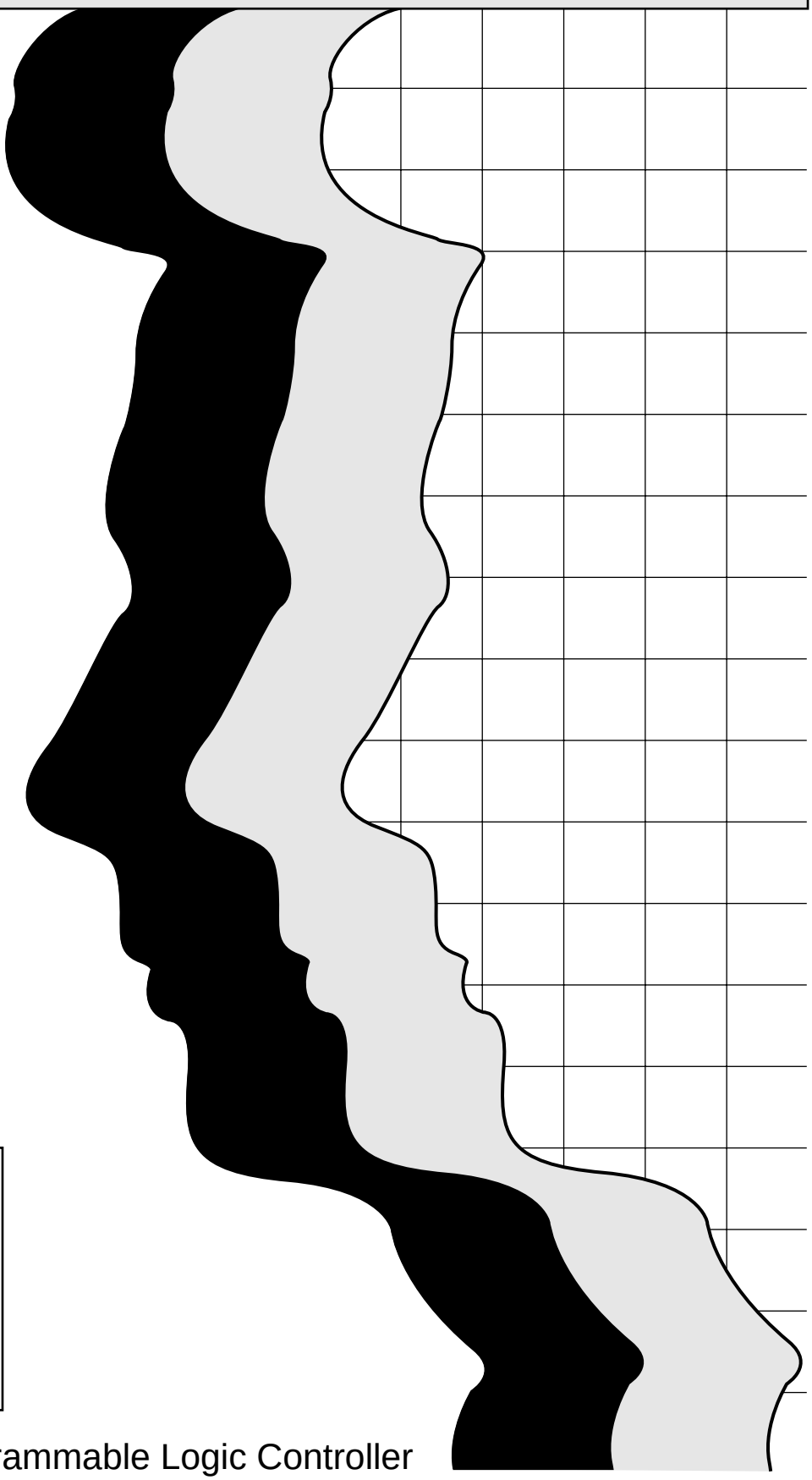
MITSUBISHI

Voice Output Module Type A11VC

User's Manual



MELSEC

Mitsubishi Programmable Logic Controller

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".

DANGER	**Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.**
CAUTION	**Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.**

Depending on circumstances, procedures indicated by ⚠ CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

[DESIGN PRECAUTIONS]

DANGER

- Build a circuit that turns on the external power supply when the PC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.

CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100 mm (3.94 inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.

[INSTALLATION PRECAUTIONS]

⚠ CAUTION

- Use the PLC in an environment that meets the general specifications contained in this manual. Using this PLC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes. Not installing the module correctly could result in erroneous operation, damage, or pieces of the product falling.
- Always switch off all phases of the external power supply before mounting or dismounting the module. Not doing so could cause damage to the product.
- Do not directly touch the module's conductive parts or electronic components. Touching the conductive parts could cause an operation failure or give damage to the module.

[WIRING PRECAUTIONS]

⚠ DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

[WIRING PRECAUTIONS]

CAUTION

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PLC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Do not connect multiple power supply modules in parallel. Doing so could cause overheating, fire or damage to the power supply module. If the terminal screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or module.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
  Tightening the terminal screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. For information regarding the crimping and pressure welding tools, see the I/O module's user's manual. Imperfect connections could result in short circuit, fires, or erroneous operation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminals while power is on. Doing so could cause shock or erroneous operation.
- Correctly connect the battery. Also, do not charge, disassemble, heat, place in fire, short circuit, or solder the battery. Mishandling of battery can cause overheating or cracks which could result in injury and fires.
- Switch all phases of the external power supply off when cleaning the module or tightening the terminal screws and module mounting screws. Not doing so could result in electric shock. If the screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or modules.

CAUTION

- Do not disassemble or modify the modules. Doing so could cause trouble, erroneous operation, injury, or fire.
- When using a wireless communication device, such as a cellular phone or PHS (Personal Handy Phone System), separate it at least 25cm away from the PLC.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause failure or malfunction of the module.
- Do not drop or give impact to the battery fitted to the module. Doing so may damage the battery, causing battery liquid leakage in the battery.
  Dispose of the battery that has been dropped or given impact, without using it.
- Always make sure to touch the grounded metal to discharge the electricity charged in the electricity charged in the body, etc., before touching the module.
  Failure to do say cause a failure or malfunctions of the module.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.

[TRANSPORTATION PRECAUTIONS]

CAUTION

- When transporting lithium batteries, make sure to treat them based on the transport regulations. (Refer to Appendix 3 for details of the controlled models.)

REVISIONS

※The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision
Dec., 1988	IB (NA) 66088-A	First edition
Sep., 2004	IB (NA) 66088-B	Partial correction SAFETY PRECAUTIONS, Chapter 1, Section 1.1, 2.1, 2.2, 2.3, 3.2, 3.3.1, 3.3.3, Section 3.6, 3.7, 4.2, 4.3.2, 6.2.2, 8.2.1 Addition Appendix 3, 3.1, 3.2

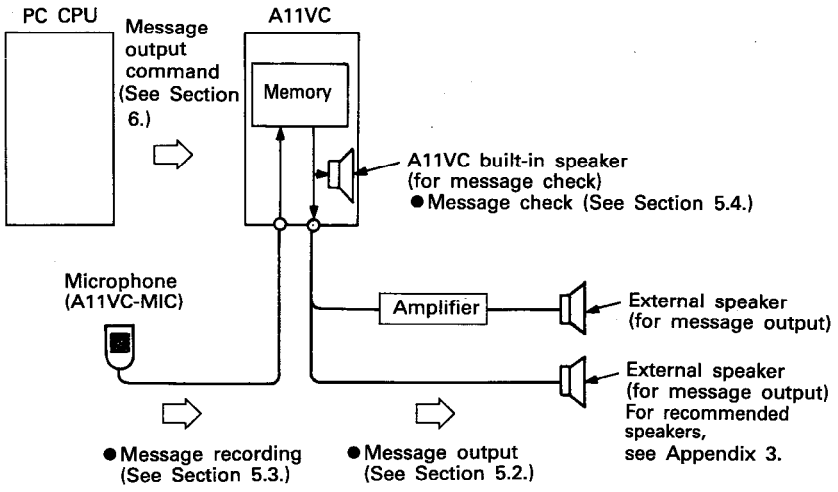
INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

CONTENTS

1. INTRODUCTION

The A11VC voice output module (referred to as "A11VC") is used with the MELSEC-A series PC CPU. The A11VC allows messages (e.g. prerecorded alarm, work directive, guidance) to be output to an external speaker and/or an amplifier by the command from the PC CPU.



- The A11VC allows messages to be recorded and corrected by using the special-purpose microphone (A11VC-MIC).
- The A11VC can be connected with an external speaker and an amplifier.
- The A11VC allows any recorded message to be checked by the built-in speaker.
- The A11VC allows the required message to be output from the external speaker by the message output command from the PC CPU.

Packing list:

Description	Quantity
A11VC voice output module	1
A6BAT lithium battery (in the module)	1
16KRAM (in the module)	4

The A11VC has the following features:

(1) Allows the user to record messages

The user can record and change messages in the memory by using the special-purpose microphone (A11VC-MIC).

(2) Two record/replay modes available:

1) Sentence mode allows a message to be recorded and replayed in the form of a sentence.

2) Word/phrase mode allows messages to be recorded in the form of words and phrases, and a combination of the words and phrases to be replayed as a message.

(3) Allows messages to be recorded and replayed on 60 channels.

As one sentence, one word or one phrase can be recorded on one channel, a total of 60 sentences, words and phrases can be recorded and replayed.

(4) Allows the recording time to be set per channel.

The recording time per channel can be set to any of 1, 2, 4 or 8 seconds.

(5) Allows the total recording time to be switched.

1) The total recording time can be switched between 32 and 64 seconds.
2) High tone quality is available in 32 seconds mode. 64 seconds mode is longer in recording time but lower in tone quality and S/N ratio.

(6) Allows any message to be checked by the built-in speaker.

The message recorded can be replayed per channel for confirmation.

(7) Allows connection with an external speaker.

1) The built-in 5W amplifier can be connected directly with an external speaker to output messages.
2) 1.8W can be output when a 0.75mm^2 (18 AWG) cable is used over a 100m (328.1 ft) distance.

(8) Allows connection with an external amplifier.

The A11VC has an external amplifier jack so that messages can be output by connecting the A11VC with the amplifier installed in the factory, etc.

(9) Allows recorded messages to be stored on ROM and disk.

Messages recorded on the A11VC can be stored on ROM and disk by using the A6GPP/A6HGP/A6PHP (referred to as "GPP") booted by the SW0GHP-A11VCP system disk.

(10) Allows any message to be output by a simple sequence program.

Any message can be output from the A11VC by specifying the required channel number in the sequence program.

1.1 Generic Terms for CPU Model Names

In this User's Manual, the CPU model names are generically called as as described below.

(1) PLC CPU

A0J2CPU (P23/R23)		
A0J2HCPU (P21/R21)		
A1CPU (P21/R21)	A1NCPU (P21/R21)	
A2CPU (P21/R21)	A2NCPU (P21/R21)	
A2CPU (P21/R21)-S1	A2NCPU (P21/R21)-S1	
A3CPU (P21/R21)	A3NCPU (P21/R21)	
A3HCPU (P21/R21)	A2UCPU	Q2ACPU
A3MCPU (P21/R21)	A2UCPU-S1	Q2ACPU-S1
A2ACPU (P21/R21)	A3UCPU	Q3ACPU
A2ACPU (P21/R21)-S1	A4UCPU	Q4ACPU
A3ACPU (P21/R21)		
A73CPU (P21/R21)		

(2) Building block type CPU

A1CPU (P21/R21)	A1NCPU (P21/R21)	
A2CPU (P21/R21)	A2NCPU (P21/R21)	
A2CPU (P21/R21)-S1	A2NCPU (P21/R21)-S1	
A3CPU (P21/R21)	A3NCPU (P21/R21)	
A3HCPU (P21/R21)	A2UCPU	Q2ACPU
A3MCPU (P21/R21)	A2UCPU-S1	Q2ACPU-S1
A2ACPU (P21/R21)	A3UCPU	Q3ACPU
A2ACPU (P21/R21)-S1	A4UCPU	Q4ACPU
A3ACPU (P21/R21)		
A73CPU (P21/R21)		

(3) Compact type CPU

A0J2CPU (P23/R23)

A0J2HCPU (P21/R21)

MEMO

2. SYSTEM CONFIGURATION

This chapter explains the system that uses the A11VC.

2.1 System Configuration

(1) Fig. 2.1 shows the system configuration that uses a building block type CPU.

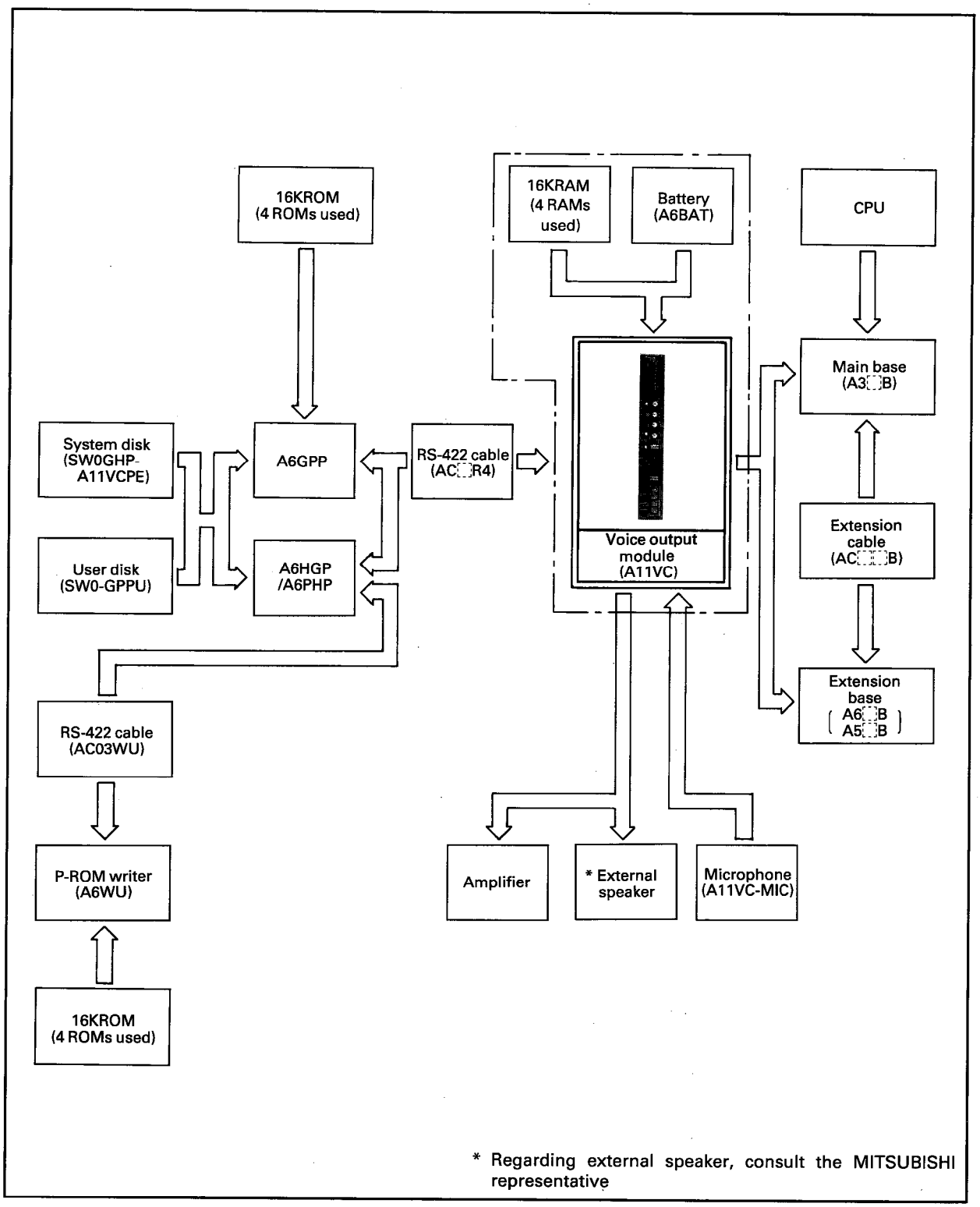


Fig. 2.1 System Configuration (using building block type CPU)

(2) Fig. 2.2 shows the system configuration that uses a compact type CPU.

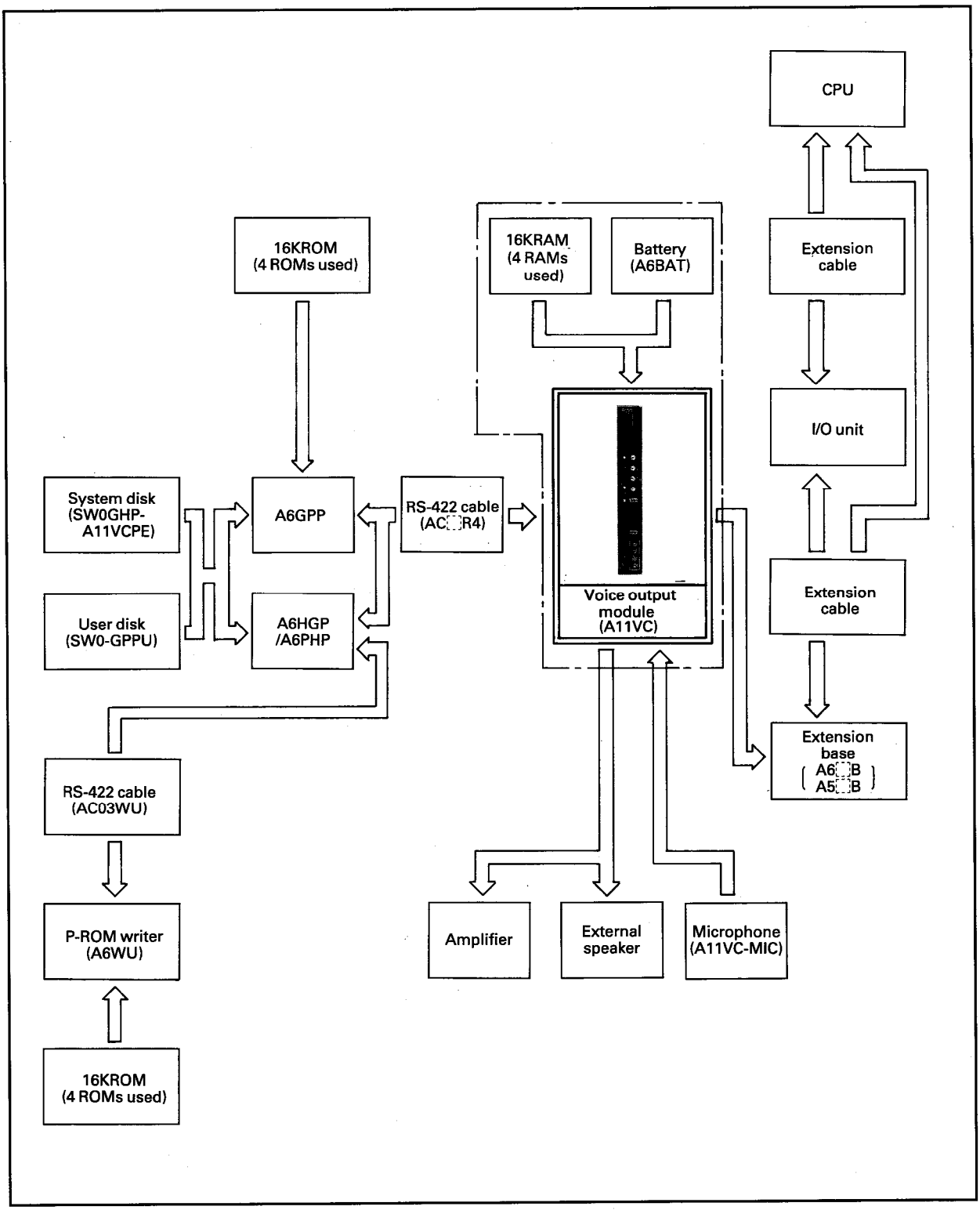


Fig. 2.2 System Configuration (using compact type CPU)

2.2 Applicable A-Series Systems

The A11VC can be used with the following CPU modules:

Applicable models	A0J2CPU A0J2HCPU A1CPU A2CPU A2CPU-S1 A3CPU	A1NCPU A2NCPU A2NCPU-S1 A3NCPU	A3HCPU A3MCPU A2ACPU A2ACPU-S1 A3ACPU A73CPU	A2UCPU A2UCPU-S1 A3UCPU A4UCPU Q2ACPU Q2ACPU-S1 Q3ACPU Q4ACPU

The A11VC may be loaded into any slot on the base unit with the following precautions:

(1) When using the A11VC with the A55B or A58B extension bases (i.e. those without power supplies), select the power supply for the main base unit in accordance with the corresponding CPU User's Manual.

(2) The A11VC may be loaded into the master station or a local station but not into a remote I/O station in a MELSECNET system. The following CPU modules are required for the MELSECNET data link system.

Applicable models (master or local stations)	A0J2HCPUP21/R21 A73CPUP21/R21 A1CPUP21/R21 A2CPUP21/R21 A2CPUP21/R21-S1 A3CPUP21/R21	A1NCPUP21/R21 A2NCPUP21/R21 A2NCPUP21/R21-S1 A3NCPUP21/R21	A3HCPUP21/R21 A3MCPUP21/R21 A2ACPUP21/R21 A2ACPUP21/R21-S1 A3ACPUP21/R21	A2UCPU A2UCPU-S1 A3UCPU A4UCPU Q2ACPU Q2ACPU-S1 Q3ACPU Q4ACPU
	A0J2CPUP23/R23 A0J2HCPUP21/R21 A73CPUP21/R21 A1CPUP21/R21 A2CPUP21/R21 A2CPUP21/R21-S1 A3CPUP21/R21	A1NCPUP21/R21 A2NCPUP21/R21 A2NCPUP21/R21-S1 A3NCPUP21/R21	A3HCPUP21/R21 A3MCPUP21/R21 A2ACPUP21/R21 A2ACPUP21/R21-S1 A3ACPUP21/R21	A2UCPU A2UCPU-S1 A3UCPU A4UCPU Q2ACPU Q2ACPU-S1 Q3ACPU Q4ACPU

2.3 Notes on Use of the A11VC

(1) See Section 6.1 when outputting any message by the PR (PRC) instruction with two or more A11VCs used or the A11VC used with the A6FD (external display).

(2) Four 16KRAMs or 16KROMs must be installed to the A11VC. All ICs used must be of the same type.

(3) The ROM No.s should match the socket No.s as shown in Section 4.3.1.

(4) Messages should be written from the GPP to the A11VC with the A11VC memory protect switch set to OFF and the MODE select switch set to REC.

(5) When using the A11VC, set the scan time of the sequence program to 5ms or more.

3. SPECIFICATIONS

3.1 General Specifications

Item	Specifications				
Operating ambient temperature	0 to 55°C				
Storage ambient temperature	−10 to 75°C				
Operating ambient humidity	10 to 90%RH, no condensation				
Storage ambient humidity	10 to 90%RH, no condensation				
Vibration resistance	Conforms *1 to JIS C 0911	**Frequency**	**Acceleration**	**Amplitude**	**Sweep Count**
		10 to 55Hz	——	0.075mm	10 times *(1 octave/minute)
		55 to 150Hz	1g	——	
Shock resistance	Conforms to JIS C0912 (10g x 3 times in 3 directions)				
Noise durability	By noise simulator 1000Vpp noise voltage, 1μs noise width and 25 to 60Hz noise frequency				
Dielectric withstand voltage	500V AC for 1 minute across AC external terminals and ground				
Insulation resistance	5MΩ or larger by 500V DC insulation resistance tester across batch of AC external terminals and ground				
Operating ambience	To be free from corrosive gases. Dust should be minimal.				
Cooling method	Self-cooling				

Table 3.1 General Specifications

REMARKS

One octave marked * indicates a change from the initial frequency to double or half frequency. For example any of the changes from 10Hz to 20Hz, from 20Hz to 40Hz, from 40Hz to 20Hz, and 20Hz to 10Hz are referred to as one octave.

*1 JIS: Japanese Industrial Standard

3.2 Performance Specifications

Item		Specifications
Number of I/O occupied		16
Voice synthesization mode		ADM*
Total recording time (second)		32/64 (selected by the switch)
Number of message recording channels		60 (Channels 1 to 60)
Recording time per channel		1, 2, 4 or 8 seconds can be selected per channel.
Voice output	Built-in speaker	8Ω, 0.3W
	Built-in amplifier output	8Ω, 5W*
	External amplifier output	600Ω, $1V_{RMS}$ balance type transformer output Balance or unbalance type amplifier may be connected.
Voice output frequency characteristic		100Hz to 3.5KHz
Memory I.C.	RAM	Four 16KRAMs (32K bytes each) supplied in the module Lithium battery backed for a total of 300 days if power failure has occurred. 5-year battery life guaranteed.
	ROM	Four 16KROMs (32K bytes each) available as option. No data backup battery required.
Terminals		4-point terminal block
Cable size		0.75 to 2mm² (tightening torque: 67N·cm)
Solderless terminals		V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A
Internal current consumption (5V DC)		0.6A
External supply power	Voltage	21.6 to 26.4V DC
	Current consumption	0.05A (0.33A during message output)
Size mm(inch)		250(9.84) (H) × 37.5(1.48) (W) × 120(4.72) (D)
Weight kg(lbs)		0.6(1.32)

Table 3.2 Performance Specifications

POINT

(1) *: External speaker output is as follows:

1) One 8Ω speaker is used·····5W
2) Two 4Ω speakers are connected in series ·····5W each
3) Two 16Ω speakers are connected in parallel ·····2.5W each

(2) When making I/O assignment using a peripheral device, assign the A11VC as a 16-point special function module.

REMARKS

*: ADM represents Adaptive Delta Modulation.

3.3 Functions

3.3.1 Recording

(1) Recording methods

The following recording methods are available:

1) New message recording

The A11VC memory is cleared to record new messages. Messages can be recorded on channels 1 to n ($1 \leqq n \leqq 60$) sequentially.

2) Message change

The messages recorded on the A11VC can be changed. The recording time must be the same as the preceding recording time.

3) Message addition

Messages can be added to the unrecorded channels of the A11VC sequentially from the earliest unrecorded channel to channel n ($2 \leqq n \leqq 60$).

(2) Recording modes

Sentence mode and word/phrase mode can be used independently or in combination.

1) Sentence mode

One sentence is recorded on one channel. As the recording time of one channel is long, the number of channels (messages) recorded is reduced.

Example
Channel 1: Please supply parts.
Channel 2: Please change parts.

2) Word/phrase mode

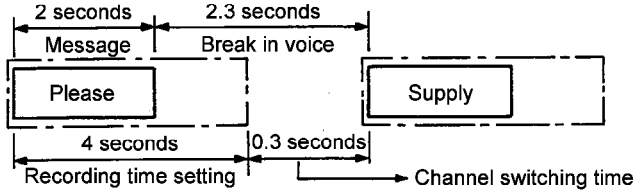
One sentence is recorded on several channels, divided into words and/or phrases. A combination of the required words and phrases is replayed as a message. Several messages can be output by changing the combination of the recorded words and phrases.

Example
Channel 1: Please
Channel 2: Supply
Channel 3: Change
Channel 4: Parts

When a combination of recorded words/phrases is replayed, a voice may be heard with a break depending on the recording time setting of the replay channel and the recording time of the message.

Example

(1)When the recording time setting is 4 seconds and the message recording time is 2 seconds, a voice is replayed with a break of 2.3 seconds.



The following methods are available to shorten a break in voice.

(a) Adjust the recording time setting according to the message to reduce the remaining recording time.

(b) Reduce the number of combined channels to reduce channel switching.

3.3.2 Replay using the A11VC START switch

Any message can be replayed by pressing the START switch with the A11VC in PLAY mode.
This method is used to confirm a message recorded on the corresponding channel.

3.3.3 Replay by the sequence program

Any message can be output by specifying the corresponding channel number in the sequence program. One or several channels can be specified as described below:

To specify one channel, use the [MOV] instruction.
To specify several channels, use the [PR] or [PRC] instruction.

(1) Using the [MOV] instruction

Output the channel number to Yn0 to Yn7 in binary.

(2) Using the [PR] instruction

1) Write the required channel numbers to the corresponding devices in ASCII and output the channel numbers from the devices by the [PR] instruction.

2) As one channel uses two ASCII codes, the number of channels specified is eight maximum.

3) When the number of channels specified is less than eight, write 20H to the unspecified channels.

Example
To specify channels 1, 2, 4, 5 in D0 to D7

	Higher 8 bits	Lower 8 bits	
D0	31_H	30_H	→Specifies channel 1.
D1	32_H	30_H	→Specifies channel 2.
D2	34_H	30_H	→Specifies channel 4.
D3	35_H	30_H	→Specifies channel 5.
D4	20_H	20_H	Specifies no processing.
D5	20_H	20_H	
D6	20_H	20_H	
D7	20_H	20_H	

→Specifies the number of tens of the channel number.
→Specifies the number of units of the channel number.

POINT

(1) When the PR instruction is used by the CPU module other than the A0J2CPU(P21/R21), A1CPU(P21/R21), A2CPU(P21/R21), A2CPU(P21/R21)-S1, and A3CPU(P21/R21), M9049 (output character count changing flag) must be turned ON to set the number of output characters to 16.

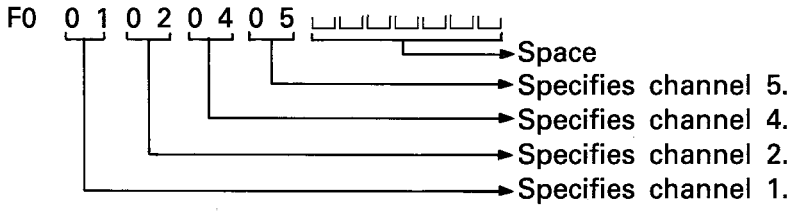
(3) Using the PRC instruction

1) Enter the channel numbers to the corresponding device comment area in replay order and output the channel numbers from the comment area by the PRC instruction.

2) As one channel uses two comment characters, the number of channels specified is seven maximum.

Example

To enter channels 1, 2, 4, 5 in F0 comment area



3.4 I/O Specifications

The A11VC uses 16 inputs (X) and 16 outputs (Y) as indicated in Table 3.3 and 3.4.

Input Number	Description	Remarks
Xn0	Watch dog timer error	ON indicates that a watch dog timer error has occurred in the A11VC.
Xn1	Voice output busy	ONLINE mode ON indicates that the A11VC is outputting a message. Used as an interlock during write from the PC CPU to the A11VC.
		REC mode ● In new message recording mode, switched on when ALL ERASE is pressed and kept on until REC mode is switched to the other mode. ● In message change/addition mode, switched on when START is pressed and kept on until recording is terminated.
		PLAY mode Switched on when the START switch is pressed and remains on while the message is output (for the period of time set in REC mode).
Xn2	Battery error	With the memory setting jumper set to RAM, ON indicates that: ● The battery voltage is below the specified level. ● The battery connector is not connected to the printed circuit board pins.
Xn3 to XnF	Must not be used.	———

Table 3.3 Input Specifications

Output Number	Description	Remarks
Yn0 to Yn7	For setting message output channels	Using [MOV] instruction Outputs 1 to 60 in binary.
		Using [PR], [PRC] instruction Outputs ASCII codes.
Yn8	Strobe signal	Used with the [PR], [PRC] instruction as a strobe signal.
Yn9	Execution flag	Used with the [PR], [PRC] instruction as an execution flag.
YnA to YnE	Must not be used	———
YnF	Message output enable flag	ON indicates that the A11VC is outputting messages corresponding to the channel numbers specified in Yn0 to Yn7.

Table 3.4 Output Specifications

REMARKS

n equals the head I/O number of the slot being used for the A11VC.

Example

Xn0 = X000 when the the A11VC is loaded in slot 0 of the main base unit.

3.5 Memory Specifications

Item \ Type	16KRAM	16KROM
Memory specifications	IC-RAM (Random access)	EP-ROM (Read only)
Memory capacity	32K bytes	
Construction	28-pin IC package	

Table 3.5 Memory Specifications

3.6 Battery Specifications

Item \ Type	A6BAT
Classification	Thionyl chloride lithium battery
Nominal voltage	3.6V DC
Guarantee period	5 years
Total power failure time	4 years at 40°C 330 days at 75°C
Application	IC-RAM backup
Size mm(inch)	ϕ 16(0.63) (dia.) × 30(1.18)

Table 3.6 Battery Specifications

3.7 A11VC-MIC Specifications

Item \ Type	A11VC-MIC
Nominal impedance	400 Ω ± 30% (1000Hz, measured by substitution method)
Nominal sensitivity	−70dB ± 3dB (1000Hz, relative measurement, 0dB = 1V/ μ BAR)
P.T.T. switch insulation resistance	10MΩ or more across terminals using 500V DC insulation resistance tester.
P.T.T. switch operation force	600 to 800g (500 to 900g after operation of 20000 times)
Storage temperature	−20 to 50°C
Weight	110g

Table 3.7 A11VC-MIC Specifications

4. HANDLING

4.1 Handling Instructions

(1) Do not subject the A11VC to impact loads.

(2) Do not remove printed circuit boards from the housing. There are no user-serviceable parts on the boards.

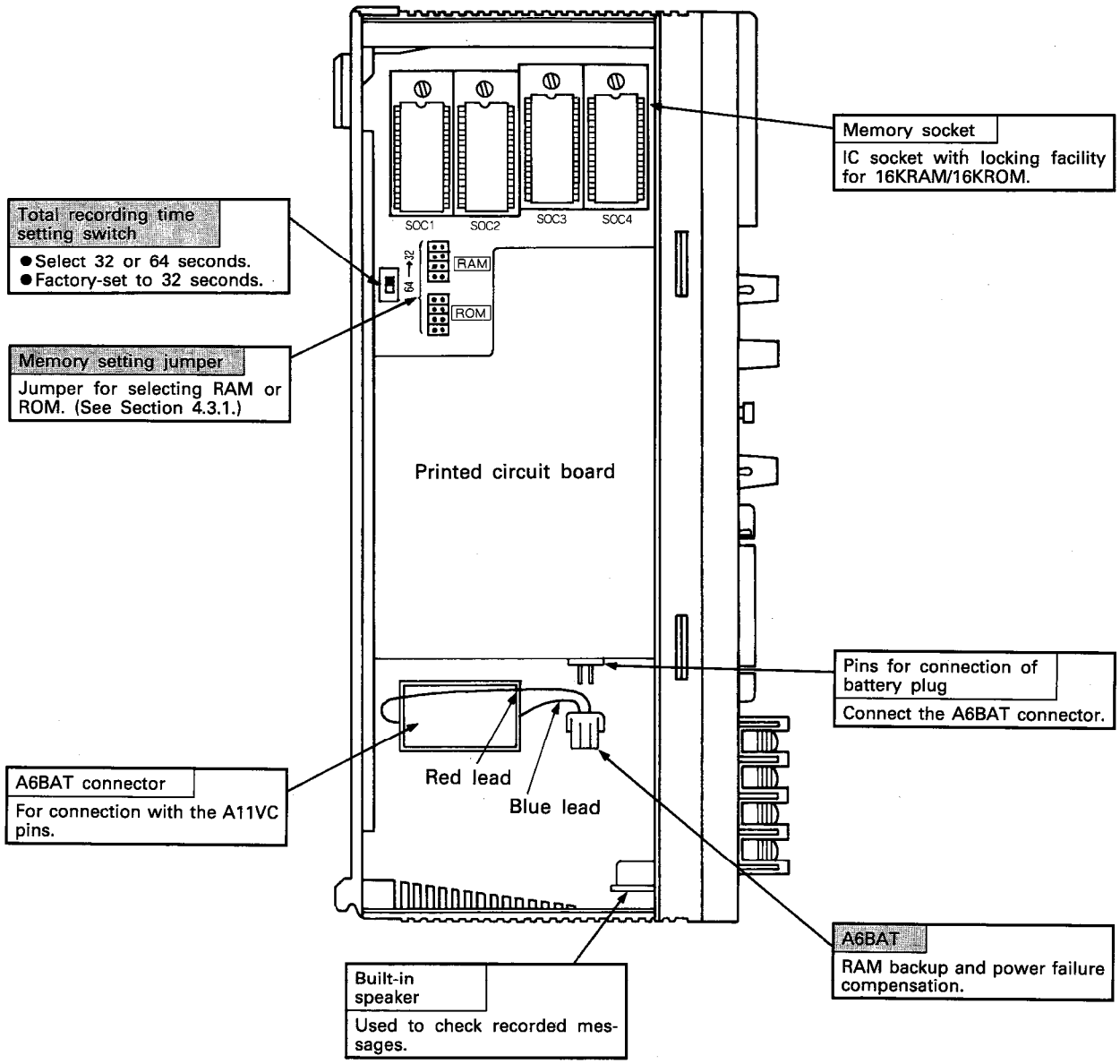
(3) Ensure that no conductive debris can enter the module. If it does, make sure that it is removed. Guard particularly against wire offcuts.

(4) The module must be loaded or removed with the PC power off.

(5) To load the module onto the base, hook the two lower lugs into the cut out and gently swing the module into place. Ensure that the top catch engages. To remove the module, press the top catch and swing the module out before unhooking the lower lugs.

4.2 Nomenclature

(1) A11VC left side



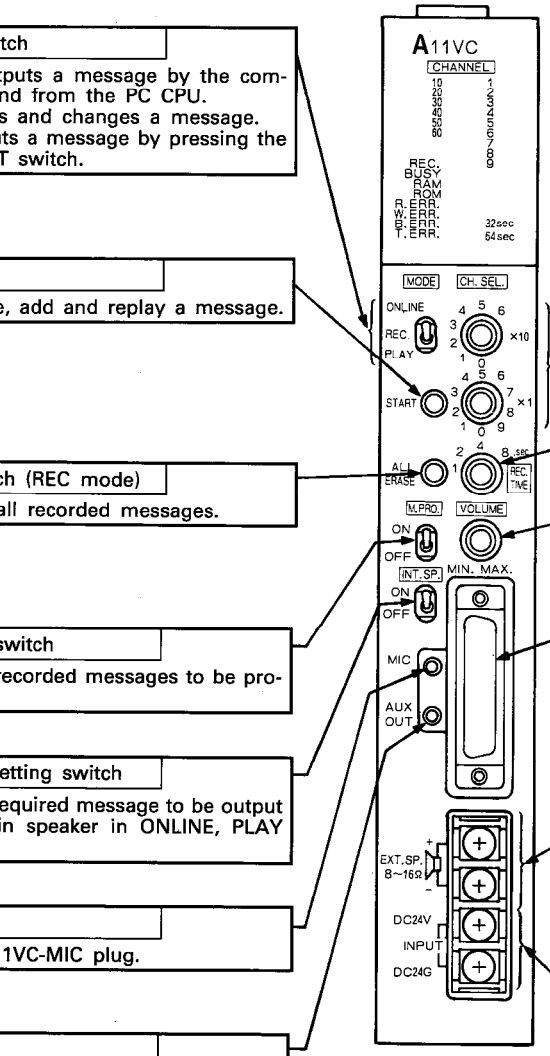
POINT

Select 32 or 64 seconds of the total recording time as follows:

1) 32 seconds when high-quality sound is required.

2) 64 seconds when the recording time exceeds 32 seconds. Sound quality and S/N ratio are lower than in the 32 seconds setting.

(2) A11VC front panel



MODE select switch
- ONLINE·····Outputs a message by the command from the PC CPU.
- REC·····Records and changes a message.
- PLAY·····Outputs a message by pressing the START switch.

START switch
- Used to change, add and replay a message.

ALL ERASE switch (REC mode)
- Used to clear all recorded messages.

Memory protect switch
- ON allows the recorded messages to be protected.

Built-in speaker setting switch
- ON allows the required message to be output from the built-in speaker in ONLINE, PLAY mode.

MIC.
- Jack for the A11VC-MIC plug.

AUX OUT
- Jack for connecting an amplifier.
- Small jack (ϕ3.5) 2P (JC-35-J-2A or equivalent) is used.

Channel select switch
- Used to set the channel to be recorded or replayed.

Recording time setting switch
- Used to set the recording time (1, 2, 4, 8 seconds) per channel.

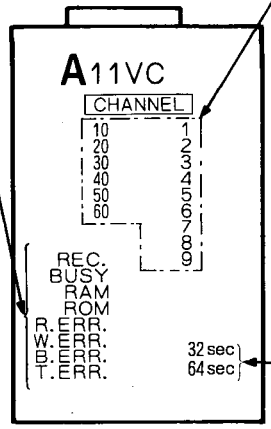
Volume adjust switch
- Used to adjust the volume of the built-in speaker, external speaker and external amplifier.

RS-422 connector
- Used to connect the A11VC and GPP by the RS-422 cable.

EXT.SP.
- Used to connect external speakers as indicated below:
  One 8Ω speaker
  Two 16Ω speaker in parallel

External input terminals
- These terminals supply 24V DC.

(3) LEDs



REC. (REC mode)

- Lit for the period of time set by the recording time setting switch after the A11VC-MIC talk switch is set to ON.
- Record a message while the REC. LED is on.

BUSY

- ONLINE mode·····On indicates that the A11VC is outputting a message.
- REC mode·····On indicates that recording is ready.
- PLAY mode·····On indicates that a message is being output.

RAM/ROM

- The LED lit indicates the memory specified by the memory setting jumper.

R.ERROR

- On indicates that a message cannot be recorded or PLAY/ONLINE mode has been selected when there is no message recorded.

WDT ERROR

- On indicates that the watch dog timer error has detected.

BATTERY ERROR

- On indicates that the battery error has been detected. With the memory setting jumper set to ROM, this LED is not lit when there is no battery loaded.

TIME ERROR

- On indicates that the total recording time has been exceeded by the sum of the time period set by the REC TIME switch and the time period already used for recording.
- In message change mode, on indicates that the current recording time is different from the preceding recording time.

Channel indicator LED

- ONLINE mode·····The number lit indicates the channel that is outputting a message.
- REC, PLAY mode·····The number lit indicates the channel specified by the channel select switch.
- Channel numbers indicated are 1 to 60.

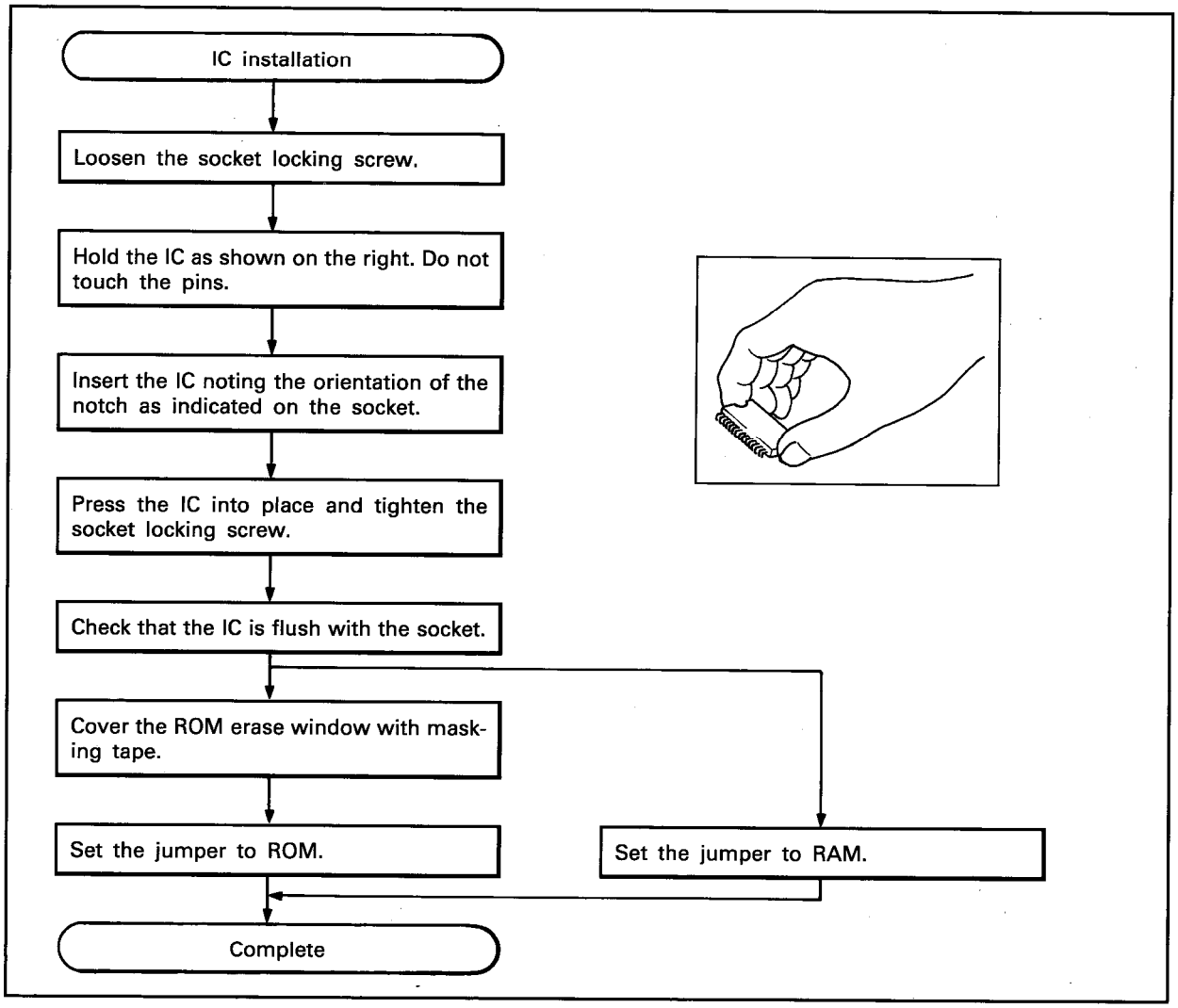
32 sec/64 sec

- The LED lit indicates the time specified by the total recording time setting switch.

4.3 Memory and Battery Installations

4.3.1 Memory IC installation

RAM or ROM must be installed and switch settings made as follows:



Memory Type	Jumper Setting
16KRAM	RAM / ROM
16KROM	RAM / ROM

Table 4.1 Jumper Setting

Memory socket	SOC1	SOC2	SOC3	SOC4
ROM No.	No.1	No.2	No.3	No.4

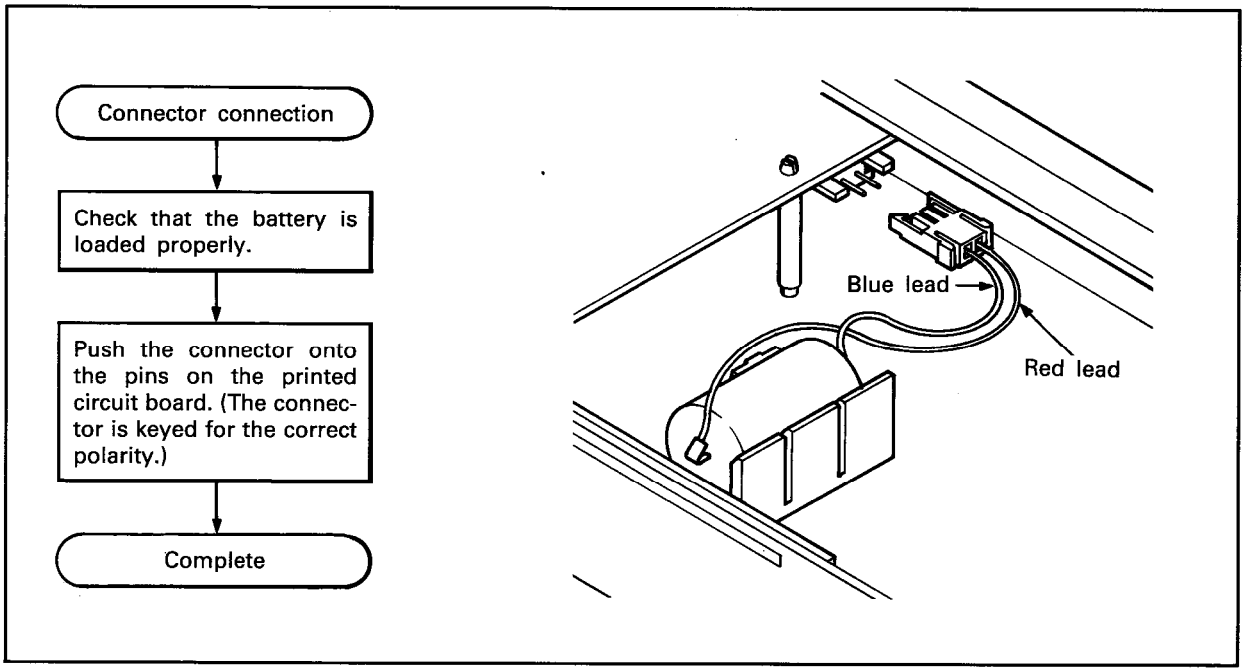
Table 4.2 Memory Sockets and ROM Numbers

REMARKS

■ indicates that the jumper has been set.

4.3.2 Battery installation

The battery connector has been disconnected before shipment. Where RAM backup and/or power failure memory retention is required, connect the battery as shown below:

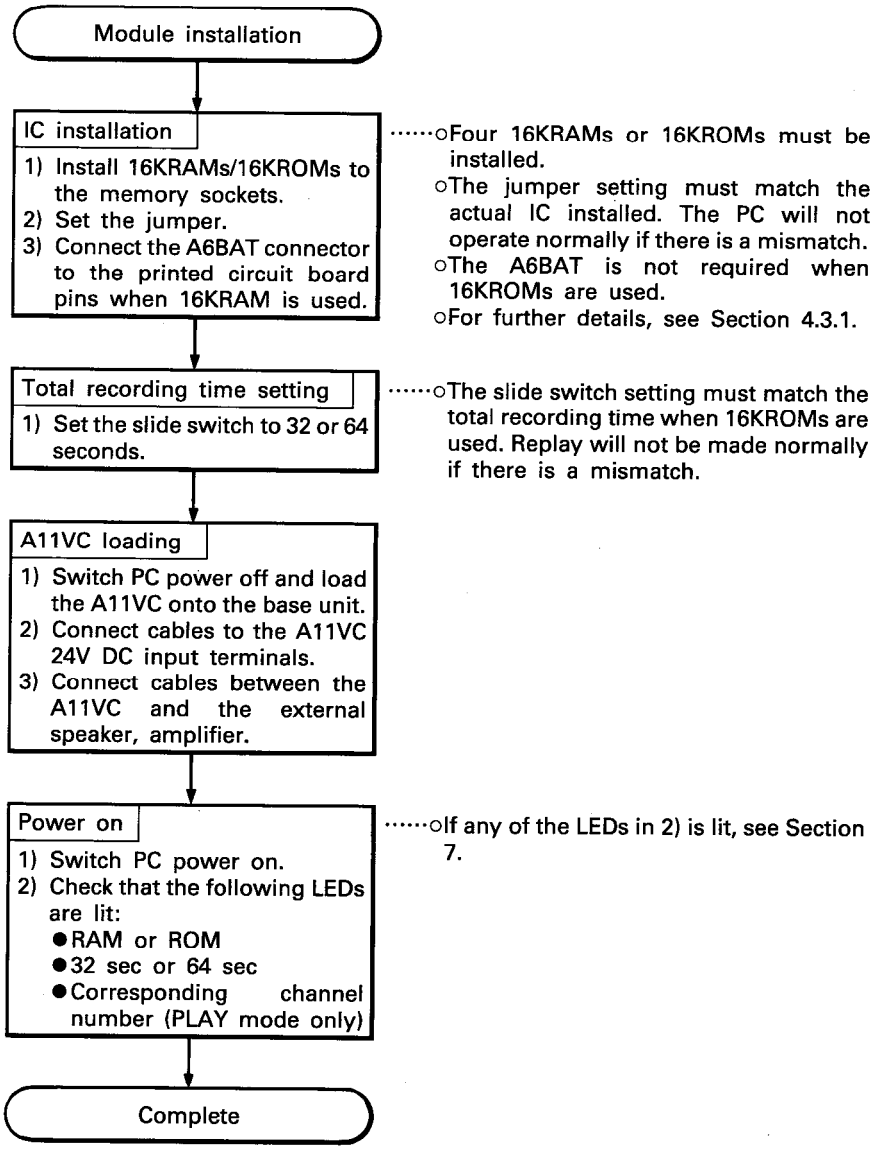


REMARKS

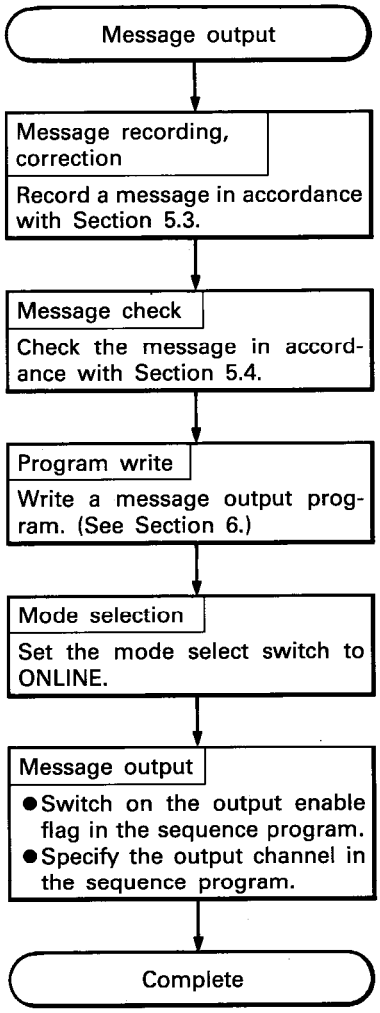
Prior to use, connect the battery connector that has been disconnected to prevent battery exhaustion during distribution and storage.

5. MODULE INSTALLATION AND OPERATION PROCEDURES

5.1 Module Installation Procedure



5.2 Message Output Procedure Using Sequence Program



5.3 Message Recording Procedure

5.3.1 Notes on message recording

(1) Notes common to message recording

1) The jumper must be set to RAM (A11VC "RAM" LED lit).

2) The A11VC memory protect must be set to OFF.

3) Any message should be recorded in a quite place. Otherwise noise will be recorded with the message.

4) Record is enabled when the A11VC-MIC talk switch is pushed.

5) REC mode is switched to the required mode by moving the mode select switch.

(2) Notes on new message recording

1) The "ALL ERASE" switch must be pressed to clear the memory.

2) New messages must be recorded in channel number order, i.e. channel 1, 2, 3.....

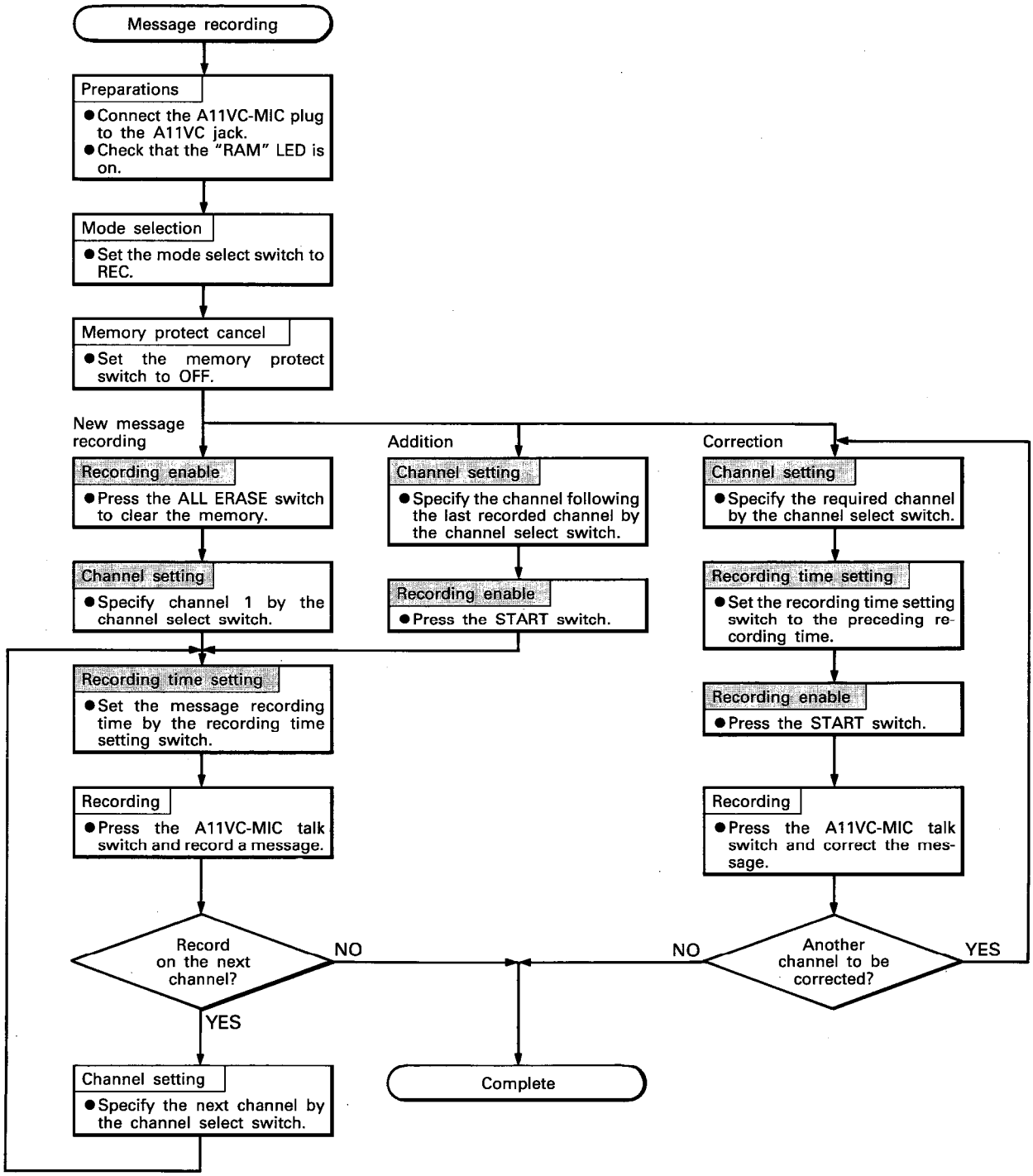
(3) Notes on message corrections

When correcting any message, the recording time set must be the same as the previous recording time. Otherwise the "T. ERR." LED will be lit and the message cannot be corrected.

(4) Notes on message additions

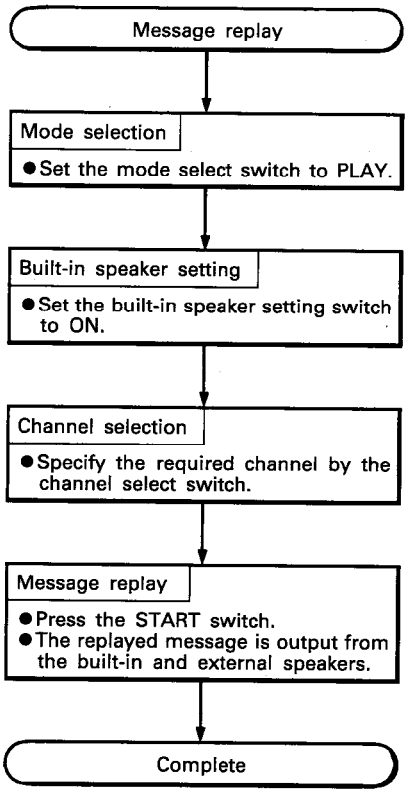
Additional messages can be recorded after the last recorded channel number in channel number order, i.e. if there are messages already recorded on 10 channels, messages added can be recorded on and after channel 11.

5.3.2 Message recording procedure



5.4 Message Checking Procedure

Any message recorded on the A11VC can be checked in the following procedure. The message is replayed by pressing the A11VC START switch and is output from the built-in speaker and external speaker.



POINT

(1) The volumes of the built-in speaker, external speaker and external amplifier can be adjusted by the volume adjust switch.

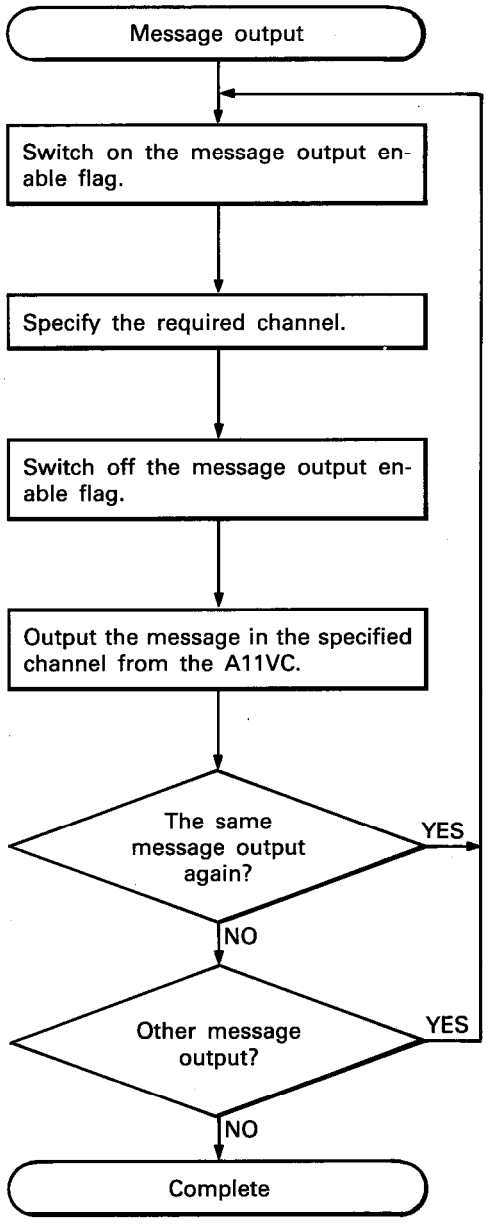
(2) For message corrections and additions, see Section 5.3.

(3) The "R. ERR." LED is lit if the mode select switch is set to PLAY with no message recorded on any channel. Set the mode select switch to REC, record a message, and finally set to PLAY to confirm the recording message.

6. PROGRAMMING

6.1 General Programming Procedure

(1) Message output procedure



1) The message output enable flag is Y□F. (□ indicates the head address of the slot being used for the A11VC.)

2) Specify the channel number as described below:
   - To output a message from one channel by one output command, specify the channel number in binary using the [MOV] instruction, etc.
   - To output a message from several channels by one output command, specify the channel numbers in ASCII using the [PR] or [PRC] instruction.

3) Specify the channel number in Y□0 to Y□7. (□ indicates the head address of the slot being used for the A11VC.)

4) Interlock the [PR] or [PRC] instructions using the execution flag (Y□9) so that they are not executed at the same time. Otherwise normal channel output cannot be provided.

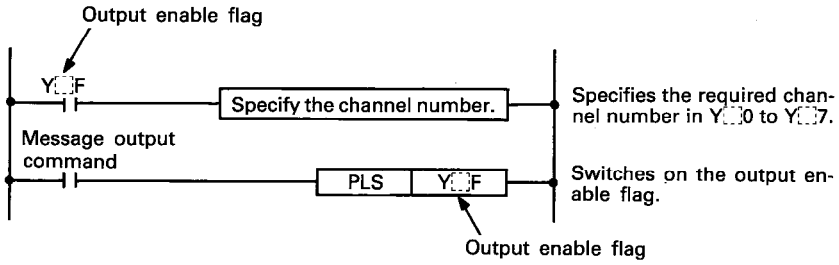
Fig. 6.1 Message Output Procedure Using Sequence Program

POINT

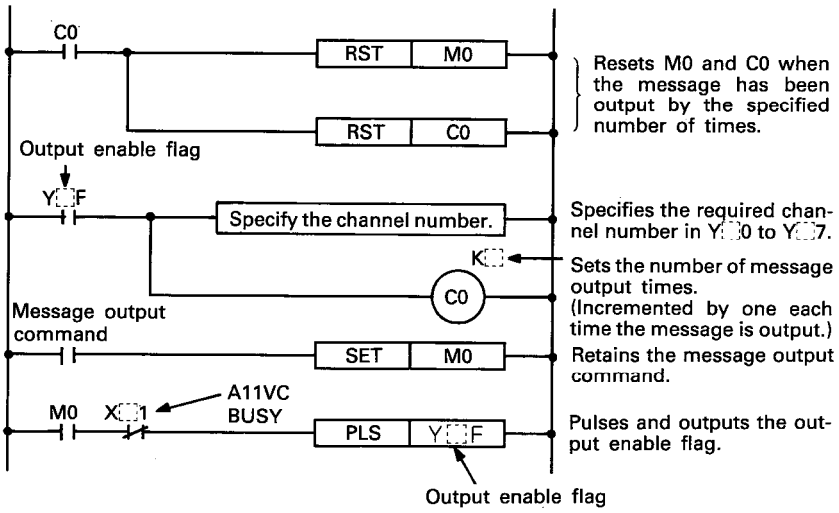
The [PR] or [PRC] instructions must not be executed simultaneously even if the output addresses are different.

(2) Program examples for the procedure in Fig. 6.1

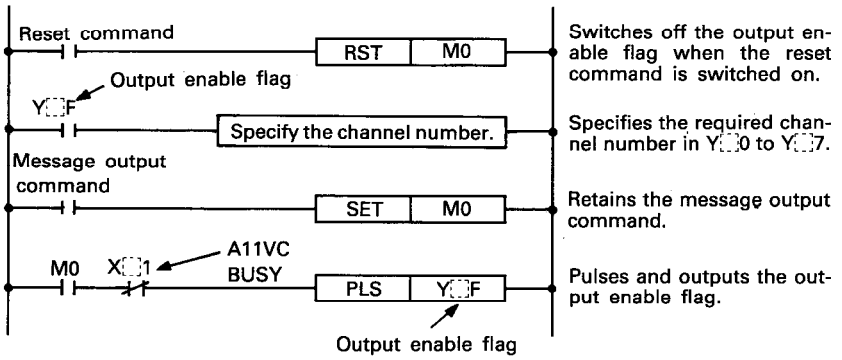
1) Message output once



2) Repeated output by the specified number of times



3) Repeated output until the reset command is switched on



6.2 Program Examples

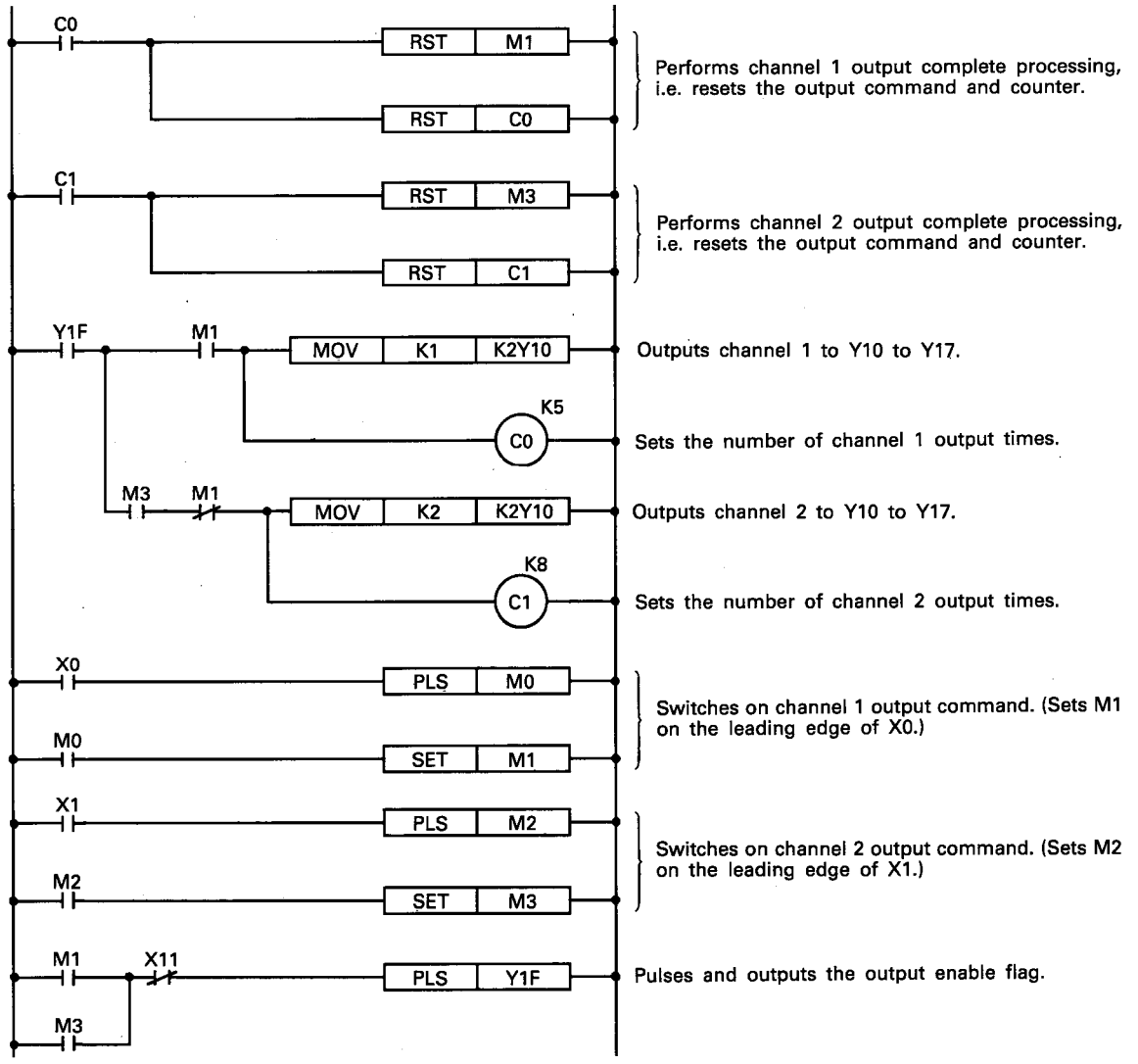
6.2.1 Outputting message from one channel

(1) To specify several channel numbers as constants

System configuration
A11VC loaded in slot 1 of the main base
I/O address X10 to X1F
Y10 to Y1F

Program

Outputs channel 1 message five times when X0 is switched on and channel 2 message eight times when X1 is switched on. As X1 input has precedence over X0 input, channel 1 message is output when X1 is switched on even if channel 2 output is not complete.

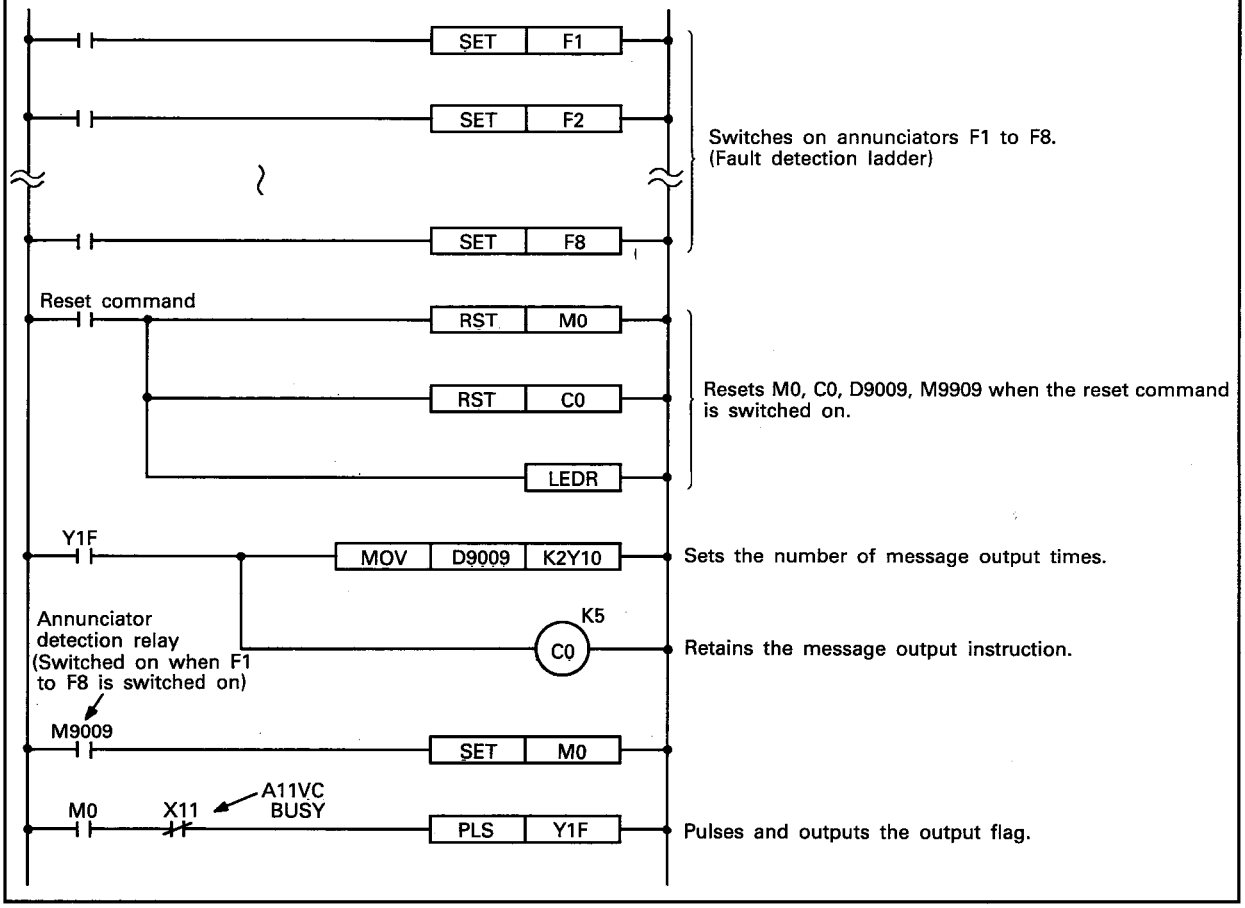


(2) To specify the channel of the same number as the annunciator (F) detected

System configuration
A11VC loaded in slot 1 of the main base
I/O address X10 to X1F
Y10 to Y1F
Channels used·····1 to 8
Annunciators used·····F1 to 8

Program

Outputs the message from the corresponding channel (having the number identical to the annunciator number in D9009) five times when any of the annunciators (F1 to F8) is switched on. When two or more annunciators are on, the next message can be output by switching on the reset command.



POINT

Execution of the LEDR instruction resets D9009, M9009 and the annunciator (F) number stored in D9009. If two or more annunciators have been switched on, execution of the LEDR instruction keeps M9009 on and writes the next annunciator number to D9009.

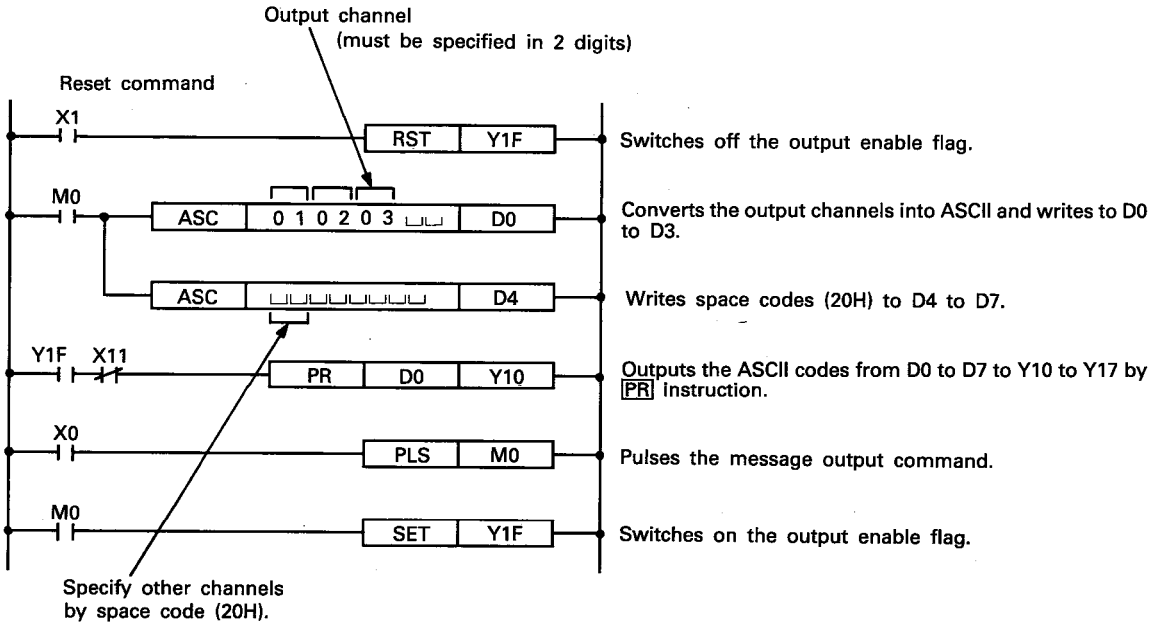
6.2.2 Outputting message from several channels consecutively

(1) To specify the channel numbers by [PR] instruction

System configuration
A11VC loaded in slot 1 of the main base
I/O address X10 to X1F
Y10 to Y1F
Message and channels
Message·····"Please Supply Parts"
Channels { "Please"·····Channel 1
"Supply"·····Channel 2
"Parts"·····Channel 3
Message output command·····X0
Message output reset command·····X1

Program

Specifies the channel numbers in D0 to D7 in ASCII when X0 is switched on and outputs the channel numbers by using the [PR] instruction.

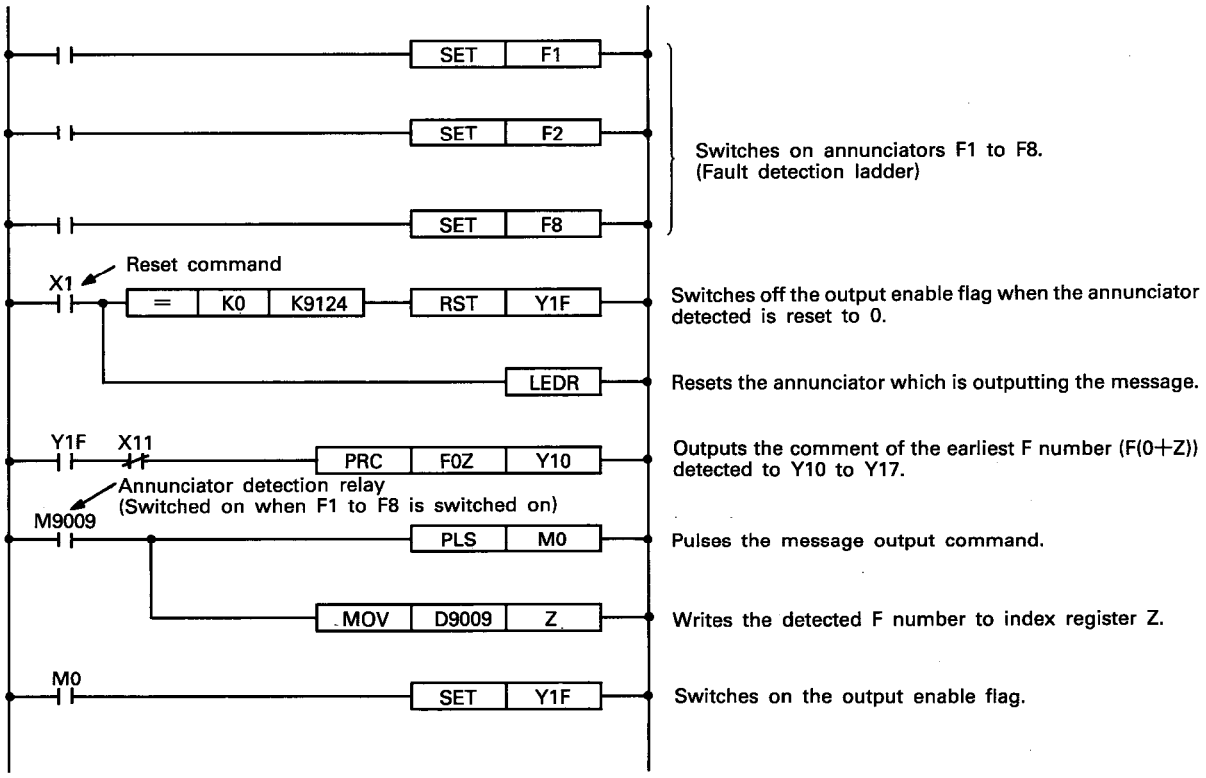


(2) To specify the channel by PRC instruction in accordance with the comment for the annunciator (F) detected

System configuration
A11VC loaded in slot 1 of the main base
I/O address X10 to X1F
Y10 to Y1F
Annunciators for specifying channel numbers·····F1 to 8
Message output reset command·····X1

Program

Outputs the message from the specified channel in accordance with the comment for the annunciator (F1 to F8) detected. The message output can be stopped by switching on X1.



POINT

Since the A0J2CPU(P23/R23) cannot index the annunciator (F), the above program cannot be created.

(3) To use several PR (PRC) instructions

System configuration

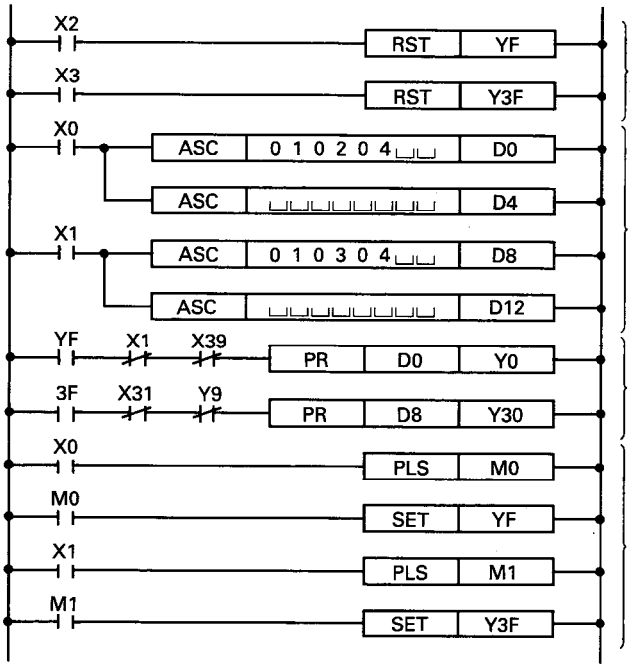
A11VCs loaded in slots 0 and 3 of the main base.

Item	Slot 0	Slot 3
I/O address	X0 to XF Y0 to YF	X30 to X3F Y30 to Y3F
Output message	Please Supply Parts	Please Change Parts
Message output command	X0	X1
Message output reset command	X2	X3

Channels
- "Please"·····Channel 1
- "Supply"·····Channel 2
- "Change"·····Channel 3
- "Parts"·····Channel 4

Program

Specifies the channel numbers in D0 to D7 in ASCII when X0 is switched on and outputs the channel numbers by using the PR instruction.
Specifies the channel numbers in D8 to D15 in ASCII when X1 is switched on and outputs the channel numbers by using the PR instruction.



Switches off the output enable flag.

Writes the channel numbers to data registers.

Outputs the channel numbers by the PR instruction. (Y39, Y9 are PR instruction execution flags.)

Switches on the output enable flag.

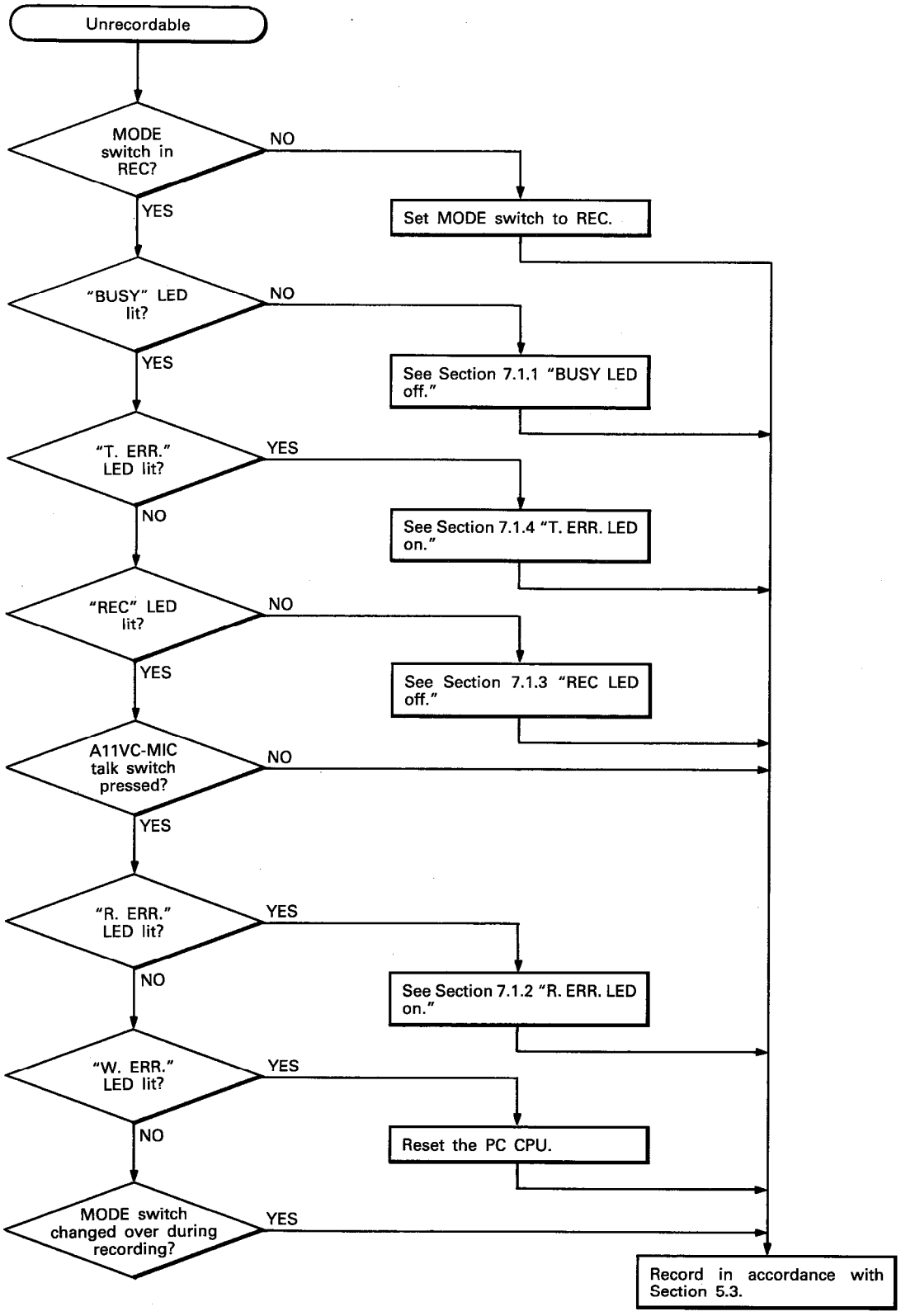
POINT

(1) When the PR instruction is used by the CPU module other than the A0J2CPU(P21/R21), A1CPU(P21/R21), A2CPU(P21/R21), A2CPU(P21/R21)-S1, and A3CPU(P21/R21), M9049 (output character count changing flag) must be turned ON to set the number of output characters to 16.

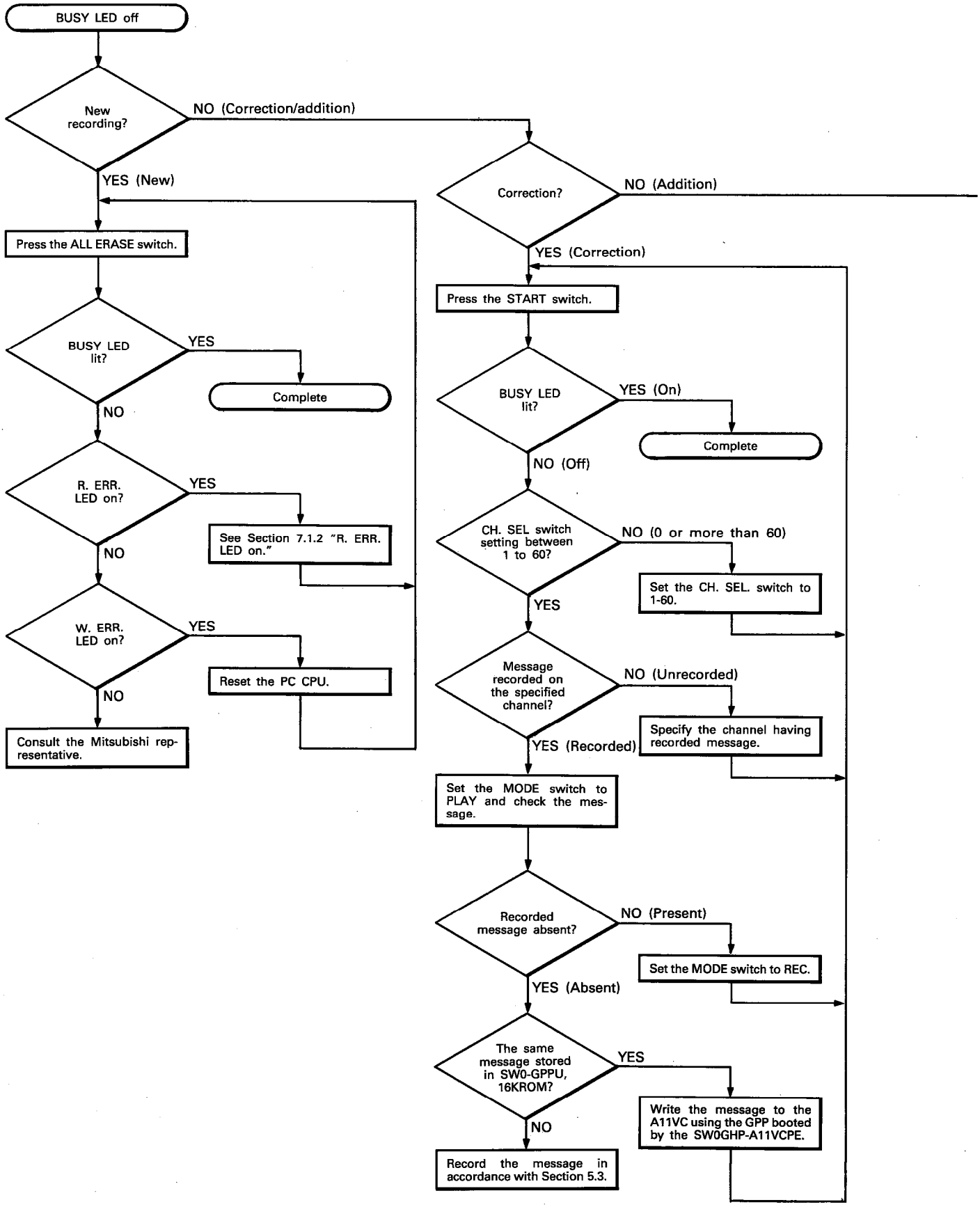
7. TROUBLESHOOTING

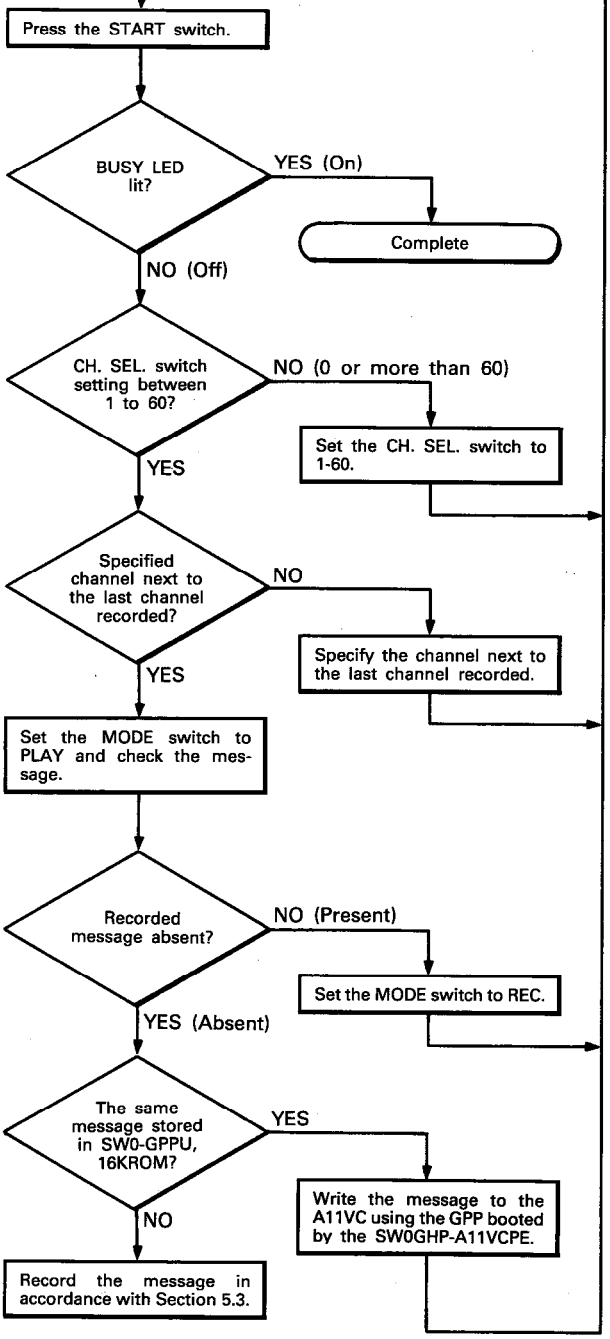
This section gives errors, causes and corrective actions.

7.1 Unrecordable



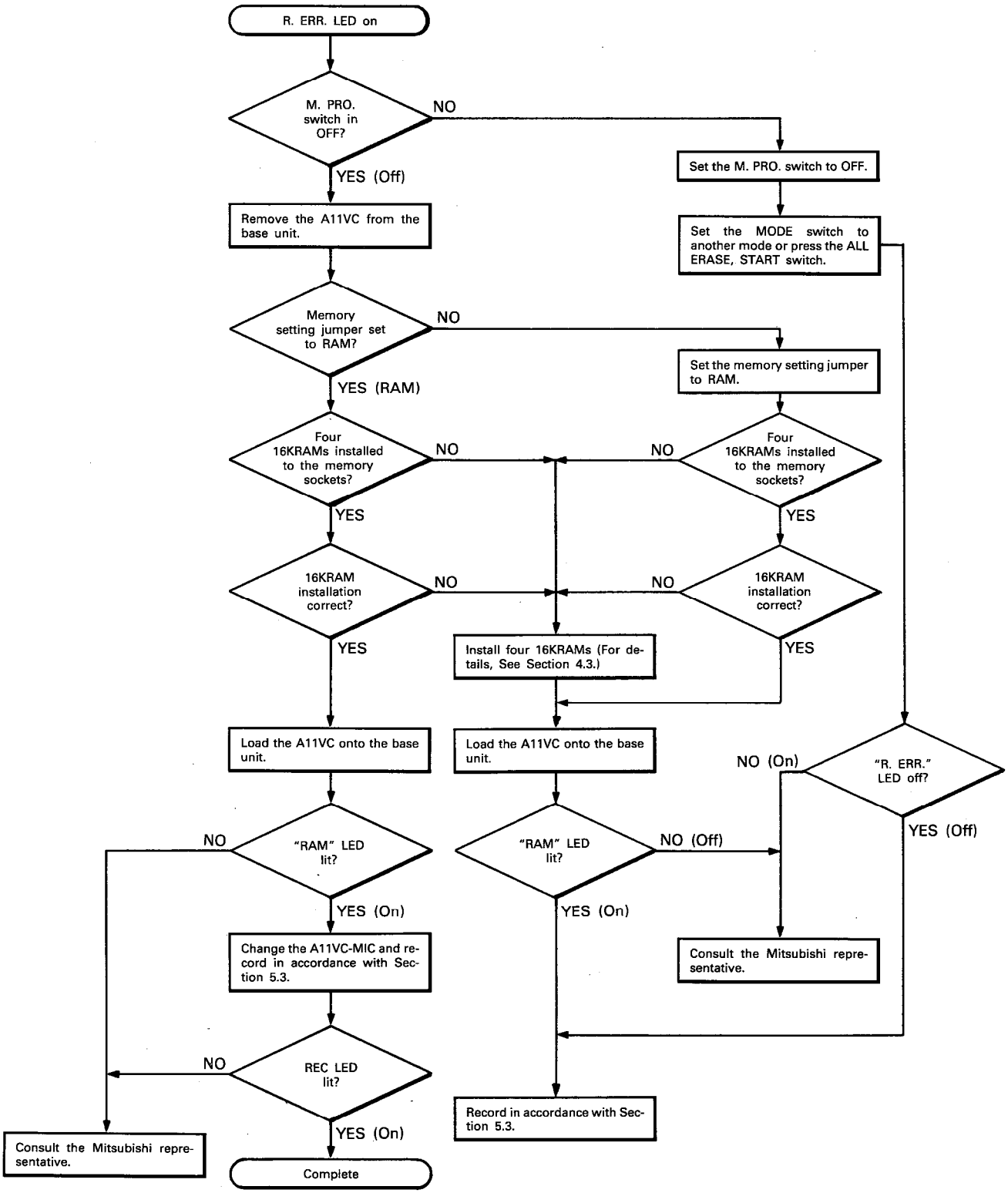
7.1.1 BUSY LED off




Press the START switch.
BUSY LED lit?
YES (On)
Complete
NO (Off)
CH. SEL. switch setting between 1 to 60?
NO (0 or more than 60)
Set the CH. SEL. switch to 1-60.
YES
Specified channel next to the last channel recorded?
NO
Specify the channel next to the last channel recorded.
YES
Set the MODE switch to PLAY and check the message.
Recorded message absent?
NO (Present)
Set the MODE switch to REC.
YES (Absent)
The same message stored in SW0-GPPU, 16KROM?
YES
Write the message to the A11VC using the GPP booted by the SW0GHP-A11VCPE.
NO
Record the message in accordance with Section 5.3.

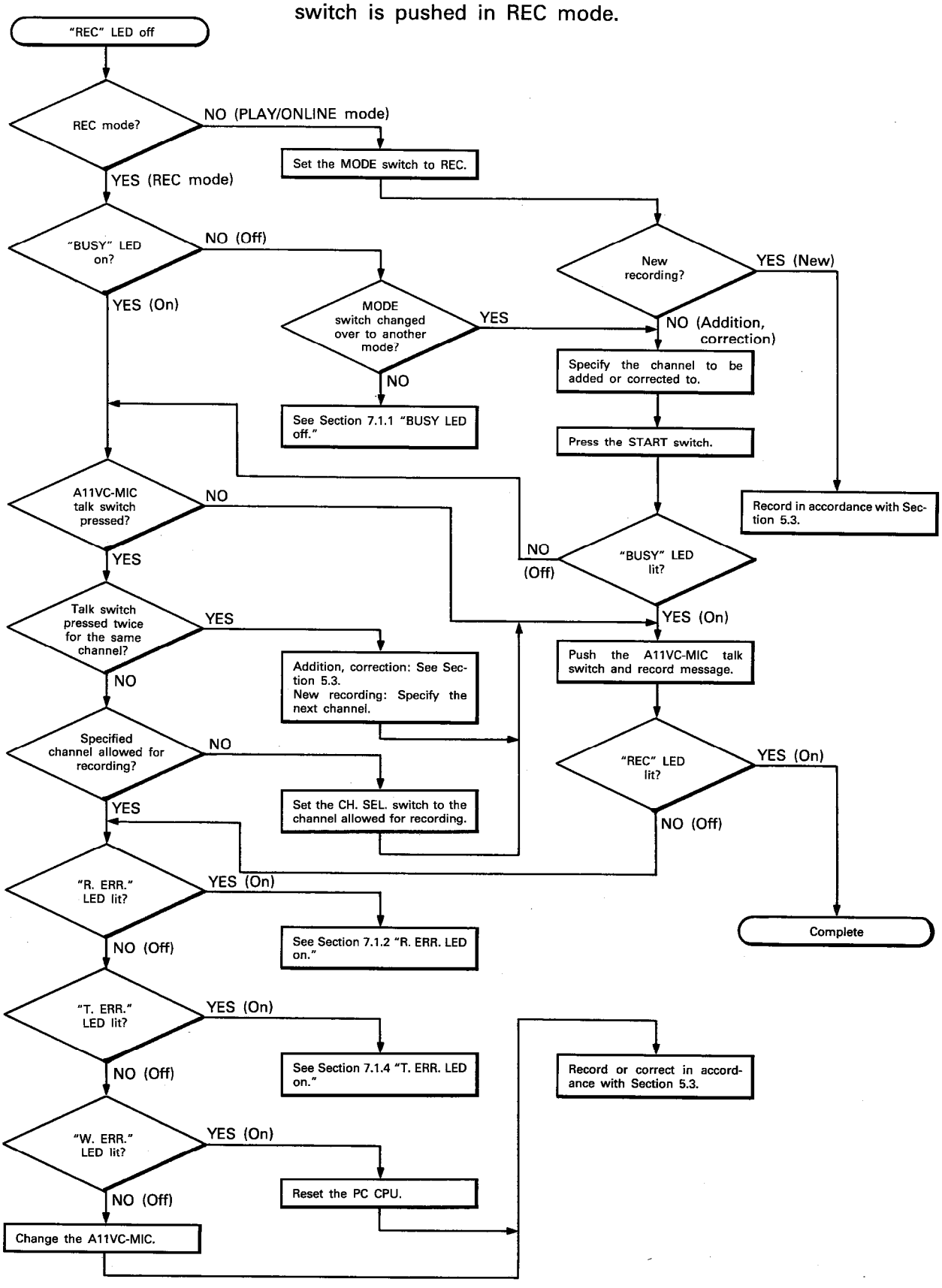
7.1.2 R. ERR. LED on

The "R. ERR.R" LED is lit when no message has been recorded in PLAY or ONLINE mode.

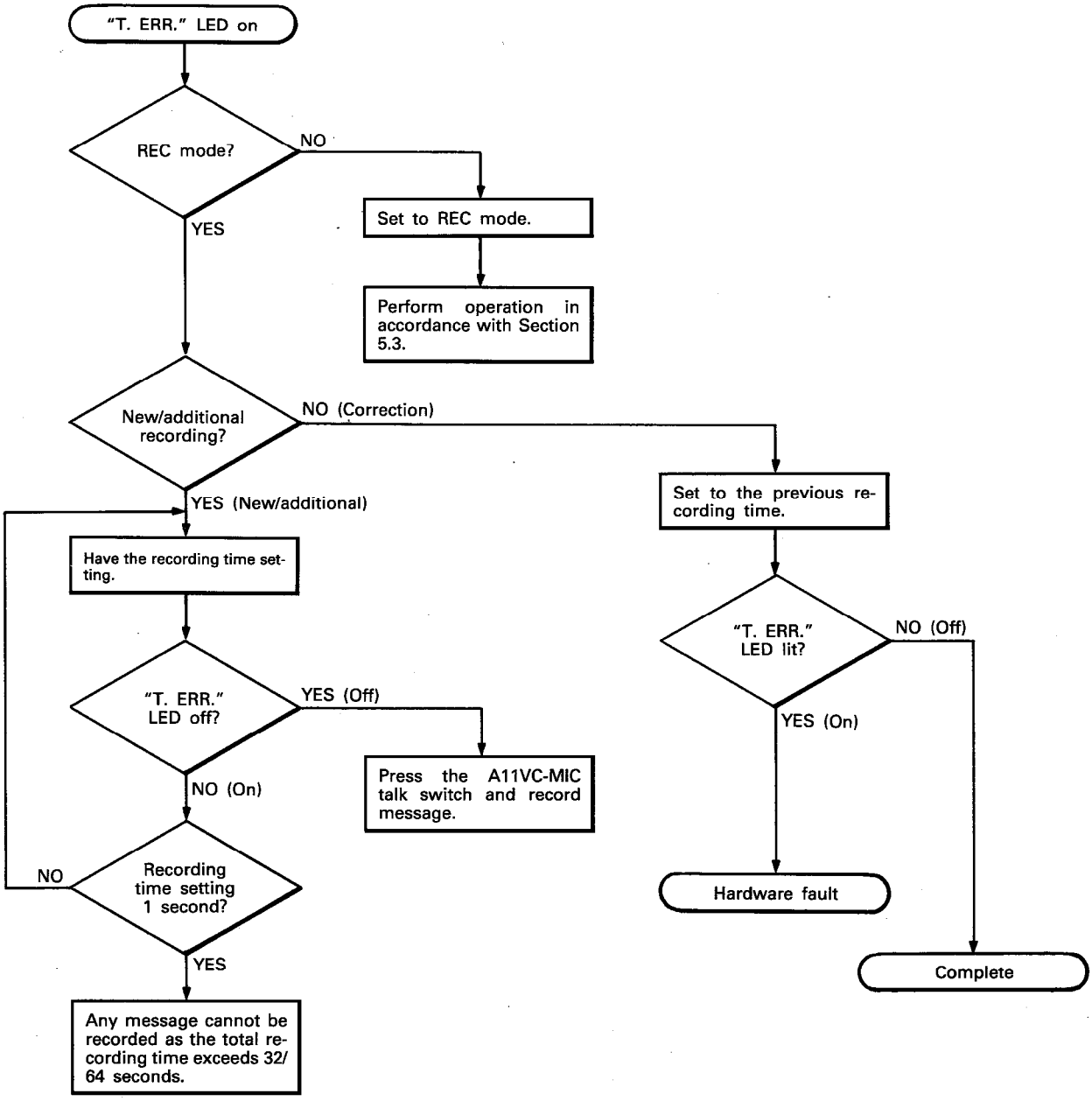


7.1.3 "REC" LED off

Check as follows if the REC LED is not lit when the A11VC-MIC talk switch is pushed in REC mode.



7.1.4 "T. ERR." LED on

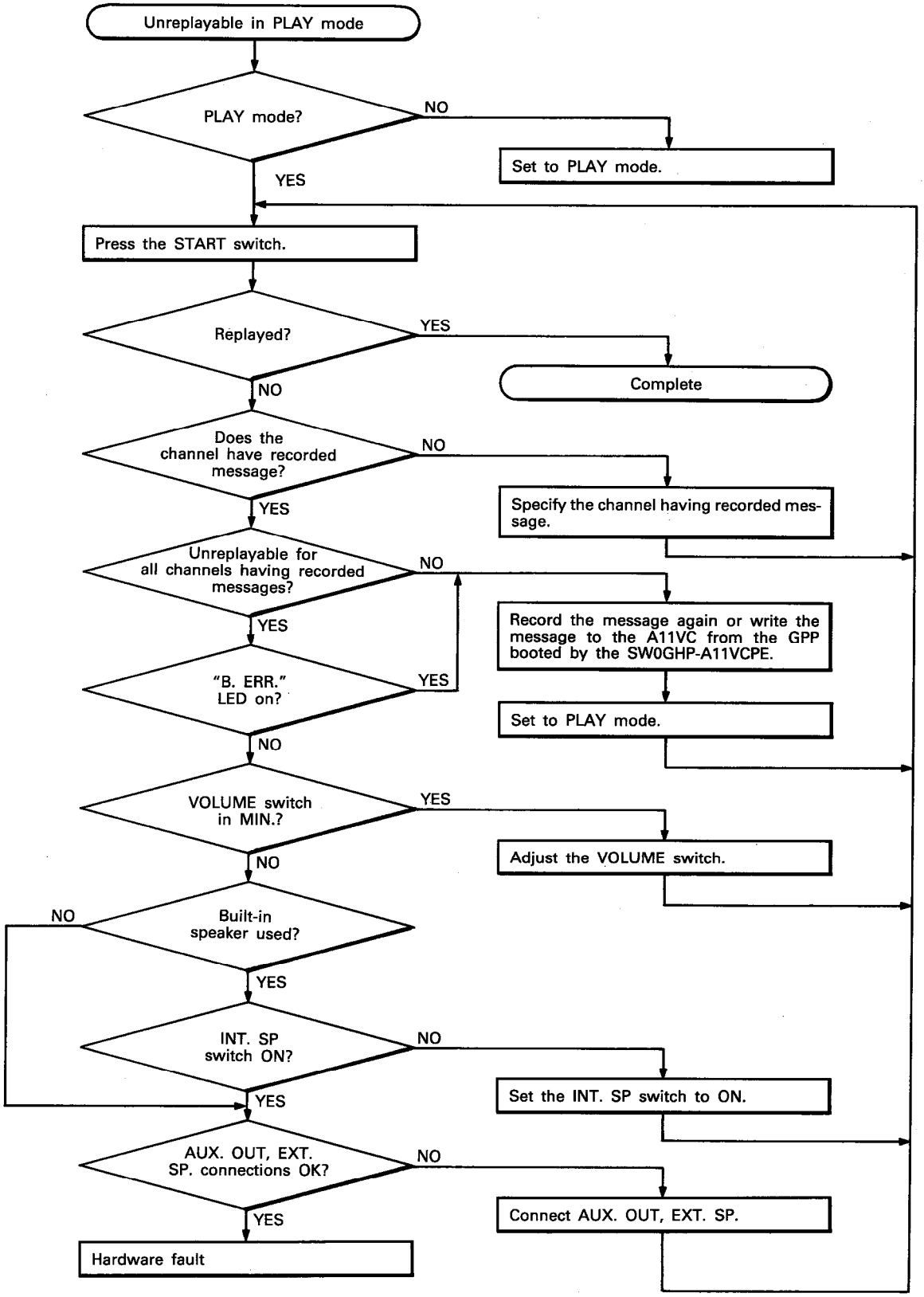


POINT

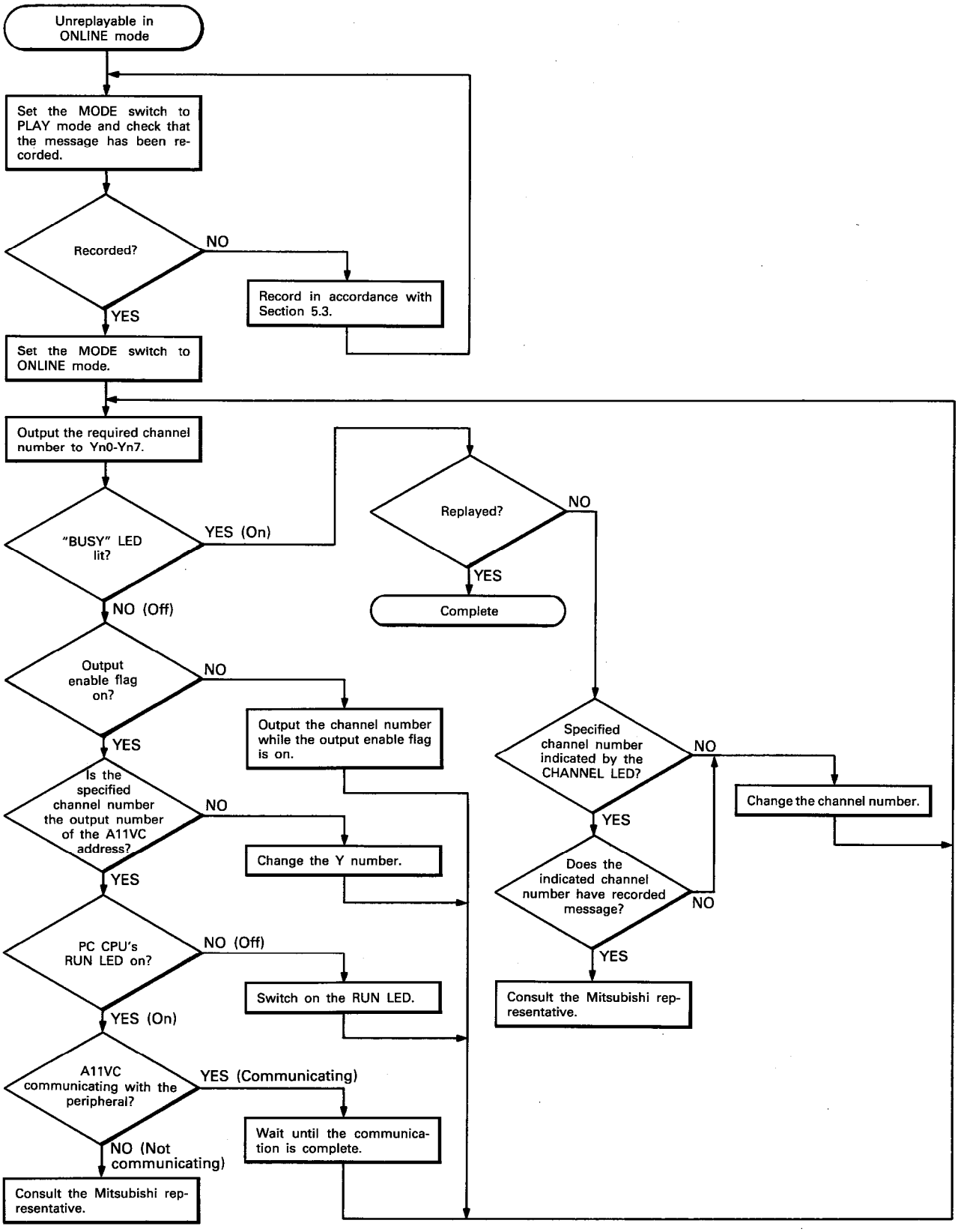
The previous recording time can be checked by using the GPP booted by the SW0GHP-A11VCPE.

7.2 Unreplayable

7.2.1 PLAY mode



7.2.2 ONLINE mode



8. MAINTENANCE

8.1 Module Storage

The A11VC should be stored in the following environments:

(1) Ambient temperature −10 to 75°C.

(2) Ambient humidity 10 to 90%RH.

(3) No condensation (e.g. due to sudden temperature changes).

(4) No direct exposure to sunlight.

(5) Free from excessive amounts of conductive powder such as dust, iron filings, oil mist, salt or organic solvent.

POINT

A two hour "warming up" period should be allowed if the A11VC has not been powered up for over 12 months. This is to allow the electrolyte in electrolytic capacitor to stabilize.

8.2 Battery Change

8.2.1 Battery change frequency

When the data backup battery voltage drops, the LED on the A11VC front panel is lit and an input signal (battery error) to the PC CPU is enabled. The battery is live for about one month more and, if it is not replaced, data will then be lost or corrupted.

Guide for preventive maintenance

1) The battery should be replaced every 4 to 5 years if it is only used for memory back up for a maximum of 300 days in that period.

2) Battery changing frequency for memory backup duty exceeding 300 days can be calculated as follows:

Example

Assume that there are five operation days (10-hour operation and 14-hour power-off during a day) and two power-off days in a week. Under these conditions, power-off period during one week is:

14 (hours) × 5 (days) = 70 hours
24 (hours) × 2 (days) = 48 hours

7200 (hours)/(70 + 48) (hours) = 61 (weeks)

61 (weeks) × 7 (days) = 427 (days)

Regarding one month as 30 days,

427 (days)/30 (days) = 14.2 months

Hence,

it is necessary to change the battery every 14 months.

REMARKS

1) The battery is the same as that for the MELSEC-A series.

2) The battery may be stored for five years. The total power failure guarantee period is 300 days.
The following battery is used:

- Description: Lithium battery
- Type and rating: A6BAT (3.6V with leads and socket)

Handling instructions:

(1) Do not short.

(2) Do not disassemble.

(3) Do not burn.

(4) Do not heat.

(5) Do not solder electrodes.

(6) Do not measure voltage with an analog voltmeter.

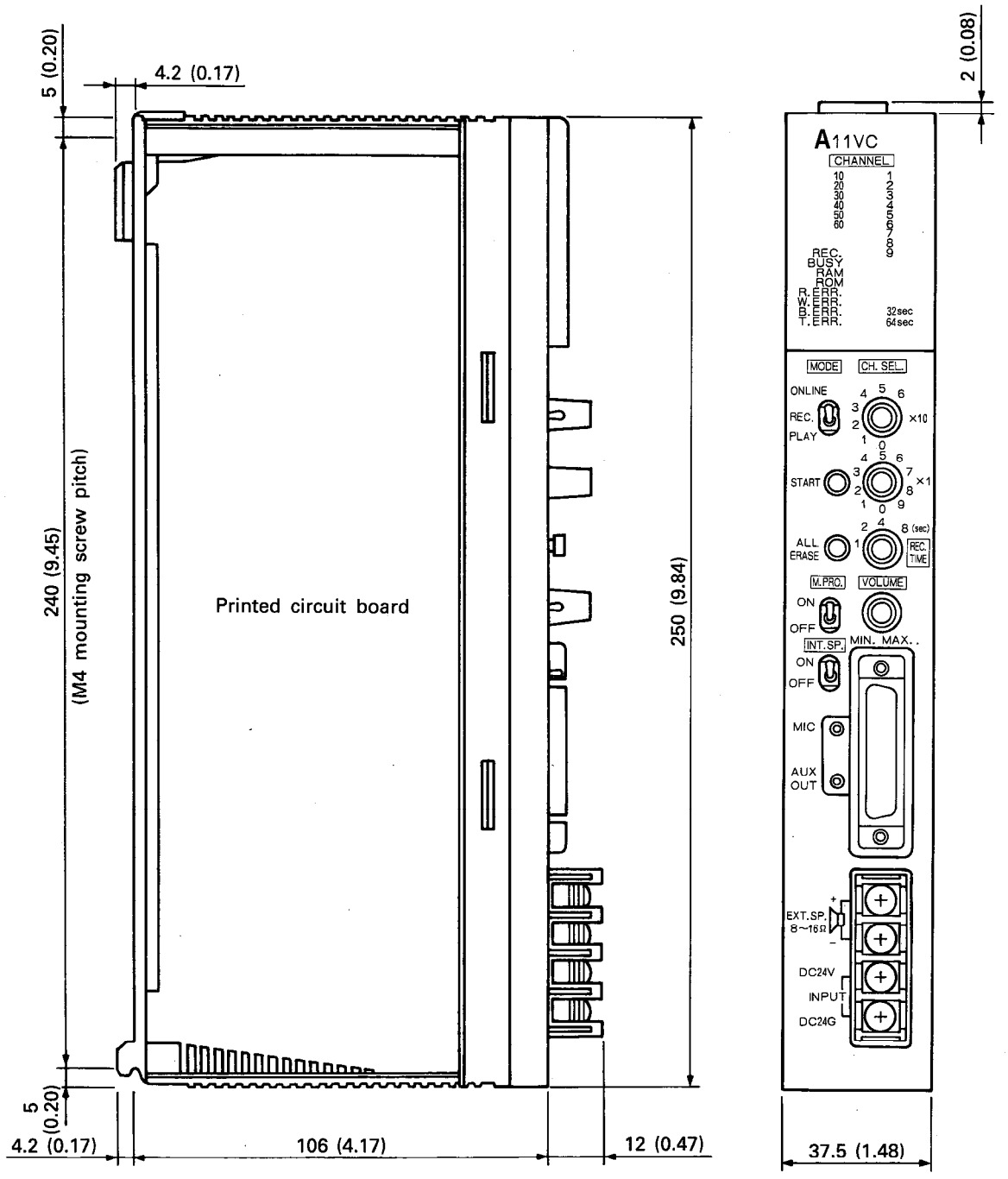
POINT

During battery replacement, set data is backed up by the capacitor for three minutes. Finish battery replacement within three minutes.

APPENDICES

APPENDIX 1 Dimensions

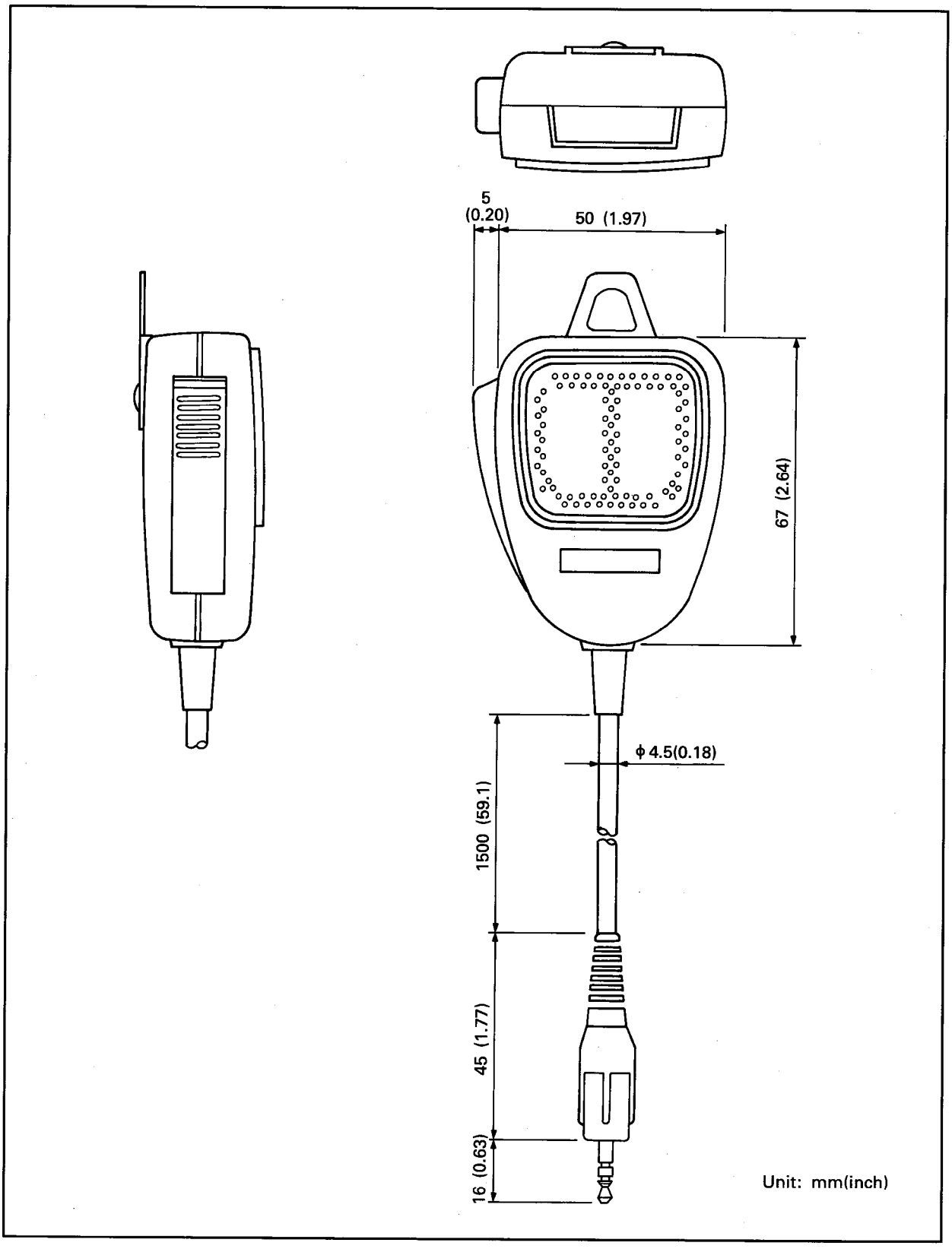
(1) A11VC



Unit: mm(inch)

APP

(2) A11VC-MIC



APP

APPENDIX 2 Message Archiving Sheet

Channel Number	Recording Time	Message	Channel Number	Recording Time	Message
1	sec		31	sec	
2			32		
3			33		
4			34		
5			35		
6			36		
7			37		
8			38		
9			39		
10			40		
11			41		
12			42		
13			43		
14			44		
15			45		
16			46		
17			47		
18			48		
19			49		
20			50		
21			51		
22			52		
23			53		
24			54		
25			55		
26			56		
27			57		
28			58		
29			59		
30			60		

APPENDIX 3 Precautions for Transportation

When transported, the lithium-containing battery must be handled in conformance to the transportation restrictions.

Appendix 3.1 Restricted model

The lithium battery used for the MELSEC-A series CPU is classified as in the following table.

Product Name	Model Name	Product Form	Handled as
A series battery	A6BAT	Single lithium battery	Non-dangerous goods

Appendix 3.2 Handling for transportation

Our battery is factory-packed in conformance to the transportation restrictions. When the customer transports the repacked or unpacked battery, conform to the IATA Dangerous Goods Regulations, IMDG Code and the corresponding country's transportation restrictions.
For details, contact your common carrier.

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not , compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.
(2) The Mitsubishi programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or Public service purposes shall be excluded from the programmable logic controller applications.
In addition, applications in which human life or property that could be greatly affected, such as in aircraft, medical applications, incineration and fuel devices, manned transportation, equipment for recreation and amusement, and safety devices, shall also be excluded from the programmable logic controller range of applications.
However, in certain cases, some applications may be possible, providing the user consults their local Mitsubishi representative outlining the special requirements of the project, and providing that all parties concerned agree to the special circumstances, solely at the users discretion.

Voice Output Module Type A11VC

User's Manual

MODEL	A11VC-USERS-E
MODEL CODE	13J640
IB(NA)-66088-B(0408)MEE	

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