] → [Lattice Semiconductor] → [ispVM system]

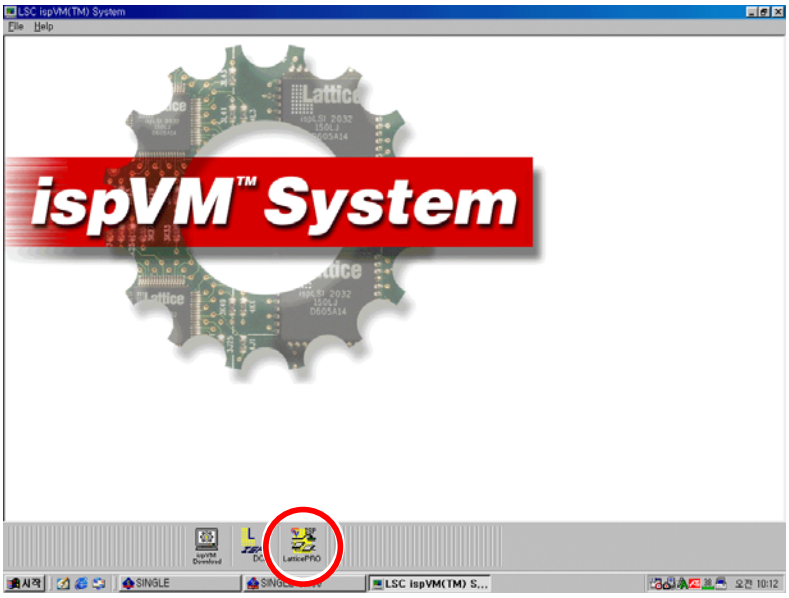


Figure 4.8 ispVM Program Initial Window

2) Select [LatticePRO] in the above window, and the following window will appear.

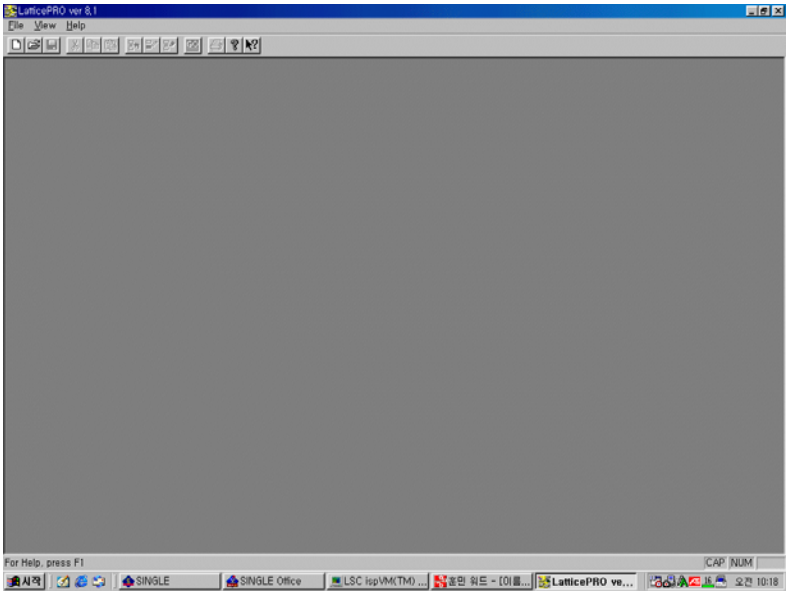


Figure 4.9 [LatticePRO ver 0.1] Window

4.2.1.4 Configure Chain File

The chain file is important file that performs the CPLD program automatically.
The Chain file contains the information such as the information on the used CPLD parts, programming mode, path of the JEDEC file, assignment of the cable for use. Also, the chain file should configure the daisy chain information on the needed parts in order to program more than two CPLDs simultaneously while the chain file is equipped with the optional board. In the initial window, the temporary file name(Chainl) is indicated.

1) Select [File] → [New] in the [LatticePRO] initial window, and the window will appear as shown below: Select the [Project] → [Advanced Options] menu to specify the form of the cable.

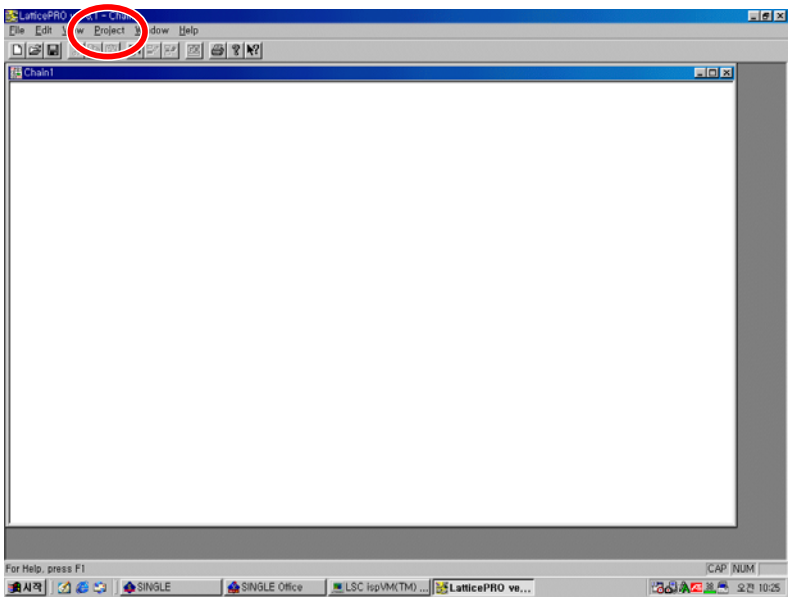


Figure 4.10 [LatticePRO ver 0.1-Chain1] Window

2) Select [Use Vantis Cable] in the [Advanced Processing Options] window, and click the [OK] button.

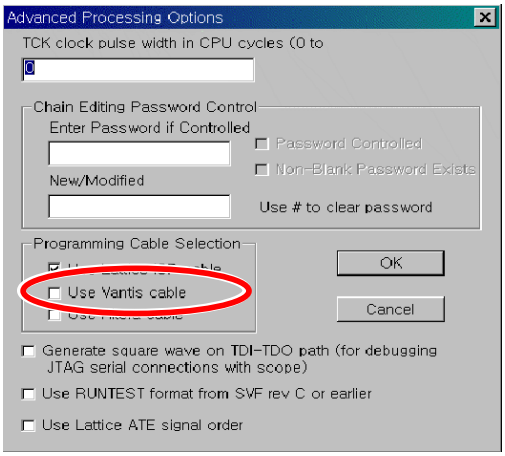


Figure 4.11 [Advanced Processing Options] Window

3) Select [Edit] → [ADD Device] in the initial window to select the type of the CPLD part, and the [JTAG Part Properties] window will appear as shown below: Click [Select Part].

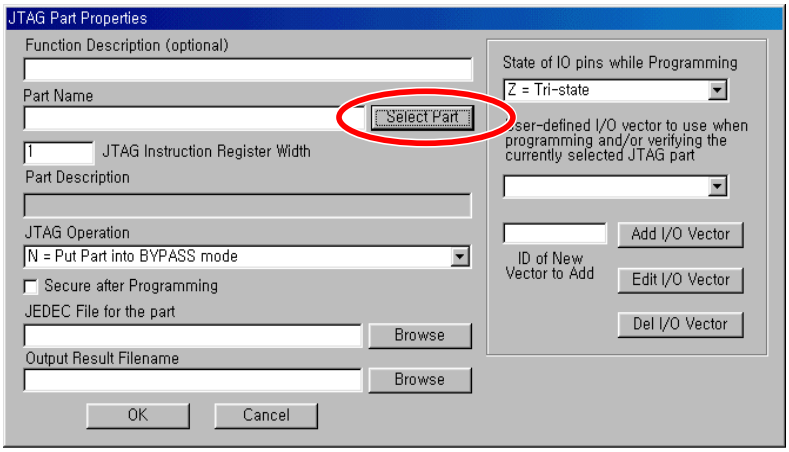


Figure 4.12 Specify Part Name in [JTAG Part Properties] Window

4) Select each type of the CPLD parts in the [Select Device] window, and click the [OK] button. Select [ispM4A] in the [Device] item at the upper of the window, and as for the part number and package item, select referring to the CPLD list below:

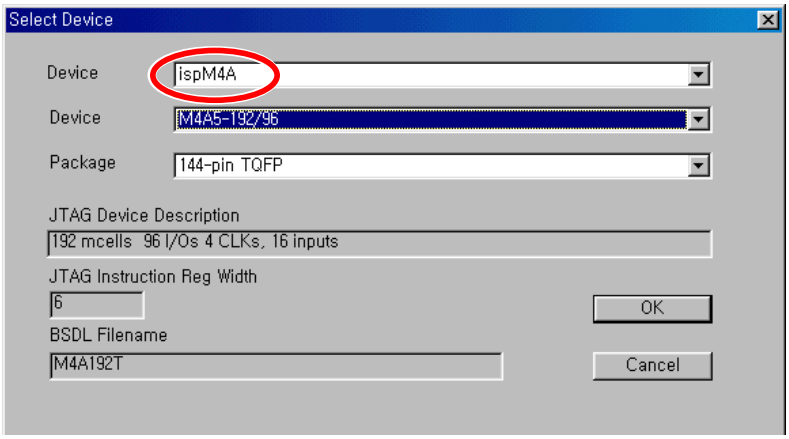


Figure 4.13 Specify Type of CPLD Part

Table 4.1 CPLD List

NO	SEC CODE	Location	Package	Quantity	Vendor	Device P/N	PBA
1	1301-001647	U63	256 PBGA	1	LATTICE	LC4256V-75F256BC	MCP
2	1301-001647	U1	256 PBGA	1	LATTICE	LC4256V-75F256BC	LCP
11	1301-001499	U6	44P TQFP	1	LATTICE	M4A5-64/32-10 V	MFM
12	1301-001499	U8	44P TQFP	1	LATTICE	M4A5-64/32-10 V	RCM
13	1301-001499	U4	44P TQFP	1	LATTICE	M4A5-64/32-10 V	MIS
14	1301-001499	U9	44P TQFP	1	LATTICE	M4A5-64/32-10 V	TEPRI

5) Click [▼] below [JTAG Operation] in the following window to set the programming mode. Read the descriptions below to set the relevant mode:

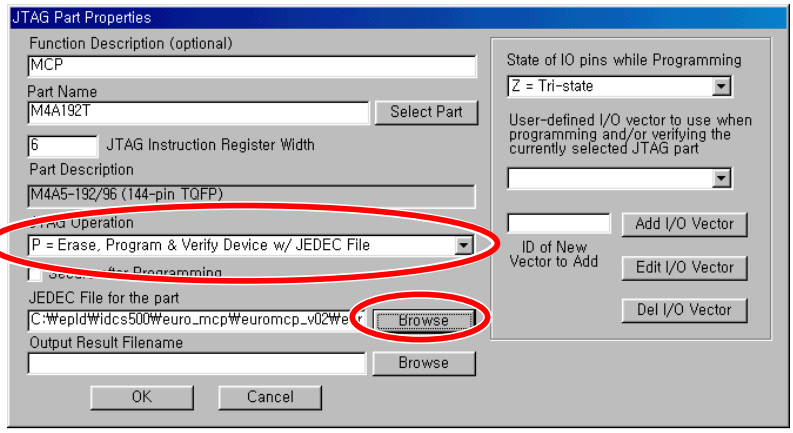


Figure 4.14 Set Programming Mode and JEDEC File Path

P = Erase, Program & Verify Device W/JEDEC File
V = Verify Device against JEDEC File
R = Read checksum
N = Put Part into BYPASS mode

Select [P] for programming. If you don't want to program the specific CPLD from several CPLDs connected by the chain in daisy chain mode, select [N] instead of [P] for the relevant CPLD.

6) Specify the path where the JEDEC file of CPLD to be programmed is located , in the [JEDEC File for the part] item. Click the [Browse] button to specify the folder in the above window. If all of the configuration setups for programming are completed, you click the [OK] button.

NOTE

When you want to program CPLD of the MCP board,

- Function Description: Simply take notes with words expressing the characteristics of the operation well.
- [Select Part] → [#1 DEVICE: ispM4A]→[#2 DEVICE: M4A5-128/56-10VC] → [Package: 100P TQFP]→[OK]
- JTAG Operation: P → Erase, Program & Verify Device w/JEDEC file
- [Browse] → Select the directory that contains the [*.JED] file → [OK]
- [File] → [Save As…] → Specify the file name and save it in the relevant directory.
- Extension: Default: '*.WCH'

7) Execute the chain file and click the [Go] button in the following window. Then, the program will be executed. When you work for programming CPLD, you should work in the state that the SmartMedia card was cleared.

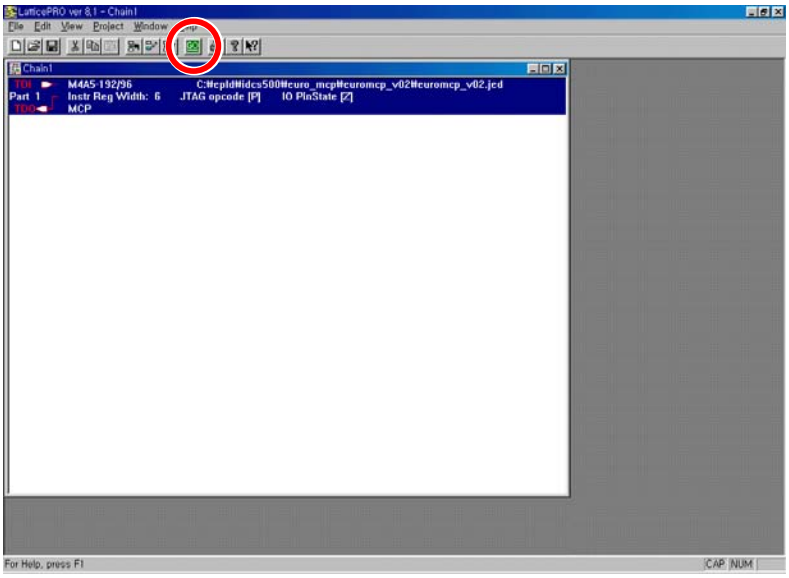


Figure 4.15 Execute Program

When the programming is normally completed, the following message appears. In this state, press the [OK] button, and all works are finished.

```
When the operation finishes normally:
Overwrite?       OK
```

- Message in a normal case

```
Device Being Processed(mach***)
Programming Row              60-0
Reading Row                  60-0
→ No Errors
Continue
JTAG Processing Complete     OK
```

- Message in an abnormal case

```
+5VDC to CPLD is low.
The programming cable is not in the directory
C:WVANTISWMACHPROWyourfilename.JED
Your CPLD chip is not installed properly into the chip socket.
You found a new way to mess up.
```

To upgrade CPLD of various boards, you must turn off the power after the operation for one board is completed, and you mount the next boar, and then you repeat the operations beginning the previous 7th step.
To change CPLD by using the new chain file, you work beginning the sixth by using the chain file that was previously operated.

Programming for MCP Optional Board

1) The CPLD in the MFM, RCM, MIS board can be programmed by being mounted in the MCP board.

2) In order to set more than two CPLDs, CPLD should be configured in the form of the daisy chain.
If the optional board is mounted in the MCP board, Part 1 should be set as MCP, Part 2, as MFM, Part 3, as RCM, and Part 4, as MIS and so on.

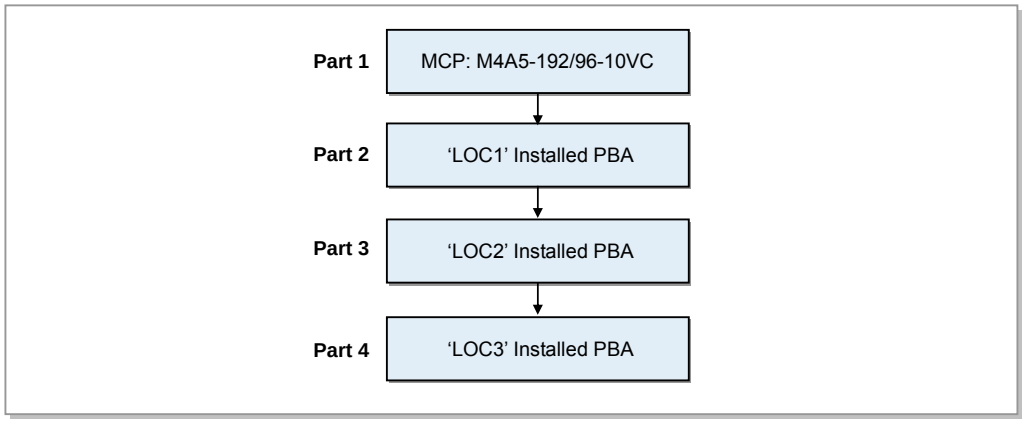


Figure 4.16 MCP Optional Board Programming

3) If you don't want to program even though the optional board is mounted, you set the behavior mode to [N: Bypass Mode] in the chain file.

4) To modify the [PART1] information, put the cursor on [PART1] in the following window, and select [enter].

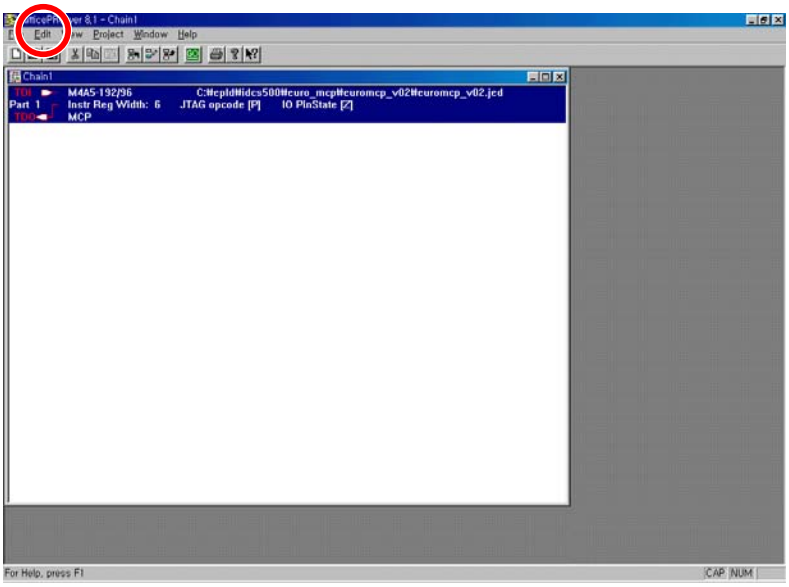


Figure 4.17 Modify Part1 Information

5) Execute beginning No. 3 step again.

6) Repeat the previous steps for the remained optional board.
Take an example, the following window shows the chain file equipped with optional board.

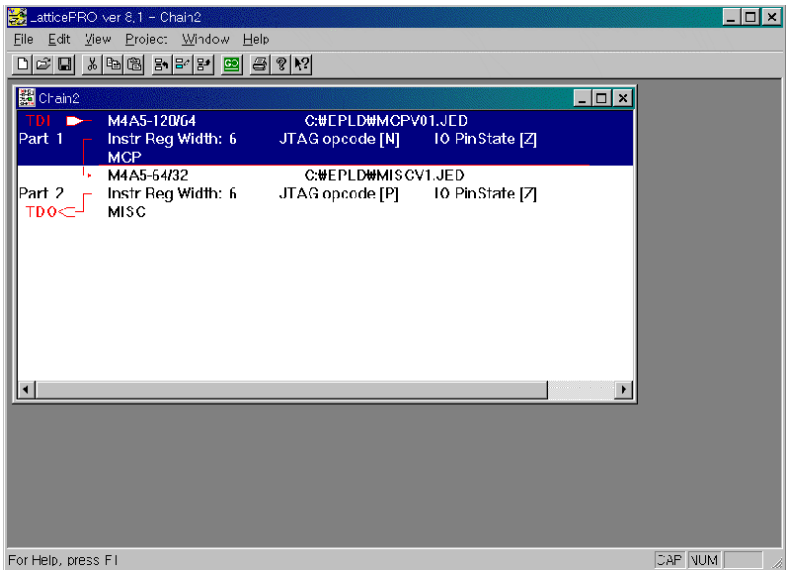


Figure 4.18 Chain File when it Is Equipped with One Optional Board

4.2.1.5 Install the 'ispVM' Program

ispVM is a CPLD program tool made by Lattice Co. and it is installed in order to program CPLD.

1) Connect to the 'http://www.gtmkorea.co.kr/htmls/vander_lattice.html' web site in the Internet Explorer.
2) Click by the following order.
   [Tool] → [Programming Software] → [ispVM System] → [Download Software] → [ispVM System]
3) Download the program to the target directory of PC and execute it.

The above website illustrates a sample in Korea.
For other countries, please contact the website of the reseller or the branch of Lattice.

4.2.2 Altera EPLD Programming

As for the board that should program Altera EPLD, there are the MGI and 4WLI board. The Configuration for Altera EPLD programming is the same as that for CPLD, and only the cable kit used for connection is different.

1) The following is the initial execution window.(MAX +plus II Programmer Only PGM) Click the [MAX+PLUS II] menu.

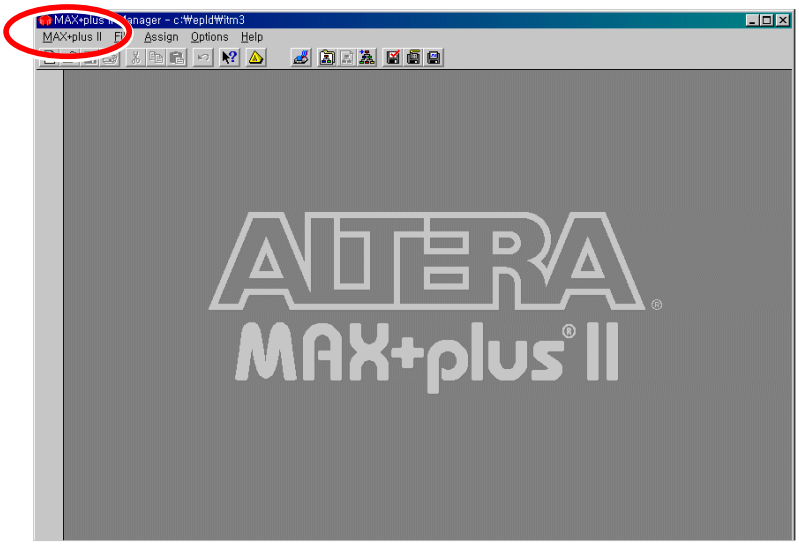


Figure 4.19 Altera MAX+plus II Program Initial Window

2) Click the [File] menu, and then select [Select Programming File].

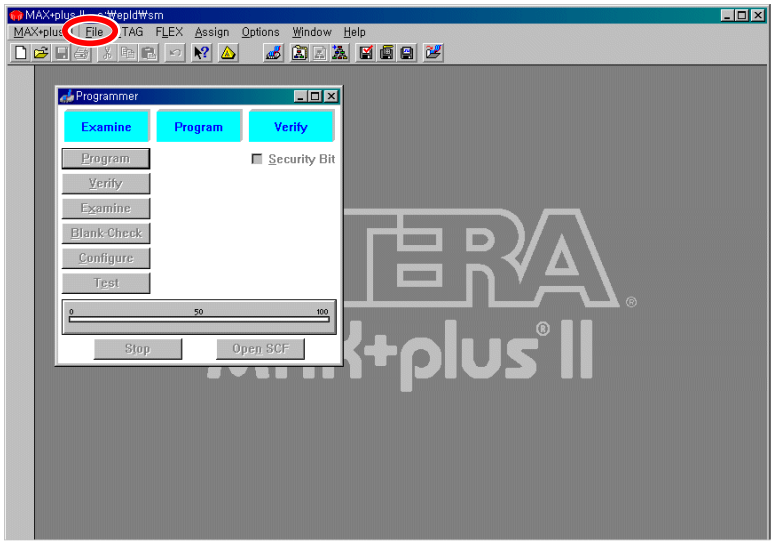


Figure 4.20 Select Program File

3) Select '*.PDF' file to be programmed, and click the [OK] button. The POF file is a data file for programming.

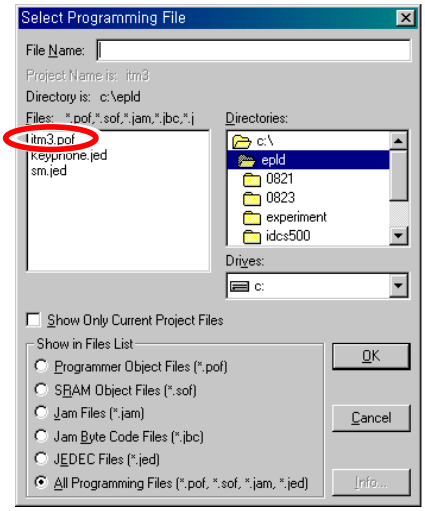


Figure 4.21 Select Data File for Programming

4) Click [Program]. Then, EPLD enters programming mode, and downloads the related POF file to EPLD.

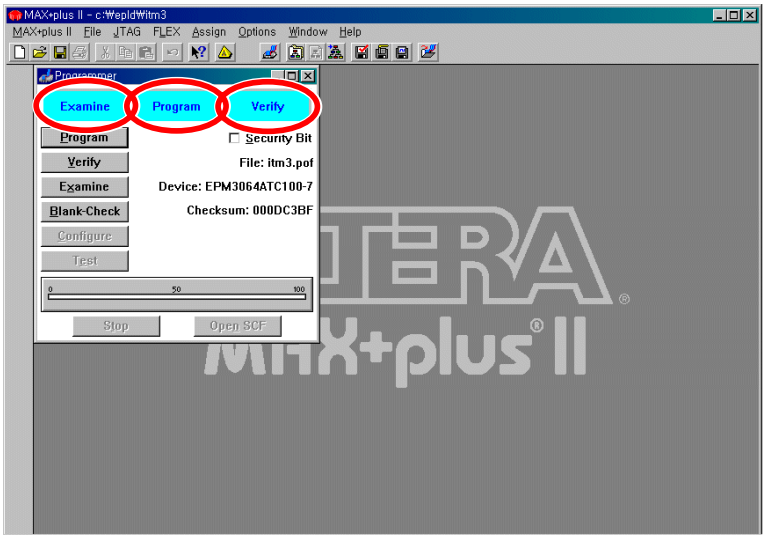


Figure 4.22 Data File Download

5) Click [Examine] to save the information of the device.

6) Click [Verify] to check the checksum of the device.

Table 4.2 EPLD List

NO	SEC CODE	Location	Package	Quantity	Vendor	Device P/N	PBA
2	1301-001473	U24	100P TQFP	1	ALTERA	MAX EPM3064ATC 100-10	MGI
5	1301-001473	U16	100P TQFP	1	ALTERA	MAX EPM3064ATC 100-10	4WLI

4.3 Offline Programming

The offline program is used to check the operation status of the system. The offline program for checking the system should be saved in the smartmedia. This program is used when you want to check the system in the field.

4.3.1 Preparing

Prepare the items below before the offline program is used to check the system.

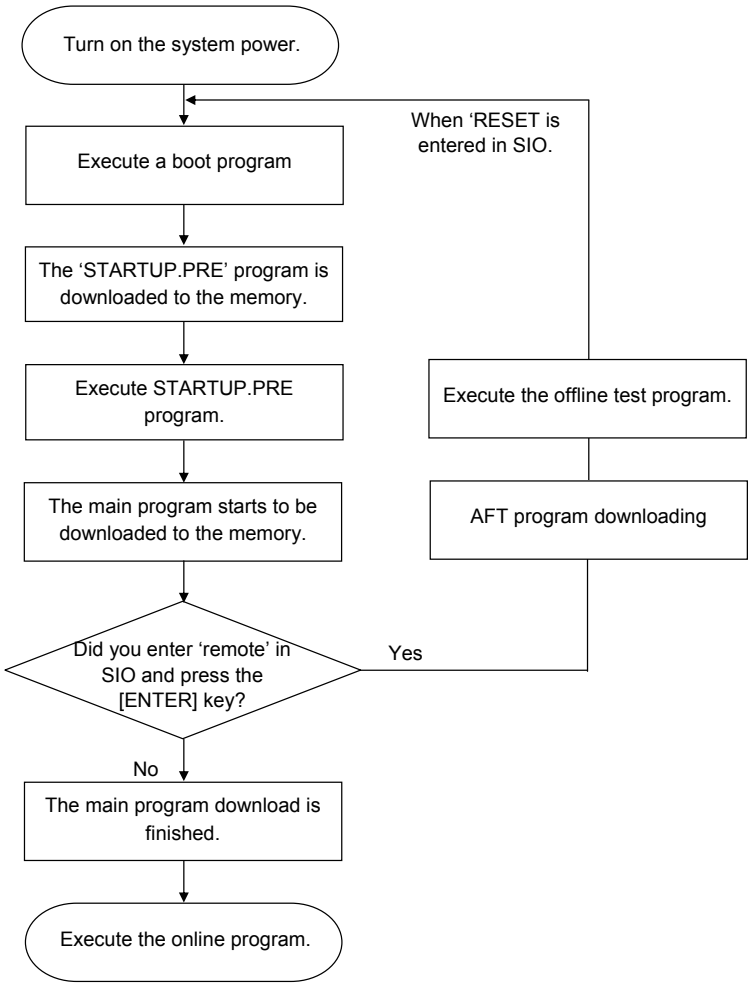
- PC for which the serial communication is supported
- Communication program: QMODEM, etc.
- SmartMedia card where the related programs(<startup.sys> <aftxxx.pgm> <mcpmxxx.pgm>) are saved.

4.3.2 Configuration

1) Connect the cable for communication between PC and the OfficeServ 7200 system. Connect to the SIO port of the MCP board.
2) Execute the communication program in PC.
3) Set the communication speed to 19,200 bps.
4) Prepare the SmartMedia card where the related programs are saved and insert it to the front side of the MCP.

4.3.3 Enter Offline Test Mode

When the above preparation is completed, the offline test is executed by the following flowchart.



4.3.3.1 Offline Program Command

The command used in the offline program will be described.

SMRD

- Test item: Checks the status of the SmartMedia.
- Result indication
  - OK: The checked status of the SmartMedia is normal.
  - FAIL: The checked status of the SmartMedia is abnormal.

BMEM

- Test item: Checks the basic memory within MCP.(DRAM 64 Mbytes, SRAM 4 Mbytes)
- Result Indication
  - PASS: The checked status of the memory is normal.
  - DRAM: The DRAM area from the checked memory is abnormal.
  - SRAM: The SRAM area from the checked memory is abnormal.

FANC

- Test item: Checks the operation status of fan 1 and fan 2. If a problem occurs, this command indicates the location of the fan where a fault occurred, with FAIL/FAN1, or FAIL/FAN2.
- Result Indication
  - PASS: The checked status of the fan is normal.
  - FAIL/FAN1: Fan 1 is abnormal.
  - FAIL/FAN2: Fan 2 is abnormal.

DMFR

- Test item: Checks the DTMF receiver status of the SCM board or MFM board.
  The MFM board supports 12 DTMF receiver channels per board.
- Result Indication
  - PASS: 12 DTMF receivers of the MFM board are normal.
  - Fail/nn/../: The nn channel of the MFM board is abnormal.(nn=00~11)
    Take an example, when ‘Fail/01/03/10/’ is indicated, this indication shows that the DTMF receiver of channel 01/03/10 of the MFM board is abnormal.

IMOH

- Test item: Tests the internal music channel of the system.
  The internal music is supported within the MCP board, and the test should be performed, connecting the speaker to the PAGE port of the MIS board, after the MIS board should be mounted in the MCP board.

- Result Indication
  - OK: Since the internal music within the MCP board is normally connected to the PAGE port of the MIS board, the internal music is sounded from the speaker.
  - Internal music fault: The internal music is not sounded from the speaker.

BMFR

- Test item: The MFR channel 4 provided basically to the MCP board is tested.
- Result Indication
  - PASS: four DTMF Receivers are all normal.
  - Fail/nn/../: The nn channel is abnormal.(nn=00~03)
    Take an example, when 'Fail/01/03/' is indicated, this indication shows that the DTMF receiver of the channel 01/03 is abnormal.

REST

- Test item: Tests the restart function of the system.
- Result indication
  - OK: Processes the command input normally.

BTSW

- Test item: Tests the time switch channel within the MCP board.
- Result indication
  - PASS: The time switch channels of the MCP board are all normal.
  - FAIL: The time switch device of the MCP board is abnormal.

POWxyz

- Test item: Tests the power on/off of the specific slot. Tests if the power is normally supplied to the specific slot. However, this test can be performed only for the DLI board.
  1) x: Cabinet number
     - Cabinet 1: 0
     - Cabinet 2: Not serviced
  2) y: Slot number
     - 0~4: Slot number
     - 5: Select the entire slots
  3) z: Select the power On/Off.
     - 0: The power Off
     - 1: The power On

- Result indication
  - OK: The power of the relevant slot is normally turned on/off.

LCPM

- Test item: Checks the memory of the LCP board. Used to check DRAM of the LCP board.
- Result indication
  - OK: The checked memory status of the LCP board is normal.
  - FAIL: The checked memory status of the LCP board is abnormal.

PRIMx

- Test item: Tests the normal operation status of the TEPRI board.
  If this command is entered, the MCP board reports the result of check to the TEPRI board of the relevant slot.
  The relevant board performs self-check, and reports its result to the MCP board
  The MCP board indicates the test result. 'x' is the information on the location where the TEPRI board is mounted.
  1) x: Slot number
     - When slot 3 is equipped: 2
     - When slot 4 is equipped: 3
     - When slot 5 is equipped: 4

- Result indication
  - PASS: The relevant TEPRI board is normally operating.
  - FAIL: The relevant TEPRI board is abnormally operating.

FALCx

- Test item: Tests the normal operation status of the FALC(Framing and Line Interface Component for E1 or T1) element within the TEPRI board.
  When this command is entered, the MCP board reports the result of checking the board to the TEPRI board of the relevant slot. The relevant board performs the self-check about the FALC element within the TEPRI board, and reports its result to the MCP board. Then, the MCP board indicates the result.
  'x' is the information on the location where the TEPRI board is mounted.
  1) x: Slot number
     - When slot 1 is equipped: 0
     - When slot 4 is equipped: 3
     - When slot 5 is equipped: 4

- Result indication
  - PASS: FALC within the relevant TEPRI board is normally operating.
  - FAIL: FALC within the relevant TEPRI board is abnormally operating.

VERS

- Test item: Indicates the version and the date of issue of the offline program.
- Result indication
  - V100: 20031220: Indicates that the version is V100, and the date of issue is 2003.12.20.

MMEMx

- Test item: Checks the memory within the MGI board. The test should be performed after the normal operation status of the MGI CARD should be checked.
  When this command is executed, the test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘x’ is the slot number.
  - Slot number: 0~4
  - When the slot 1 is equipped: 0

- Result indication
  - PASS: The memory status of the relevant MGI board is normal.
  - FAIL: The memory status of the relevant MGI board is abnormal.

MGIDx

- Test item: Tests if the board ID of the MGI board can be normally read.
  That is, checks if the MGI board type of the specified slot and the actually loaded ID are the same. When this command is executed, test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘x’ is the slot number.
  - Slot number: 0~4
  - When slot 1 is equipped: 0

- Result indication
  - PASS: The ID loaded from the relevant MGI board is equal to the specified board type.
  - FAIL: The ID loaded from the relevant MGI board is not equal to the specified board type.

MDSPx

- Test item: Tests if the DSP within the MGI board is normally operating.
  That is, checks if the MGI board of the specified slot and the actually loaded ID are equal. When this command is executed, the test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘x’ is the slot number.
  - Slot number: 0~4
  - When slot 1 is equipped: 0

- Result indication
  - PASS: DSPs within the relevant MGI board are normally operating.
  - FAIL: DSPs within the relevant MGI board are abnormally operating.

MLANx

- Test item: Tests if the Ethernet port within the MGI board is normally operating. When this command is executed, the test should be performed after the MGI board should be mounted in the one-tier cabinet. ‘x’ is the slot number. .
  - Slot number: 0~4
  - When slot 1 is equipped: 0

- Result indication
  - PASS: The Ethernet port within the relevant MGI board is normally operating.
  - FAIL: The Ethernet port within the relevant MGI board is abnormally operating.

MSIOx

- Test item: Tests if the SIO port within the MGI board is normally operating. In this test, the command should be entered after the DB9 connector, where Tx(Pin2) and Rx(Pin3) are connected, is prepared to be mounted in the SIO port of the MGI board. When this command is executed, the test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘x’ is the slot number (0~4).
- Result indication
  - PASS: The SIO loop back test result within the relevant MGI board is normal.
  - FAIL: The SIO loop back test result within the relevant MGI board is abnormal.

MACRxy

- Test item: Reads and indicates the MAC address within the MGI board or MCP board. When this command is executed, the test should be performed after the MGI board to be tested should be in the one-tier cabinet. ‘xy’ is the information on the locations where the boards, which require the MAC address information, are mounted.
  1) x: Board type
     - MCP board: 0
     - MGI board: 1
  2) y: Slot number
     - Slot number: 0~4(for MCP, 0 is used.)

- Result indication
  - x...x: indicates 12-place MAC address of the specified board.
  - FAIL or BUSY: There is no port for which LAN is supported in the relevant board, or the MAD address is abnormally operating.

MACWxy n...n (Six places)

- Test item: Enters the MAC address within the MGI board or MCP board.
  When this command is executed, the test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘xy’ is the information on the location where the boards, which require the MAC address, are mounted.
  1) x: Board type
     – MCP board: 0
     – MGI board: 1
  2) y: Slot number
     – Slot number: 0~4(For MCP, O is used.)
  3) n...n: 6-place number in the ending of the MAC address
     – ‘000F0’ is entered in the beginning 6-place numbers of the MAC address

- Result indication
  – PASS: The MAC address of the specified board is normally entered.
  – FAIL or BUSY: There is no port for which LAN is supported in the relevant board, or the MAC address is abnormally entered.

MPTOx

- Test item: Tests if the CODEC conversion function within the MGI board is normally operating. When this comm. and is executed, the test should be performed after the MGI board to be tested should be mounted in the one-tier cabinet. ‘x’ is the slot number(0~4).
- Result indication
  – PASS: The CODEC of the specified board is normally operating.
  – FAIL: The CODEC of the specified board is abnormally operating.

WTSTxy

- Test item: This command enters/releases the test mode when the 4WLI board is tested. The execution of the commands related to 4WLI, that is, WMEMx, WDMCx, WTCMx, WRSWxy, should be started by using this command(STSTxy), and when the execution of the related command is completed, the test mode should be released by using the WTSTxy command. ‘xy’ is the information on the mounted location and the control of entering the test mode.
  1) x: Slot number
     – Slot number: 0~4
     – When slot 1 is equipped: 0
     – When slot 2 is equipped: 1
     – When slot 5 is equipped: 4
  2) y: Information on entering and releasing the test mode.
     – When the test mode is entered: 1
     – When the test mode is released: 0

- Result indication
  - PASS: The test for the 4WLI board is normally performed by the command being entered.
  - FAIL: The normal processing fails in the command execution process.

WMEMx

- Test item: Checks the memory of the 4WLI board(DPRAM, SRAM, Flash Memory).
  'x' is the location where the 4WLI board is mounted.
  1) x: Slot number
     - Slot number: 0~4

- Result indication
  - PASS: The memory status of the relevant 4WLI board is normal.
  - DPRAM: The DPRAM status of the relevant 4WLI board is abnormal.
  - SRAM: The SRAM status of the relevant 4WLI board is abnormal.
  - FLASH: The flash memory status of the relevant 4WLI board is abnormal.

WDMCx

- Test item: Tests two DMCs within the 4WLI board(STL7052 ASIC).
  'x' is the location where the 4WLI board is mounted.
  1) x: Slot number s
     - Slot number: 0~4

- Result indication
  - PASS: DMC within the relevant 4WLI board is normally operating.
  - FAIL: DMC within the relevant 4WLI board is abnormally operating.

WTCMx

- Test item: Tests 16 DASLs mounted in the specified 4WLI board.
  'x' is the location where the 4WLI board is mounted.
  1) x: Slot number
     - Slot number: 0~4

- Result indication
  - PASS: DASL within the relevant 4WLI board is normally operating.
  - FAIL: DASl within the relevant 4WLI board is abnormally operating.

WRSWxy

- Test item: Checks the operation status of the relay within the 4WLI board. ‘xy’ is the location where the 4WLI board is mounted.
  1) x: Slot number
     - Slot number: 0~4
  2) y: Power on/off information
     - When the RELAY is blocked: 0
     - When the RELAY operates: 1

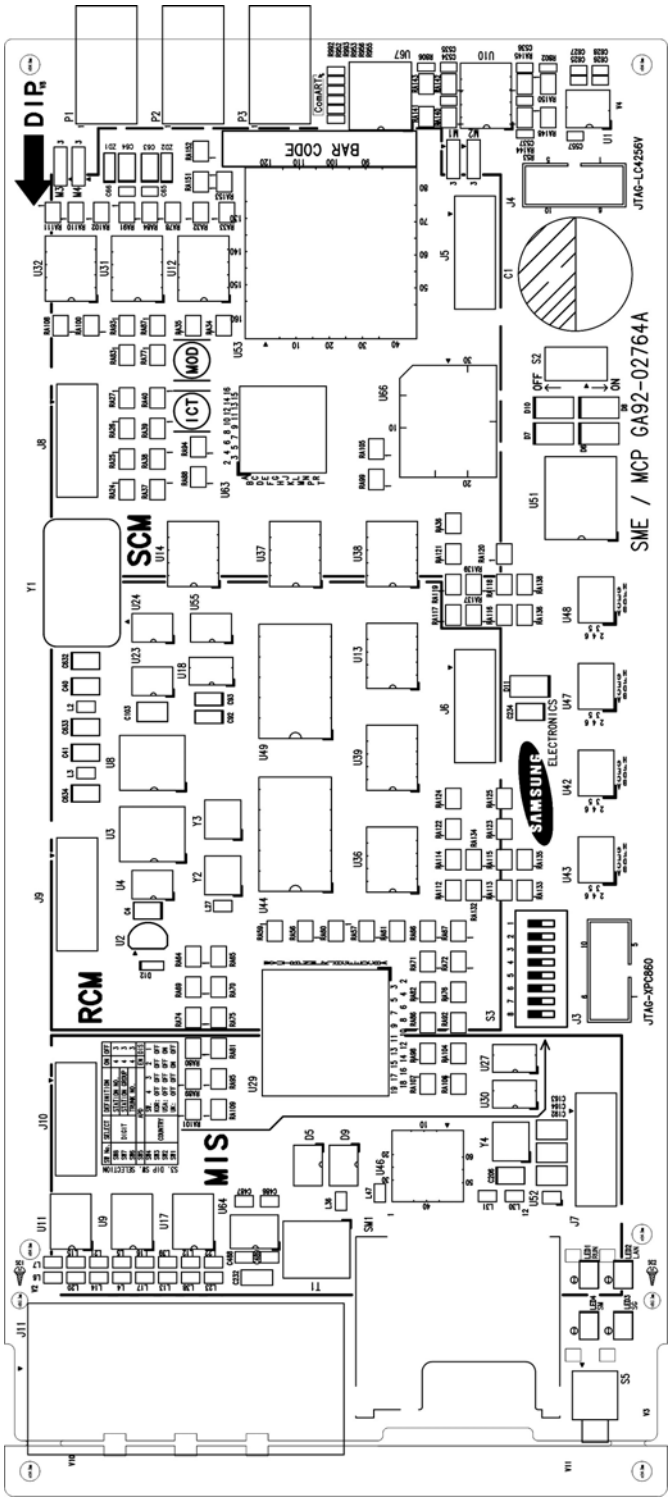
- Result indication
  - PASS: The relay connection/block within the relevant 4WLI board is normally done.
  - FAIL: The relay connection/block within the relevant 4WLI board is abnormally done.

CHAPTER 5. Component Layout

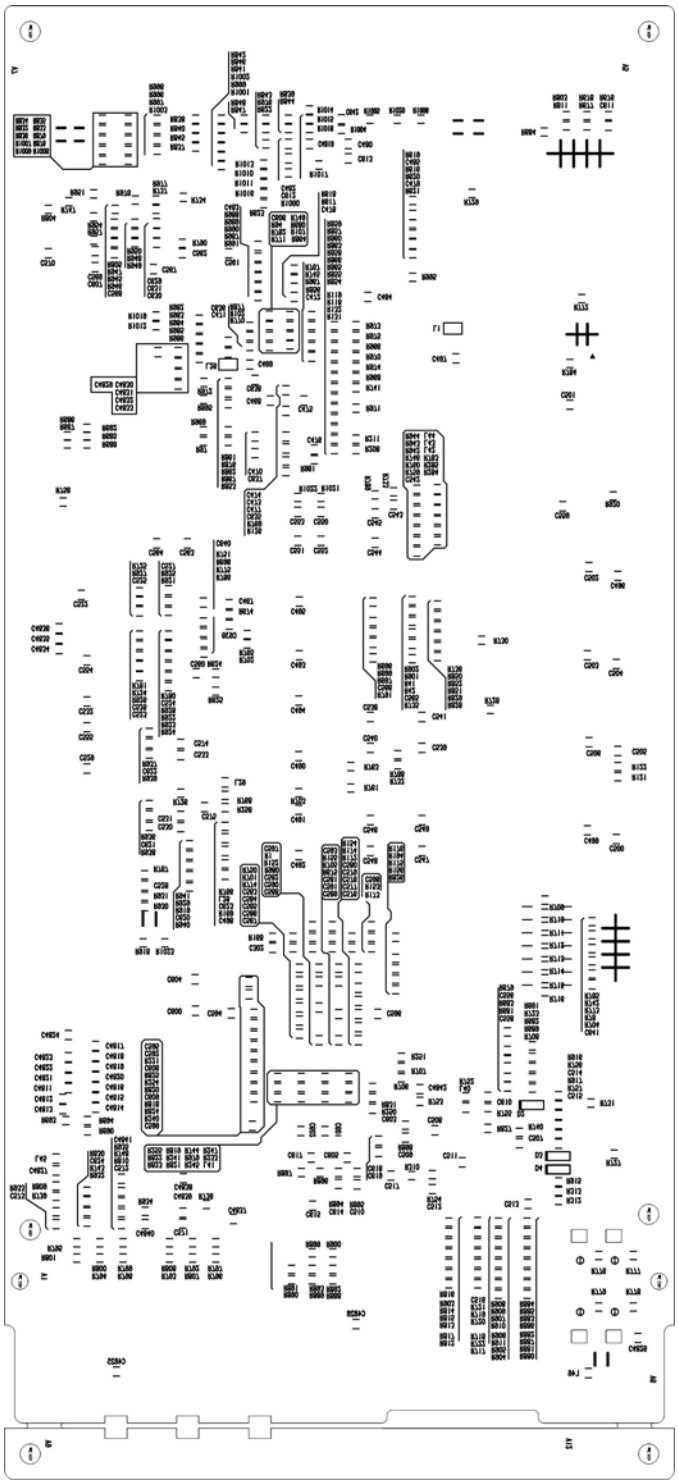
This chapter describes component layout for each board of the OfficeServ 7200 system.

5.1 MCP Board

Component Side

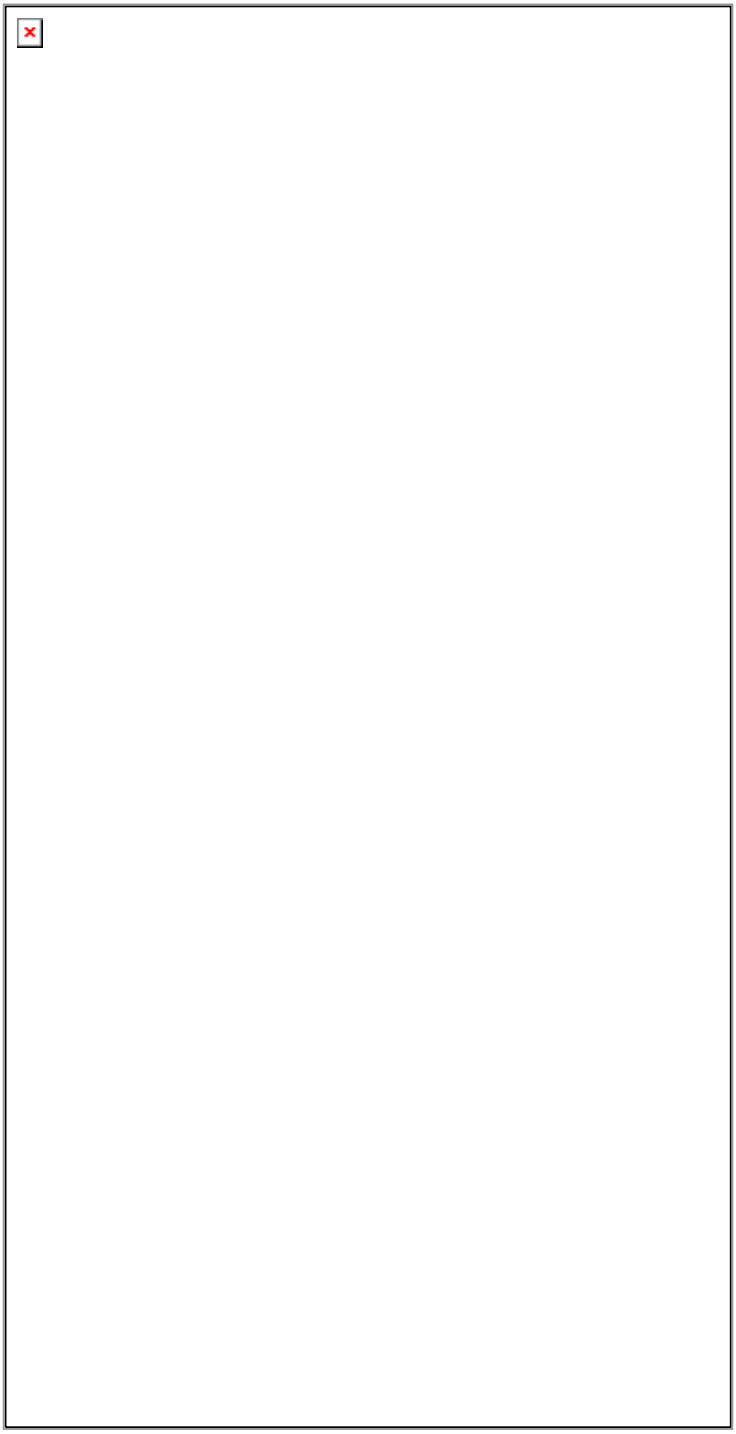


Solder Side

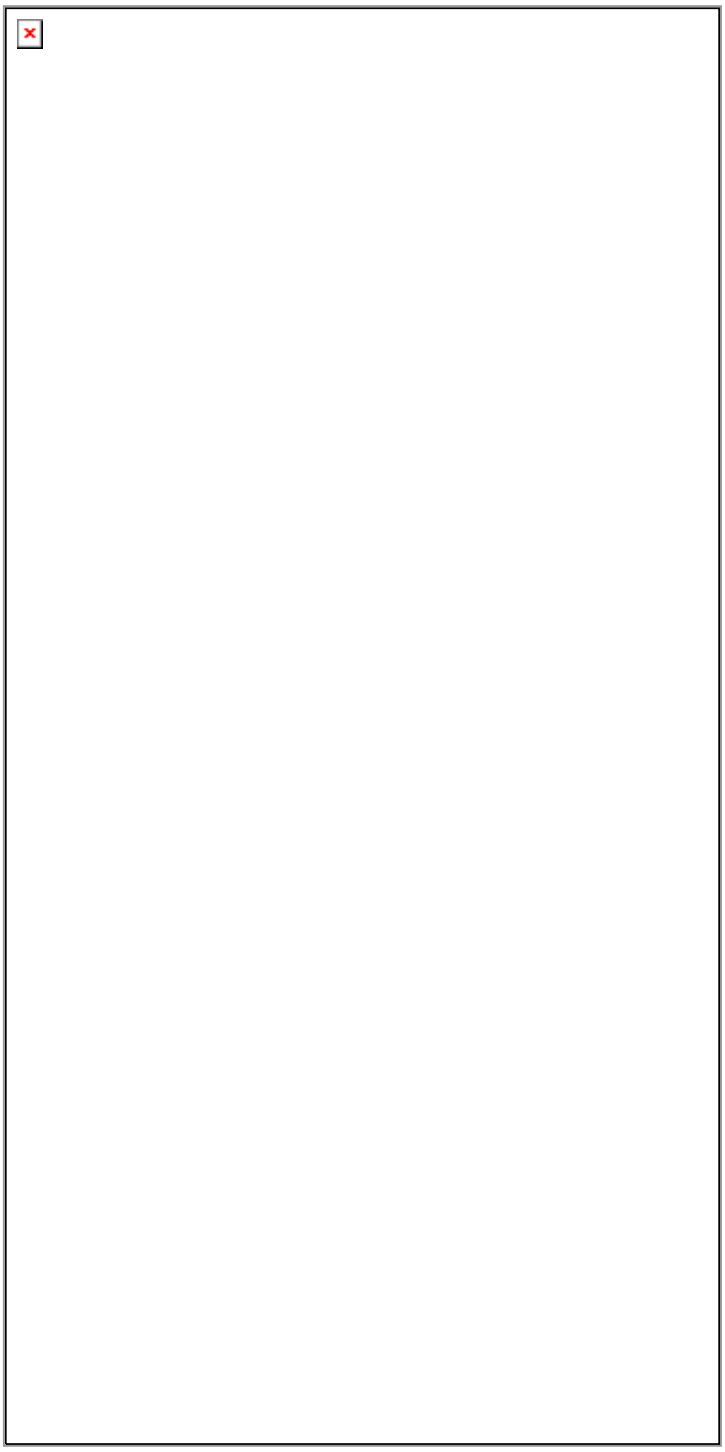


5.2 LCP Board

Component side

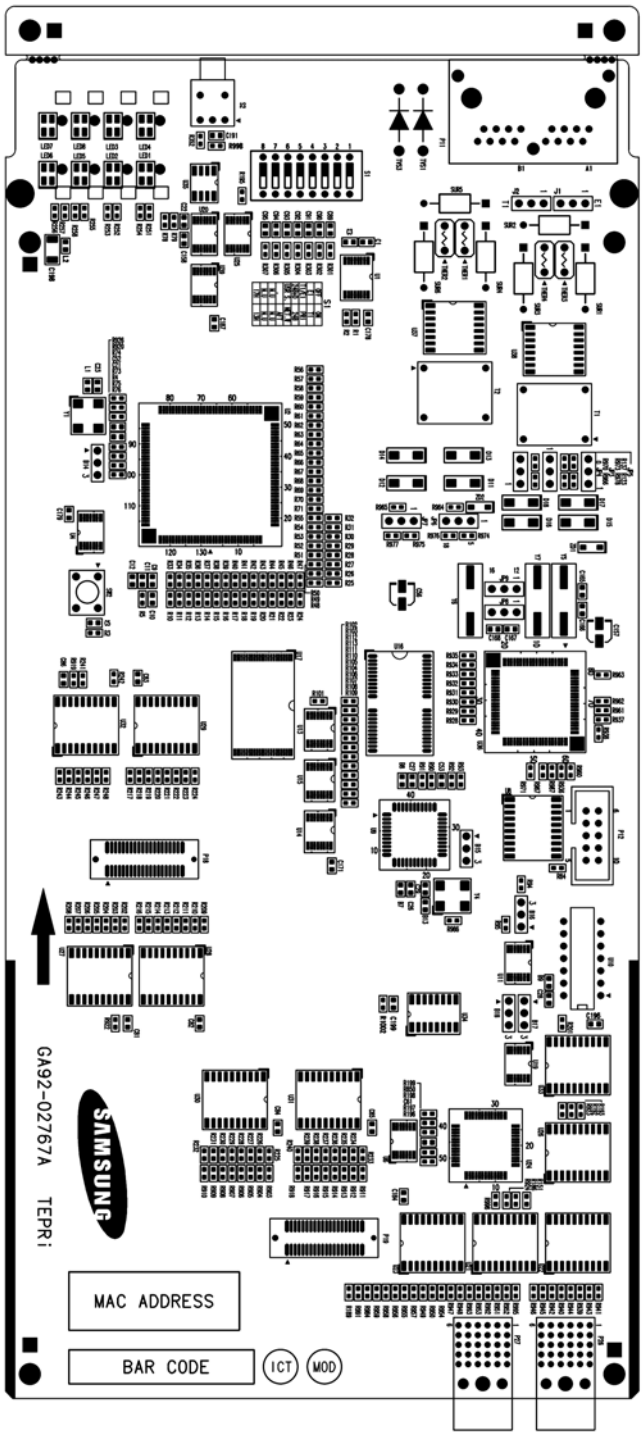


Solder side

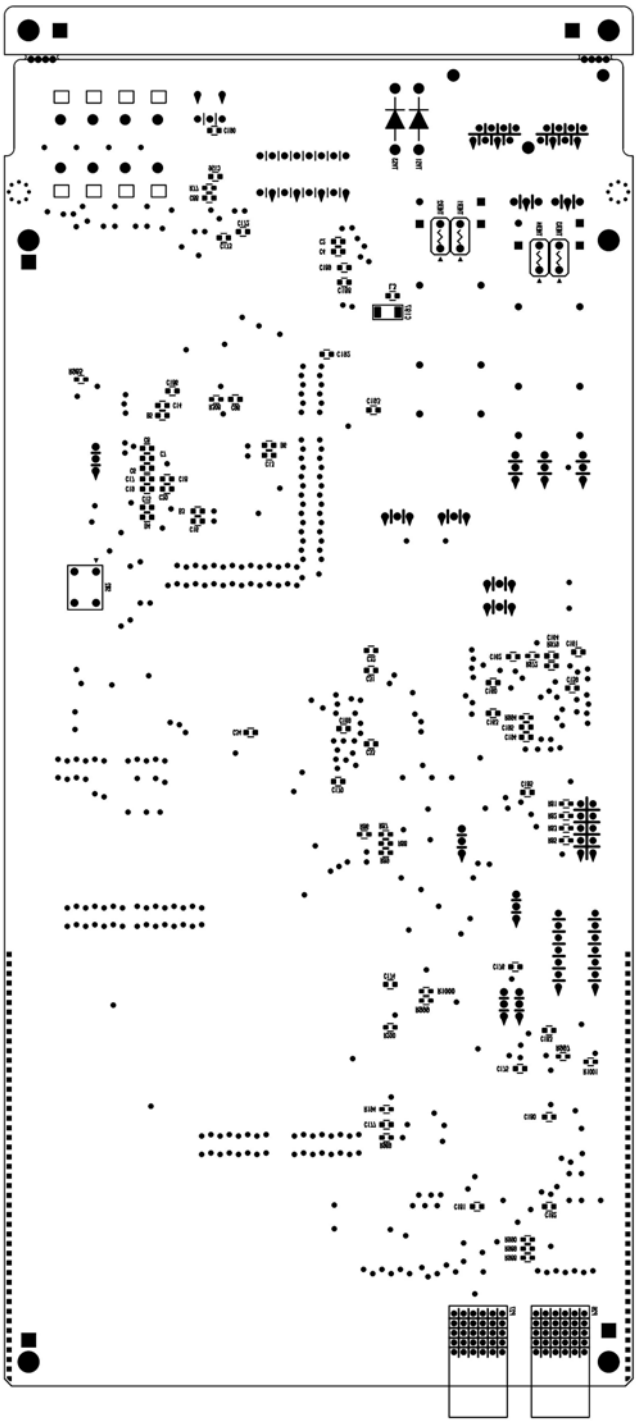


5.3 TEPRI Board

Component side

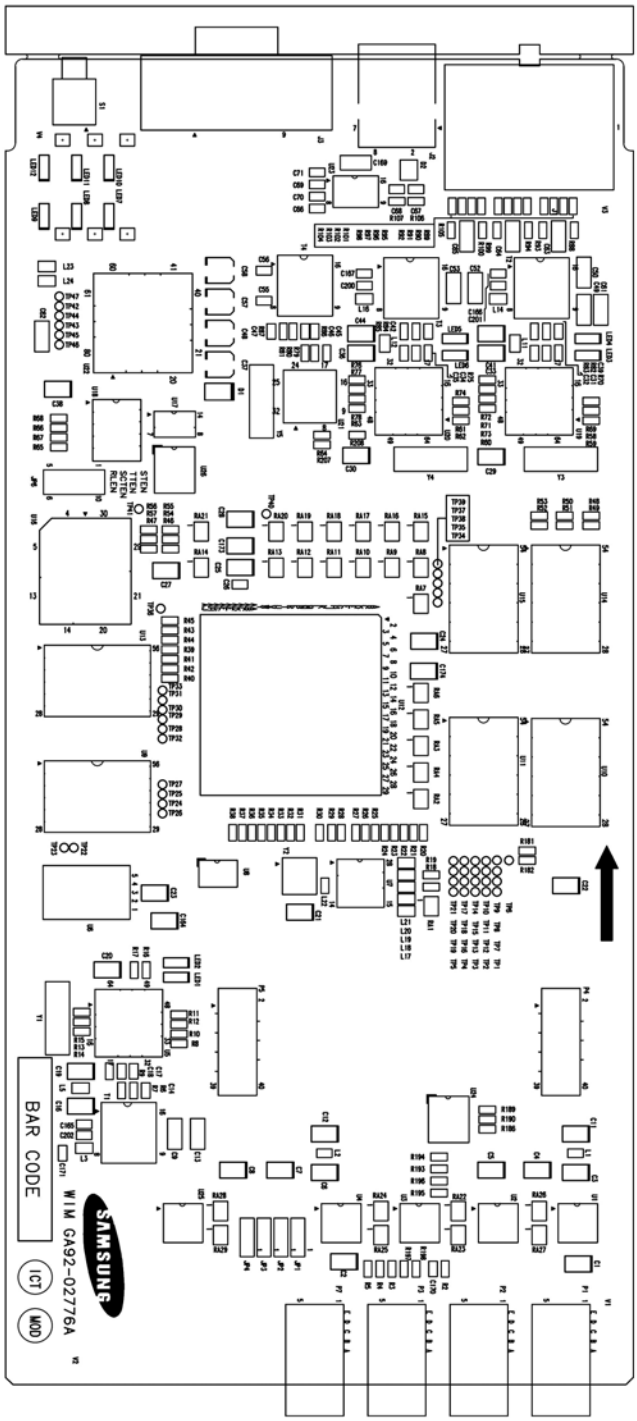


Solder side

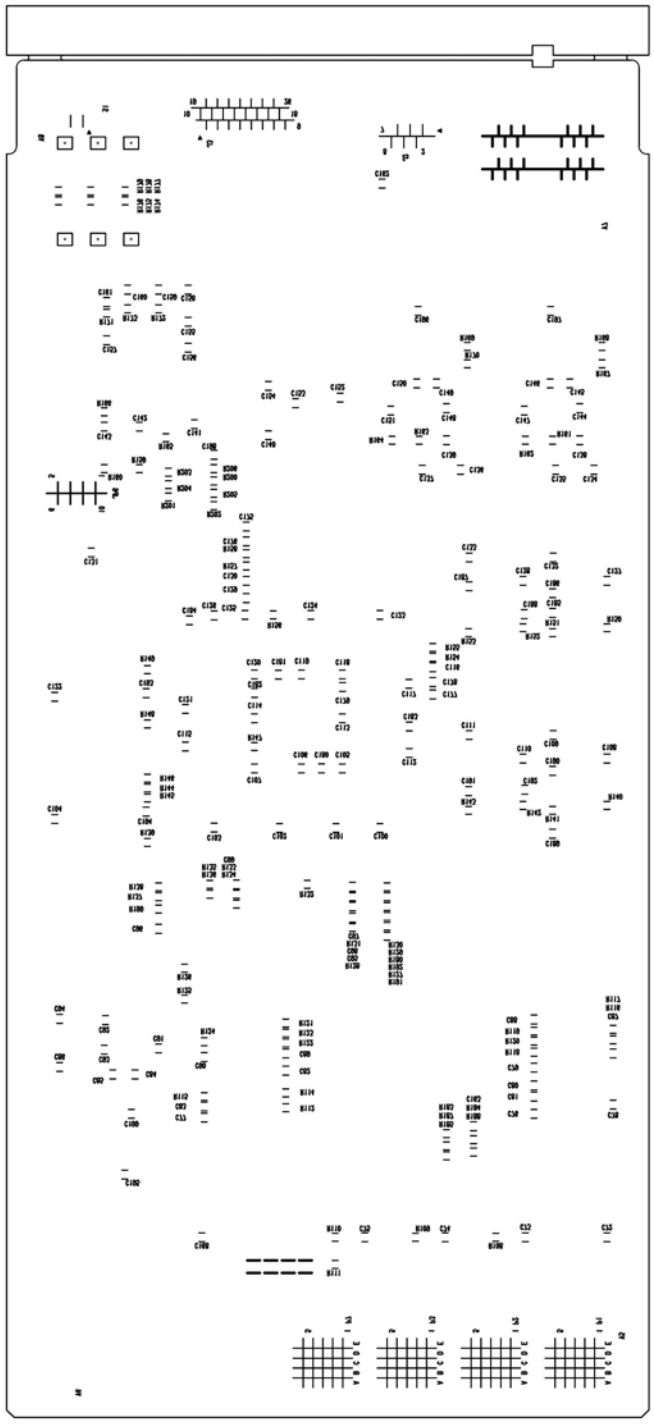


5.4 WIM Board

Component side

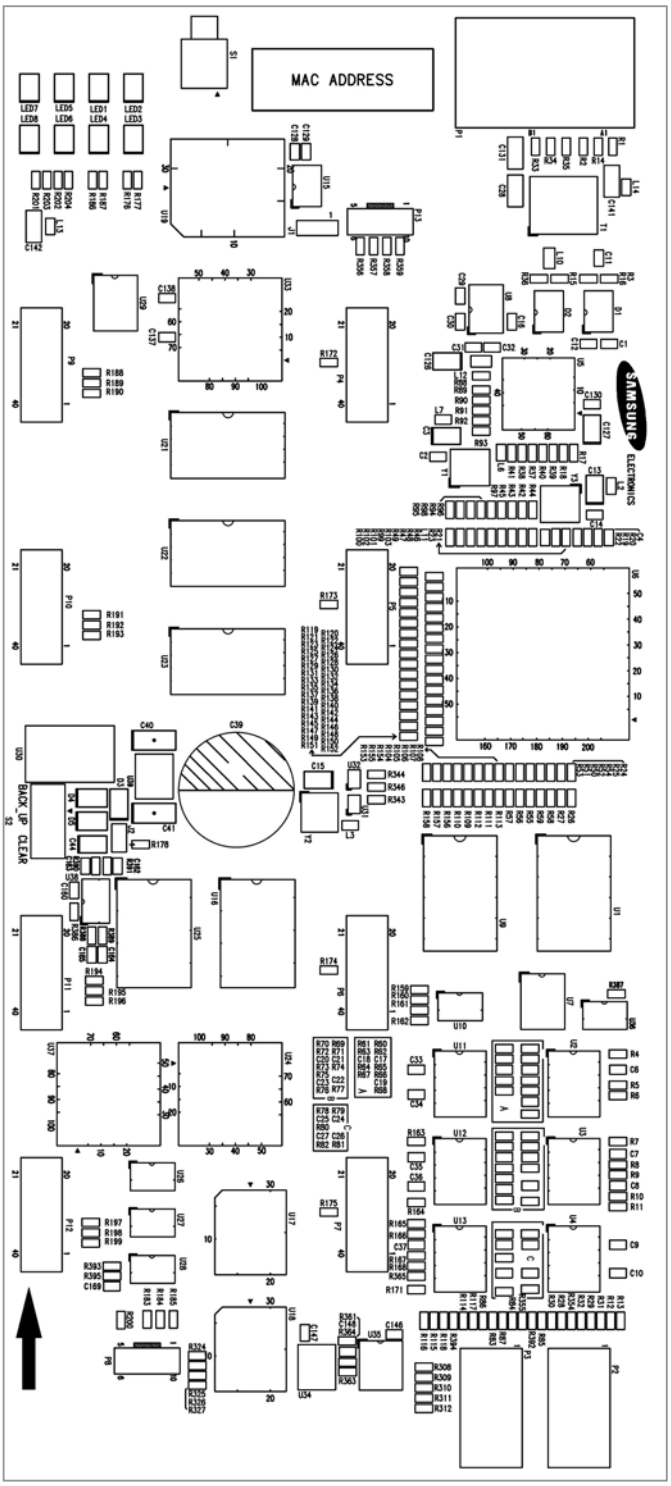


Solder side

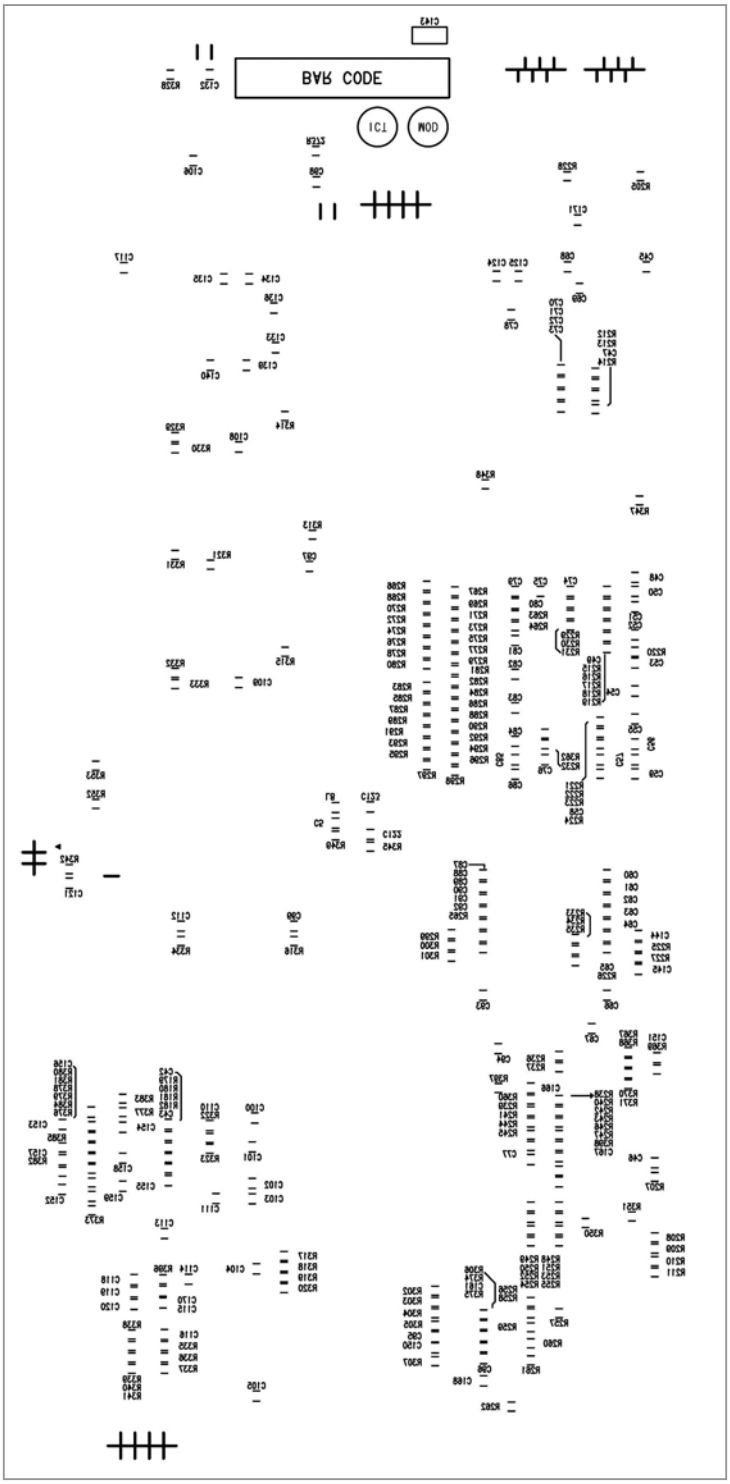


5.5 MGI Board

Component side

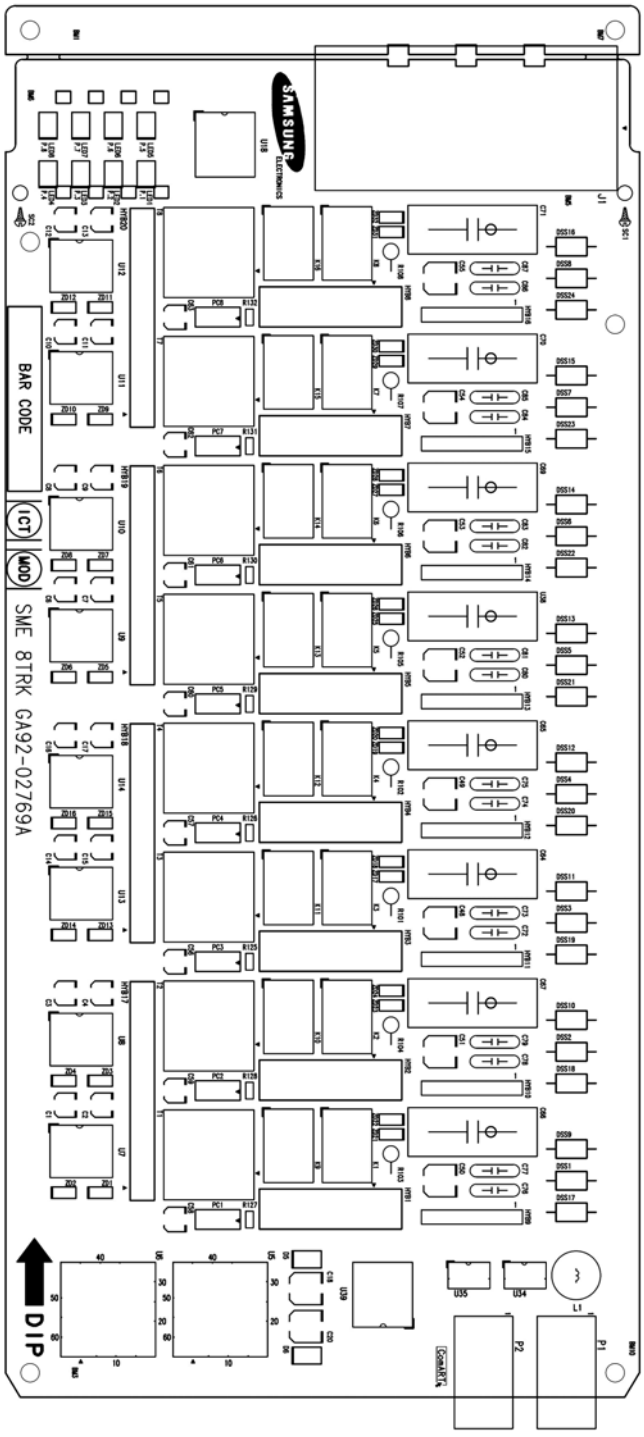


Solder side

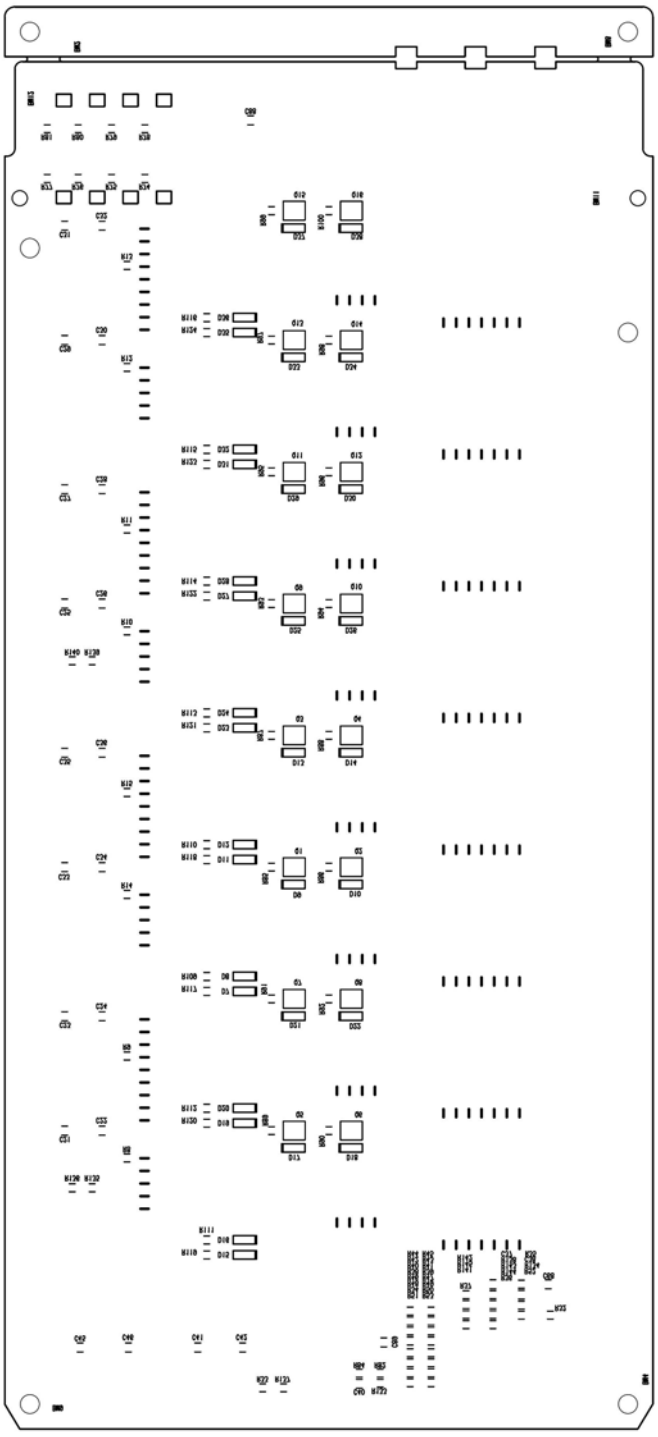


5.6 8TRK Board

Component side

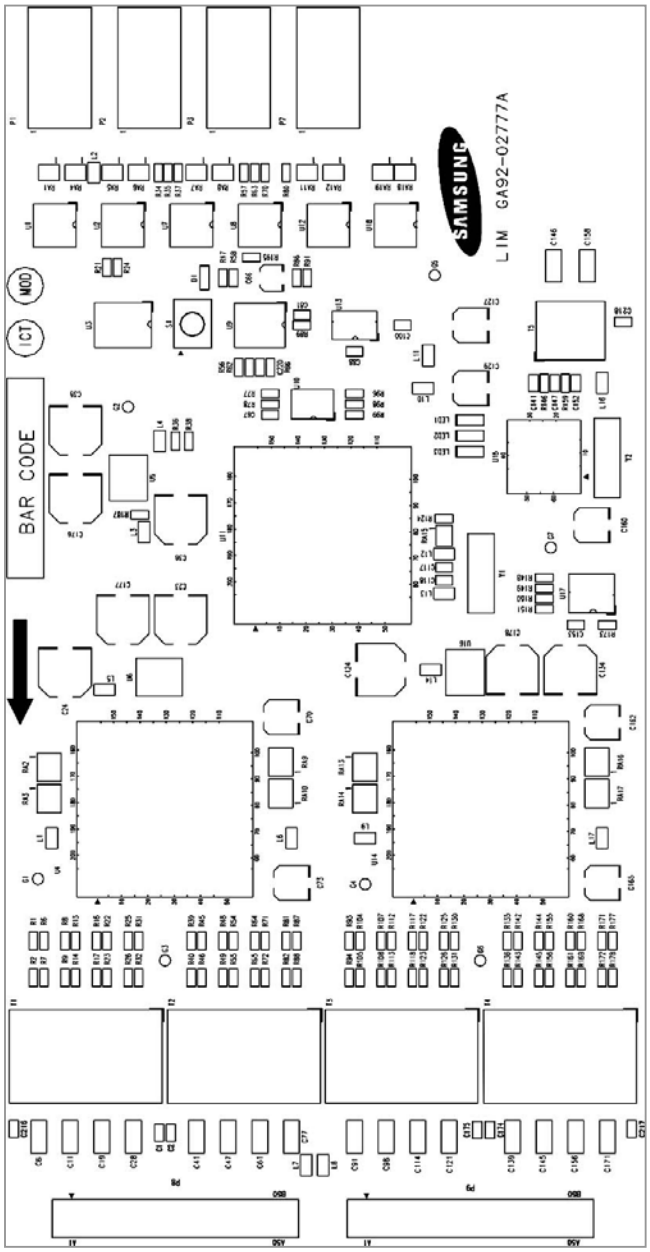


Solder side

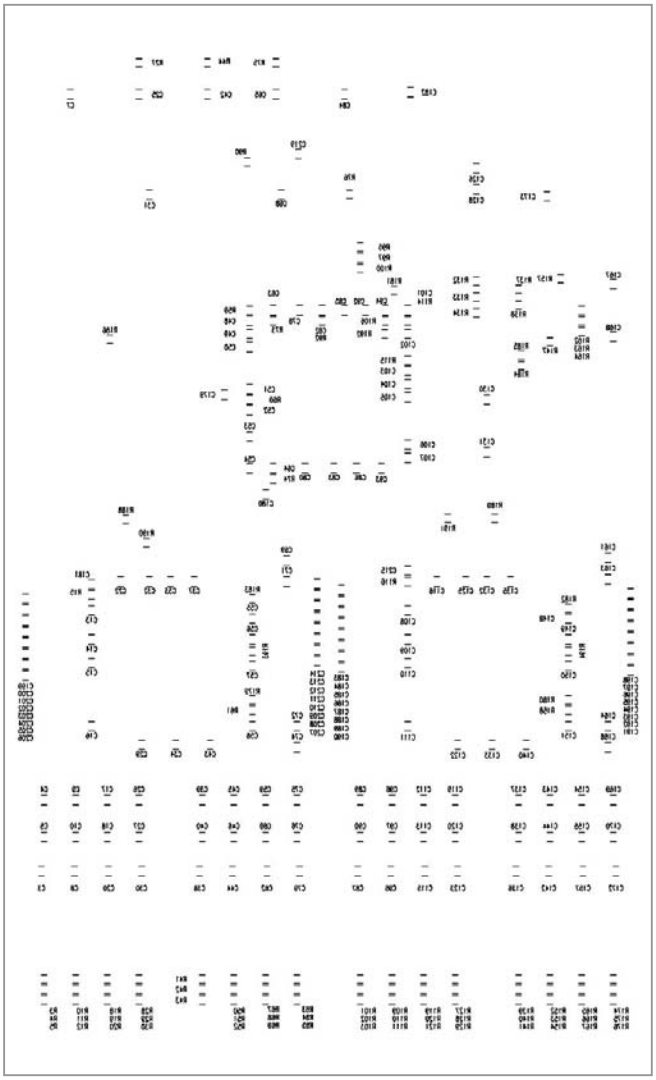


5.7 LIM Board

Component side

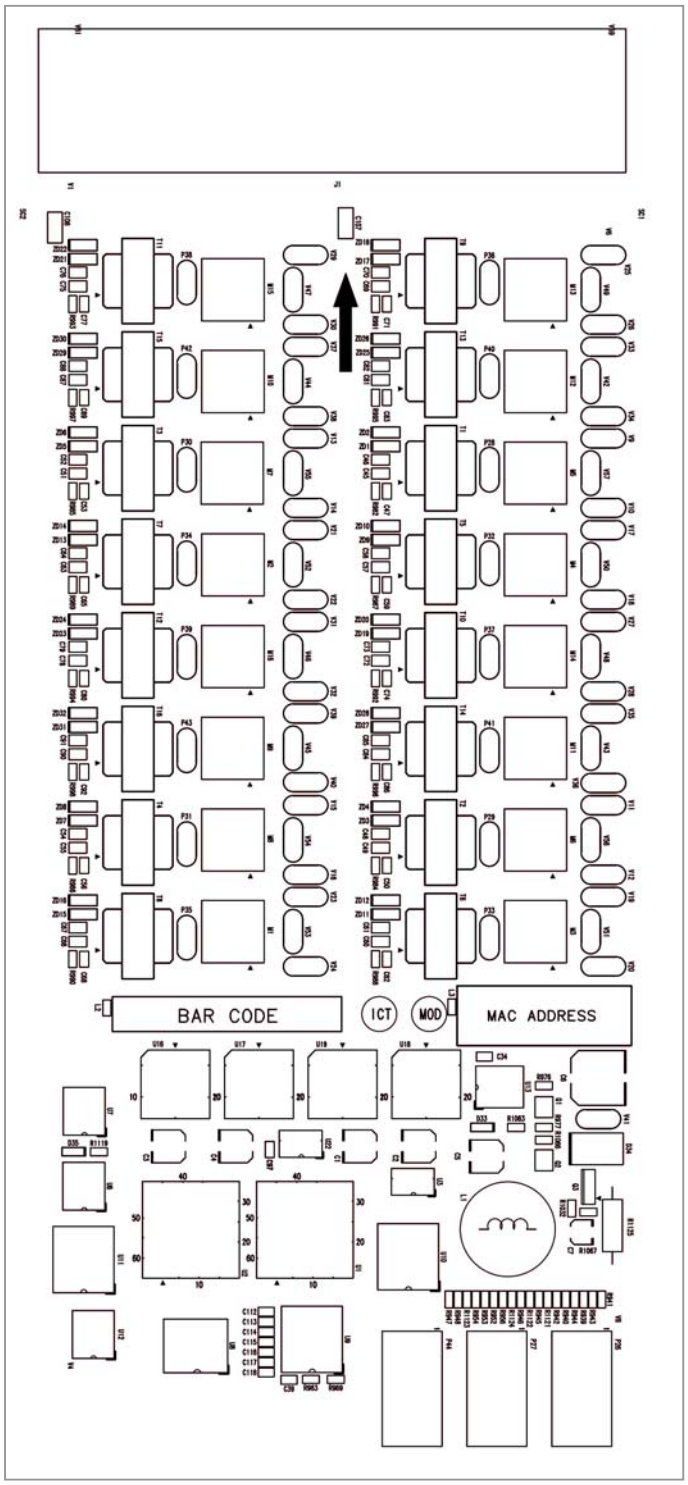


Solder side

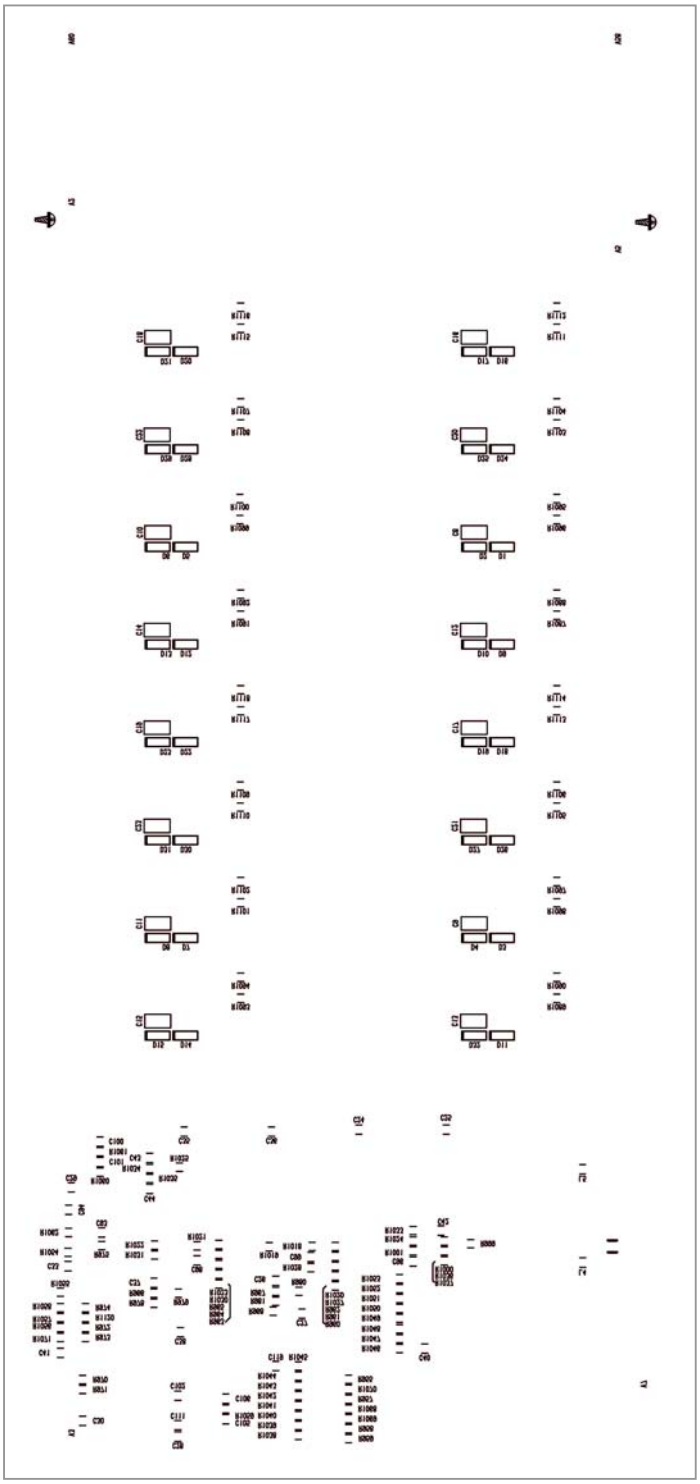


5.8 16DLI2 Board

Component side

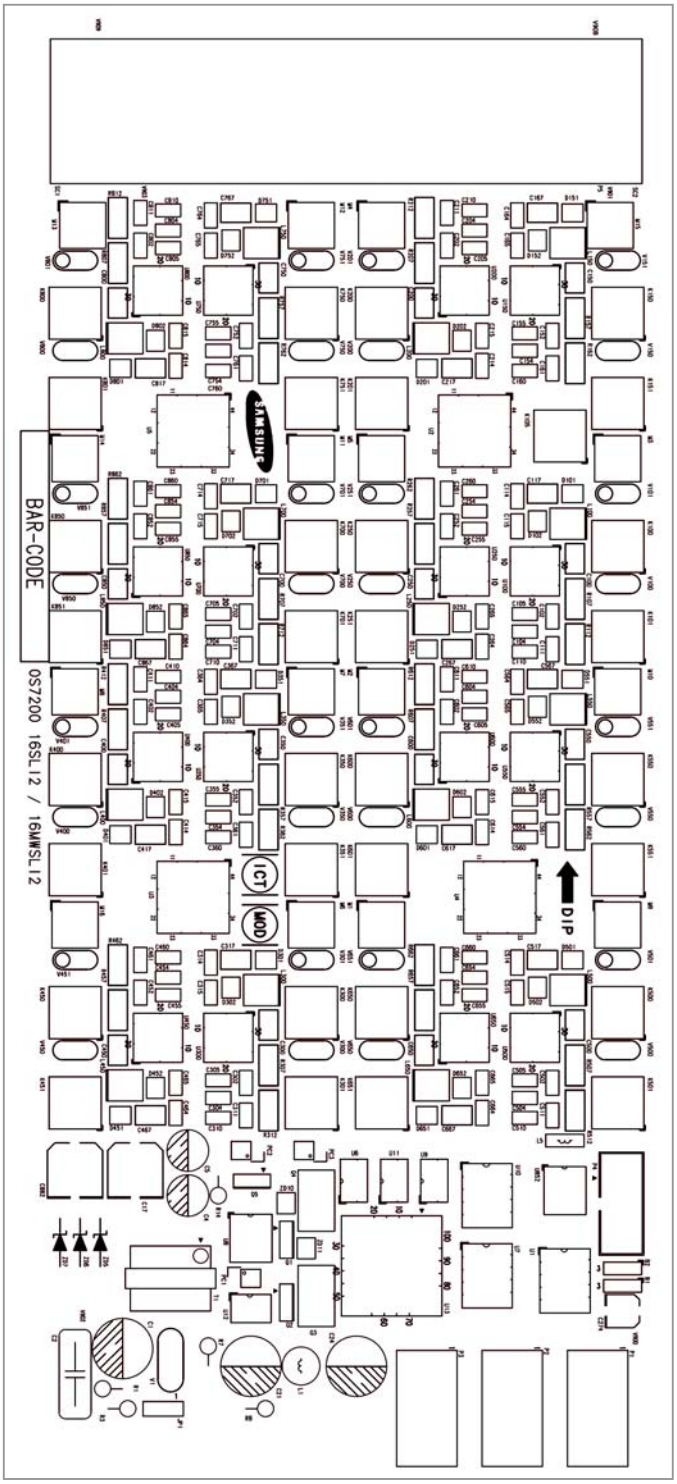


Solder side

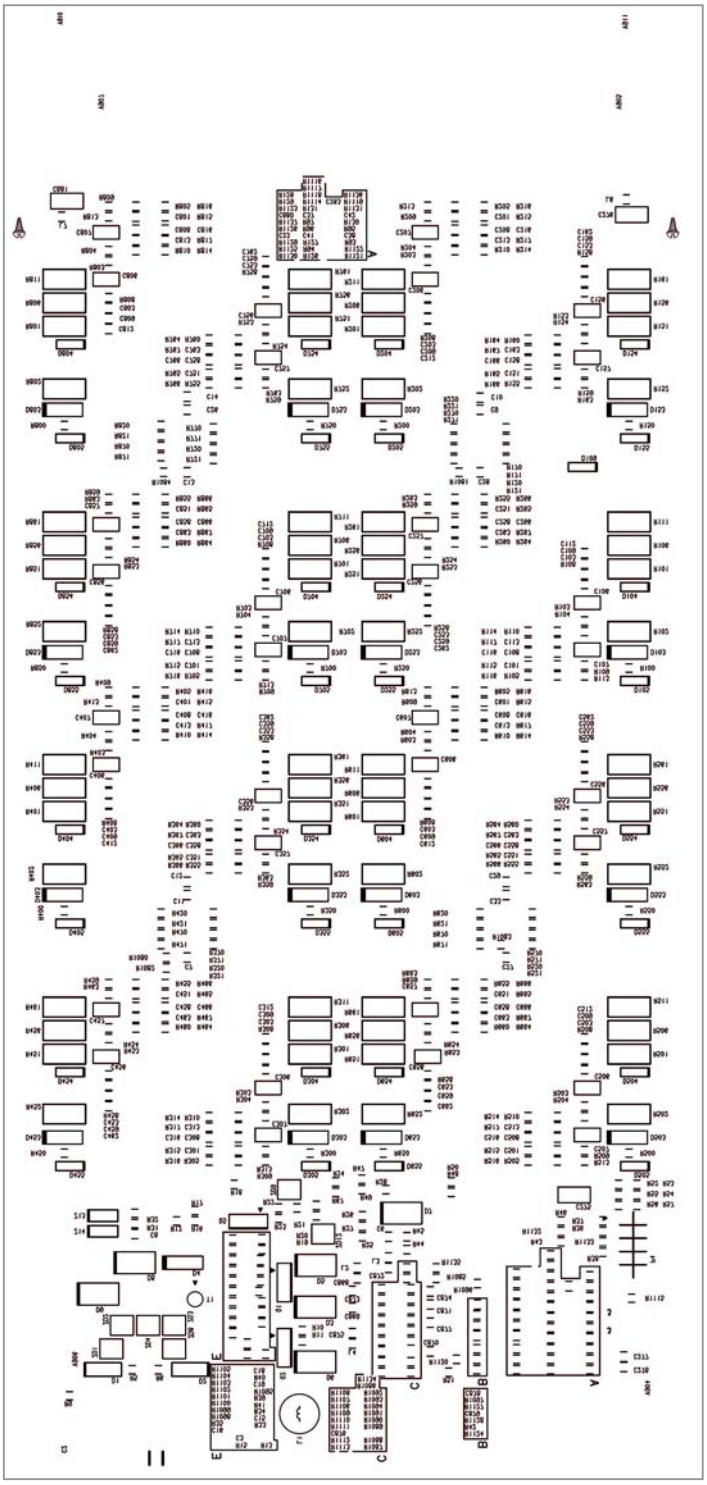


5.9 16SLI2/16MWSLI Board

Component side

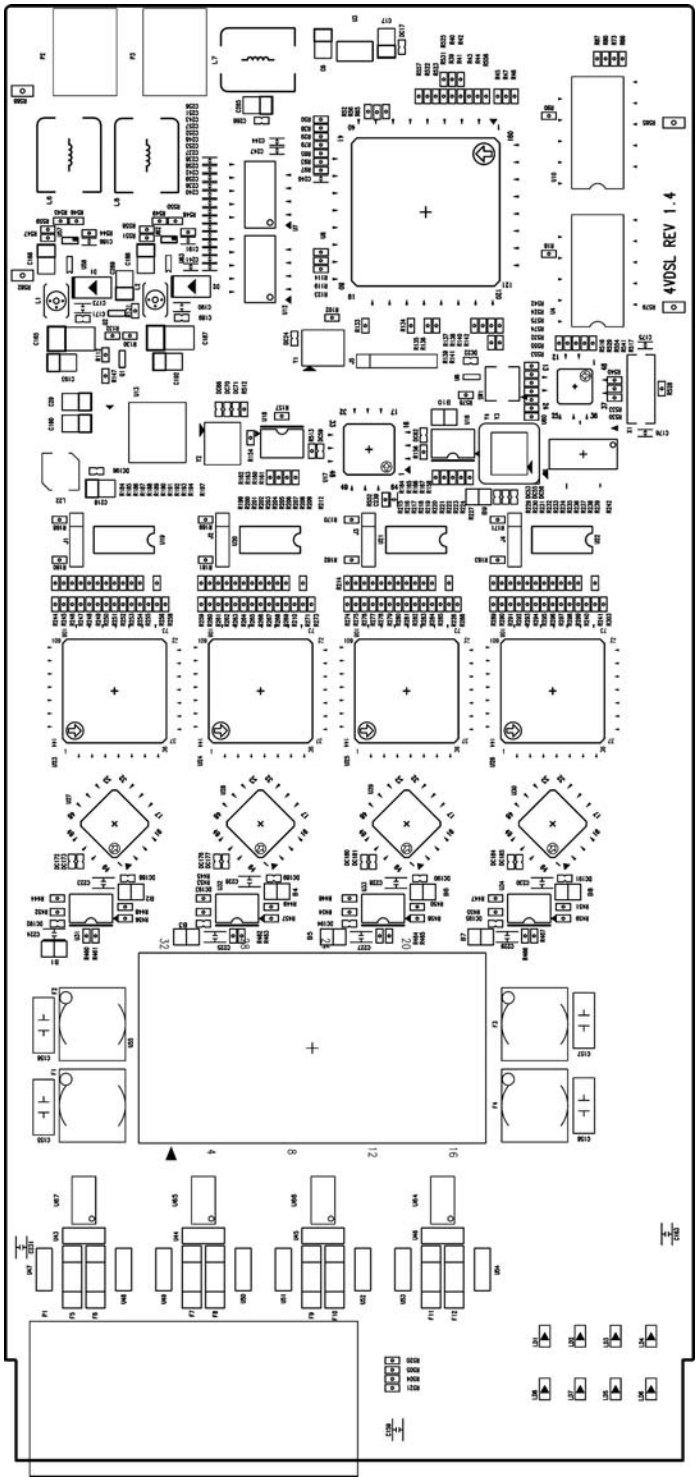


Solder side

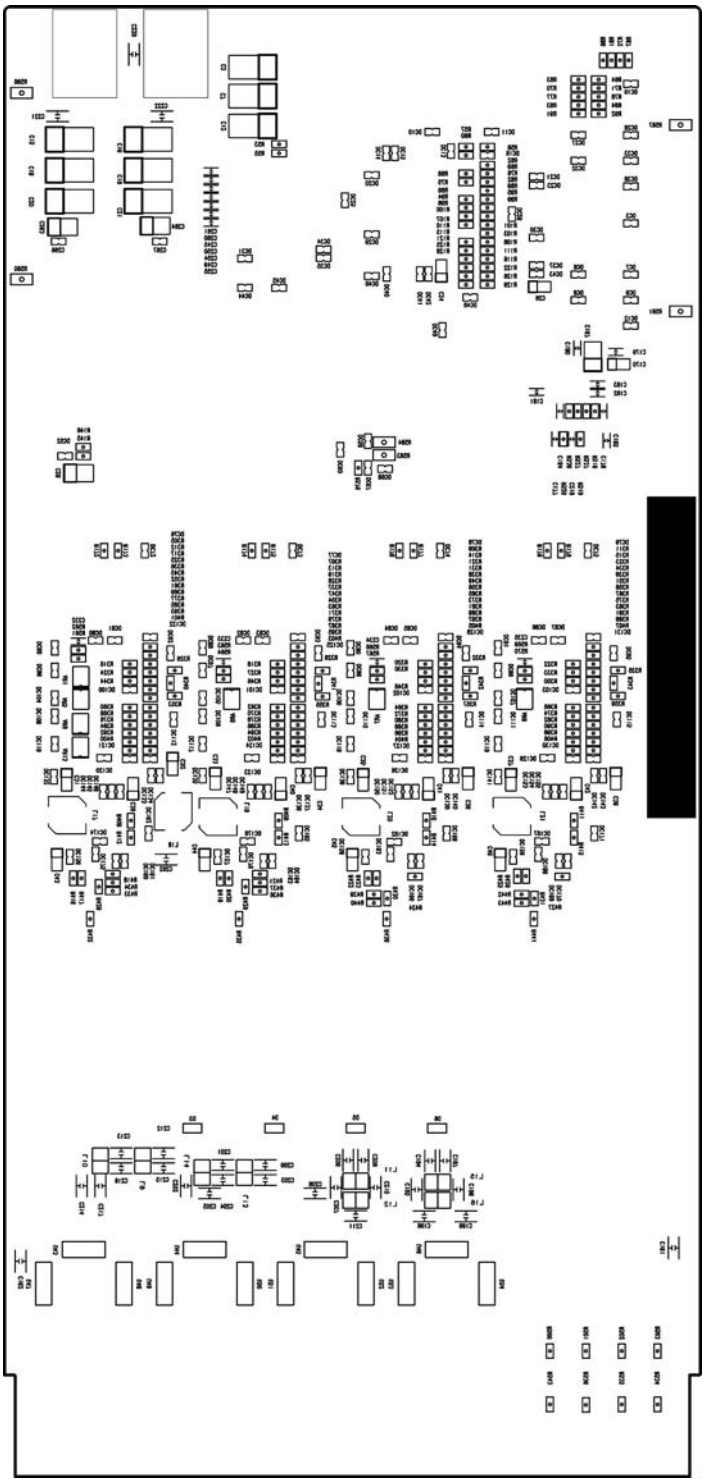


5.10 4DSL Board

Component side

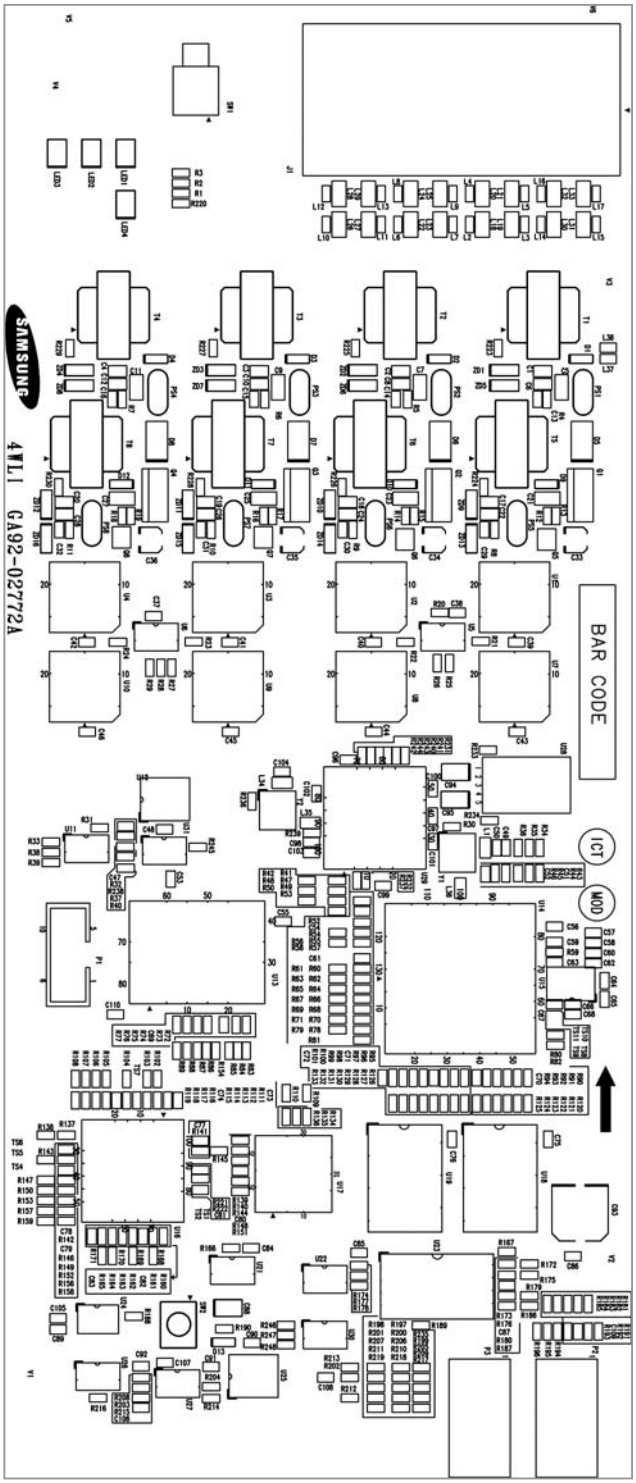


Solder side

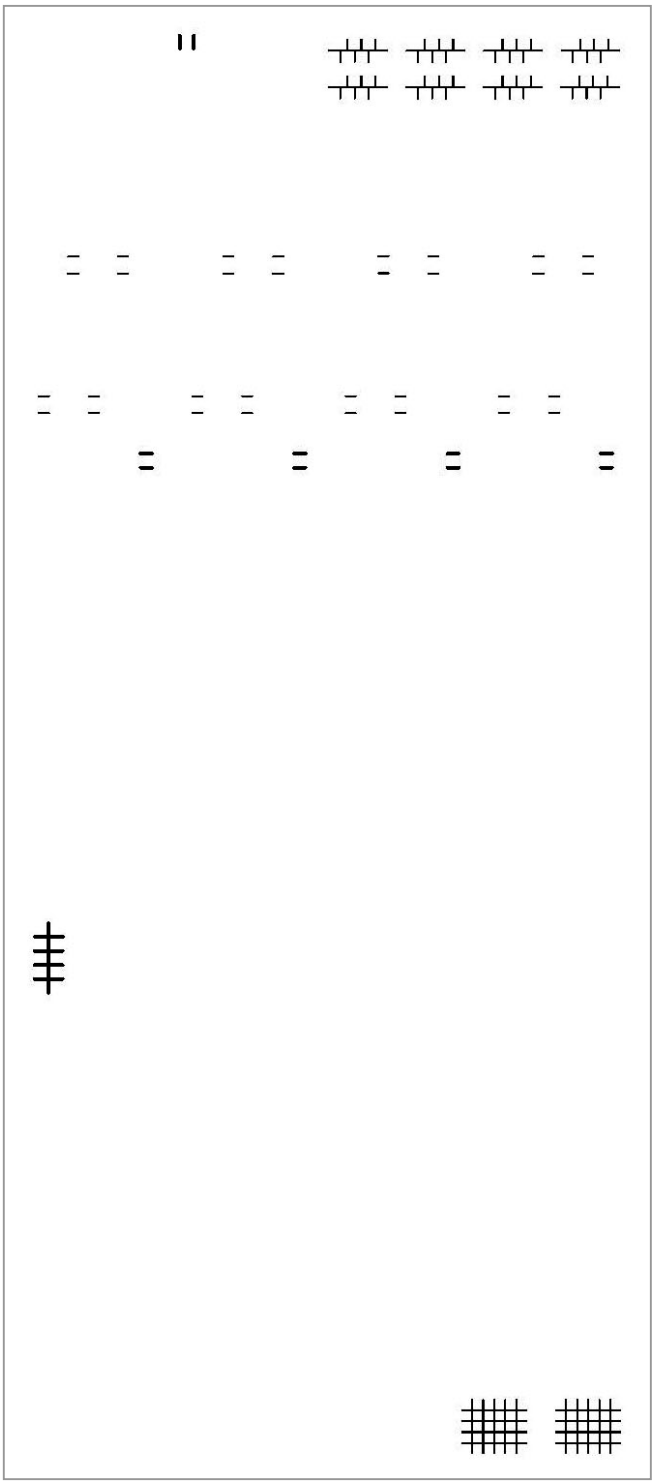


5.11 4WLI Board

Component side

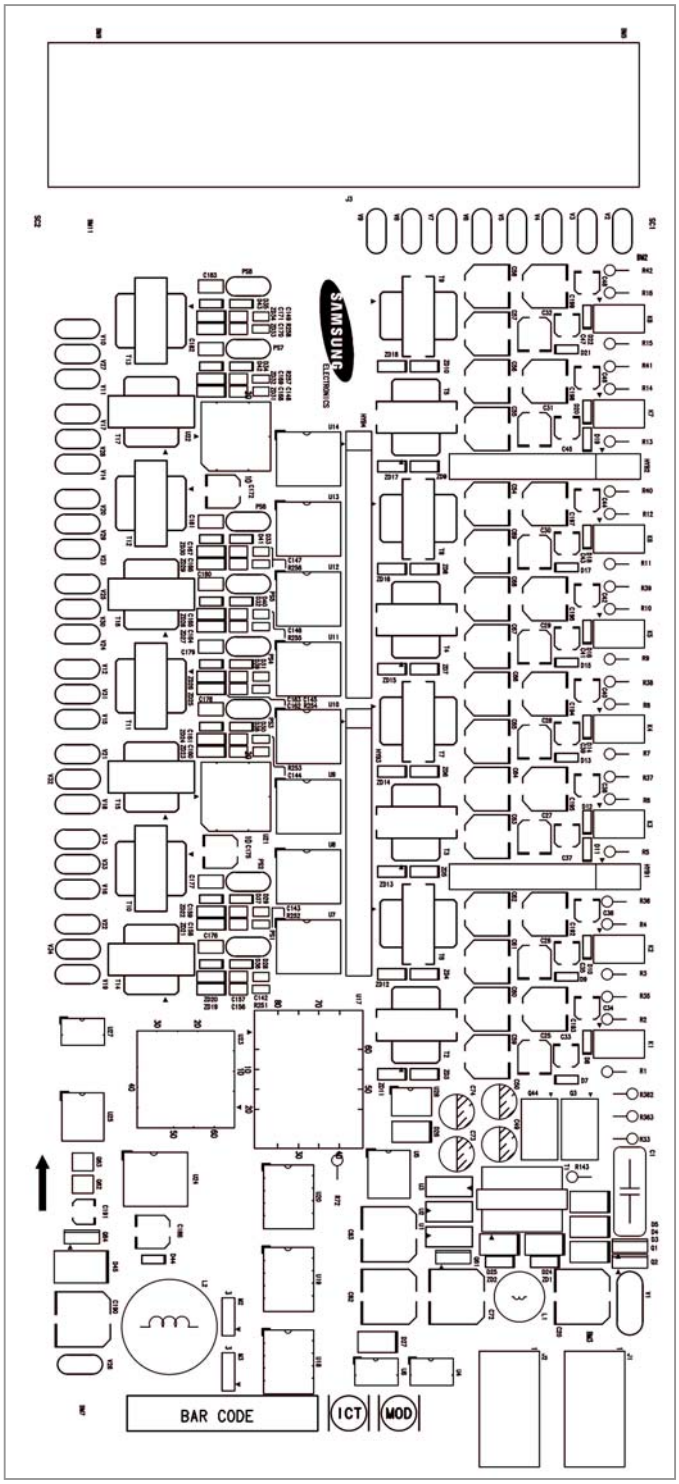


Solder side

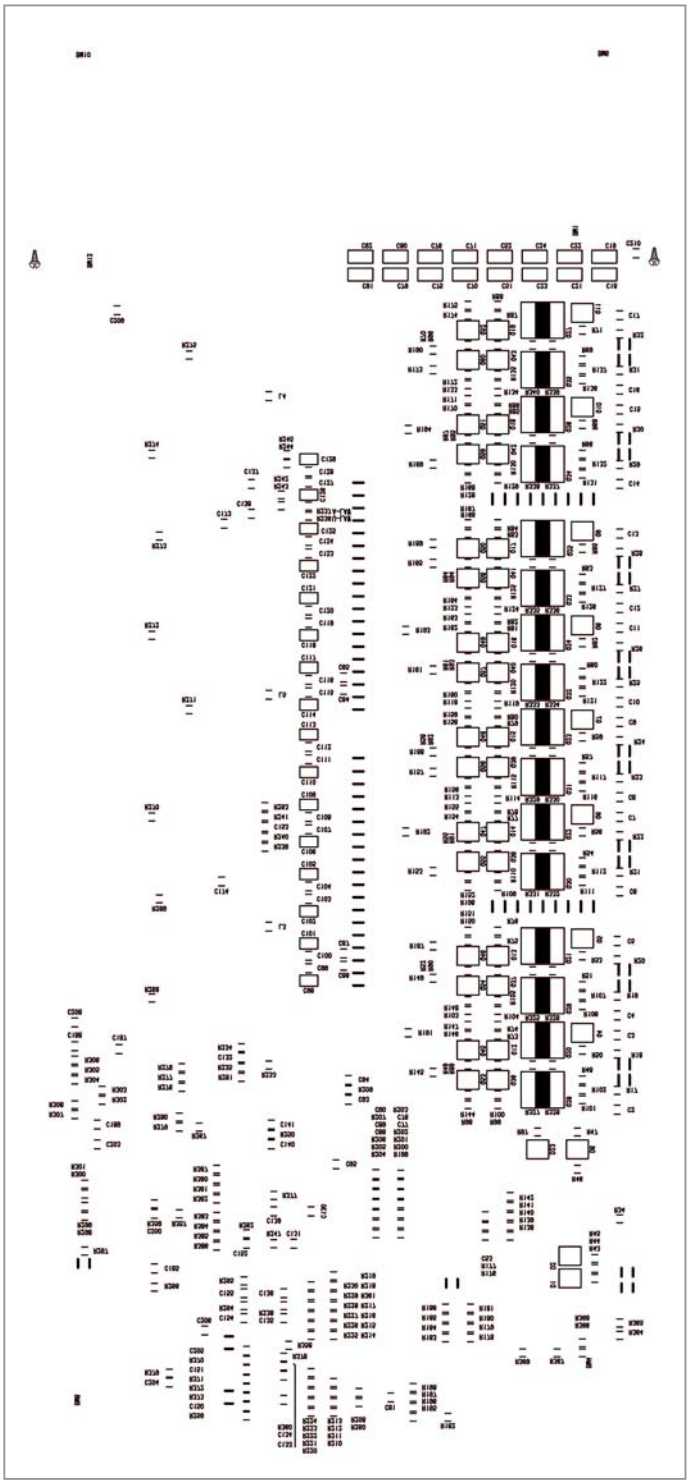


5.12 8COMBO Board

Component side

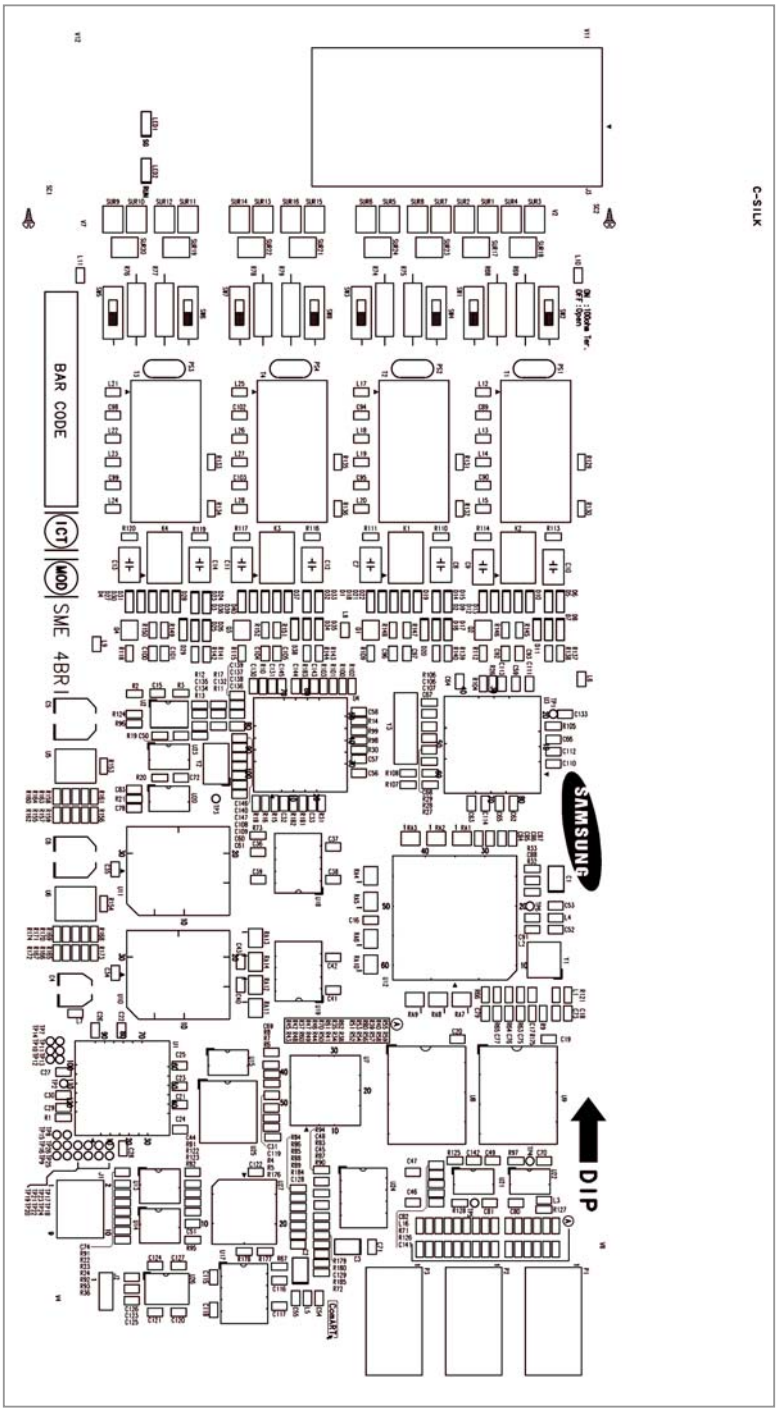


Solder side

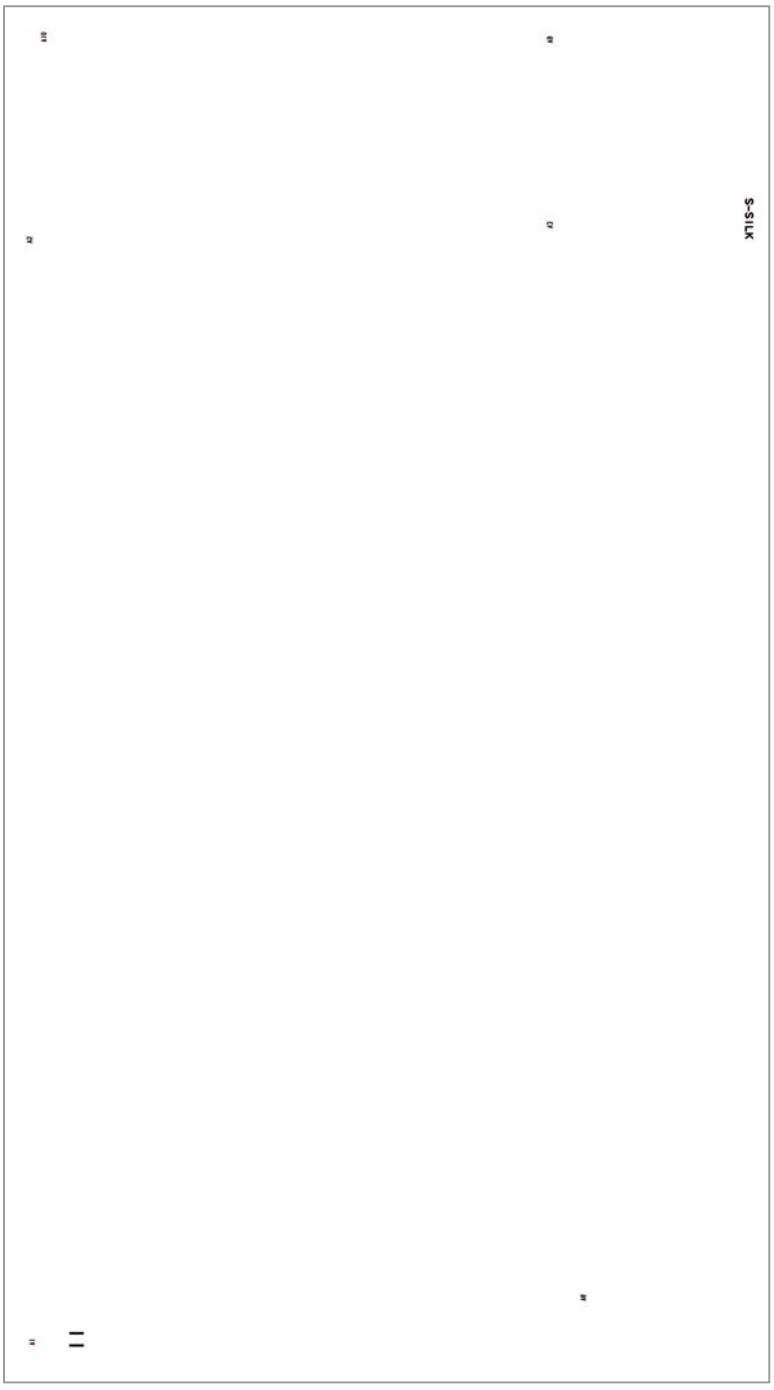


5.13 4BRI Board

Component side

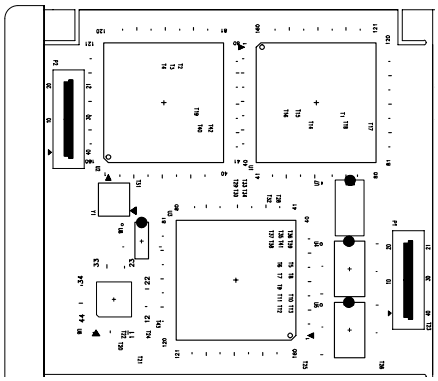


Soder side

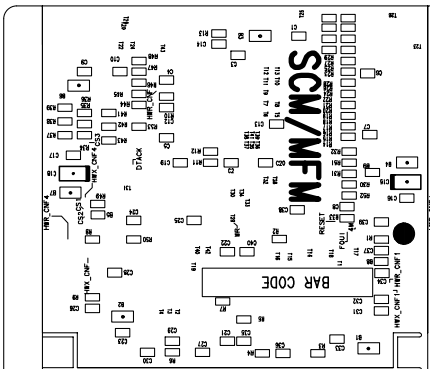


5.14 MFM Board

Component side

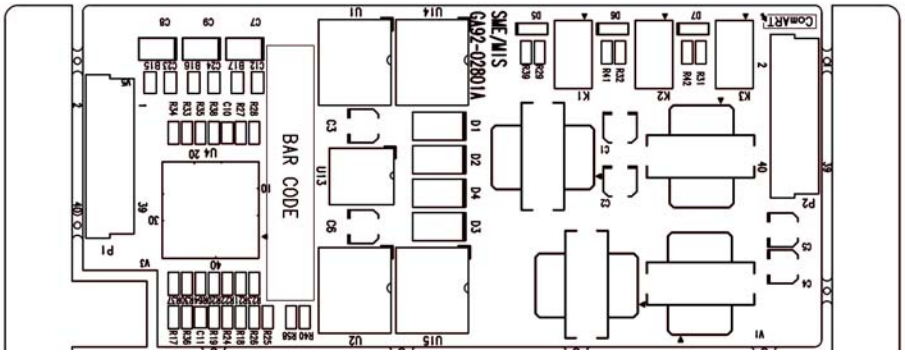


Solder side

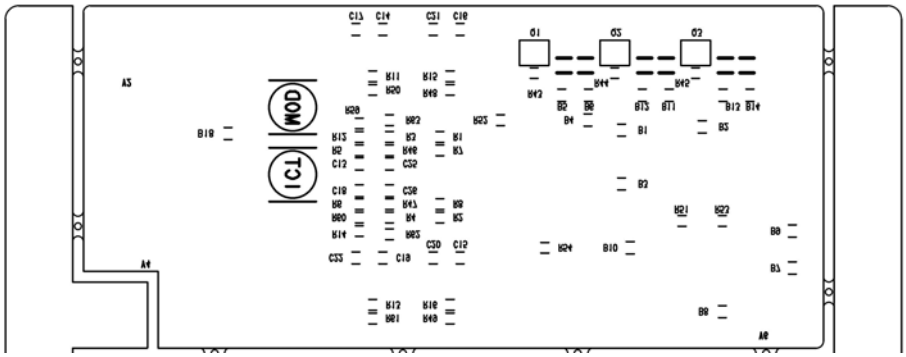


5.15 MIS Board

Component side

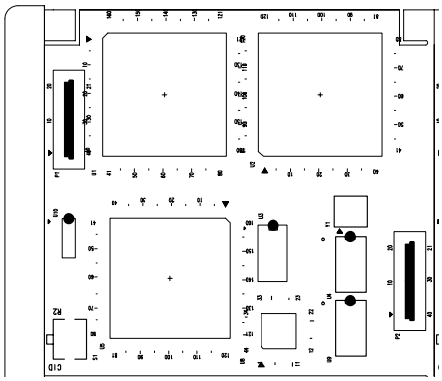


Solder side

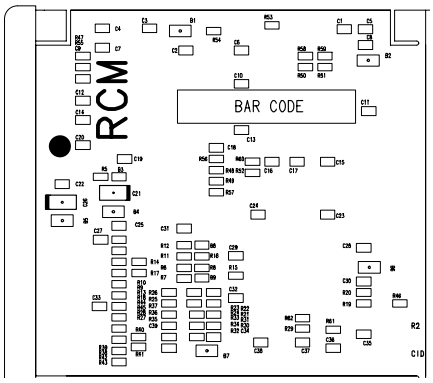


5.16 RCM Board

Component side

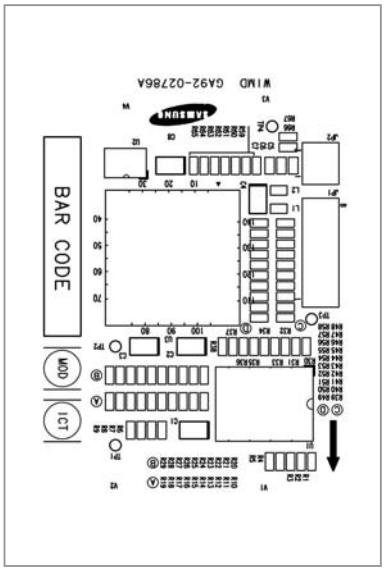


Solder side

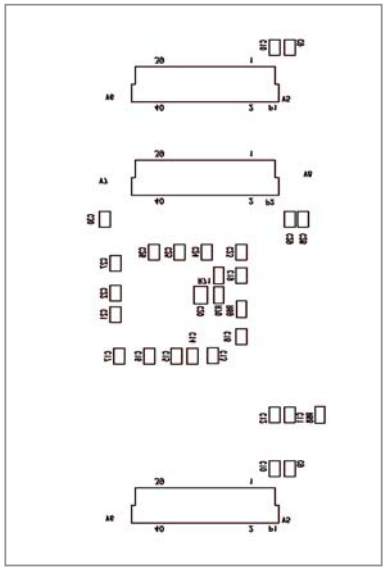


5.17 WIMD Board

Component side

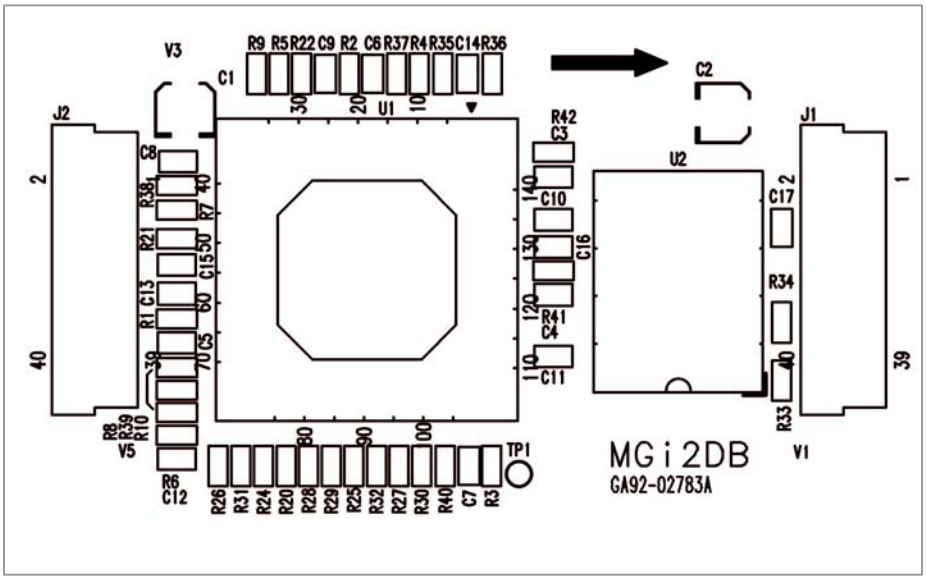


Solder side

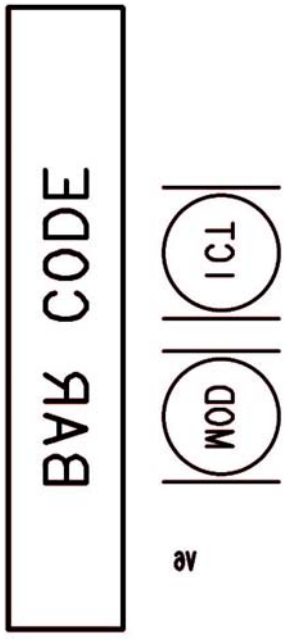


5.18 MGI2D Board

Component side

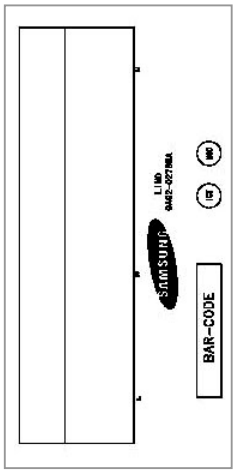


Solder side

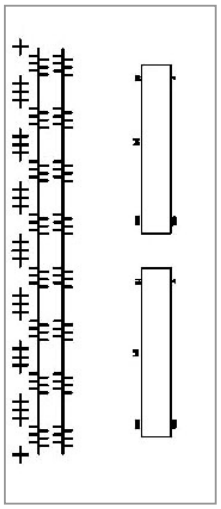


5.19 LIMD Board

Component side

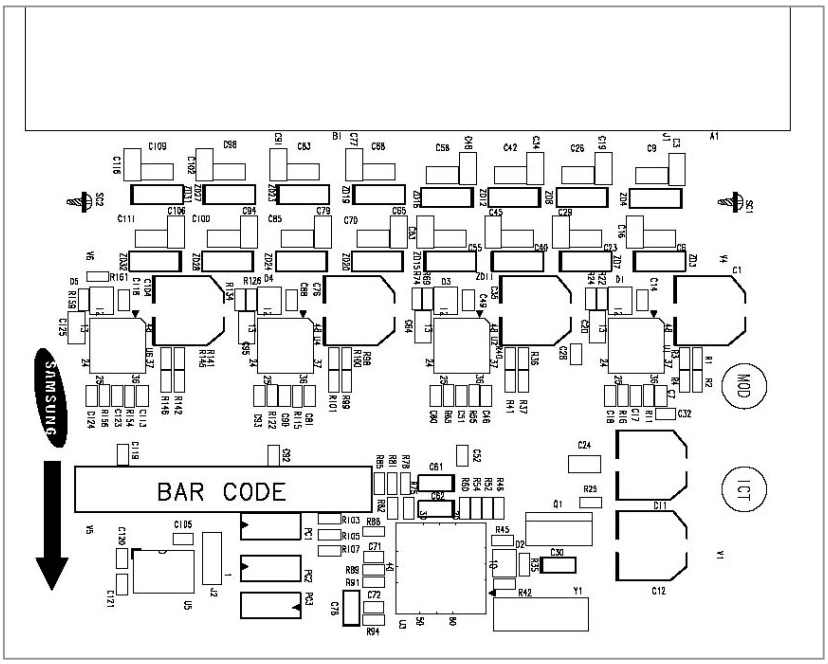


Solder side

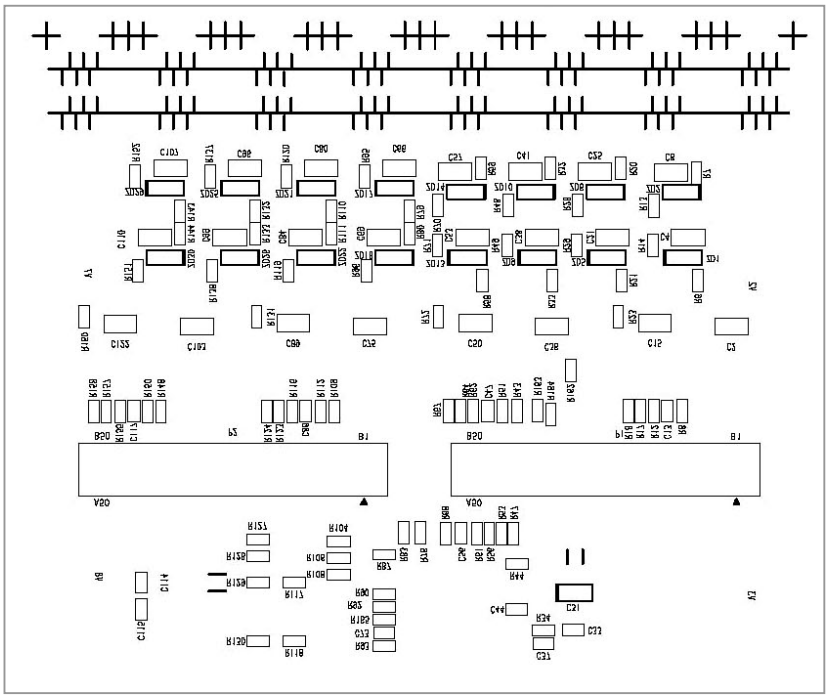


5.20 LIMD-P Board

Component side

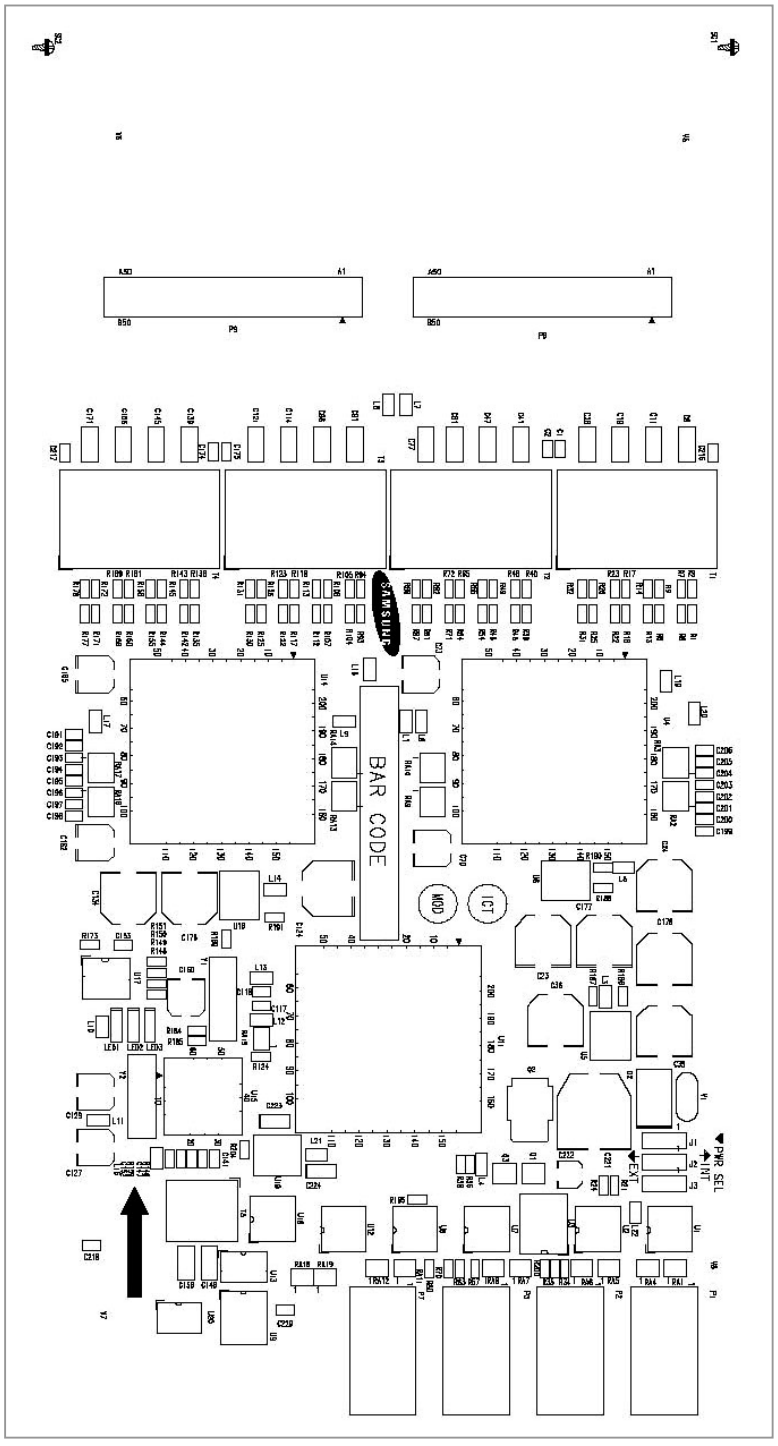


Solder side

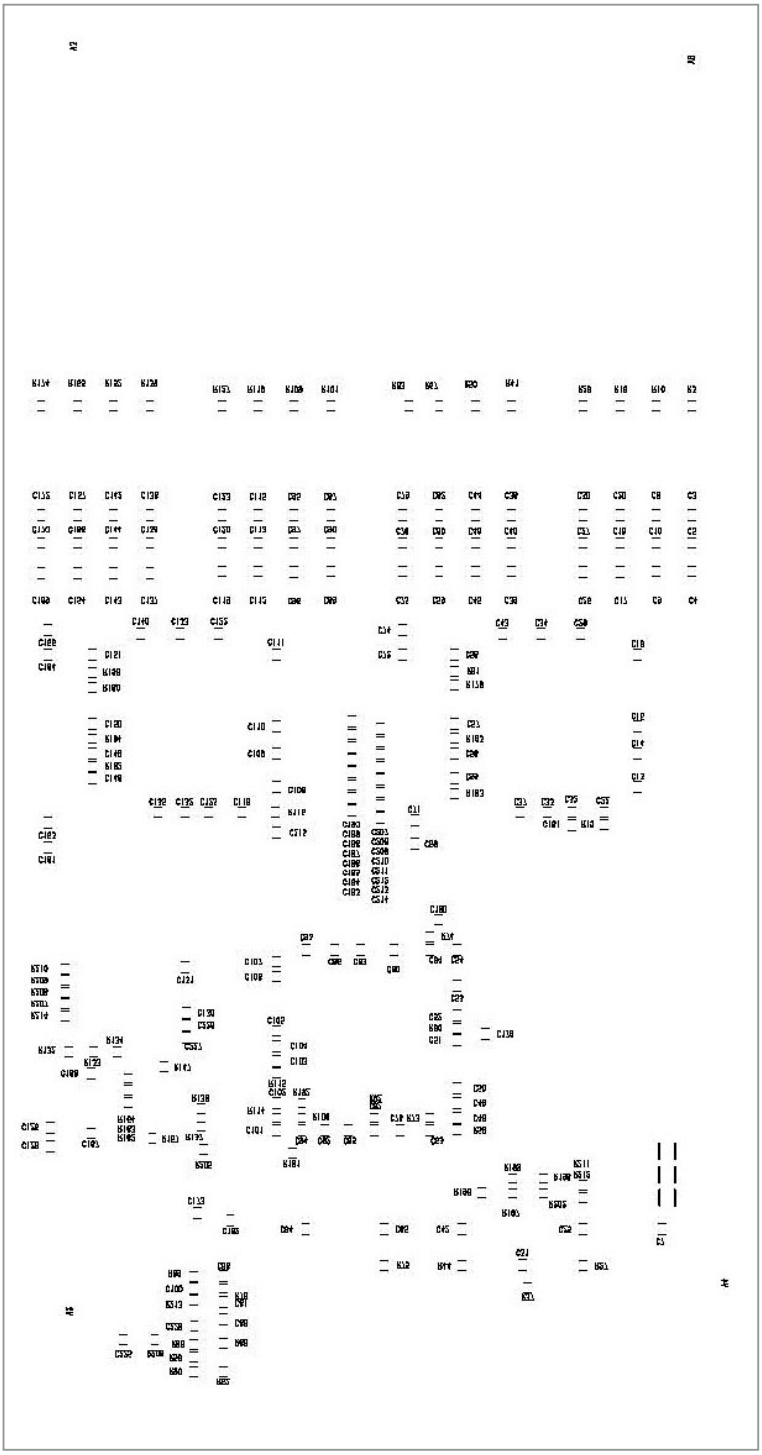


5.21 LIM-P Board

Component side



Solder side



CHAPTER 6. Parts List

This chapter describes parts list of the OfficeServ 7200 system.

6.1 MCP Board

Parts Code	Location	Product Name	Specification
GA92-02948A	-	-	-
0401-001099	D12, D2, D3, D4	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001056	D10, D11, D6, D7, D8	DIODE-RECTIFIER	MBRS140, 40 V, 1 A, CASE403A, TP
0403-001164	ZD1	DIODE-ZENER	MMSZ5232B, 5.32-5.88 V, 500MW, SOD-123, TP
0403-001416	ZD2	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500MW, SOD-123, TP
0406-001070	D5, D9	DIODE-TVS	LC03-6, 6.8/-/-V, 750W, SO-8
0601-001064	LED1~LED4	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560NM, 3x2.5x1.5 mm
0801-000794	U52	IC-CMOS LOGIC	7S08, AND GATE, SOT-25, 5, 63MIL, SINGLE, TP, 2.0/6.0 V
0801-001079	U67	IC-CMOS LOGIC	74ACT245, BUS TRANSCEIVER, SOP, 20, 300MIL, OCTAL, TP, 4.5/5.5 V
0801-002127	U10	IC-CMOS LOGIC	74FCT16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, ST, 4.5/5.5 V
0801-002162	U12~U14, U31, U32	IC-CMOS LOGIC	74FCT164245, TRANSLATOR, TSSOP, 48, 240MIL, DUAL, ST, 2.7/3.6 V
0801-002446	U30	IC-CMOS LOGIC	74LCx14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-001029	U36~U39	IC-BICMOS LOGIC	74LVTH16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, TP, 2.7/3.6 V
0802-001076	U1	IC-BICMOS LOGIC	74LVTH541, BUFFER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V

(Continued)

Parts Code	Location	Product Name	Specification
0802-001099	U18, U27	IC-BICMOS LOGIC	74LVTH125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 2.7/3.6 V
0902-001701	U29	IC-MICROPROCESSOR	XPC855T, 50 MHz, 32bit, BGA, 357P, TR, PLASTIC, 3.3 V, 735MW, 0TO+95C, 4/4/8KB, 32bit, ATM/100
0909-000105	U51	IC-REAL TIME CLOCK	RTC72423, 4bit, SOP, 24P, 16.3x7.9 mm, 32.768 KHz, ST, CMOS, PLASTIC, 5 V, -, -40TO+85C, -, -, 4B
1006-000281	U17, U9	IC-LINE DRIVER	DS3487, SOP, 16P, 157MIL, QUAD, ST, PLASTIC, 5.25 V, 0to+70C, 1051 mW, 4, 0
1006-000288	U11	IC-LINE RECEIVER	3486, SOP, 16P, 155MIL, QUAD, ST, PLASTIC, 5.25 V, 0to+70C, 1002 mW, 4
1006-001140	U64	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1105-001351	U44, U49	IC-DRAM	K4S561632A, 4Mx16x4bit, TSOP, 54P, 400MIL, 7.5NS, 3.3 V, 10%, PLASTIC, 0TO+70C, 2MA, CMOS, TR
1106-001428	U42, U43, U47, U48	IC-SRAM	K6F8016U6, 512Kx16bit, TBGA, 48P, 7x6 mm, 70NS, 3 V, 10%, PLASTIC, -40TO+85C, 0.5UA, CMOS, TR
1107-001534	U66	IC-FLASH MEMORY	39VF040, 512Kx8bit, PLCC, 32P, 13.97x11.43 mm, 70NS, 2.7/3.6 V, 15UA, -, 0TO+70C, 15UA, -, TP
1201-000197	U4	IC-OP AMP	MC34072, SOP, TP, 8P, 150MIL, DUAL, 100V/MV, PLASTIC, 44 V, -, 0TO+70C, 97DB, 13V/US, 6NA, 500N
1201-000309	U23, U24	IC-OP AMP	CA3140, SOP, ST, 8P, 150MIL, SINGLE, 100 V/MV, PLASTIC, 36 V, 180MW, -55TO+125C, 90 DB, 9V/US, 0
1203-001643	U55	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1204-002075	U2	IC-MELODY	M994T-05L, TO-92, 3P, 4.6x4.6 mm, PLASTIC, 3.5 V, 1.2W, 0TO+60C, TP, SWEET HOME
1205-000120	U8	IC-CODEC	TP3054WMX, SOP, 16P, 300MIL, PLASTIC, 5.25 V, 60MW, -25TO+125C, TP, -
1205-000394	U3	IC-CODEC FILTER	TP3057WM, SOP, 16P, -, PLASTIC, 5.2
1205-001864	U46	IC-TRANSCEIVER	DJLXT972ALC, LQFP, 64P, 393MIL, PLASTIC, 4V, -, 0TO+70C, TR, -

(Continued)

Parts Code	Location	Product Name	Specification
1301-001647	U63	IC-CPLD	LC4256V-75F256BC, FPBGA, 256P, 17x17 mm, 7.5NS, 3.3 V, 10%, 12.5 MA, 0TO+90C, -, 160, 160, -, 16
2007-000041	R1004, R1005	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608
2007-000043	R247 R773~R775 R780~R783	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R1, R1000 ~R1019, R102, R1020, R1022, R1023, R107, R118, R119, R121, R122, R126, R131, R132, R152~R156, R169, R172, R175, R176, R221, R233, R258, R284, R285, R310, R312, R313, R41, R42, R53, R616~R621, R624, R625, R674, R675, R679~R748, R78, R94, R966~R969, R97, R970~R975, R995, R999	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R915~R917, R919	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000070	R751, R955, R956	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R1006, R758, R784~R810, R832~R835, R837	R-CHIP	100O HM, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-000475	R920~R923	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-000669	R901~R911	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-001164	R899, R900	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-002902	R928	R-CHIP	162 kohm, 1%, 1/10W, TP, 1608
2007-002906	R941	R-CHIP	200 kohm, 1%, 1/10W, TP, 1608
2007-002910	R924~R926	R-CHIP	30.1 kohm, 1%, 1/10W, TP, 1608
2007-002987	R676~R678	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-002991	R940	R-CHIP	61.9 kohm, 1%, 1/10W, TP, 1608
2007-007049	R898, R918	R-CHIP	22.1 kohm, 1%, 1/10W, TP, 1608
2007-007226	R888~R893, R896, R897	R-CHIP	49.9 ohm, 1%, 1/10W, TP, 1608
2007-007237	R936, R937	R-CHIP	24.3 kohm, 1%, 1/10W, TP, 1608
2007-007454	R776~R779	R-CHIP	332 ohm, 1%, 1/10W, TP, 1608
2007-007507	R942~R947	R-CHIP	2.74 kohm, 1%, 1/10W, TP, 1608
2007-007610	R930~R935	R-CHIP	301 ohm, 1%, 1/10W, TP, 1608
2007-007645	R168, R240, R241, R245, R250, R251, R254, R255, R622, R623, R811~R831, R836, R838~R848, R850~R867, R876~R887, R948~R952, R954, R957, R976~R979, R981~R991, R996~R998	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-008122	R1021, R173, R174, R194, R208 , R211, R749, R750, R752~R757, R759, R760, R761, R763, R765~R772, R953, R980, R992, R993	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-008148	R927	R-CHIP	121 kohm, 1%, 1/10W, TP, 1608
2007-008223	R938, R939	R-CHIP	39.2 kohm, 1%, 1/10W, TP, 1608
2007-008225	R929	R-CHIP	226 kohm, 1%, 1/10W, TP, 1608
2011-000664	RA100, RA105~RA108, RA111, RA132~RA143, RA148, RA150~RA153, RA24~RA27, RA56, RA57, RA64, RA67, RA69	R-NET	2.7 kohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2011-000664	RA72, A74, RA77, RA80, RA83, RA87, RA88, RA91, RA93, RA94, RA99	R-NET	2.7 kohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2011-000881	RA66, RA71	R-NET	33 ohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2011-001011	RA59	R-NET	10 kohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2011-001194	RA101, RA102, RA104, RA109, RA110, RA112~RA125, RA144, RA145, RA32~RA40, RA60, RA61, RA65, RA70, RA75, RA76, RA78, RA81, RA82, RA84, RA86, RA89, RA92, RA95, RA98	R-NET	51 ohm, 5%, 1/16W, L, CHIP, 8P, TP
2203-000236	C4825~C4828, C611, C612	C-CER, CHIP	0.1nF, 5%, 50V, C0G, 1608
2203-000257	C4829~C4833, C4842, C615, C617, C639~C641	C-CER, CHIP	10nF, 10%, 50V, X7R, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2203-000426	C606~C610	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000838	C302	C-CER, CHIP	0.39nF, 5%, 50 V, C0G, TP, 1608
2203-000998	C4834~C4841, C613, C623~C631	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-001408	C618, C619	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-002793	C486~C489	C-CER, CHIP	1000nF, +80-20%, 25 V, Y5 V, 2012
2203-003027	C620~C622	C-CER, CHIP	0.82nF, 5%, 50 V, NP0, TP, 1608
2203-005249	C467~C485, C490~C517, C522~C604, C635~C638, C642, C65, C66, C103, C163, C164, C192	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C232	C-CER, CHIP	1nF, 10%, 2KV, X7R, TP, 4520
2203-005565	C4811~C4824	C-CER, CHIP	1nF, 5%, 50V, NP0, TP, 1608
2404-001037	C206, C234, C4, C40, C41, C63, C632~C634, C64	C-TA, CHIP	10uF, 10%, 16V, -, TP, 3528, -
2404-001074	C92, C93	C-TA, CHIP	10uF, 10%, 10 V, GP, TP, 3216
2409-001034	C1	C-EDL	1300000uF, 5.5 V, -, -, BK, 21x7.5 mm, 5
2601-001056	T1	TRANS-SMD, PULSE	350uH, -, 1:1, 1:1, 12.7x6.73x5.97 mm, TP
2804-001247	Y4	OSCILLATOR-CLOCK	25 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 80 mA
2804-001297	Y3	OSCILLATOR-CLOCK	9.216 MHz, 25 ppm, 10TTL, 15pF, TP, 3.3 V, 20 mA
2804-001325	Y2	OSCILLATOR-CLOCK	50 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
2806-000131	Y1	OSCILLATOR-VCXO	16.384 MHz, 20PPM, 2TTL, BK, 5 V, 20 MA
2901-000188	M1~M4	FILTER-EMI ON BOARD	50 V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP, -

(Continued)

Parts Code	Location	Product Name	Specification
3301-000317	L12~L17, L20~L23, L38, L39, L4~L7	BEAD-SMD	120 ohm, 2012, TP, -, -
3301-001120	L1, L2, L26, L27, L3, L30, L31, L36, L47	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3301-001308	L28, L29, L40, L45, L46	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3301-001463	L41~L44	BEAD-SMD	120 ohm, 1608, 200, TP, -, -, 0.5
3403-001104	S5	SWITCH-PUSH	28 V, 0.4A, 1P, MOMENTARY, D2.8 (Plunger)
3407-000131	S3	SWITCH-DIP	24 V, 300 mA, SLIDE, STANDARD
3408-000230	S2	SWITCH-SLIDE	30 V DC, 200 mA, DPDT, -, ANGLE SHAPE
3703-001252	P1~P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3704-000249	U66	SOCKET-IC	32P, PLCC, SN, 1.27 mm
3709-001139	SM1	CONNECTOR-CARD EDGE	26P, 1.1 mm, SMD-A, AUF
3710-001659	J5~J10	CONNECTOR-SOCKET	40P, 2R, 0.8 mm, SMD-S, AUF, NTR
3711-003272	J3, J4	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-002045	J11	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
GA13-10064A	U53	IC ASIC	DCS, STL7065C, QFP, 160P, -
GA41-00132A	PCS.03	PCB-MCP	OFFICESERV SME, FR4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.2 LCP Board

Parts Code	Location	Product Name	Specification
GA92-02951A	-	-	-
0403-001164	ZD1	DIODE-ZENER	MMSZ5232B, 5.32-5.88V, 500MW, SOD-123, TP
0403-001416	ZD2	DIODE-ZENER	MMSZ5227B, 3.42-3.78V, 500MW, SOD-123, TP
0601-000005	LED1, LED2	LED	SMD, GRN, 3x2 mm, 570 NM, 3x2 mm
0801-001079	U15	IC-CMOS LOGIC	74ACT245, BUS TRANSCEIVER, SOP, 20, 300MIL, OCTAL, TP, 4.5/5.5 V
0801-002127	U11~U13	IC-CMOS LOGIC	74FCT16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, ST, 4.5/5.5 V
0801-002446	U16	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-001076	U14	IC-BICMOS LOGIC	74LVTH541, BUFFER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V
0902-000231	U10	IC-MICROPROCESSOR	MC68302, 16.67 MHz, 16bit, QFP, 132P, TR, PLASTIC, 5V, 525 MW, 0TO+70C, 1.152 KB, 24bit
1006-000281	U7	IC-LINE DRIVER	DS3487, SOP, 16P, 157MIL, QUAD, ST, PLASTIC, 5.25 V, 0to+70C, 1051 mW, 4, 0
1006-000288	U8, U9	IC-LINE RECEIVER	3486, SOP, 16P, 155MIL, QUAD, ST, PLASTIC, 5.25 V, 0to+70C, 1002 mW, , 4
1006-001140	U6	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571mW, 2, 2
1105-001390	U18	IC-DRAM	K4S641632, 1Mx16x4bit, TSOP(II), 54P, 400MIL, 7.5NS, 3.3 V, 10%, -, 0TO+70C, 30MA, CMOS, TR
1107-001079	U5	IC-FLASH MEMORY	29F800, 1Mx8/512Kx16, TSOP, 48P, 18.4x12 mm, 4.5/5.5 V, 0to+70C
1203-001643	U2	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1301-001647	U1	IC-CPLD	LC4256V-75F256BC, FPBGA, 256P, 17x17 mm, 7.5NS, 3.3V, 10%, 12.5MA, 0TO+90C, -, 160, 160, -, 16
2007-000041	R19, R20, R200, R201	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-000052	R22, R146, R195~R199, R21, R216~R226, R23, R233, R24, R25~R85	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R1~R3, R229~R232	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R191, R227, R89, R90, R92~R97	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000669	R10~R18, R192~R194, R202~R215, R4~R9	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-002987	R86~R88	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007610	R100~R121, R98, R99	R-CHIP	301 ohm, 1%, 1/10W, TP, 1608
2007-007645	R156~R174, R177~R190, R228	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-008122	R123~~R132, R145, R147~R151	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2011-000664	RA21, RA22	R-NET	2.7 kohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2011-001194	RA1, RA10~RA16, RA19, RA2, RA20, RA3~RA9	R-NET	51 ohm, 5%, 1/16W, L, CHIP, 8P, TP
2203-000236	C49~C61, C83, C84	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C78~C82	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000626	C77	C-CER, CHIP	0.022nF, 5%, 50 V, C0G, TP, 1608
2203-000998	C74~C76, C89	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-002793	C1~C4	C-CER, CHIP	1000nF, +80-20%, 25 V, Y5V, 2012

(Continued)

Parts Code	Location	Product Name	Specification
2203-005249	C9~C36, C41~C48, C5, C6, C62, C65~C67, C7, C8, C85~C88	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C68, C69	C-CER, CHIP	1nF, 10%, 2KV, X7R, TP, 4520
2404-001037	C63, C64	C-TA, CHIP	10uF, 10%, 16V, -, TP, 3528, -
2804-001453	Y1	OSCILLATOR-CLOCK	32.768 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
2804-001588	Y2	OSCILLATOR-CLOCK	50 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
2901-000188	M1~M3, M5, M6	FILTER-EMI ON BOARD	50 V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP, -
3301-001120	L5, L6	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3301-001308	L1~L4, L7, L8	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3403-001104	S1, S2	SWITCH-PUSH	28 V, 0.4A, 1P, MOMENTARY, D2.8(Plunger)
3703-001252	P1~P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3711-003272	J1	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001449	J2	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU50U
GA41-00133A	PCS.03	PCB-LCP	OFFICESERV SME, FR -4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.3 TEPRI Board

Parts Code	Location	Product Name	Specification
GA92-02767A	-	-	-
0402-001081	D11~D18	DIODE-RECTIFIER	RGF1D, 200V, 1A, DO-214BA, TP
0403-001164	ZD1, ZD2	DIODE-ZENER	MMSZ5232B, 5.32-5.88 V, 500MW, SOD-123, TP
0406-000127	TVS1, TVS3	DIODE-TVS	P6KE18CA, 17.1/18/18.9 V, 600W, DO
0406-001073	U37, U38	DIODE-TVS	LC01-6, 8/-/-V, 1500W, SO-16
0601-001064	LED1~LED8	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560 NM, 3x2.5x1.5 mm
0801-000547	U33	IC-CMOS LOGIC	74ACT273, D FLIP-FLOP, SOP, 20, 300 MIL, OCTAL, ST, 4.5/5.5 V
0801-002325	U6	IC-CMOS LOGIC	74LCX04, INVERTER, TSSOP, 14, 173 MIL, HEX, TP, 2.0/3.6 V
0801-002326	U25, U4	IC-CMOS LOGIC	74LCX32, OR GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002381	U34	IC-CMOS LOGIC	74LCX138, DECODER/DEMULTIPLEXE, SOP, 16, 150MIL, SINGLE, TP, 2.0/3.6 V
0801-002446	U19, U20, U40	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0801-002711	U11	IC-CMOS LOGIC	74LCX86, XOR GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0802-000111	U21~U23, U26~U31	IC-CMOS LOGIC	74FCT245, BUS TRANSCEIVER, SOP, 20P, 12.8x7.5 mm, OCTAL, ST, 0to+70C
0802-001076	U8	IC-BICMOS LOGIC	74LVTH541, BUFFER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V
0802-001084	U39	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
0902-000231	U2	IC-MICROPROCESSOR	MC68302, 16.67 MHz, 16bit, QFP, 132P, TR, PLASTIC, 5 V, 525MW, 0TO+70C, 1.152KB, 24bit
1006-001140	U1	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1105-001390	U16	IC-DRAM	K4S641632, 1Mx16x4bit, TSOP(II), 54P, 400MIL, 7.5NS, 3.3 V, 10%, -, 0TO+70C, 30 MA, CMOS, TR
1106-001136	U24	IC-SRAM	7C136, 2Kx8bit, QFP, 52P, 10x10 mm, 55NS, 5 V, 10%, PLASTIC, 0TO+70C, 15 MA, CMOS, TR

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Parts Code	Location	Product Name	Specification
1107-001079	U17	IC-FLASH MEMORY	29F800, 1Mx8/512Kx16, TSOP, 48P, 18.4x12 mm, 4.5/5.5 V, 0to+70C
1203-001643	U35	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1205-001191	U36	IC-FRAMER	PEB2254H, QFP, 80P, 300MIL, PLASTI
1301-001663	U9	IC-CPLD	LC4128 V-75T128C, TQFP, 128P, 14x14 mm, 7.5NS, 3.3 V, 10%, -, 0TO+90C, -, 92, 92, 4, 333 MHz, 3.47
1404-001115	THER1~THER4	THERMISTOR-PTC	0.1 ohm, 30%, -, 30 Vac, 40A, 2.2A, BK
2007-000052	R10, R1000, R1004, R1011~R1035, R1056, R11~R18, R186, R189, R19, R192, R194~R199, R20, R201, R21, R22~R30, R3, R301~R308, R31, R32, R352, R4, R73~R75, R77, R79, R81~R84, R903~R920, R922~R924, R926, R967, R969, R971, R972, R984, R994~R999	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R123, R76, R962, R964~R966	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R1, R151, R193, R2, R200, R242, R5, R78, R850, R928~R938, R95	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-000536	R973	R-CHIP	200 ohm, 1%, 1/10W, TP, 1608
2007-000969	R974, R975	R-CHIP	5.1 ohm, 1%, 1/10W, TP, 1608
2007-002901	R979	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608
2007-007302	R137	R-CHIP	24.9 ohm, 1%, 1/10W, TP, 1608
2007-007302	R970	R-CHIP	24.9 ohm, 1%, 1/10W, TP, 1608
2007-007454	R251~R258	R-CHIP	332 ohm, 1%, 1/10W, TP, 1608
2007-007645	R1005, R1009, R1010, R1036~R1065, R202~R241, R243~R248, R33~R71, R939, R94, R940~R960, R988~R993	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-008105	R976, R977	R-CHIP	18.2 ohm, 1%, 1/10W, TP, 1608
2007-008111	R978	R-CHIP	191 ohm, 1%, 1/10W, TP, 1608
2007-008122	R1069, R85	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2203-000041	C165, C166, C200	C-CER, CHIP	0.01nF, 0.25PF, 50 V, C0G, TP, 1608
2203-000236	C10~C12, C158, C17~C22, C52, C6, C7, C8, C88, C89, C9, C90~C96	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C190	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-001408	C188, C189, C191~C193	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-003027	C164	C-CER, CHIP	0.82nF, 5%, 50 V, NP0, TP, 1608
2203-005009	C167, C168, C202, C212	C-CER, CHIP	0.0056nF, 0.25pF, 50 V, NP0, TP, 1608

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Parts Code	Location	Product Name	Specification
2203-005249	C1, C13~C15, C156, C159, C16, C160~C163, C172~C187, C194, C195, C2, C201, C203~C216, C28, C3, C34, C4, C5, C61	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005249	C1, C13~C15, C156, C159, C16, C160~C163, C172~C187, C194, C195, C2, C201, C203~C216, C28, C3, C34, C4, C5, C61, C81~C86	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C197, C198	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2402-000204	C157, C56	C-AL, SMD	10uF, 20%, 16 V, WT, TP, 4.3x4.3x5.4
2602-000054	T1, T2	TRANS-PULSE	4MH, -, 1:1.41, 14x12.5x13 mm, TR
2801-004043	Y5~Y7	CRYSTAL-SMD	12.352 MHz, 15PPM, SMD, 18PF, 50ohm, TP
2804-001588	Y8	OSCILLATOR-CLOCK	50 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
2901-000188	B14, B16~B19	FILTER-EMI ON BOARD	50 V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP, -
3301-001308	L2~L4, L6~L10	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3403-001104	S2	SWITCH-PUSH	28 V, 0.4A, 1P, MOMENTARY, D2.8 (Plunger)
3404-001008	SW2	SWITCH-TACT	15 V, 50 MA, 160GF, 6x6x5 mm, SPST
3407-000131	S1	SWITCH-DIP	24 V, 300 mA, SLIDE, STANDARD
3703-001252	P26, P27	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3710-000001	J1~JP9	CONNECTOR-SHUNT	2P, 1R, 2.54 mm, AUF

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Parts Code	Location	Product Name	Specification
3710-001659	P18, P19	CONNECTOR-SOCKET	40P, 2R, 0.8 mm, SMD-S, AUF, NTR
3711-001465	J1, J2, JP3~JP9	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3711-003272	P12	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001050	P11	JACK-MODULAR	8P/8C, STANDARD, Y, ANGLE, N, BLK, AU50U
4711-000162	U10	DELAY LINE	200ns, -, 8.1x19.8x6.4 mm, ST
4715-000127	SUR1~ SUR6	SURGE ABSORBER	300 V, 15%, 500A, -, -
GA41-00135A	PCS.03	PCB-TEPRI	OFFICESERV SME, FR -4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.4 WIM Board

Parts Code	Location	Product Name	Specification
GA92-02776A	-	-	-
0402-001207	D1	DIODE-SCHOTTKY	UPS5819, 40 V, 1000MA, DO-216AA, TP
0406-001021	D2	DIODE-TVS	SM15, 15 V, 300W, SOT-23
0601-000005	LED1~LED12	LED	SMD, GRN, 3x2 mm, 570 NM, 3x2 mm
0801-000862	U24, U26	IC-BICMOS LOGIC	74LVT126, BUFFER, SOP, 14P, 8.7x4 mm, QUAD, ST, -40to+85C
0801-002446	U17	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-001037	U1~U4, U25	IC-BICMOS LOGIC	74LVT245, BUS TRANSCEIVER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V
0802-001041	U18	IC-BICMOS LOGIC	74LVTH16373, D LATCH, TSSOP, 48, 240MIL, DUAL, TP, 2.7/3.6 V
0902-001732	U12	IC-MICROPROCESSOR	MPC8250A, 300 MHz, 64bit, TBGA, 480P, TR, PLASTIC, 2 V, 3.1W, 0TO+105C, 16/16/32 KB, 32bit, 300
1003-001668	U7	IC-CLOCK DRIVER	74FCT388915, SSOP, 28P, 208MIL, SINGLE, -, TP, PLASTIC, 3.3 V, 0TO+70C, -, 2.4/0.5 V, IDT74FCT
1006-001030	U22	IC-DRIVER/RECEIVER	504, QFP, 80P, -, -, TR, CERAMIC, 5 V
1006-001140	U23	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1105-001351	U10, U11, U14, U15	IC-DRAM	K4S561632A, 4Mx16x4bit, TSOP, 54P, 400MIL, 7.5NS, 3.3 V, 10%, PLASTIC, 0TO+70C, 2MA, CMOS, TR
1107-001118	U16	IC-FLASH MEMORY	29LV040, 512Kx8, PLCC, 32P, 11.4x13.9 mm, 2.7/3.6 V, 0to+70C
1107-001229	U13, U9	IC-FLASH MEMORY	28F128, 16Mx8/8Mx16 Bit, TSOP, 56P, 18.4x14 mm, 150nS, 2.7/3.6 V, -, -, -40to+85C, 120uA, -, ST
1203-001475	U8	IC-RESET	DS1832, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1203-001691	U6	IC-POSI.ADJUST REG.	29152, TO-263, 5P, -, PLASTIC, 1.24/26 V, -, -40TO+125C, 1.5A, -, TP

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Parts Code	Location	Product Name	Specification
1205-001748	U21	IC-TRANSCEIVER	LXT905LC, LQFP, 32P, 275MIL, PLASTIC, 3.3 V, -, 0TO+70C, TR, -
1205-001864	U19, U20, U5	IC-TRANSCEIVER	DJLXT972ALC, LQFP, 64P, 393MIL, PLASTIC, 4 V, -, 0TO+70C, TR, -
2007-000040	R171~R173	R-CHIP	150 ohm, 1%, 1/10W, TP, 1608
2007-000042	R144, R146, R66~R68	R-CHIP	499 ohm, 1%, 1/10W, TP, 1608
2007-000043	R108~R111, R127, R128, R13, R130, R132, R136, R139, R14, R140, R142, R148, R150, R152, R159, R160, R166, R187, R188, R198, R2, R203~R206, R22, R26, R39, R4, R41~R45, R58, R61, R64, R69, R74	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R156, R208, R40	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R11, R12, R189, R190, R194, R196, R32, R33, R38, R49, R50, R53, R60, R63, R73, R78	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-001139	R79	R-CHIP	7.5 kohm, 1%, 1/10W, TP, 1608
2007-001164	R137, R180	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-002899	R199	R-CHIP	10 ohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-002987	R10, R106, R107, R112, R114~R124, R145, R149, R15, R165, R181~R186, R200~R202, R21, R25, R29, R30, R31, R34, R35~R37, R55, R59, R62, R71, R72, R76, R77, R8	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007049	R70, R75, R9	R-CHIP	22.1 kohm, 1%, 1/10W, TP, 1608
2007-007613	R138	R-CHIP	121 ohm, 1%, 1/10W, TP, 1608
2007-007645	R100~R105, R16, R161~R164, R17, R6, R7, R82~R99	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007737	R147	R-CHIP	43.2 ohm, 1%, 1/10W, TP, 1608
2007-008122	R131, R134, R141, R143, R151, R153, R154, R155, R157, R158, R18, R19, R191, R192, R197, R47, R5, R57	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2007-008150	R80, R81	R-CHIP	12.1 ohm, 1%, 1/10W, TP, 1608
2007-008166	R125, R126, R167, R168~R170, R174~R179	R-CHIP	182 ohm, 1%, 1/10W, TP, 1608
2011-000002	RA1, RA10, RA11, RA12, RA16~RA19, RA2, RA22~RA29, RA3, RA4	R-NET	22 ohm, 5%, 1/16W, L, CHIP, 8P, TP, 3216
2011-001278	RA13~RA15, RA20, RA21, RA5~RA9	R-NET	3.3 kohm, 5%, 1/16W, L, CHIP, 8P, TP

(Continued)

Parts Code	Location	Product Name	Specification
2203-000041	C199	C-CER, CHIP	0.01nF, 0.25PF, 50 V, C0G, TP, 1608
2203-000236	C171, C45, C46	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C14, C165~C167, C39, C42, C55, C56, C76, C77, C80~C82, C87~C90	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000426	C134~C137, C140, C154, C195, C86, C94	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-001408	C17, C18, C26, C31, C32, C34, C35, C67, C68	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-002099	C196	C-CER, CHIP	0.0068nF, 0.25PF, 50 V, C0G, TP, 1608
2203-005249	C100~C133, C138, C139, C141~C163, C168, C170, C175~C194, C198, C200~C202, C47, C66, C69~C79, C83~C85, C91, C93, C95~C99	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	CC169, C49, C50, C52, C53 C61~C65, C9	C-CER, CHIP	1nF, 10%, 2KV, X7R, TP, 4520
2203-005565	C129	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608
2402-000209	C37, C48 , C57 , C58	C-AL, SMD	22uF, 20%, 16 V, WT, TP, 5.3x5.3 mm, 1
2404-001037	C11, C12, C16, C164, C173, C174, C19~C21, C24, C25, C27, C29, C3, C30, C33, C36, C38, C41, C44, C6	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
2404-001051	C1, C2, C22, C4, C5, C7, C8	C-TA, CHIP	22uF, 10%, 10 V, GP, TP, 3528
2404-001289	C23, C28	C-TA, CHIP	47uF, 10%, 10 V, GP, TP, 3528

(Continued)

Parts Code	Location	Product Name	Specification
2601-001045	T4	TRANS-SMD, PULSE	200uH, 1.0O HM, 1CT:2CT/1CT:1CT, 12.7x9.4x5.08 mm, TP
2601-001056	T1~T3	TRANS-SMD, PULSE	350uH, -, 1:1, 1:1, 12.7x6.73x5.97 mm, TP
2801-003755	Y5	CRYSTAL-SMD	20 MHz, 30PPM, SMD, 20PF, 50 ohm, TP
2801-004058	Y1, Y3, Y4	CRYSTAL-SMD	25 MHz, 30PPM, SMD, 20PF, 50 ohm, TP
2804-001302	Y2	OSCILLATOR-CLOCK	66 MHz, 25 ppm, 10TTL, 15pF, TP, 3.3 V, 80 mA
3301-001120	L11, L12, L14, L16~L20, L23, L24, L3, L5	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3301-001308	L1, L2	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3301-001463	L22	BEAD-SMD	120 ohm, 1608, 200, TP, -, -, 0.5
3403-001104	S1	SWITCH-PUSH	28 V, 0.4A, 1P, MOMENTARY, D2.8(Plunger)
3701-001291	J3	CONNECTOR-DSUB	26P, 3R, FEMALE, ANGLE, AU30U
3703-001252	P1~P3, P7	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3704-000249	U16	SOCKET-IC	32P, PLCC, SN, 1.27 mm
3710-000001	JP1~JP4, JP6	CONNECTOR-SHUNT	2P, 1R, 2.54 mm, AUF
3710-001659	P4, P5	CONNECTOR-SOCKET	40P, 2R, 0.8 mm, SMD-S, AUF, NTR
3711-001465	JP1~JP4	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3711-002630	JP6	CONNECTOR-HEADER	NOWALL, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001399	J2	JACK-MODULAR	8P/8C, STANDARD, Y, ANGLE, N, BLK, AU15U
3722-001449	J1	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU50U
6203-001065	-	HEAT SINK	MKS-02422, T2.25, W40, L40, H22, ANODIZING-BLK, A6063S-T5
GA41-00142A	PCS.02	PCB-WIM	OFFICESERV SME, FR-4, 8L, 00, 1.6T, 130x275mm, -, -, -, -
GA92-02786A	-	PBA MAIN-VPN SECURITY	OFFICESERV SME, DOM/EXP, WORLD, VPN SECURITY, FR-4, 8L, -, 275*138, WIMD

(Continued)

Parts Code	Location	Product Name	Specification
0902-001734	U3	IC-NPU	7951, 33 MHz, -, TQFP, 144P, TR, PLASTIC, 3.3V, -, 0TO+70C, -, 32bit, -
1106-001228	U1	IC-SRAM	6R1016, 64Kx16bit, TSOP, 44P, 400MIL, 10 NS, 3.3 V, 10%, PLASTIC, 0TO+70C, 5 MA, CMOS, ST
2007-000043	R62, R68	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000070	R71	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-002901	R70	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608
2007-002913	R10~R45, R47~R58, R63~R65	R-CHIP	33.2 ohm, 1%, 1/10W, TP, 1608
2007-002987	R1	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-002987	R38, R46, R60, R61, R67, R69	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007454	R59	R-CHIP	332 ohm, 1%, 1/10W, TP, 1608
2007-007840	R2, R3, R30~R37, R4~R9	R-CHIP	825 ohm, 1%, 1/10W, TP, 1608
2203-000151	C20	C-CER, CHIP	1.5nF, 5%, 50 V, C0G, TP, 2012
2203-000257	C10~C18, C21~C30, C6, C7, C9	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-005249	C19, C5	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2404-001037	C1~C4, C8	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
3301-001308	L1, L2	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3711-004744	P1, P2	CONNECTOR-HEADER	BOX, 40P, 2R, 0.8 mm, SMD-S, AU30U, NTR
GA41-00146A	PCS.02	PCB-WIMD	OFFICESERV SME, FR-4, 6L, 00, 1.6T, 50x85 mm, -, -, -, -

6.5 MGI Board

Parts Code	Location	Product Name	Specification
GA92-02954A	-	-	-
0402-001207	D3~D5	DIODE-SCHOTTKY	UPS5819, 40 V, 1000 MA, DO-216AA, TP
0406-001070	D1, D2	DIODE-TVS	LC03-6, 6.8/-/-V, 750W, SO-8
0601-001064	LED1~LED8	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560NM, 3x2.5x1.5 mm
0801-000906	U35	IC-CMOS LOGIC	74HCT74, D FLIP-FLOP, SOP, 14, 150MIL, DUAL, TP, 4.5/5.5 V
0801-002295	U29	IC-CMOS LOGIC	74HCT259, 8bit LATCH, SOP, 16P, 39
0801-002381	U7	IC-CMOS LOGIC	74LCX138, DECODER/DEMULTIPLEXE, SOP, 16, 150MIL, SINGLE, TP, 2.0/3.6 V
0801-002403	U10	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002446	U27	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0801-002462	U31, U32	IC-CMOS LOGIC	7SZ125, GATE BUFFER, SOT-23, 5P, 63MIL, SINGLE, TP, 3-STATE, 5 V, 5 V, -40to+85C, -, 5 V, -, -, -
0802-001029	U2~U4, U11~U13	IC-BICMOS LOGIC	74LVTH16245, TRANSCEIVER, TSSOP, 48, 240 MIL, DUAL, TP, 2.7/3.6 V
0802-001099	U26, U28, U36, U38	IC-BICMOS LOGIC	74LVTH125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 2.7/3.6 V
0903-001151	U6	IC-MICROCONTROLLER	S3C4510, 32bit, QFP, 208P, 28x28 mm, 50MHz, TR, CMOS, PLASTIC, 3.3 V, -, 0TO+70C, 8 KB, -, 22bit
1006-001140	U8	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1105-001103	U1, U9	IC-DRAM	4S641632, 1Mx16x4bit, TSOP, 54P, 400MIL, 10NS, 3.3 V, 10%, PLASTIC, 0TO+70C, 30MA, CMOS, TR
1106-001354	U16, U25	IC-SRAM	6x4008, 512Kx8bit, TSOP2, 32P, 400MIL, 70NS, 3.3 V, 10%, PLASTIC, 0TO+70C, 15UA, CMOS, ST
1107-001367	U21~U23	IC-FLASH MEMORY	29LV160, 2Mx8/1Mx16, TSOP, 48P, 18.4x12 mm, 2.7/3.6 V, -40to+85 C
1107-001534	U19	IC-FLASH MEMORY	39VF040, 512K×8bit, PLCC, 32P, 13.97x11.43 mm, 70NS, 2.7/3.6 V, 15UA, -, 0TO+70C, 15UA, -, TP
1109-000126	U17, U18	IC-FIFO	7201, 512x9 bit, PLCC, 32P, 13.9x11.4 mm, 50NS, 5 V, 0.1, PLASTIC, 0TO+70C, 5 MA, CMOS, TR

(Continued)

Parts Code	Location	Product Name	Specification
1203-001227	U34	IC-RESET	DS1233D, SOT-223, 4P, 6.3x3.3 mm, PLASTIC, -, -, -40TO+85C, 8 MA, -, TP
1203-001643	U15	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1203-002267	U30	IC-POSI.FIXED REG.	-, TO-263-5, 5P, 400MIL, PLASTIC, 1.782/1.818 V, 3W, -40TO+125C, 1.5A, -, TP
1205-001864	U5	IC-TRANSCEIVER	DJLXT972ALC, LQFP, 64P, 393MIL, PLASTIC, 4 V, -, 0TO+70C, TR, -
1301-001473	U24	IC-CPLD	3064, TQFP, 100P, 16x16 mm, 10nS, 3.3, 10%
2007-000043	R183~R185, R200, R337, R356~R359, R364	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R10, R100~R108, R11, R119~R155, R160, R162~R168, R17, R171, R188, R189~R199, R208, R209, R21, R210, R211, R216~R219, R231, R237, R238, R239, R24, R240, R241~R246, R248, R25, R251, R253~R255, R262, R263, R280, R281, R302~R307, R313~R315, R321~R323, R328, R330, R333, R335, R336, R340, R350, R352, R353, R360, R361~R363, R372, R387,	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000052	R42~R49, R5, R50~R54, R6, R60~R69, R71, R74, R76, R77, R8, R80, R81, R88, R9, R94~R99	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R179~R182, R329, R331, R332, R339, R341, R345, R354, R370, R384, R385, R386	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R178, R258, R261, R347~R349, R367, R368, R369, R78, R86	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-001164	R205, R228	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-002987	R159, R215, R221~R224, R232, R247, R264, R317~R320, R324~R326, R327, R351	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007049	R212	R-CHIP	22.1 kohm, 1%, 1/10W, TP, 1608
2007-007226	R1~R3, R14, R16, R33~R35, R355	R-CHIP	49.9 ohm, 1%, 1/10W, TP, 1608
2007-007454	R161, R176, R177, R186, R187, R20, R201~R204, R22, R220, R229, R23, R230, R46	R-CHIP	332 ohm, 1%, 1/10W, TP, 1608
2007-007645	R114	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-007645	R115~R118, R12, R13, R28, R29, R30, R308, R309, R31, R310, R311, R312, R32, R365, R374, R388~R392, R83~R85, R87	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-008122	R109~R113, R156~R158, R172~R175, R18, R207, R213, R214, R226, R227, R233~R236, R249, R250, R252, R256, R26, R265~R269, R27, R270~R279, R282~R301, R334, R338, R342~R344, R37~R39, R394, R4, R40, R41, R55~R59, R7, R70, R72, R73, R75, R82, R89~R93	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2007-008166	R225	R-CHIP	182 ohm, 1%, 1/10W, TP, 1608
2203-000236	C95	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C11, C45	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000405	C128~C130	C-CER, CHIP	0.18nF, 5%, 50 V, C0G, TP, 1608
2203-000426	C170	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000998	C115, C118~C120, C150	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-001408	C1, C12, C124, C125	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-002099	C69	C-CER, CHIP	0.0068nF, 0.25PF, 50V, C0G, TP, 1608
2203-003027	C4	C-CER, CHIP	0.82nF, 5%, 50 V, NP0, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2203-005249	C10, C100~C106, C108~C117, C121~C123, C132~C139, C14, C140, C146~C148, C151, C16, C160, C17, C18, C19, C2, C20~C37, C42, C43, C46~C49, C5, C50~C59, C6, C60~C67, C7, C70~C79, C8, C80~C89, C9, C90~C99	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C131, C28	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2404-001037	C126, C127, C13, C15, C3, C44	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
2404-001096	C40, C41	C-TA, CHIP	33uF, 10%, 16 V, GP, TP, 6032, -
2409-001034	C39	C-EDL	1300000uF, 5.5 V, -, -, BK, 21x7.5 mm, 5
2601-001056	T1	TRANS-SMD, PULSE	350uH, -, 1:1, 1:1, 12.7x6.73x5.97 mm, TP
2804-001245	Y3	OSCILLATOR-CLOCK	10 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 80 mA
2804-001247	Y1	OSCILLATOR-CLOCK	25 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 80 mA
2804-001499	Y2	OSCILLATOR-CLOCK	20 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
3301-001120	L10, L12	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3301-001308	L11, L13, L14, L2, L3, L6, L7, L8	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3403-001104	S1	SWITCH-PUSH	28 V, 0.4A, 1P, MOMENTARY, D2.8(Plunger)
3408-000230	S2	SWITCH-SLIDE	30 V DC, 200 mA, DPDT, -, ANGLE SHAPE
3703-001252	P2, P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3704-000249	U19	SOCKET-IC	32P, PLCC, SN, 1.27 mm
3710-000001	J1, J2	CONNECTOR-SHUNT	2P, 1R, 2.54 mm, AUF
3710-001659	P9~P12, P4~P7	CONNECTOR-SOCKET	40P, 2R, 0.8 mm, SMD-S, AUF, NTR

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Parts Code	Location	Product Name	Specification
3711-001465	J1	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3711-002630	P13, P8	CONNECTOR-HEADER	NOWALL, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3711-002633	J2	CONNECTOR-HEADER	NOWALL, 2P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001050	P1	JACK-MODULAR	8P/8C, STANDARD, Y, ANGLE, N, BLK, AU50U
GA41-00134A	PCS.03	PCB-MGI	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.6 8TRK Board

Parts Code	Location	Product Name	Specification
GA92-02856A	-	-	-
0401-001099	D10~D38, D7, D8, D9	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001207	D5, D6	DIODE-SCHOTTKY	UPS5819, 40 V, 1000 MA, DO-216AA, TP
0403-000549	ZD17~ZD32	DIODE-ZENER	RLZJ24B, 23.61-24.92 V, 500 MW, LL-34, TP
0403-001416	ZD1, ZD10~ZD16, ZD2~ZD9	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500 MW, SOD-123, TP
0501-000477	Q1~Q16	TR-SMALL SIGNAL	MMBT5550, NPN, 300 MW, SOT-23, TP, 20-250
0601-001064	LED1~LED8	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560 nm, 3x2.5x1.5 mm
0604-001002	PC1~PC8	PHOTO-COUPLER	TR, 100-600%, 200 mW, SOP-4, TP
0802-000111	U18, U39	IC-CMOS LOGIC	74FCT245, BUS TRANSCEIVER, SOP, 20P, 12.8x7.5 mm, OCTAL, ST, 0to+70C
0802-001084	U34, U35	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5V
1205-000394	U7~U14	IC-CODEC FILTER	TP3057WM, SOP, 16P, -, PLASTIC, 5.2
2003-002007	R101~R108	R-METAL OXIDE(S)	4.7 kohm, 5%, 2W, AF, TP, 3.9x10 mm
2007-000043	R100, R85~R99	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R109~R116	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R82	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000063	R117~R124	R-CHIP	150 kohm, 1%, 1/10W, TP, 1608
2007-000070	R8~R15	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R133, R134, R32, R34~R53, R74~R81	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000475	R84	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-007277	R125~R132	R-CHIP	392 ohm, 1%, 1/10W, TP, 1608
2007-007547	R135~R145	R-CHIP	2.43 kohm, 1%, 1/10W, TP, 1608
2201-000545	C72~C87	C-CERAMIC, DISC	4.7nF, 20%, 400 V, Y5U, -, 16x7 mm, 7.5
2203-000236	C38	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C40~C42, C45	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000815	C91	C-CER, CHIP	0.033nF, 5%, 50 V, C0G, 1608
2203-005249	C21~C37, C68, C88, C89	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -

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Parts Code	Location	Product Name	Specification
2305-001053	C64~C67, C69~C71, C90	C-FILM, LEAD-PEF	2200nF, 10%, 250 V, TP, 18x8.5x14.5
2402-000120	C18, C20, C48~C55	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4 mm
2402-000170	C1, C10~C17, C2, C3, C4, C56~C59, C6, C60~C63, C7, C8, C9	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
3501-001035	K1~K16	RELAY-MINIATURE	5VDC, 140 MW, 2000 MA, 2FORMC, 4 MS, 4 MS
3703-001252	P1, P2	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3704-001001	HYB9~HYB16	SOCKET-IC	8P, SIP, SN, 2.54 mm
3722-002045	J1	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
4715-000127	DSS1~DSS9, DSS10~DSS19, DSS20~DSS24	SURGE ABSORBER	300 V, 15%, 500A, -, -
EC27-30514A	L1	COIL RF	INFOREX, 35uH, -, 40T
GA13-00002A	HYB1~HYB8	IC HYBRID-KP CTR	KP-CTR, DCS, 8P, 48 V, -10to+70C, SIP, BK, -, -, -
GA13-00004A	U5, U6	IC ASIC-TMC	STL7053E, IDCS500 PREMIUM, 60 PIN, 5 V, -, QFP, TR, -, -, -
GA13-10567A	HYB17~HYB20	IC HYBRID	TARGET, KP0053SA, SIP, 16P, -
GA26-50068A	T1~T8	TRANS MATCHING-DCS	MATCHING TRANS, 2000 VAC, 600/600
GA41-00137A	PCS.02	PCB-8TRK	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.7 LIM Board

Parts Code	Location	Product Name	Specification
GA92-02777A	-	-	-
0401-001099	D1	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0601-000005	LED1~LED3	LED	SMD, GRN, 3x2 mm, 570 NM, 3x2 mm
0801-000862	U9	IC-BICMOS LOGIC	74LVT126, BUFFER, SOP, 14P, 8.7x4 mm, QUAD, ST, -40to+85C
0801-002095	U17	IC-CMOS LOGIC	74LCX245, TRANSCEIVER, TSSOP, 20, 173MIL, OCTAL, TP, 2.0/3.6 V
0801-002446	U13	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0801-002643	U3	IC-CMOS LOGIC	74LCX139, DECODER/DEMUX, SOP, 16, 150MIL, QUAD, TP, 2.0/3.6 V
0802-001037	U1, U12, U18, U2, U7, U8	IC-BICMOS LOGIC	74LVT245, BUS TRANSCEIVER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V
1203-002681	U16, U5, U6	IC-POSI.FIXED REG.	LP3962, SOT-223, 5P, -, PLASTIC, 2.475/2.525 V, -, -40TO+125 C, 1.5A, -, TP
1205-001864	U15	IC-TRANSCEIVER	DJLXT972ALC, LQFP, 64P, 393MIL, PLASTIC, 4 V, -, 0TO+70C, TR, -
1205-002452	U11	IC-ETHERNET SWITCH	VT6526CF, LQFP, 208P, 28x28 mm, PLASTIC, 5.5 V, 2.8W, 0TO+70C, TR, IC-ETHERNET SWITCH
1205-002455	U14, U4	IC-TRANSCEIVER	VT6108, PQFP, 208P, 28x28 mm, PLASTIC, 3.45 V, 1.8W, 0TO+70C, TR, 8 PORT TRANSCEIVER
2007-000043	R147, R162, R163, R173, R192, R195, R24, R34, R37, R44, R57, R63, R75	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000045	R179, R180	R-CHIP	3.32 kohm, 1%, 1/10W, TP, 1608
2007-000052	R186~R191, R66, R76, R92	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R47, R56, R86	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-001164	R10, R101~R103, R109, R11, R110, R111, R119, R12, R120, R121, R127~R129,	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-001164	R139~R141, R152~R154, R165~R167, R174~R176, R18~R20, R28, R29, R3, R30, R4, R41~R43, R5, R50~R52, R67~R69, R83~R85	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-001164	R85	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-002916	R58	R-CHIP	475 kohm, 1%, 1/10W, TP, 1608
2007-002987	R114, R115, R137, R138, R151, R164, R182, R183, R193, R194, R21, R27, R62, R73, R90, R91	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007049	R157	R-CHIP	22.1 kohm, 1%, 1/10W, TP, 1608
2007-007443	R158, R61	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007645	R1, R104, R105, R107, R108, R112, R113, R117, R118, R122, R123, R125, R126, R13, R130, R131, R135, R136, R14, R142~R146, R155, R156, R159, R16, R160,R161, R168, R169, R17, R171, R172, R177, R178, R2, R22, R23, R25, R26, R31, R32, R39, R40, R45, R46, R48, R49, R54, R55, R6 ,R64, R65, R7, R71, R72 ,R8, R81, R82, R87, R88, R9, R93, R94	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007796	R36, R38	R-CHIP	2.21 kohm, 1%, 1/10W, TP, 1608
2007-008122	R116, R124, R148, R149 , R15 , R150 , R184 , R185 , R35 , R60 , R70 , R74 , R80 , R89	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2007-008166	R132~R134	R-CHIP	182 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2011-000002	RA1, RA11, RA12, RA15, RA18, RA19, RA4~RA8	R-NET	22 ohm, 5%, 1/16W, L, CHIP, 8P, TP, 3216
2011-001238	RA10, RA13, RA14, RA16, RA17, RA2, RA3, RA9	R-NET	330 ohm, 5%, 1/8W, L, CHIP, 8P, TP
2203-000041	C130, C131	C-CER, CHIP	0.01nF, 0.25PF, 50 V, C0G, TP, 1608
2203-000236	C216~C218	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C147	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000426	C167, C168	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000815	C100, C81	C-CER, CHIP	0.033nF, 5%, 50 V, C0G, TP, 1608
2203-001408	C141, C152	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-005249	C1, C10, C101~C128, C13, C132, C133, C135~C138, C14, C140~C144, C148, C149, C15, C150, C151, C153~C155, C157, C16, C161, C163, C164, C166, C169, C17, C170, C172, C174, C175, C18, C182, C2, C20, C219, C22, C220, C25, C26, C27, C29, C3, C30, C31~C34, C37~C39, C4, C40, C42~C49, C5, C50~C60, C62~C65, C68, C69, C7, C71, C72, C74~C79, C8, C80, C82~C89, C9, C90, C92~C97	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C11, C114, C121, C139, C145, C146, C156, C158, C171 , C19, C28, C41, C47, C6, C61, C77, C91, C98	C-CER, CHIP	1nF, 10%, 2KV, X7R, TP, 4520
2203-005565	C183~C214	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2402-000120	C127, C129, C160 , C162, C165, C70, C73	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4 mm
2402-000170	C66	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
2402-001082	C124, C134, C176~C178, C23, C24, C35, C36	C-AL, SMD	33uF, 20%, 50 V, GP, TP, 8.3x8.3x6.3
2601-001056	T5	TRANS-SMD, PULSE	350uH, -, 1:1, 1:1, 12.7x6.73x5.97 mm, TP
2601-001111	T1~T4	TRANS-SMD, PULSE	350uH, 0.9 ohm, 1CT:1CT, 28.58x16.00x5.84 mm, TP
2801-004058	Y1, Y2	CRYSTAL-SMD	25 MHz, 30PPM, SMD, 20PF, 50 ohm, TP
3301-001120	L1, L10~L14, L16, L17, L2~L9	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3404-001008	S1	SWITCH-TACT	15V, 50 MA, 160GF, 6x6x5 mm, SPST
3703-001252	P1, P2, P3, P7	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3711-005026	P8, P9	CONNECTOR-HEADER	BOX, 100P, 2R, 0.8 mm, SMD-S, AUF, NTR
6203-001062	-	HEAT SINK	HS2727B, T2.6, W27, L27, H4.8, ANODIZING-BLK, A6063S-T5
EC70-00091A	-	IPR-MEDIA DBD SPACER	SMG-3200, SECC, -, T1.0, W11, PASS, L11, -, -
GA41-00141A	PCS.03	PCB-LIM	OFFICESERV SME, FR-4, 6L, 00, 1.6T, 130x275 mm, -, -, -, -
GA92-02788A	-	-	-
3710-001756	P4, P5	CONNECTOR-SOCKET	100P, 2R, 0.8 mm, SMD-S, AUF, NTR
3722-002054	J1	JACK-MODULAR	8P/8C, STANDARD/INVERTED, Y, ANGLE-F, -, GRN, BLK, AU50U
GA41-00147A	PCS.03	PCB-LIMD	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x45 mm, -, -, -, -

6.8 16DLI2 Board

Parts Code	Location	Product Name	Specification
GA92-02944A	-	-	-
0401-001099	D33, D35	DIODE-SWITCHING	1N4148WS, 75V, 150 mA, SOD-323, TP
0402-001211	D34	DIODE-RECTIFIER	MURS320, 200 V, 3A, MSR, TP
0403-001416	ZD1, ZD10~ZD19, ZD2, ZD20~ZD29, ZD3, ZD30~ZD32, ZD4~ZD9	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500MW, SOD-123, TP
0501-000476	Q2	TR-SMALL SIGNAL	KST5401TA, PNP, 350 MW, SOT-23, TP, 60-240
0501-000477	Q1	TR-SMALL SIGNAL	MMBT5550, NPN, 300 MW, SOT-23, TP, 20-250
0505-001769	Q3	FET-SILICON	FQU12N20, N, 200V, 9.0A, 0.28 ohm, 55W, TO-251
0801-000379	U7	IC-CMOS LOGIC	74HC00, NAND GATE, SOP, 14, 150MIL, QUAD, TP, 2.0/6.0 V
0801-000841	U6	IC-CMOS LOGIC	74ACT14, INVERTER, SOP, 14, 150MIL, HEX, ST, 4.5/5.5 V
0801-001071	U12	IC-CMOS LOGIC	74ACT08, AND GATE, SOP, 14, 150MIL, QUAD, TP, 4.5/5.5 V
0801-001073	U13	IC-CMOS LOGIC	74ACT74, D FLIP-FLOP, SOP, 14, 150MIL, DUAL, TP, 4.5/5.5 V
0801-002215	U8	IC-CMOS LOGIC	74FCT138, 1-OF-8 DECODER, SOP, 16, 300MIL, SINGLE, TP, 4.5/5.5 V
0802-000111	U9~U11	IC-CMOS LOGIC	74FCT245, BUS TRANSCEIVER, SOP, 20P, 12.8x7.5 mm, OCTAL, ST, 0to+70C
0802-001084	U3, U22	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
1404-000126	P28~P43	THERMISTOR-PTC	4.85 ohm, -, -, 60V, 5 mm
1405-000171	V10~V57, V9	VARISTOR	82 V, 1200A, 9x6 mm, TP
2005-001199	R1125	R-WIRE WOUND(S), NON	0.8 ohm, 1%, 3W, AA, TP, 6x16 mm
2007-000052	R1119, R960~R977	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R1027, R1028, R1030~R1032	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R1067	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-000070	R1036, R1037, R1087~R1118	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R1000, R1001, R1060, R1061, R978~R999	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000475	R1062	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-002987	R1018~R1025	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007443	R1063	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007645	R1038~R1070, R1121~R1124, R939~R948, R952~R959	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007796	R1033~R1035	R-CHIP	2.21 kohm, 1%, 1/10W, TP, 1608
2007-008091	R1066	R-CHIP	4.32 kohm, 1%, 1/10W, TP, 1608
2203-000236	C93, C106	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C102	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000626	C100, C101	C-CER, CHIP	0.022nF, 5%, 50 V, C0G, TP, 1608
2203-000815	C112~C119	C-CER, CHIP	0.033nF, 5%, 50 V, C0G, TP, 1608
2203-000998	C42~C44, C98, C99	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-005144	C45, C46, C48, C49, C51, C52, C54, C55, C57, C58, C60, C61, C63, C64, C66, C67, C69, C70, C72, C73, C75, C76, C78, C79, C81, C82, C84, C85, C87, C88, C90, C91	C-CER, CHIP	1000nF, 10%, 10 V, X7R, TP, 2012
2203-005218	C9~C23	C-CER, CHIP	470nF, 10%, 50 V, X7R, TP, 3216, -
2203-005249	C24~C30, C33~C41, C47, C50, C53, C56, C59, C62, C65, C68, C71, C74, C77, C80, C83, C86, C89, C92, C94, C96, C97	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C107, C108	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2203-005565	C111	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608

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Parts Code	Location	Product Name	Specification
2402-000120	C1~C5	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4 mm
2402-000170	C7	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
2402-001083	C6	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
3301-001463	L2~L5	BEAD-SMD	120 ohm, 1608, 200, TP, -, -, 0.5
3703-001252	P26, P27, P44	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3722-001302	J1	JACK-MODULAR	8P/16PORT, -, AU50U, BLK, NO
EN13-10502A	U16~U19, U1, U2	IC ASIC	DECT, TP3404, PLCC, 28P, -
GA26-10053A	T1, T10~T16, T2~T9	TRANS PULSE	DGP 360, 144//72.5/72T, 5mH
GA27-30057A	L1	COIL RF	PRO-56EX/120MX, 72uH, -, -
GA41-00186A	PCS.01	PCB	OFFICESERV 7200, FR4, 4L, -, 1.6 T, 130x275 mm, -, -, -, -

6.9 16SLI Board

Parts Code	Location	Product Name	Specification
GA92-02928A	-	-	-
0401-001099	D109	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0401-001134	D101, D102, D151, D152, D201, D202, D251, D252, D301, D302, D351, D352, D401, D402, D451, D452, D501, D502, D551, D552, D601, D602, D651, D652, D701, D702, D751, D752, D801, D802, D851, D852	DIODE-SWITCHING	BAV23C, 250 V, 400 MA, SOT-23, TP
0402-000197	D4	DIODE-RECTIFIER	D1FL40-4063, 400 V, 0.6A, 1F, TP
0402-000309	D1, D2	DIODE-RECTIFIER	1SR154-400, 400 V, 1A, SOD-106, TP
0402-001216	D3, D5-D9	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0403-000283	ZD8-ZD12	DIODE-ZENER	MMBZ5234B, 5.78-6.44 V, 225MW, SOT-23, TP
0403-001396	Z13, Z14	DIODE-ZENER	MMSZ5263B, 5%, 500MW, SOD-123, TP
0505-001477	Q3, Q4	FET-SILICON	SFR9220, P, 200 V, 3.1A, 1.5 ohm, 30W, D-PAK
0505-001478	Q1, Q2, Q5	FET-SILICON	FQU5N40, N, 400 V, 3.4A, 1.6 ohm, 45W, I-PAK
0604-001002	PC1-PC3	PHOTO-COUPLER	TR, 100-600%, 200 mW, SOP-4, TP
0801-002127	U1, U7, U10	IC-CMOS LOGIC	74FCT16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, ST, 4.5/5.5 V
0801-002171	U852	IC-CMOS LOGIC	74LCX125, BUS BUFFER, SOP, 14, 150MIL, QUAD, TP, 2.0/3.6 V
0801-002403	U6	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002446	U9, U11	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
1203-000302	U8	IC-PWM CONTROLLER	3842B, SOP, 14P, 150MIL, PLASTIC, 3
1203-001213	U12	IC-VOL. REFERANCE	431A, SOP, 8P, 150MIL, PLASTIC, 37 V

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Parts Code	Location	Product Name	Specification
1205-002314	U100, U150, U200, U250, U300, U350, U400, U450, U500, U550, U600, U650, U700, U750, U800, U850	IC-SLIC	LE7955-2FQC, QFN, 32P, 8x8 mm, PLASTIC, 5 V, 860MW, 0TO+70C, TR
1205-002345	U2-U5	IC-SLIC	LE58QL021BVC, TQFP, 44P, 10x10 mm, PLASTIC, 3.3 V, 170MW, -40TO+85C, TR, QLSLAC
1301-001680	U13	IC-CPLD	LC4064V-75T100C, TQFP, 100P, 16x16 mm, 7.5NS, 3.3 V, 10%, 12MA, 0TO+90C, -, 64, 64, 4, -, -0.5/5
1405-000125	V1	VARISTOR	220 V, 4500A, 17x4.2 mm, TP
1405-000130	V101, V151, V201, V251, V301, V351, V401, V451, V501, V551, V601, V651, V701, V751, V801, V851	VARISTOR	270 V, 1200A, 9x4.6 mm, TP
1405-000171	V100, V150, V200, V250, V300, V350, V400, V450, V500, V550, V600, V650, V700, V750, V800, V850	VARISTOR	82 V, 1200A, 9x6 mm, TP
2003-000147	R3, R8, R14	R-METAL OXIDE	100 ohm, 5%, 2W, AA, TP, 6x16 mm
2007-000043	R26-R28, R35, R43, R46	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R1095-R1097, R1134, R220, R221, R270, R271, R320, R321, R370, R371, R24, R36-R38, R40, R44, R45, R47-R50, R53, R420, R421, R470, R471, R520, R521, R570, R571, R54, R57, R67, R120, R121, R131, R170, R171, R620, R621, R670, R671, R720, R721, R770, R771, R820, R821, R870, R871, R1080-R1084, R1086	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000060	R5, R6, R9, R11, R15-R18, R20, R23, R34	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R10, R19, R21, R22	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608
2007-000070	R100, R150, R200, R250, R300, R350, R400, R450, R500, R550, R600, R650, R700, R750, R800, R850	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000231	R108, R158, R208, R258, R308, R358, R408, R458, R508, R558, R608, R658, R708, R758, R808, R858	R-CHIP	1.3kohm, 1%, 1/10W, TP, 1608
2007-000497	R104, R113, R154, R163, R204, R213, R254, R263, R304, R313, R354, R363, R404, R413, R454, R463, R504, R513, R554, R563, R604, R613, R654, R663, R704, R713, R754, R763, R804, R813, R854, R863	R-CHIP	2.2 Mohm, 1%, 1/10W, TP, 1608
2007-000954	R107, R112, R157, R162, R207, R212, R257, R262, R307, R312, R357, R362, R407, R412, R457, R462, R507, R512, R557, R562, R607, R612, R657, R662, R707, R712, R757, R762, R807, R812, R857, R862	R-CHIP	49.9 ohm, 1%, 1W, TP, 6432
2007-001139	R25	R-CHIP	7.5 kohm, 1%, 1/10W, TP, 1608
2007-001342	R103, R109, R153, R159, R203, R209, R253, R259, R303, R309, R353, R359, R403, R409, R453, R459, R503, R509, R553, R559, R603,	R-CHIP	2 Mohm, 5%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-001342	R609, R653, R659, R703, R709, R753, R759, R803, R809, R853, R859	R-CHIP	2 Mohm, 5%, 1/10W, TP, 1608
2007-002901	R39	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608
2007-002910	R12, R31, R32, R105, R155, R205, R255, R305, R355, R405, R455, R505, R555, R605, R655, R705, R755, R805, R855	R-CHIP	30.1 kohm, 1%, 1/10W, TP, 1608
2007-002987	R1087-R1094	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007331	R117, R167, R217, R267, R317, R367, R417, R467, R517, R567, R617, R667, R717, R767, R817, R867	R-CHIP	90.9 kohm, 1%, 1/10W, TP, 1608
2007-007443	R13, R33	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007519	R110, R114, R160, R164, R210, R214, R260, R264, R310, R314, R360, R364, R410, R414, R460, R464, R510, R514, R560, R564, R610, R614, R660, R664, R710, R714, R760, R764, R810, R814, R860, R864	R-CHIP	80.6 kohm, 1%, 1/10W, TP, 1608
2007-007645	R1136, R1137, R41, R42, R93~R97, R126~R130, R1106~R1133	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007768	R115, R116, R165, R166, R215, R216, R265, R266 , R315, R316, R365, R366, R415, R416, R465, R466, R515, R516, R565, R566, R615, R616, R665, R666, R715, R716, R765, R766, R815, R816, R865, R866	R-CHIP	13 kohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-008122	R51, R52, R55, R56, R1085, R1135	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2007-008150	R1098-R1105	R-CHIP	12.1 ohm, 1%, 1/10W, TP, 1608
2007-008681	R101, R106, R111, R151, R156, R161, R201, R206, R211, R251, R256, R261, R301, R306, R311, R351, R356, R361, R401, R406, R411, R451, R456, R461, R501, R506, R511, R551, R556, R561, R601, R606, R611, R651, R656, R661, R701, R706, R711, R751, R756, R761, R801, R806, R811, R851, R856, R861	R-CHIP	1.2 KOHM, 5%, 1W, TP, 6432
2203-000426	C277, C278, C283	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000576	C110, C160, C210, C260, C310, C360, C410, C460, C510, C560, C610, C660, C710, C760, C810, C860	C-CER, CHIP	220nF, 10%, 50 V, X7R, 3216
2203-000888	C15, C19	C-CER, CHIP	4.7nF, 10%, 50 V, X7R, TP, 1608
2203-001386	C102, C104, C105, C111, C114, C115, C152, C154, C155, C161, C164, C165, C202, C204, C205, C211, C214, C215, C252, C254, C255, C261, C264, C265, C302, C304, C305, C311, C314, C315, C352, C354, C355, C361, C364, C365, C402, C404, C405, C411, C414, C415, C452, C454, C455, C461, C464, C465, C502, C504, C505, C511, C514, C515,	C-CER, CHIP	100nF, 10%, 100 V, X7R, TP, 3216, 3.2

(Continued)

Parts Code	Location	Product Name	Specification
2203-001386	C552, C554, C555, C561, C564, C565, C602, C604, C605, C611, C614, C615, C652, C654, C655, C661, C664, C665, C702, C704, C705, C711, C714, C715, C752, C754, C755, C761, C764, C765, C802, C804, C805, C811, C814, C815, C852, C854, C855, C861, C864, C865	C-CER, CHIP	100nF, 10%, 100 V, X7R, TP, 3216, 3.2
2203-001656	C16	C-CER, CHIP	0.47nF, 5%, 50 V, NP0, TP, 1608
2203-001697	C113, C163, C213, C263, C313, C363, C413, C463, C513, C563, C613, C663, C713, C763, C813, C863	C-CER, CHIP	0.082nF, 5%, 50 V, NP0, 1608
2203-002080	C112, C162, C212, C262, C312, C362, C412, C462, C512, C562, C612, C662, C712, C762, C812, C862	C-CER, CHIP	0.56nF, 5%, 50 V, C0G, TP, 1608
2203-005221	C101, C109, C151, C159, C201, C209, C251, C259, C301, C309, C351, C359, C401, C409, C451, C459, C501, C509, C551, C559, C601, C609, C651, C659, C701, C709, C751, C759, C801, C809, C851, C859	C-CER, CHIP	15nF, 10%, 50 V, X7R, TP, 1608, -
2203-005249	C203, 208, C216, 253, C258, C266, C303, C308, C3, C6~C14, C18, C23, C26~C29, C33, C37, C38, C316, C353, C358, C366, C403, C408, C416,	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -

(Continued)

Parts Code	Location	Product Name	Specification
2203-005249	C453, C41, C42, C103, C108, C116, C153, C158, C166, C458, C466, C503, C508, C516, C553, C558, C566, C603, C608, C616, C653, C658, C666, C703, C708, C716, C753, C758, C766, C803, C808, C816, C853, C858, C866, C868~C880	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C275, C276, C881	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2203-005687	C106, C107, C156, C157, C206, C207, C256, C257, C306, C307, C356, C357, C406, C407, C456, C457, C506, C507, C556, C557, C606, C607, C656, C657, C706, C707, C756, C757, C806, C807, C856, C857	C-CER, CHIP	2.2nF, 10%, 500 V, X7R, TP, 3216
2203-006115	C100, C117, C150, C167, C200, C217, C250, C267, C300, C317, C350, C367, C400, C417, C450, C467, C500, C517, C550, C567, C600, C617, C650, C667, C700, C717, C750, C767, C800, C817, C850, C867	C-CER, CHIP	470nF, 20%, 250 V, X7R, TP, 4532
2305-000385	C2	C-FILM, LEAD-PEF	470nF, 10%, 250 V, BK, 18x6x12, 15
2401-000625	C4, C5	C-AL	2.2uF, 20%, 160 V, GP, TP, 6.3x11, 5
2401-003291	C1	C-AL	22uF, 20%, 200 V, WT, TP, 10x16, 5
2401-003298	C21, C24	C-AL	100uF, 20%, 63 V, GP, TP, 8x11.5, 5
2402-000120	C274	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4 mm
2402-001083	C17, C882	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10

(Continued)

Parts Code	Location	Product Name	Specification
2702-001112	L5	INDUCTOR-RADIAL	60uH, 35%, 7.5x8.0 mm
2703-002639	L100, L150, L200, L250, L300, L350, L400, L450, L500, L550, L600, L650, L700, L750, L800, L850	INDUCTOR-SMD	1000uH, 20%, 5.2x5.2x1.8 mm
2901-000188	B1, B2	FILTER-EMI ON BOARD	50V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP
3301-001308	L2-L4, L6, L7	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3501-001258	K100, K250, K105, K150, K400, K200, K300, K550, K350, K450, K700, K500, K600, K850, K650, K750	RELAY-MINIATURE	5 V, 100 MW, 1000 MA, 2FORMC, 3 MS, 3 MS
3501-001258	K800	RELAY-MINIATURE	5 V, 100 MW, 1000 MA, 2FORMC, 3 MS, 3 MS
3703-001252	P1-P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3710-000001	JP1	CONNECTOR-SHUNT	2P, 1R, 2.54 mm, AUF
3711-001465	JP1	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3711-003272	P4	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001302	P5	JACK-MODULAR	8P, -, -, ANGLE, -, BLK, AU50U
EC27-30514A	L1	COIL RF	INFOREX, 35uH, -, 40T
GA26-30073A	T1	TRANS POWER	DCS, -48 V//13 V/85 V, 877 uH//100 uH
GA41-00177A	PCS.01	PCB MAIN-OS7200 16SLI2	OFFICESERV 7200, FR4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.10 8COMBO Board

Parts Code	Location	Product Name	Specification
GA92-02984A	-	-	-
0401-001099	D10~D22, D44, D7~D9	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001049	D26	DIODE-RECTIFIER	MURS160, 600 V, 1A, DO-214AA (SMB), TP
0402-001211	D45	DIODE-RECTIFIER	MURS320, 200 V, 3A, MSR, TP
0402-001216	D24, D25, D27, D3, D4, D5	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0403-000283	D1, D2, D23, D6	DIODE-ZENER	MMBZ5234B, 5.78-6.44 V, 225MW, SOT-23, TP
0403-001396	ZD1, ZD2	DIODE-ZENER	MMSZ5263B, 5%, 500MW, SOD-123, TP
0403-001416	ZD10~D29, ZD3, ZD30~ZD34, ZD4~ZD9	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500MW, SOD-123, TP
0501-000476	Q45~Q52, Q62	TR-SMALL SIGNAL	KST5401TA, PNP, 350MW, SOT-23, TP, 60-240
0501-000477	Q10~Q19, Q36~Q39, Q4, Q40~Q43, Q5, Q53~Q59, Q6, Q60, Q63, Q7~Q9	TR-SMALL SIGNAL	MMBT5550, NPN, 300MW, SOT-23, TP, 20-250
0502-001066	Q20~Q27	TR-POWER	PZTA42, NPN, 1000 mW, SOT-223, TP, 25-
0502-001067	Q28~Q35	TR-POWER	FZT957, PNP, 3W, SOT-223, TP, 100-3
0505-001477	Q3, Q44	FET-SILICON	SFR9220, P, 200V, 3.1A, 1.5 ohm, 30W, D-PAK
0505-001478	Q1, Q2, Q61	FET-SILICON	FQU5N40, N, 400V, 3.4A, 1.6 ohm, 45W, I-PAK
0505-001769	Q64	FET-SILICON	FQU12N20, N, 200 V, 9.0A, 0.28OHM, 55W, TO-251
0604-001002	U1~U3	PHOTO-COUPLER	TR, 100-600%, 200 mW, SOP-4, TP
0801-001073	U25	IC-CMOS LOGIC	74ACT74, D FLIP-FLOP, SOP, 14, 150MIL, DUAL, TP, 4.5/5.5 V
0801-002215	U24	IC-CMOS LOGIC	74FCT138, 1-OF-8 DECODER, SOP, 16, 300MIL, SINGLE, TP, 4.5/5.5 V
0801-002403	U4	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002446	U6	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V

(Continued)

Parts Code	Location	Product Name	Specification
0802-001026	U18~U20	IC-BICMOS LOGIC	74ABT16245, BUS TRANSCEIVER, TSSOP, 48, 380MIL, QUAD, TP, 4.5/5.5 V
0802-001084	U27	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
1203-000302	U5	IC-PWM CONTROLLER	3842B, SOP, 14P, 150MIL, PLASTIC, 3
1203-001213	U28	IC-VOL. REFERANCE	431A, SOP, 8P, 150MIL, PLASTIC, 37V
1205-000120	U9~U14	IC-CODEC	TP3054WMX, SOP, 16P, 300MIL, PLASTIC, 5.25 V, 60MW, -25TO+125C, TP, -
1404-000126	PS1~PS8	THERMISTOR-PTC	4.85 ohm, -, -, 60V, 5 mm
1405-000125	V1	VARISTOR	220 V, 4500A, 17x4.2 mm, TP
1405-000130	V2~V9	VARISTOR	270 V, 1200A, 9x4.6 mm, TP
1405-000171	V10~V34	VARISTOR	82 V, 1200A, 9x6 mm, TP
2003-000458	R143, R33, R72	R-METAL OXIDE(S)	100 ohm, 5%, 2W, AF, TP, 4x12 mm
2003-001032	R1~R16	R-METAL OXIDE(S)	220 ohm, 5%, 1W, AF, TP, 2.5x6.5 mm
2003-002037	R35, R36, R362, R363, R37~R42	R-METAL OXIDE(S)	270 ohm, 5%, 2W, AF, TP, 3.9x10 mm
2007-000040	R17~R32	R-CHIP	150 ohm, 1%, 1/10W, TP, 1608
2007-000043	R104, R109, R114, R119, R124, R129, R134, R182, R196, R198, R204, R308, R49, R52, R55, R58, R61, R64, R67, R70, R99	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000045	R142	R-CHIP	3.32 kohm, 1%, 1/10W, TP, 1608
2007-000052	R100, R105, R110, R115, R120, R125, R130, R135, R145, R146, R149, R150, R153, R154, R157, R158, R161, R162, R165, R166, R169, R170,	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000052	R173, R174, R195, R199, R203, R208, R209, R259, R260, R262, R265~R279, R281, R300~R304, R357, R358~R360, R377~R387	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R138~R141, R176, R207, R233, R241, R245, R298, R34, R45, R46	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R101, R106, R111, R116, R121, R126, R131, R136, R297, R43, R44, R47, R73~R88, R97	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608
2007-000070	R187~R194, R268, R269, R270~R275, R307, R365	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R210~R230, R235, R236, R238, R247, R250~R258, R264, R267, R280, R305, R306, R366~R369	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000475	R234	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-000669	R147, R151, R155, R159, R163, R167, R171, R175	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-001139	R197	R-CHIP	7.5 kohm, 1%, 1/10W, TP, 1608
2007-002901	R205	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-002910	R103, R108, R113, R118, R123, R128, R133, R144, R148, R152, R156, R160, R164, R168, R172, R201, R202, R98	R-CHIP	30.1 kohm, 1%, 1/10W, TP, 1608
2007-002912	R177	R-CHIP	33.2 kohm, 1%, 1/10W, TP, 1608
2007-002987	R102, R107, R112, R117, R122, R127, R132, R137, R239, R240, R244, R263, R89~R96	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007226	R200	R-CHIP	49.9 ohm, 1%, 1/10W, TP, 1608
2007-007443	R206, R266	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007613	R325~R340	R-CHIP	121 ohm, 1%, 1/10W, TP, 1608
2007-007645	R370~R373	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007796	R242, R243	R-CHIP	2.21 kohm, 1%, 1/10W, TP, 1608
2007-008091	R299	R-CHIP	4.32 kohm, 1%, 1/10W, TP, 1608
2007-008133	R48, R50, R51, R53, R54, R56, R57, R59, R60, R62, R63, R65, R66, R68, R69, R71	R-CHIP	56.2 kohm, 1%, 1/10W, TP, 1608
2007-008150	R178~R186	R-CHIP	12.1 ohm, 1%, 1/10W, TP, 1608
2011-001099	HYB1, HYB2	R-NET	300 ohm, 5%, 2W, X, ARRAY, 10P, BK
2203-000236	C200, C208~C210	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000426	C205	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000888	C89, C90	C-CER, CHIP	4.7nF, 10%, 50 V, X7R, TP, 1608
2203-000998	C137, C138, C188	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-001656	C88	C-CER, CHIP	0.47nF, 5%, 50 V, NP0, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2203-005144	C101, C102, C105, C106, C109, C110, C113, C114, C117, C118, C121, C122, C125, C126, C129, C156, C157, C158, C159, C160~C171, C98	C-CER, CHIP	1000nF, 10%, 10 V, X7R, TP, 2012
2203-005218	C176~C183	C-CER, CHIP	470nF, 10%, 50 V, X7R, TP, 3216, -
2203-005249	C10, C100, C103, C104, C107, C108, C11, C111, C112, C115, C116, C119, C12, C120, C123, C124, C127, C128, C13, C130, C131, C132~C136, C139, C14, C140, C142~C149, C15, C150~C155, C16, C17, C173, C174, C185, C187, C189, C2~C4, C5, C53, C6, C7, C77, C78, C8, C81, C84~C87, C9, C93, C94, C95, C99	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005565	C203, C204	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608
2305-000385	C1	C-FILM, LEAD-PEF	470nF, 10%, 250 V, BK, 18x6x12, 15
2401-001216	C49, C50, C73, C74	C-AL	4.7uF, 20%, 100 V, GP, TP, 5x11, 5
2402-000120	C172, C175, C186, C25~C32	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4mm
2402-000130	C33, C35, C37, C39, C41, C43, C45, C47	C-AL, SMD	2.2uF, 20%, 50 V, GP, TP, 4.3x4.3x5.
2402-000170	C191, C34, C36, C38, C40, C42, C44, C46, C48	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4
2402-001083	C190, C20, C72, C82, C83	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
2402-001224	C192~C199, C54~C69	C-AL, SMD	10uF, ±20%, 100 V, GP, TP, 8.0x10.0mm
2901-000188	M2, M3	FILTER-EMI ON BOARD	50 V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP, -
3301-001308	L3~L5	BEAD-SMD	10OHM, 1608, 500, TP, -, -, 0.15

(Continued)

Parts Code	Location	Product Name	Specification
3501-001139	K1~K8	RELAY-MINIATURE	4.5 VDC, 140 MW, 1000 MA, 2FORMC, 4 MS, 4 MS
3703-001252	J1, J2	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3722-001302	J3	JACK-MODULAR	8P, -, -, ANGLE, -, BLK, AU50U
EC26-20501A	T2~T9	TRANS AF	INFOREX, -, 800 mH
EC27-30514A	L1	COIL RF	INFOREX, 35uH, -, 40T
EN13-10502A	U21, U22	IC ASIC	DECT, TP3404, PLCC, 28P, -
EN13-10503A	U23	IC ASIC	DECT, STI-9511, QFP, 60P, -
GA13-10066A	U17	IC ASIC	DCS, SBS-9401, QFP, 80P, -
GA13-10576A	HYB3, HYB4	IC HYBRID-BALANCE	DCS-KOR, KP0078SA, SIP, 20, 2000
GA26-10053A	T10~T13	TRANS PULSE	DGP 360, 144//72.5/72T, 5 mH
GA26-10053A	T14	TRANS PULSE	DGP 360, 144//72.5/72T, 5 mH
GA26-10053A	T15, T16	TRANS PULSE	DGP 360, 144//72.5/72T, 5 mH
GA26-10053A	T17	TRANS PULSE	DGP 360, 144//72.5/72T, 5 mH
GA26-30073A	T1	TRANS POWER	DCS, -48 V//13 V/85 V, 877 uH//100 uH
GA27-30057A	L2	COIL RF	PRO-56EX/120MX, 72uH, -, -
GA41-00191A	PCS.01	PCB-8HYB2	OFFICESERV 7200, FR4, 4L, -, 1.6, 130x275 mm, -, -, -, 8HYB2

6.11 8DLI Board

Parts Code	Location	Product Name	Specification
GA92-02771A	-	-	-
0401-001099	D33	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0401-001099	D35	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001211	D34	DIODE-RECTIFIER	MURS320, 200 V, 3A, MSR, TP
0403-001416	ZD1, ZD10~ZD16, ZD2~ZD9	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500MW, SOD-123, TP
0501-000476	Q2	TR-SMALL SIGNAL	KST5401TA, PNP, 350MW, SOT-23, TP, 60-240
0501-000477	Q1	TR-SMALL SIGNAL	MMBT5550, NPN, 300MW, SOT-23, TP, 20-250
0505-001769	Q3	FET-SILICON	FQU12N20, N, 200V, 9.0A, 0.28 ohm, 55W, TO-251
0601-001064	LED1~LED8	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560NM, 3x2.5x1.5 mm
0801-000379	U7	IC-CMOS LOGIC	74HC00, NAND GATE, SOP, 14, 150MIL, QUAD, TP, 2.0/6.0 V
0801-000841	U6	IC-CMOS LOGIC	74ACT14, INVERTER, SOP, 14, 150MIL, HEX, ST, 4.5/5.5 V
0801-001071	U12	IC-CMOS LOGIC	74ACT08, AND GATE, SOP, 14, 150MIL, QUAD, TP, 4.5/5.5 V
0801-001073	U13	IC-CMOS LOGIC	74ACT74, D FLIP-FLOP, SOP, 14, 150MIL, DUAL, TP, 4.5/5.5 V
0801-002055	U14	IC-CMOS LOGIC	74FCT374, D REGISTER, SOP, 20, 300MIL, OCTAL, TP, 4.5/5.5 V
0801-002215	U8	IC-CMOS LOGIC	74FCT138, 1-OF-8 DECODER, SOP, 16, 300MIL, SINGLE, TP, 4.5/5.5 V
0801-002446	U20	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-000111	U9, U10, U11	IC-CMOS LOGIC	74FCT245, BUS TRANSCEIVER, SOP, 20P, 12.8x7.5 mm, OCTAL, ST, 0to+70C
0802-001084	U3, U4	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
1404-000126	P28~P35	THERMISTOR-PTC	4.85 ohm, -, -, 60V, 5 mm
1405-000171	V10~V24, V41, V50~V57, V9	VARISTOR	82 V, 1200A, 9x6 mm, TP
2005-001199	R1125	R-WIRE WOUND(S), NON	0.8 ohm, 1%, 3W, AA, TP, 6x16 mm

(Continued)

Parts Code	Location	Product Name	Specification
2007-000041	R1002, R1004, R1006, R1008, R1010, R1012, R1014, R1016	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608
2007-000052	R1119, R1120, R960~R971, R975~R977	R-CHIP	10kohm, 1%, 1/10W, TP, 1608
2007-000060	R1030~R1032	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R1067	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608
2007-000070	R1036, R1037, R1087~R1102	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R1000, R1001, R978, R979, R982~R990, R999	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000475	R1062	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-002987	R1019~R1025	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007443	R1063	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007645	R1038~R1061, R1068~R1071, R1121~R1124, R939~R948, R952~R959	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007796	R1033~R1035	R-CHIP	2.21 kohm, 1%, 1/10W, TP, 1608
2007-008091	R1066	R-CHIP	4.32 kohm, 1%, 1/10W, TP, 1608
2203-000236	C93, C106	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000257	C102	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000998	C100, C101, C42~C44, C98	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, TP, 1608
2203-005144	C45, C46, C48, C49, C51, C52, C54, C55, C57, C58, C60, C61, C63, C64, C66, C67	C-CER, CHIP	1000nF, 10%, 10 V, X7R, TP, 2012
2203-005218	C8~C15	C-CER, CHIP	470nF, 10%, 50 V, X7R, TP, 3216, -
2203-005249	C112, C28~C41, C47, C50 , C53, C56, C59, C62, C65, C68, C94, C96, C97	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C107, C108	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520

(Continued)

Parts Code	Location	Product Name	Specification
2203-005565	C103, C104, C111	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608
2402-000120	C3~C5	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4mm
2402-000170	C7	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
2402-001083	C6	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
3301-001463	L2~L5	BEAD-SMD	120OHM, 1608, 200, TP, -, -, 0.5
3703-001252	P26, P27	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3722-002045	J1	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
EN13-10502A	U16, U17	IC ASIC	DECT, TP3404, PLCC, 28P, -
EN13-10503A	U2	IC ASIC	DECT, STI-9511, QFP, 60P, -
GA26-10053A	T1~T8	TRANS PULSE	DGP 360, 144//72.5/72T, 5 mH
GA27-30057A	L1	COIL RF	PRO-56EX/120MX, 72uH, -, -
GA41-00138A	PCS.02	PCB-16DLI	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x275mm, -, -, -, -

6.12 8SLI Board

Parts Code	Location	Product Name	Specification
GA92-02899A	-	-	-
0401-001099	D1~D9, D10~D16, D44	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001049	D38	DIODE-RECTIFIER	MURS160, 600 V, 1A, DO-214AA (SMB), TP
0402-001216	D17, D26~D29, D39	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0403-000283	ZD33~Z36	DIODE-ZENER	MMBZ5234B, 5.78-6.44 V, 225 MW, SOT-23, TP
0403-001396	ZD37, ZD38	DIODE-ZENER	MMSZ5263B, 5%, 500 MW, SOD-123, TP
0403-001416	ZD1, ZD10~ZD16, ZD2~ZD9	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500 MW, SOD-123, TP
0501-000476	Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47	TR-SMALL SIGNAL	KST5401TA, PNP, 350 MW, SOT-23, TP, 60-240
0501-000477	Q12, Q14, Q15, Q17~Q19, Q2, Q20~Q24, Q34, Q36, Q38, Q4, Q40, Q42, Q44, Q46, Q48~Q56, Q6, Q8, Q9	TR-SMALL SIGNAL	MMBT5550, NPN, 300 MW, SOT-23, TP, 20-250
0502-001066	Q1, Q10, Q11, Q13, Q16, Q3, Q5, Q7	TR-POWER	PZTA42, NPN, 1000 mW, SOT-223, TP, 25-
0502-001067	Q25~Q32	TR-POWER	FZT957, PNP, 3W, SOT-223, TP, 100-3
0505-001477	Q58, Q69	FET-SILICON	SFR9220, P, 200 V, 3.1A, 1.5 ohm, 30W, D-PAK
0505-001478	Q57, Q59, Q60	FET-SILICON	FQU5N40, N, 400 V, 3.4A, 1.6 ohm, 45W, I-PAK
0601-001064	LED1~LED8	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560 NM, 3x2.5x1.5 mm
0604-001002	U22~U24	PHOTO-COUPLER	TR, 100-600%, 200 mW, SOP-4, TP
0801-002215	U6	IC-CMOS LOGIC	74FCT138, 1-OF-8 DECODER, SOP, 16, 300MIL, SINGLE, TP, 4.5/5.5 V
0801-002403	U16	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6V

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Parts Code	Location	Product Name	Specification
0801-002446	U15, U17, U95, U97	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-001026	U1, U2, U5	IC-BICMOS LOGIC	74ABT16245, BUS TRANSCEIVER, TSSOP, 48, 380MIL, QUAD, TP, 4.5/5.5 V
0802-001084	U12	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
1203-000302	U19	IC-PWM CONTROLLER	3842B, SOP, 14P, 150MIL, PLASTIC, 3
1203-001213	U96	IC-VOL. REFERANCE	431A, SOP, 8P, 150MIL, PLASTIC, 37 V
1205-000120	U10, U13, U14, U3, U4, U7~U9	IC-CODEC	TP3054WMX, SOP, 16P, 300MIL, PLASTIC, 5.25 V, 60MW, -25TO+125C, TP, -
1405-000125	V17	VARISTOR	220 V, 4500A, 17x4.2 mm, TP
1405-000130	V1~V8	VARISTOR	270 V, 1200A, 9x4.6 mm, TP
2003-000458	R396~R298	R-METAL OXIDE(S)	100 ohm, 5%, 2W, AF, TP, 4x12 mm
2003-001032	R1, R12, R13, R16, R17, R20, R21, R24, R25, R28, R29, R32, R4, R5, R8, R9	R-METAL OXIDE(S)	220 ohm, 5%, 1W, AF, TP, 2.5x6.5 mm
2003-002037	R530, R531, R55~R62	R-METAL OXIDE(S)	270 ohm, 5%, 2W, AF, TP, 3.9x10 mm
2007-000040	R10, R11, R14, R15, R18, R19, R2, R22, R23, R26, R27, R3, R30, R31, R6, R7	R-CHIP	150 ohm, 1%, 1/10W, TP, 1608
2007-000041	R515~R522	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608
2007-000043	R171, R175, R179, R183, R187, R191, R195, R199, R230, R231, R254, R278, R283, R63, R66, R69, R72, R75, R78, R81, R84	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000045	R286	R-CHIP	3.32 kohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000052	R101, R102, R105, R108, R111, R114, R117, R120, R123, R131, R168~R225, R237, R242, R244, R249~R251, R299, R46, R523~R527, R87, R89, R90	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R228, R256, R266, R267, R279, R280, R282, R285, R303, R361	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R103, R106, R109, R112, R115, R118, R121, R124, R134, R135, R137, R138, R140, R141, R143, R144, R146, R147, R149, R150, R152, R153, R155, R156, R269, R281, R284, R304	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608
2007-000070	R529	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R100, R126~R130, R132, R157, R158, R167, R202~R209, R226, R232, R33~R45, R47, R49, R50, R503~R506, R51, R52, R53, R54, R88, R91~R98	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000475	R227	R-CHIP	1 Mohm, 1%, 1/10W, TP, 1608
2007-000669	R170, R174, R178, R182, R186, R190, R194, R198	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-001139	R243	R-CHIP	7.5 kohm, 1%, 1/10W, TP, 1608
2007-002901	R253	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608
2007-002910	R172, R173, R176, R177, R180, R181, R184, R185, R188, R189, R192, R193, R196, R197, R200, R201, R233~R236, R238, R239, R240, R241, R366, R367	R-CHIP	30.1 kohm, 1%, 1/10W, TP, 1608
2007-002912	R268	R-CHIP	33.2 kohm, 1%, 1/10W, TP, 1608
2007-002987	R133, R136, R139, R142, R145, R148, R151, R154, R159~R166, R64, R67, R70, R73, R76, R79, R82, R85	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007226	R252	R-CHIP	49.9 ohm, 1%, 1/10W, TP, 1608
2007-007443	R255	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007613	R471~R480, R487~R490, R493, R494	R-CHIP	121 ohm, 1%, 1/10W, TP, 1608
2007-007796	R507~R514	R-CHIP	2.21 kohm, 1%, 1/10W, TP, 1608
2007-008133	R104, R107, R110, R113, R116, R119, R122, R125, R65, R68, R71, R74, R77, R80, R83, R86	R-CHIP	56.2 kohm, 1%, 1/10W, TP, 1608
2007-008150	R257~R260, R270~R273	R-CHIP	12.1 ohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2011-001099	HYB2, HYB4	R-NET	300 ohm, 5%, 2W, X, ARRAY, 10P, BK
2203-000426	C283	C-CER, CHIP	0.018nF, 5%, 50V, C0G, 1608
2203-000888	C137, C139	C-CER, CHIP	4.7nF, 10%, 50V, X7R, TP, 1608
2203-001408	C279, C281, C282	C-CER, CHIP	0.27nF, 5%, 50V, NP0, TP, 1608
2203-001656	C138	C-CER, CHIP	0.47nF, 5%, 50V, NP0, TP, 1608
2203-005144	C102, C103, C106, C121, C124, C125, C128, C26, C29, C30, C33, C51, C54, C55, C58, C99	C-CER, CHIP	1000nF, 10%, 10V, X7R, TP, 2012
2203-005249	C1, C10, C100, C101, C104, C105, C109, C11, C110~C113, C116~C118, C12, C122, C123, C126, C127, C13, C131, C132, C14, C15, C153, C16~C19, C2, C20, C23~C25, C27, C28, C3, C31, C32, C36, C37, C38, C4, C41, C42, C5, C52, C53, C56, C57, C6, C7, C78, C8, C9, C98	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C275, C276	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2203-005565	C97	C-CER, CHIP	1nF, 5%, 50 V, NP0, TP, 1608
2305-000385	C175	C-FILM, LEAD-PEF	470nF, 10%, 250 V, BK, 18x6x12, 15
2401-001216	C246~C249	C-AL	4.7uF, 20%, 100 V, GP, TP, 5x11, 5
2402-000120	C274, C61, C63, C65, C67, C69, C71, C73, C75	C-AL, SMD	10uF, 20%, 50V, GP, TP, 6.6x6.6x5.4 mm
2402-000130	C62, C64, C66, C68, C70, C72, C74, C76	C-AL, SMD	2.2uF, 20%, 50 V, GP, TP, 4.3x4.3x5.

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Parts Code	Location	Product Name	Specification
2402-000170	C43~C50	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
2402-001083	C135, C154, C202, C213	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
2402-001224	C258~C260, C264~C267, C269, C81~C96	C-AL, SMD	10uF, ±20%, 100 V, GP, TP, 8.0x10.0 mm
2901-000188	M2, M3	FILTER-EMI ON BOARD	50V, 1A, -, 47pF, 7.5x2.5x6.2mm, TP, -
3301-001308	L2, L3, L6, L7	BEAD-SMD	10OHM, 1608, 500, TP, -, -, 0.15
3501-001139	K1~K9	RELAY-MINIATURE	4.5 VDC, 140 MW, 1000 MA, 2FORMC, 4 MS, 4 MS
3703-001252	J1, J2	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3722-002045	J3	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
EC26-20501A	T1~T8	TRANS AF	INFOREX, -, 800 mH
EC27-30514A	L1	COIL RF	INFOREX, 35uH, -, 40T
GA13-10066A	U11	IC ASIC	DCS, SBS-9401, QFP, 80P, -
GA13-10576A	HYB1, HYB3	IC HYBRID-BALANCE	DCS-KOR, KP0078SA, SIP, 20, 2000
GA26-30073A	T17	TRANS POWER	DCS, -48 V//13 V/85 V, 877 uH//100 uH
GA41-00136A	PCS.03	PCB-8SLI	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.13 MIS Board

Parts Code	Location	Product Name	Specification
GA92-02785A	-	-	-
0401-001099	D5~D7	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001216	D1~D4	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0501-000477	Q1~Q3	TR-SMALL SIGNAL	MMBT5550, NPN, 300 MW, SOT-23, TP, 20-250
1201-000236	U13	IC-OP AMP	TL084, SOP, TP, 14P, 150MIL, QUAD, 200V/MV, PLASTIC, 18 V, 680 MW, 0TO+70C, 86DB, 13V/US, 5PA, 2
1205-000120	U14	IC-CODEC	TP3054WMX, SOP, 16P, 300MIL, PLASTIC, 5.25 V, 60 MW, -25TO+125C, TP, -
1205-000120	U15	IC-CODEC	TP3054WMX, SOP, 16P, 300MIL, PLASTIC, 5.25 V, 60 MW, -25TO+125C, TP, -
1205-000394	U1, U2	IC-CODEC FILTER	TP3057WM, SOP, 16P, -, PLASTIC, 5.2
1301-001499	U4	IC-CPLD	4A5, TQFP, 44P, 10x10 mm, 10nS, 5, 5%
2007-000043	R58	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R17~R42, R64	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R3, R4	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000287	R51~R54	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000669	R43~R45	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-002906	R5~R6	R-CHIP	200 kohm, 1%, 1/10W, TP, 1608
2007-002918	R1~R2	R-CHIP	51.1 kohm, 1%, 1/10W, TP, 1608
2007-002991	R46~R49	R-CHIP	61.9 kohm, 1%, 1/10W, TP, 1608
2007-007237	R50, R61	R-CHIP	24.3 kohm, 1%, 1/10W, TP, 1608
2007-007274	R59, R60	R-CHIP	27.4 kohm, 1%, 1/10W, TP, 1608
2007-008102	R62, R63	R-CHIP	357 ohm, 1%, 1/10W, TP, 1608
2007-008223	R11~R16	R-CHIP	39.2 kohm, 1%, 1/10W, TP, 1608
2007-008225	R7, R8	R-CHIP	226 kohm, 1%, 1/10W, TP, 1608
2203-003027	C25, C26	C-CER, CHIP	0.82nF, 5%, 50 V, NP0, TP, 1608
2203-005249	C10~C24	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2402-000130	C1~C6	C-AL, SMD	2.2uF, 20%, 50 V, GP, TP, 4.3x4.3x5.
2404-001037	C7~C9	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
3301-001308	B1~B18	BEAD-SMD	10OHM, 1608, 500, TP, -, -, 0.15
3501-001139	K1~K3	RELAY-MINIATURE	4.5 VDC, 140 MW, 1000 MA, 2FORMC, 4 MS, 4 MS
3711-004744	P1, P2	CONNECTOR-HEADER	BOX, 40P, 2R, 0.8 mm, SMD-S, AU30U, NTR

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Parts Code	Location	Product Name	Specification
EC26-20501A	T1~T4	TRANS AF	INFOREX, -, 800 mH
GA41-00143A	PCS.02	PCB-MISC	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 120x45 mm, -, -, -, -

6.14 MGI2DB Board

Parts Code	Location	Product Name	Specification
GA92-02782A	-	-	-
1106-001469	U2	IC-SRAM	GA71116ATP-8, 64Kx16bit, TSOP, 44P, 400MIL, 8 NS, 3.3 V, 10%, -, 0TO+70C, 20MA, -, TP
1204-002202	U1	IC-AUDIO CONTROLLER	AC48204E6-C, TQFP, 144P, 20x20 mm, PLASTIC, 3.6 V, 200 MW, 0TO+70C, TR, VOP PROCESSOR
2007-000043	R22, R32	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000070	R10, R21, R35~R42, R7~R9	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-001164	R33, R34	R-CHIP	75 ohm, 1%, 1/10W, TP, 1608
2007-002987	R1, R2, R24~R29, R3~R5	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2203-005249	C10~C17, C3~C9	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2402-001140	C1, C2	C-AL, SMD	4.7UF, -, 50 V, GP, TP, 4.3x4.3x5.3 mm
3711-004744	J1, J2	CONNECTOR-HEADER	BOX, 40P, 2R, 0.8 mm, SMD-S, AU30U, NTR
GA41-00145A	PCS.02	PCB-MGI2D	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 120x240 mm, -, -, -, -

6.15 4BRI Board

Parts Code	Location	Product Name	Specification
GA92-02905A	-	-	-
0401-001099	D1~D4, D9~D13, D18~D22, D27~D31, D36~D40	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0403-001407	D5~D8, D14~D17, D23~D26, D32~D35	DIODE-ZENER	MMSZ5242B, 11.4-12.6 V, 500 MW, SOD-123, TP
0501-000477	Q1~Q4	TR-SMALL SIGNAL	MMBT5550, NPN, 300 MW, SOT-23, TP, 20-250
0601-000005	LED1, LED2	LED	SMD, GRN, 3x2 mm, 570 NM, 3x2 mm
0801-002055	U25	IC-CMOS LOGIC	74FCT374, D REGISTER, SOP, 20, 300MIL, OCTAL, TP, 4.5/5.5 V
0801-002127	U24	IC-CMOS LOGIC	74FCT16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, ST, 4.5/5.5 V
0801-002270	U17	IC-CMOS LOGIC	74LCX16373, LATCH, TSSOP, 48, 240MIL, DUAL, TR, 2.0/3.6 V
0801-002325	U15	IC-CMOS LOGIC	74LCX04, INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0801-002403	U20	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0802-001029	U18-U19	IC-BICMOS LOGIC	74LVTH16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, TP, 2.7/3.6 V
0802-001076	U13-U14	IC-BICMOS LOGIC	74LVTH541, BUFFER, TSSOP, 20, 173MIL, OCTAL, TP, 2.7/3.6 V
0802-001084	U21-U23	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
0902-000314	U12	IC-MICROPROCESSOR	MC68EC000, 16 MHz, 16bit, PLCC, 68P, ST, PLASTIC, 5 V, 260 MW, 0TO+70C, -, 24bit
0904-001363	U27	IC-UART	ST16C1551, 8bit, PLCC, 28P, 11.5x11.5 mm, 24 MHz, TR, CMOS, PLASTIC, 5V, 500 MW, 0TO+70C, -, -, 3
1006-001140	U26	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1106-000131	U8-U9	IC-SRAM	K6X1008C2, 128KX8bit, SOP, 32P, 20.87x11.43 mm, 55 NS, 4.5/5.5 V, -, PLASTIC, 0TO+70C, 15UA, C
1106-001157	U7	IC-SRAM	7C131, 1Kx8bit, QFP, 52P, 10x10 mm, 55 NS, 5V, 10%, PLASTIC, 0TO+70C, 15 MA, CMOS, TR

(Continued)

Parts Code	Location	Product Name	Specification
1107-001534	U10-U11	IC-FLASH MEMORY	39VF040, 512K×8bit, PLCC, 32P, 13.97x11.43 mm, 70NS, 2.7/3.6V, 15UA, -, 0TO+70C, 15UA, -, TP
1203-001643	U2	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP
1203-002452	U5-U6	IC-NEGA.FIXED REG.	LM337IMP, SOT-223, 3P, 140MIL, PLASTIC, -1.2/-37 V, 2W, 0TO+125C, 1.5A, -1.2/-1.3V, TP
1205-002389	U3	IC-TRANSCEIVER	PEB20590, MQFP, 80P, 14x14 mm, PLASTIC, 3.47 V, 99 MW, 0TO+70C, TR, ISDN TRANSCEIVER IC
1205-002390	U4	IC-EPIC	PEB20570, TQFP, 100P, 14x14 mm, PLASTIC, 3.47 V, 880 MW, 0TO+70C, TR, IC-EPIC
1301-001663	U1	IC-CPLD	LC4128 V-75T128C, TQFP, 128P, 14x14 mm, 7.5NS, 3.3 V, 10%, -, 0TO+90C, -, 92, 92, 4, 333 MHz, 3.47
1404-000126	PS1-PS4	THERMISTOR-PTC	4.85 ohm, -, -, 60V, 5 mm
2003-000455	R68-R69, R74-79	R-METAL OXIDE(S)	100 ohm, 5%, 2W, AA, TP, 4x12 mm
2007-000041	R1-R2	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608
2007-000043	R109-R121, R175, R177	R-CHIP	1 kohm, 1%, 1/10W, TP, 1608
2007-000052	R3-R24, R26-R33, R101-R103, R127, R128, R178	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R61, R122-R123, R179-R180	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R35-R60, R62-R67, R70-R73, R80, R176	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-000669	R124-R126	R-CHIP	2 kohm, 1%, 1/10W, TP, 1608
2007-002899	R137-R144	R-CHIP	10 ohm, 1%, 1/10W, TP, 1608
2007-002912	R155-R174	R-CHIP	33.2 kohm, 1%, 1/10W, TP, 1608
2007-002987	R81-R94, R184-R185	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007238	R129-R136	R-CHIP	8.25 kohm, 1%, 1/10W, TP, 1608
2007-007342	R145-R152	R-CHIP	1.82 kohm, 1%, 1/10W, TP, 1608
2007-007613	R153-R154	R-CHIP	121 ohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-007645	R95-R100, R104-R108, R181-R183	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2011-000151	RA1-RA10	R-NET	100 ohm, 5%, 1/16W, L, CHIP, 8P, TP, 3216
2011-000515	RA11-RA14	R-NET	4.7 kohm, 5%, 1/16W, L, CHIP, 8P, TP, 3.2x1.6x0.5 mm
2203-000041	C106-C107	C-CER, CHIP	0.01nF, 0.25pF, 50 V, C0G, 1608
2203-000236	C74-C78, C130-C142	C-CER, CHIP	0.1nF, 5%, 50 V, C0G, 1608
2203-000721	C108-C109	C-CER, CHIP	0.0033nF, 0.25pF, 50 V, C0G, 1608
2203-000998	C89-C90, C92-C105, C128-C129	C-CER, CHIP	0.047nF, 5%, 50 V, C0G, 1608
2203-001408	C120-C121	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, 1608
2203-001607	C79-C82	C-CER, CHIP	0.22nF, 5%, 50 V, NP0, -, 1608
2203-005249	C15-C73, C110-C119, C122-C127, C143-C147	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2301-001470	C7-C14	C-FILM, LEAD-PEF	100nF, 10%, 250 V, TP, 7.2x5x10 mm, 5
2402-001209	C4	C-AL, SMD	47uF, 20%, 50 V, WT, TP, 7.1x6.6x7.7 mm
2402-001224	C5-C6	C-AL, SMD	10uF, ±20%, 100 V, GP, TP, 8.0x10.0 mm
2404-001037	C1-C3	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
2801-004403	Y2	CRYSTAL-SMD	16.384 MHz, 20 PPM, SMD, 28PF, 25 ohm, TP
2801-004431	Y3	CRYSTAL-SMD	15.36 MHz, 20 PPM, SMD, 10PF, 50 ohm, TP
2804-001496	Y1	OSCILLATOR-CLOCK	16.384 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
3301-001308	L4-L28	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3301-001309	L1-L3	BEAD-SMD	47 ohm, 1608, 500, TP, -, -, 0.3
3407-001082	SW1-SW8	SWITCH-SMD	50 VDC, 100 MA, SLIDE, SMD
3501-001260	K1-K4	RELAY-MINIATURE	4.5 VDC, 140 MW, 1000 MA, 2FORMC, 4 MS, 4 MS
3703-001252	P1-P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3704-000249	U10-U11	SOCKET-IC	32P, PLCC, SN, 1.27 mm
3711-001465	J2	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK

(Continued)

Parts Code	Location	Product Name	Specification
3711-003801	J1	CONNECTOR-HEADER	NOWALL, 10P, 2R, 2.54 mm, SMD-S, AU30U, BLK
3722-002045	J3	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
4715-001082	SUR1-SUR24	SURGE ABSORBER	300 V, 15%, 1500A, -, SMD
GA26-00004A	T1-T4	TRANS PULSE	APT-2S0-22B, COMPACT II, 10P, -, -, -, CO-BASE ALLOY, -, -10TO80C, BK, -
GA41-00188A	PCS.01	PCB-4BRI	OFFICESERV 7200, FR-4, 4L, 01, 1.6T, 130x275mm, -, -, -, 4BRI

6.16 4WLI Board

Parts Code	Location	Product Name	Specification
GA92-02772A	-	-	-
0401-001099	D1~D4, D9~D13	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0402-001216	D5~D8	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0403-001416	ZD1~ZD16	DIODE-ZENER	MMSZ5227B, 3.42-3.78 V, 500MW, SOD-123, TP
0406-001053	L19, L21, L23, L25, L27, L29, L31, L33	DIODE-TVS	SMBJ30CA, 33.3/35.8/38.3 V, 600W, DO-214AA
0501-000476	Q5~Q8	TR-SMALL SIGNAL	KST5401TA, PNP, 350 MW, SOT-23, TP, 60-240
0505-001031	Q1~Q4	FET-SILICON	IRF540, N, 100 V, 28 A, 0.077 ohm, 125
0601-001064	LED1~LED4	LED	SMD, RED/Y-GRN, 1.7x2.5 mm, 660/560 NM, 3x2.5x1.5 mm
0801-001090	U12, U25	IC-CMOS LOGIC	74HC14, SCHMITT INVERTER, SOP, 14, 150 MIL, HEX, TP, 2.0/6.0 V
0801-002325	U21	IC-CMOS LOGIC	74LCX04, INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0801-002403	U26	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002446	U31	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
0802-001084	U11, U27, U30, U5, U6	IC-BICMOS LOGIC	74ABT125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 4.5/5.5 V
0802-001099	U22	IC-BICMOS LOGIC	74LVTH125, BUFFER, TSSOP, 14, 173MIL, QUAD, TP, 2.7/3.6 V
0902-000231	U14	IC-MICROPROCESSOR	MC68302, 16.67 MHz, 16 bit, QFP, 132P, TR, PLASTIC, 5 V, 525 MW, 0TO+70C, 1.152 KB, 24 bit
1006-001140	U15	IC-LINE TRANSCEIVER	3232, SSOP, 16P, 212MIL, DUAL, TP, PLASTIC, 5.5 V, 0to+70C, 571 mW, 2, 2
1106-000353	U18, U19	IC-SRAM	6X4008, 512Kx8bit, TSOP(II), 32P, 400 MIL, 70 NS, 5V, 10%, PLASTIC, 0TO+70C, 20UA, CMOS, ST
1106-001136	U17	IC-SRAM	7C136, 2Kx8 bit, QFP, 52P, 10x10 mm, 55 NS, 5 V, 10%, PLASTIC, 0TO+70C, 15 MA, CMOS, TR
1107-001079	U23	IC-FLASH MEMORY	29F800, 1Mx8/512Kx16, TSOP, 48P, 18.4x12 mm, 4.5/5.5 V, 0to+70C
1203-001643	U24	IC-RESET	DS1706, SOIC, 8P, 150MIL, PLASTIC, -, -, -40TO+85C, -, -, TP

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Parts Code	Location	Product Name	Specification
1203-002267	U28	IC-POSI.FIXED REG.	-, TO-263-5, 5P, 400 MIL, PLASTIC, 1.782/1.818 V, 3W, -40TO+125C, 1.5A, -, TP
1204-002210	U29	IC-ECHO	ZL50235QCC, LQFP, 100P, 14x14xmm, PLASTIC, 3.6 V, -, -40TO+85C, TR, 16CH VOICE ECHO-IC
1205-000443	U1, U2, U3, U4, U7~U10	IC-ADAPTER	TP3464V, PLCC, 28P, -, PLASTIC, 7 V, 0, 0to+70C, ST, -
1301-001473	U16	IC-CPLD	3064, TQFP, 100P, 16x16 mm, 10 nS, 3.3, 10%
1404-000126	PS1~PS8	THERMISTOR-PTC	4.85 ohm, -, -, 60V, 5 mm
2007-000041	R1~R3, R220	R-CHIP	475 ohm, 1%, 1/10W, TP, 1608
2007-000043	R102~R108, R111, R114, R138, R143, R147, R150, R153, R154, R157, R159, R160, R163, R168, R169, R170, R171, R221	R-CHIP	1K ohm, 1%, 1/10W, TP, 1608
2007-000052	R13, R140, R15, R151, R17, R19, R190, R203, R208, R215, R216, R233, R234, R30, R34, R35, R42, R43, R44, R48, R50, R53~R58	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000070	R113, R115, R116, R119, R120, R141, R145, R146, R152, R156, R158, R162, R164, R165, R166, R201, R21, R214, R22, R223~R229,	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000070	R23, R230, R238, R239, R24, R240~R248, R25~R27, R29, R40, R41, R47, R49, R52, R59, R80, R82, R90	R-CHIP	0 ohm, 5%, 1/10W, TP, 1608
2007-000287	R10, R11, R117, R118, R121, R122~R129, R137, R142, R144, R148, R149, R177, R181~R185, R191~R200, R202, R205~R207, R209~R213, R217~R219, R235, R236, R37~R39, R4~R6, R60~R69, R7, R70, R8, R9, R91~R97	R-CHIP	100 ohm, 1%, 1/10W, TP, 1608
2007-001153	R31	R-CHIP	750 ohm, 1%, 1/10W, TP, 1608
2007-002918	R12, R14, R16, R18	R-CHIP	51.1 kohm, 1%, 1/10W, TP, 1608
2007-002987	R100, R101, R109, R110, R130~R136, R139, R167, R172, R173, R175, R176, R179, R180, R186~R189, R231, R232, R36, R46, R71~R79, R81, R83~R89, R98, R99	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007296	R45	R-CHIP	1.21 kohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-007645	R112, R161, R178, R20, R204, R246, R28, R32	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-008122	R237, R33	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2203-000257	C52, C86	C-CER, CHIP	10nF, 10%, 50 V, X7R, 1608
2203-000426	C110	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-001408	C57, C58	C-CER, CHIP	0.27nF, 5%, 50 V, NP0, TP, 1608
2203-002793	C1, C10, C12, C17~C19, C2, C20, C22, C24, C26, C28, C3, C4, C6, C8	C-CER, CHIP	1000nF, +80-20%, 25 V, Y5 V, 2012
2203-005218	C11, C21, C23, C25, C27, C5, C7, C9	C-CER, CHIP	470nF, 10%, 50 V, X7R, TP, 3216, -
2203-005249	C100~C107, C13~C16, C29~C32, C37~C56, C59~C99	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2402-000170	C33~C36	C-AL, SMD	1uF, 20%, 50 V, GP, TP, 4.3x4.3x5.4,
2402-001083	C93	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
2404-001037	C88, C94, C95	C-TA, CHIP	10uF, 10%, 16 V, -, TP, 3528, -
2804-001496	Y1	OSCILLATOR-CLOCK	16.384 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
2804-001499	Y2	OSCILLATOR-CLOCK	20 MHz, 50 ppm, 10TTL, 15pF, TP, 3.3 V, 40 mA
3301-001120	L1, L34~L36	BEAD-SMD	30 ohm, 2012, 3000, TP, -, -, 0.015
3301-001308	L37, L38	BEAD-SMD	10 ohm, 1608, 500, TP, -, -, 0.15
3301-001309	L10~L17, L2~L9	BEAD-SMD	47 ohm, 1608, 500, TP, -, -, 0.3
3404-001008	SW2	SWITCH-TACT	15V, 50 MA, 160GF, 6x6x5 mm, SPST
3703-001252	P2, P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U
3711-003272	P1	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-002045	J1	JACK-MODULAR	8P/8C, INVERTED, Y, ANGLE, N, BLK, AU15U
GA13-10051A	U13	IC ASIC	DCS, STL7052E, QFP, 80P, -
GA26-10053A	T1~T8	TRANS PULSE	DGP 360, 144//72.5/72T, 5mH
GA41-00139A	PCS.03	PCB-WLI	OFFICESERV SME, FR-4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

6.17 16MWSLI Board

Parts Code	Location	Product Name	Specification
GA92-02964A	-	-	-
0401-001099	D109	DIODE-SWITCHING	1N4148WS, 75 V, 150 mA, SOD-323, TP
0401-001134	D101, D102, D151, D152, D201, D202, D251, D252, D301, D302, D351, D352, D401, D402, D451, D452, D501, D502, D551, D552, D601, D602, D651, D652, D701, D702, D751, D752, D801, D802, D851, D852	DIODE-SWITCHING	BAV23C, 250 V, 400 MA, SOT-23, TP
0402-000197	D4, D103, D153, D203, D253, D303, D353, D403	DIODE-RECTIFIER	D1FL40-4063, 400 V, 0.6A, 1F, TP
0402-000197	D4, D103, D153, D203, D253, D303, D353, D403, D453, D503, D553, D603, D653, D703, D753, D803, D853	DIODE-RECTIFIER	D1FL40-4063, 400 V, 0.6A, 1F, TP
0402-000309	D1, D2	DIODE-RECTIFIER	1SR154-400, 400 V, 1A, SOD-106, TP
0402-001216	D3, D5-D9	DIODE-RECTIFIER	MURS120, 200 V, 1A, TO-220F, TP
0403-000141	ZD5-ZD7	DIODE-ZENER	1N4735A, 5%, 1000 MW, DO-41, TP
0403-000283	ZD1-ZD4, ZD8-ZD12	DIODE-ZENER	MMBZ5234B, 5.78-6.44 V, 225 MW, SOT-23, TP
0403-001396	Z13, Z14	DIODE-ZENER	MMSZ5263B, 5%, 500 MW, SOD-123, TP
0505-001477	Q3, Q4	FET-SILICON	SFR9220, P, 200V, 3.1A, 1.5 ohm, 30W, D-PAK
0505-001478	Q1, Q2, Q5	FET-SILICON	FQU5N40, N, 400V, 3.4A, 1.6 ohm, 45W, I-PAK
0604-001002	PC1-PC3	PHOTO-COUPLER	TR, 100-600%, 200 mW, SOP-4, TP
0801-002127	U1, U7, U10	IC-CMOS LOGIC	74FCT16245, TRANSCEIVER, TSSOP, 48, 240MIL, DUAL, ST, 4.5/5.5 V

(Continued)

Parts Code	Location	Product Name	Specification
0801-002171	U852	IC-CMOS LOGIC	74LCX125, BUS BUFFER, SOP, 14, 150MIL, QUAD, TP, 2.0/3.6 V
0801-002403	U6	IC-CMOS LOGIC	74LCX08, AND GATE, TSSOP, 14, 173MIL, QUAD, TP, 2.0/3.6 V
0801-002446	U9, U11	IC-CMOS LOGIC	74LCX14, SCHMITT INVERTER, TSSOP, 14, 173MIL, HEX, TP, 2.0/3.6 V
1203-000302	U8	IC-PWM CONTROLLER	3842B, SOP, 14P, 150MIL, PLASTIC, 3
1203-001213	U12	IC-VOL. REFERANCE	431A, SOP, 8P, 150MIL, PLASTIC, 37 V
1205-002314	U100, U150, U200, U250, U300, U350, U400, U450, U500, U550, U600, U650, U700, U750, U800, U850	IC-SLIC	LE7955-2FQC, QFN, 32P, 8x8 mm, PLASTIC, 5 V, 860 MW, 0TO+70C, TR, -
1205-002345	U2-U5	IC-SLIC	LE58QL021BVC, TQFP, 44P, 10x10 mm, PLASTIC, 3.3 V, 170 MW, -40TO+85C, TR, QLSLAC
1301-001680	U13	IC-CPLD	LC4064V-75T100C, TQFP, 100P, 16x16 mm, 7.5 NS, 3.3 V, 10%, 12 MA, 0TO+90C, -, 64, 64, 4, -, -0.5/5
1405-000125	V1	VARISTOR	220 V, 4500A, 17x4.2 mm, TP
1405-000130	V101, V151, V201, V251, V301, V351, V401, V451, V501, V551, V601, V651, V701, V751, V801, V851	VARISTOR	270 V, 1200A, 9x4.6 mm, TP
1405-000171	V100, V150, V200, V250, V300, V350, V400, V450, V500, V550, V600, V650, V700, V750, V800, V850	VARISTOR	82V, 1200A, 9x6 mm, TP
2003-000458	R1, R3, R7, R8, R14	R-METAL OXIDE(S)	100 ohm, 5%, 2W, AF, TP, 4x12 mm
2007-000043	R26-R28, R35, R43, R46	R-CHIP	1K ohm, 1%, 1/10W, TP, 1608

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Parts Code	Location	Product Name	Specification
2007-000052	R1095~R1097, R1134, R220, R221, R270, R271, R320, R321, R370, R371, R24, R36~R38, R40, R44, R45, R47~R50, R53, R420, R421, R470, R471, R520, R521, R570, R571, R54, R57, R67, R120, R121, R131, R170, R171, R620, R621, R670, R671, R720, R721, R770, R771, R820, R821, R870, R871, R1080~R1084, R1086	R-CHIP	10 kohm, 1%, 1/10W, TP, 1608
2007-000060	R5, R6, R9, R11, R15-R18, R20, R23, R34	R-CHIP	100 kohm, 1%, 1/10W, TP, 1608
2007-000066	R10, R19, R21, R22	R-CHIP	20 kohm, 1%, 1/10W, TP, 1608
2007-000231	R108, R158, R208, R258, R308, R358, R408, R458, R508, R558, R608, R658, R708, R758, R808, R858	R-CHIP	1.3 kohm, 1%, 1/10W, TP, 1608
2007-000497	R104, R113, R154, R163, R204, R213, R254, R263, R304, R313, R354, R363, R404, R413, R454, R463, R504, R513, R554, R563, R604, R613, R654, R663, R704, R713, R754, R763, R804, R813, R854, R863	R-CHIP	2.2 Mohm, 1%, 1/10W, TP, 1608
2007-000954	R107, R112, R157, R162, R207, R212, R257, R262, R307, R312, R357, R362, R407, R412, R457, R462, R507, R512,	R-CHIP	49.9 ohm, 1%, 1W, TP, 6432

(Continued)

Parts Code	Location	Product Name	Specification
2007-000954	R557, R562, R607, R612, R657, R662, R707, R712, R757, R762, R807, R812, R857, R862	R-CHIP	49.9 ohm, 1%, 1W, TP, 6432
2007-001139	R25	R-CHIP	7.5 kohm, 1%, 1/10W, TP, 1608
2007-001342	R103, R109, R153, R159, R203, R209, R253, R259, R303, R309, R353, R359, R403, R409, R453, R459, R503, R509, R553, R559, R603, R609, R653, R659, R703, R709, R753, R759, R803, R809, R853, R859	R-CHIP	2 Mohm, 5%, 1/10W, TP, 1608
2007-002901	R39	R-CHIP	12.1 kohm, 1%, 1/10W, TP, 1608
2007-002910	R12, R31, R32, R105, R155, R205, R255, R305, R355, R405, R455, R505, R555, R605, R655, R705, R755, R805, R855	R-CHIP	30.1 kohm, 1%, 1/10W, TP, 1608
2007-002987	R1087-R1094	R-CHIP	4.75 kohm, 1%, 1/10W, TP, 1608
2007-007331	R117, R167, R217, R267, R317, R367, R417, R467, R517, R567, R617, R667, R717, R767, R817, R867	R-CHIP	90.9 kohm, 1%, 1/10W, TP, 1608
2007-007443	R13	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007443	R33	R-CHIP	3.01 kohm, 1%, 1/10W, TP, 1608
2007-007519	R110, R114, R160, R164, R210, R214, R260, R264, R310, R314, R360, R364, R410, R414, R460, R464, R510, R514, R560, R564, R610, R614, R660, R664, R710, R714, R760, R764, R810, R814, R860, R864	R-CHIP	80.6 kohm, 1%, 1/10W, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2007-007637	R102, R152, R202, R252, R302, R352, R402, R452, R502, R552, R602, R652, R702, R752, R802, R852	R-CHIP	15 KOHM, 5%, 1W, TP, 6432
2007-007645	R1136, R1137, R41, R42, R93~R97, R126~R130, R1106~R1133	R-CHIP	51.1 ohm, 1%, 1/10W, TP, 1608
2007-007768	R115, R116, R165, R166, R215, R216, R265, R266, R315, R316, R365, R366, R415, R416, R465, R466, R515, R516, R565, R566, R615, R616, R665, R666, R715, R716, R765, R766, R815, R816, R865, R866	R-CHIP	13 kohm, 1%, 1/10W, TP, 1608
2007-008122	R51, R52, R55, R56, R1135	R-CHIP	22.1 ohm, 1%, 1/10W, TP, 1608
2007-008150	R1098-R1105	R-CHIP	12.1 ohm, 1%, 1/10W, TP, 1608
2007-008681	R101, R106, R111, R151, R156, R161, R201, R206, R211, R251, R256, R261, R301, R306, R311, R351, R356, R361, R401, R406, R411, R451, R456, R461, R501, R506, R511, R551, R556, R561, R601, R606, R611, R651, R656, R661, R701, R706, R711, R751, R756, R761, R801, R806, R811, R851, R856, R861	R-CHIP	1.2 KOHM, 5%, 1W, TP, 6432
2203-000426	C277, C278, C283	C-CER, CHIP	0.018nF, 5%, 50 V, C0G, 1608
2203-000576	C110, C160, C210, C260, C310, C360, C410, C460, C510, C560, C610, C660, C710, C760, C810, C860	C-CER, CHIP	220nF, 10%, 50 V, X7R, 3216
2203-000888	C15, C19	C-CER, CHIP	4.7nF, 10%, 50 V, X7R, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2203-001386	C102, C104, C105, C111, C114, C115, C152, C154, C155, C161, C164, C165, C202, C204, C205, C211, C214, C215, C252, C254, C255, C261, C264, C265, C302, C304, C305, C311, C314, C315, C352, C354, C355, C361, C364, C365, C402, C404, C405, C411, C414, C415, C452, C454, C455, C461, C464, C465, C502, C504, C505, C511, C514, C515, C552, C554, C555, C561, C564, C565, C602, C604, C605, C611, C614, C615, C652, C654, C655, C661, C664, C665, C702, C704, C705, C711, C714, C715, C752, C754, C755, C761, C764, C765, C802, C804, C805, C811, C814, C815, C852, C854, C855, C861, C864, C865	C-CER, CHIP	100nF, 10%, 100 V, X7R, TP, 3216, 3.2
2203-001656	C16	C-CER, CHIP	0.47nF, 5%, 50 V, NP0, TP, 1608
2203-001697	C113, C163, C213, C263, C313, C363, C413, C463, C513, C563, C613, C663, C713, C763, C813, C863	C-CER, CHIP	0.082nF, 5%, 50 V, NP0, 1608
2203-002080	C112, C162, C212, C262, C312, C362, C412, C462, C512, C562, C612, C662, C712, C762, C812, C862	C-CER, CHIP	0.56nF, 5%, 50 V, C0G, TP, 1608

(Continued)

Parts Code	Location	Product Name	Specification
2203-005221	C101, C109, C151, C159, C201, C209, C251, C259, C301, C309, C351, C359, C401, C409, C451, C459, C501, C509, C551, C559, C601, C609, C651, C659, C701, C709, C751, C759, C801, C809, C851, C859	C-CER, CHIP	15nF, 10%, 50 V, X7R, TP, 1608, -
2203-005249	C203, C208, C216, C253, C258, C266, C303, C308, C3, C6~C14, C18, C23, C26~C29, C33, C37, C38, C316, C353, C358, C366, C403, C408, C416, C453, C41, C42, C103, C108, C116, C153, C158, C166, C458, C466, C503, C508, C516, C553, C558, C566, C603, C608, C616, C653, C658, C666, C703, C708, C716, C753, C758, C766, C803, C808, C816, C853, C858, C866, C868~C880	C-CER, CHIP	100nF, 10%, 50 V, X7R, TP, 1608, -
2203-005457	C275, C276, C881	C-CER, CHIP	1nF, 10%, 2 KV, X7R, TP, 4520
2203-005687	C106, C107, C156, C157, C206, C207, C256, C257, C306, C307, C356, C357, C406, C407, C456, C457, C506, C507, C556, C557, C606, C607, C656, C657, C706, C707, C756, C757, C806, C807, C856, C857	C-CER, CHIP	2.2nF, 10%, 500 V, X7R, TP, 3216

(Continued)

Parts Code	Location	Product Name	Specification
2203-006115	C100, C117, C150, C167, C200, C217, C250, C267, C300, C317, C350, C367, C400, C417, C450, C467, C500, C517, 550, C567, C600, C617, C650, C667, C700, C717, C750, C767, C800, C817, C850, C867	C-CER, CHIP	470nF, 20%, 250 V, X7R, TP, 4532
2305-000385	C2	C-FILM, LEAD-PEF	470nF, 10%, 250 V, BK, 18x6x12, 15
2401-000625	C4, C5	C-AL	2.2uF, 20%, 160 V, GP, TP, 6.3x11, 5
2401-003291	C1	C-AL	22uF, 20%, 200 V, WT, TP, 10x16, 5
2401-003298	C21, C24	C-AL	100uF, 20%, 63 V, GP, TP, 8x11.5, 5
2402-000120	C274	C-AL, SMD	10uF, 20%, 50 V, GP, TP, 6.6x6.6x5.4 mm
2402-001083	C17, C882	C-AL, SMD	100uF, 20%, 50 V, GP, TP, 10x10.3x10
2702-001112	L5	INDUCTOR-RADIAL	60uH, 35%, 7.5x8.0 mm
2703-002639	L100, L150, L200, L250, L300, L350, L400, L450, L500, L550, L600, L650, L700, L750, L800, L850	INDUCTOR-SMD	1000uH, 20%, 5.2x5.2x1.8 mm
2901-000188	B1, B2	FILTER-EMI ON BOARD	50V, 1A, -, 47pF, 7.5x2.5x6.2 mm, TP, -
3301-001308	L2-L4, L6, L7	BEAD-SMD	10OHM, 1608, 500, TP, -, -, 0.15
3501-001258	K100, K250, K105, K150, K400, K200, K300, K550, K350, K450, K700, K500, K600, K850, K650, K750, K451, K501, K551, K601, K651, K701, K751, K801, K800, K101, K151, K201, K251, K301, K351, K401	RELAY-MINIATURE	5V, 100 MW, 1000 MA, 2FORMC, 3 MS, 3 MS
3501-001258	K851	RELAY-MINIATURE	5V, 100 MW, 1000 MA, 2FORMC, 3 MS, 3 MS
3703-001252	P1-P3	CONNECTOR-BACK PANEL	30P, 5R, FEMALE, ANGLE-F, AU30U

(Continued)

Parts Code	Location	Product Name	Specification
3710-000001	JP1	CONNECTOR-SHUNT	2P, 1R, 2.54 mm, AUF
3711-001465	JP1	CONNECTOR-HEADER	NOWALL, 3P, 1R, 2.54 mm, STRAIGHT, AUF, BLK
3711-003272	P4	CONNECTOR-HEADER	BOX, 10P, 2R, 2.54 mm, STRAIGHT, AUF, BLK
3722-001302	P5	JACK-MODULAR	8P, -, -, ANGLE, -, BLK, AU50U
EC27-30514A	L1	COIL RF	INFOREX, 35uH, -, 40T
GA26-30073A	T1	TRANS POWER	DCS, -48 V//13 V/85 V, 877 uH//100 uH
GA41-00177A	PCS.01	PCB MAIN-OS7200 16SLI2	OFFICESERV 7200, FR4, 4L, 00, 1.6T, 130x275 mm, -, -, -, -

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CHAPTER 7. Exploded View

This chapter displays the device parts diagram of the OfficeServ 7200 system.

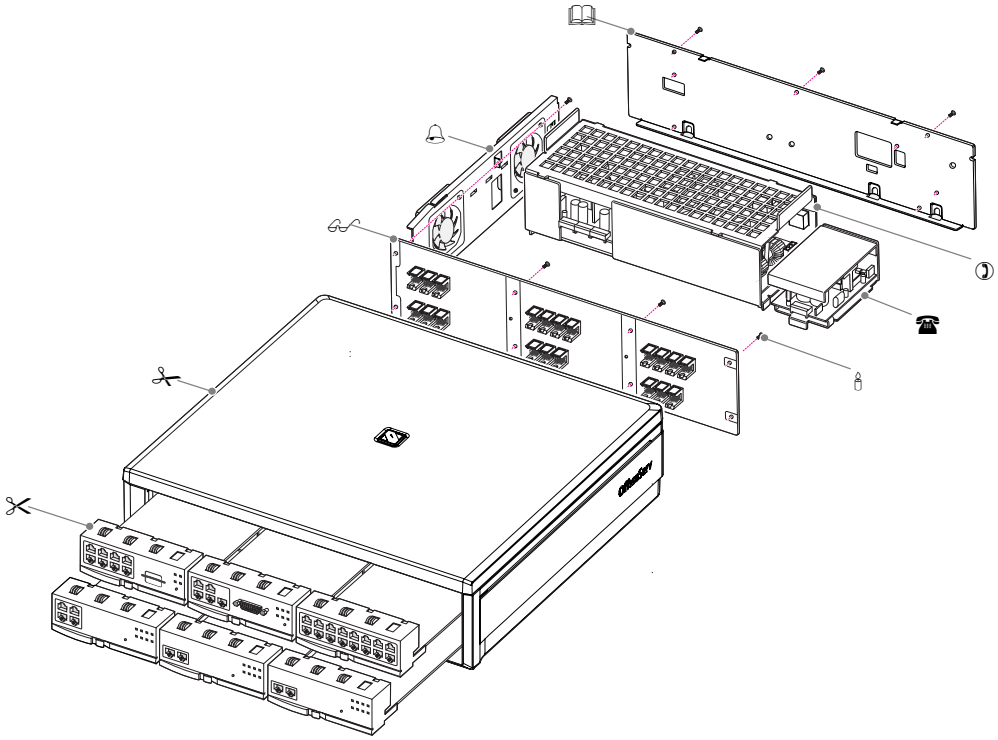
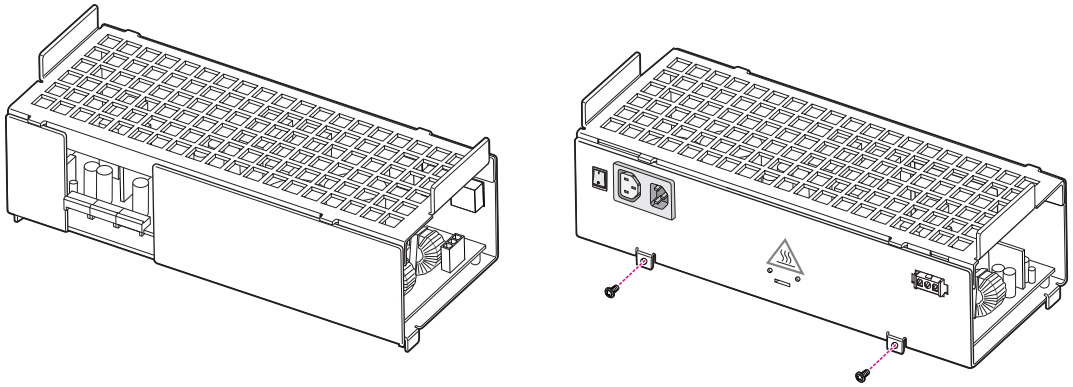


Figure 7.1 OfficeServ 7200 Decomposition Diagram

Table 7.1 List of Device Parts

No.	Name	Component Code	Volu-me
1	MCP STIFFENER ASSY	GA75-00004A	1
2	SME RACK ASSY	GA97-01898A	1
3	SME MBD	GA92-02800A	1
4	FAN ASSY	GA96-00822A	1

No.	Name	Component Code	Volu -me
5	REAR PANEL	GA70-00054A	1
6	M3 SCREW	6003-000127	17
7	RINGER ASSY	-	1
8	AC/DC UNIT	GA44-00015A	1



(Front) (Back)

Figure 7.2 Front and Back Side of the Power Module

ABBREVIATION

A

AC	Alternating Current
AGC	Automatic Gain Control
AFE	Alternative Front End
AMI	Alternate Mark Inversion
AOM	Add On Module
AP	Access Point
APLL	Analog Phase Locked Loop
ASIC	Application Specific Integrated Chip

B

BFI	Bad Frame Interpolation
BPSK	Binary Phase Shift Keying
BRI	Basic Rate Interface

C

CA	Call Agent
CAS	Channel Associated Signalling
CCS	Common Channel Signalling
CID	Caller Identification
CO	Central Office
CPLD	Complex Programmable Logic Device
CSU	Communication Service Unit
CTI	Computer Telephony Integration

D

DASL	Digital Adaptor for Subscriber Loop
DC	Direct Current
DECT	Digital Enhanced Cordless Telecommunications
DGP	Digital Phone
DHCP	Dynamic Host Configuration Protocol
DLI	Digital Line Interface
DPLL	Digital Phase Locked Loop
DPIM	Door Phone Interface Module
DPRAM	Dual Port Random Access Memory
DSP	Digital Transceiver
DSSS	Direct Sequence Spread Spectrum

E

EMI	Electro-Magnetic Interference
EPLD	Erasable Programming Logic Device

H

HDLC	High level Data Link Control
HFC	High Feature CODEC
HOS	Hook-Off Sensing

I

ID	Identification
IDS	Intrusion Detection System
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPC	Inter Processor Communication
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
ITP	IP Telephone

K

KDB	Keyset Daughter Board

L

LAN	Local Area Network
LCD	Liquid Crystal Display
LCP	Local Control Processor
LED	Light Emitting Diode
LIM	LAN Interface Module
LOS	Loss Of Signal

M

MCP	Main Control Processor
MGI	Media Gateway Interface
MMC	Man Machine Communication
MMU	Memory Management Unit
MOH	Music On Hold

P

PBA	Printed circuit Board Assembly
PCM	Pulse Code Modulation
PCMMC	PC based Man Machine Communication
PD	Powered Devices
PLD	Programmable Logic Device

PLL	Phase Locking Loop
PoE	Power over Ethernet
PPS	Pulse Per Second
PRI	Primary Rate Interface
PSE	Power Sourcing Equipment
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit

Q

QAM	Quadrate Amplitude Modulation
QDSL	Quad Digital Adapter for Subscriber Loops
QFP	Quad Flat Pack
Q-SIG	Q-Signalling
QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying

R

RTP	Real-time Transmission Protocol

S

SIP	Session Initiation Protocol
SLI	Single Line Interface
SLT	Single Line Telephone
STP	Signalling Transfer Point

T

TCM	Time Compression Multiplexed
TEPRI	T1E1PRI
TRK	Trunk
TSAC	Time Slot Assignment Control
TTS	Text-To Speech

U

UART	Universal Asynchronous Receiver and Transmitter

V

VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network

W

WAN	Wide Area Network
WIM	WAN Interface Module
WLI	Wireless LAN Interface

X

xDSL	x-Digital Subscriber Line

OfficeServ 7200

Service Manual

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