2 Technical Guide

2.1. Introduction of IC Recorder

IC Recorder is a digital recording and playback equipment, same as MD record/player.

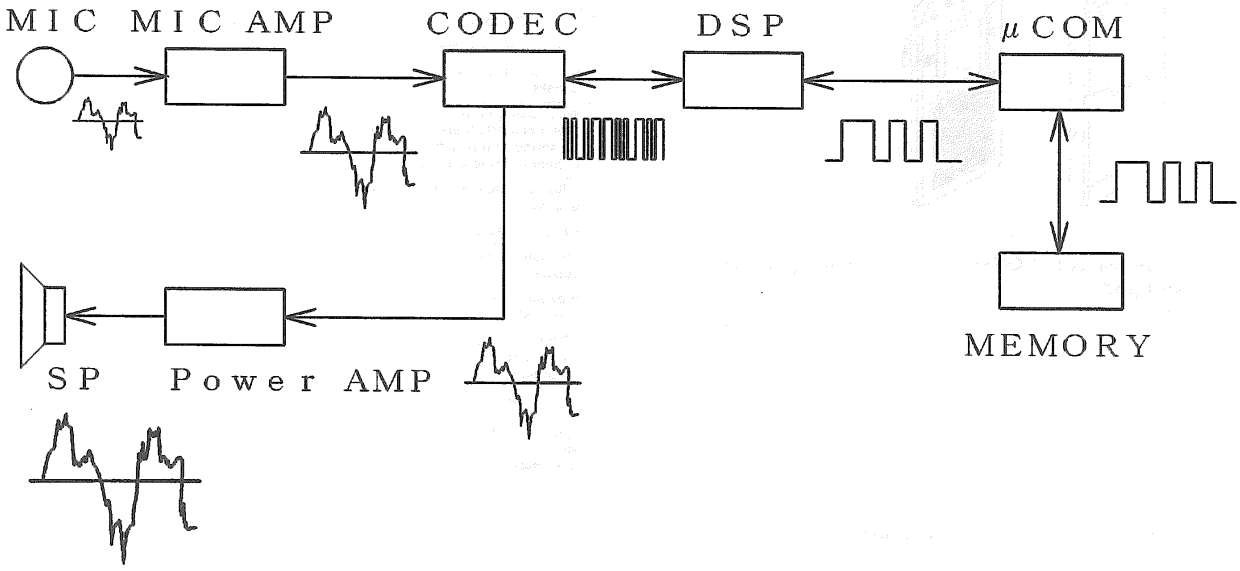
Recording medium is using a semiconductor memory.

Compress a signal on recording process and expand a signal on playing process.

It's for saving a memory.

Playing speed is easy controllable.

2.2. Out line



2.2.1. Recording process

1. Pick up a signal by MIC. and amplitude.
2. Translate a signal from analog to digital by CODEC.
3. Compress a signal by DSP.
4. Storage a signal in Flash memory.

2.2.2. Playing process

1. Pick up a signal from Flash memory.
2. Expand a signal by DSP.
3. Translate a signal from digital to analog by CODEC.
4. Amplitude a signal and out put to S.P.

2.3. Operation of CODEC

Translate a analog signal to digital 12bit liner by sample rate is 8kHz.

Retranslate digital to analog.

12bit liner signal is

2.4. Operation of DSP

Compress a 12bit liner signal. 12bit liner signal (112kbps) to CELP data (5.6kbps).

Translate to cord of 14byte data from 160samples 12bit liner signal at every 27mSec.

Expand a CELP data to 12bit liner signal. CELP decode a 12byte CELP data at every 27msec.

2.5. CELP (Code Excited Linear Predictive) Technology

During recording, input audio data is divided into, for example, 5-msec packages, and then compared with sound source patterns stored in the code book. The most similar pattern is then selected, and that code number is recorded in memory.

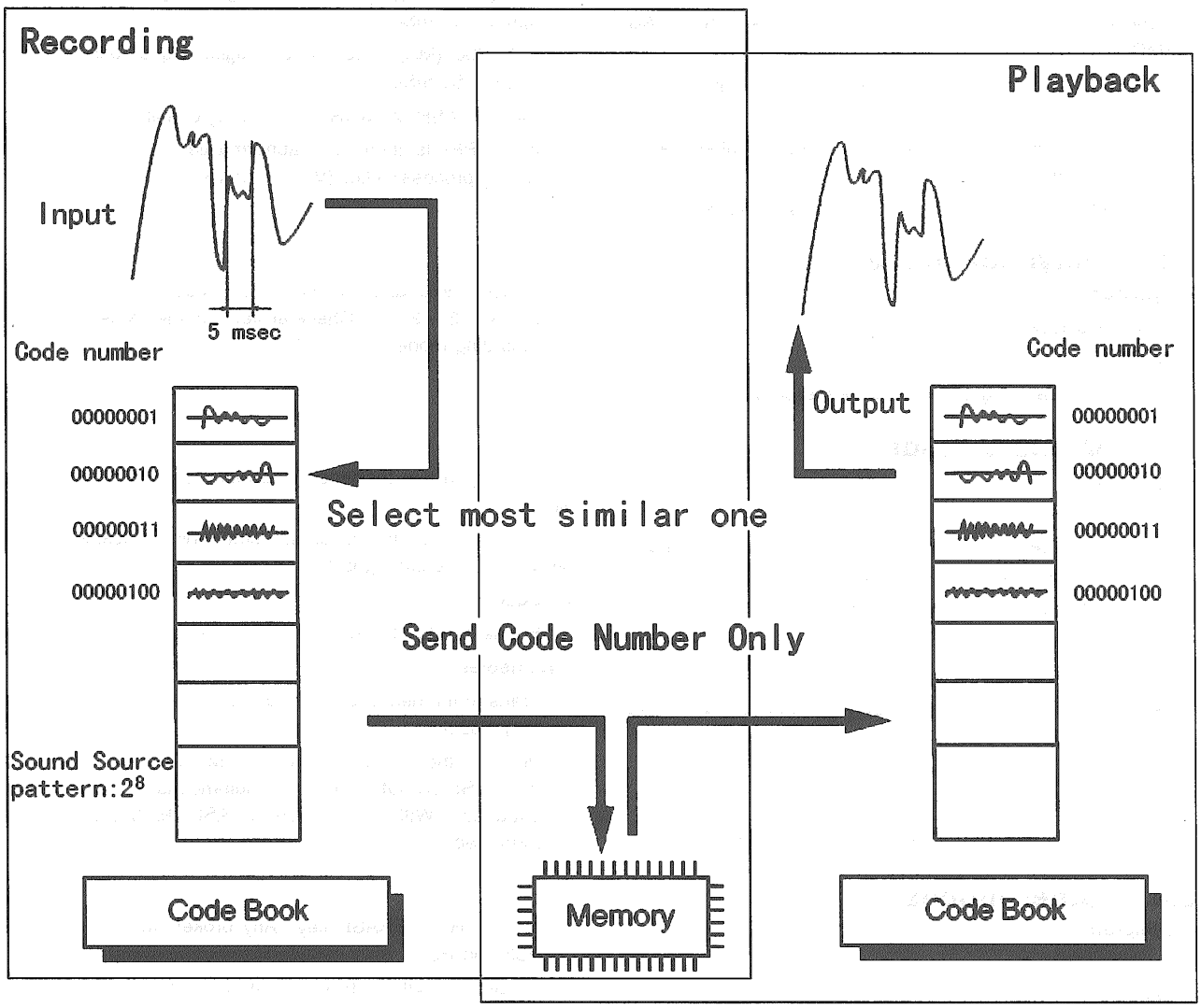
During playback, the code number is retrieved from memory and its sound source pattern is output.

2.6. Memory

This function is memorize a CELP data.

Use a 16Mbit Flash Memory.

2.7. Diagram



3 Troubleshooting Guide

Use the following check items as your reference to your repair services.

In case of NG, check each IC signal's input/output and any abnormalities on PCBs,

and make necessary remedies. (IC abnormalities -- IC change -- Short open of PCBfilm -- Repair of film etc.)

3.1. Recording mode

< Symptom >

Cannot record

< Check >

Check recording signals in order of the process.

1) Check analog MIC AMP

- IC1 [GSX] Does 18 pin modulate amplitude according to microphone inputs? <Vpmax = +/-0.7 V>

2) Check communication between CODEC (IC1) and DSP (IC2)

- IC1 [BITCLOCK] Does 13-pin digital signal output? <T = approx. 2 uSec.>
- IC1 [RSYNG, XSYNC] Do 9- and 12-pin digital signal output? <T= approx. 167 uSec.>
- IC1 [PCMOUT] Does 11-pin digital signal (8 bit data) output?
- IC1 [PCMIN] Is it kept "H" when 10-pin output is in operation?

3) Check communication between DSP (IC2) and CPU (IC4)

- IC2 [P0-P7] Do 59--66-pin digital signals (8 bit data) output? <T = approx. 27 mSec.>
- IC2 [DSPMON] Does 79-pin digital signal output? <T= approx. 27 mSec.>
- IC2 [DATFRM] Are 77-pin digital signal's "H" and "L" reversed? <T= approx. 27 mSec.>

- IC2 [DSPMON] Is it kept "L" when 79-pin output is in recording?

4) Check communication between CPU (IC4) and FLASH MEMORY (IC7)

- IC4 [SBT0, SBT1] Do 27- and 30-pin digital signals output?<T = approx. 55 mSec.>
- IC4 [SBO0, SBO1] Do 25- and 28-pin digital signals output? <T = approx. 55 mSec.>
- IC4 [SBI0, SBI1] Do 26- and 29-pin digital signals output? <T = approx. 55 mSec.>
- IC4 [P31 (PD)] Does 44-pin digital signal output? <T = approx. 55 mSec.>
- IC4 [P30 (MS)] Does 43-pin digital signal output? <T = approx. 55 mSec.>

5) Check FLASH MEMORY's operating conditions.

- IC7 [VPP] Is there any abnormalities in input of 19-pin writing process? <DC (V) = 12-10V>

3.2. Playback mode

< Symptom >

Cannot playback

< Check >

Check playback signals in order of the process.

- Check 1) to 5) above in the reverse order of recording mode (5 -- 4 -- 3 -- 2- - 1). Check all items in the same manner as recording mode.

3.3. Memory mode

< Symptom >

--- Recording ---

1. Even total set recording time is less than 60 minutes, "FULL" display appears when recording is set.
2. "Sorry" display appears when replacing batteries.

--- Playback ---

1. Inaccurate display
2. With "00:00" kept being displayed, only sound is play backed normally.
3. Honking noise is play backed every second.
4. Erased sound is play backed.
5. Total time of recorded file is far shorter than 60 minutes.

*Recording time is shortened by about 1 second maximum per file.

(This is because the minimum time unit of usable FLASH MEMORY in recording is 1 second.)

< Cause >

Formats in FLASH MEMORY are not linked properly.

< Remedies >

1. Transfer the necessary recorded information to another unit to get backups.
2. Press the main unit's "MODE" button and "PLAY/SEL/STOP" dial simultaneously, and insert batteries. (With this action, FLASH MEMORY can be formatted.)

3.4. Other modes

< Symptom >

Lighter LCD

< Check >

Check the voltage waveform.

- IC4 [COM3 - COM0] Are 1- - 4-pin output waveform normal?
- IC4 [/WE./RE./CS] Are 46-, 47- and 48-pin output waveform normal?

< Symptom >

No key operation

< Check >

Check AD key input resistant broken wire.

- MODE, REC, ERASE keys Any broken wire in R44, R42, R33 and R31?
- 10 SEC REVIEW, PLAY/STOP keys Any broken wire in R43, R41 and R32?

< Symptom >

VDD is started up (3.3 V), but the unit cannot operate. (LCD is remained turned off.)

< Check >

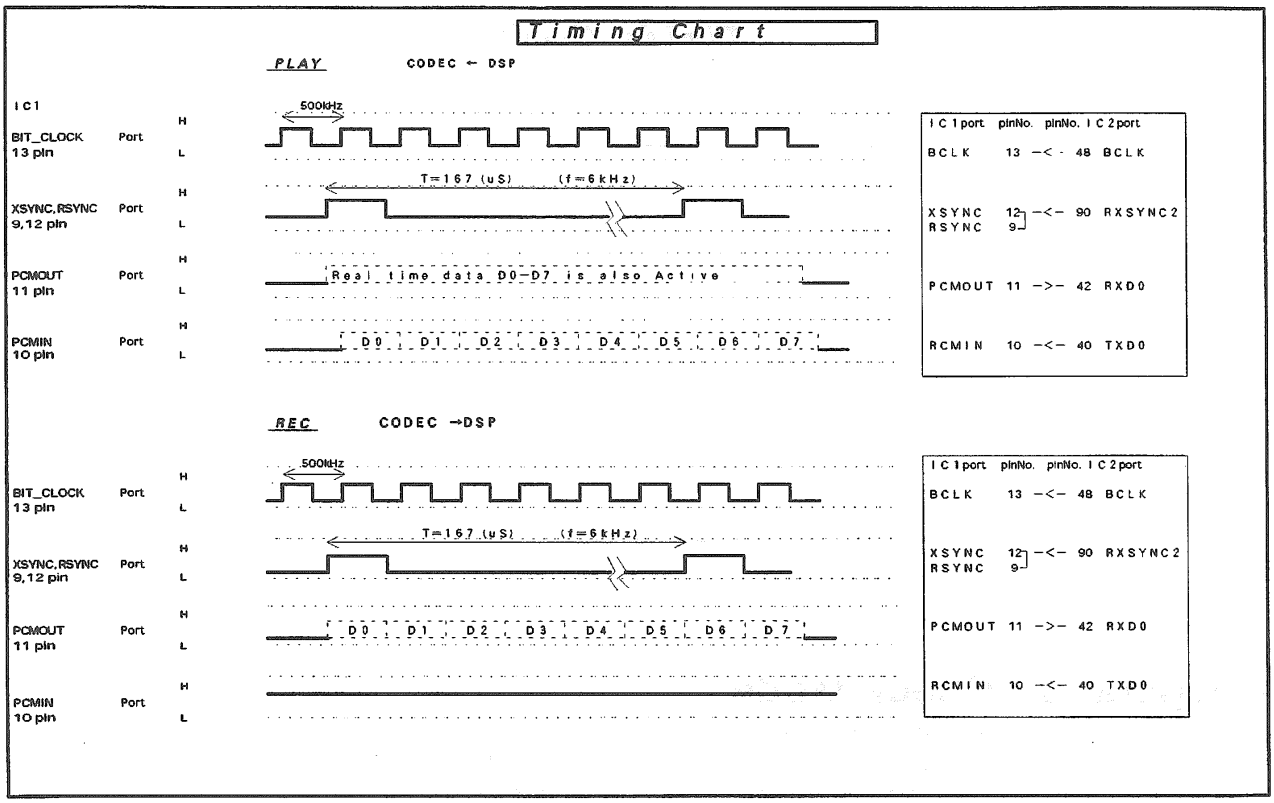
Check Vcc voltage inspection circuit. Any broken wire in R40?

Note:

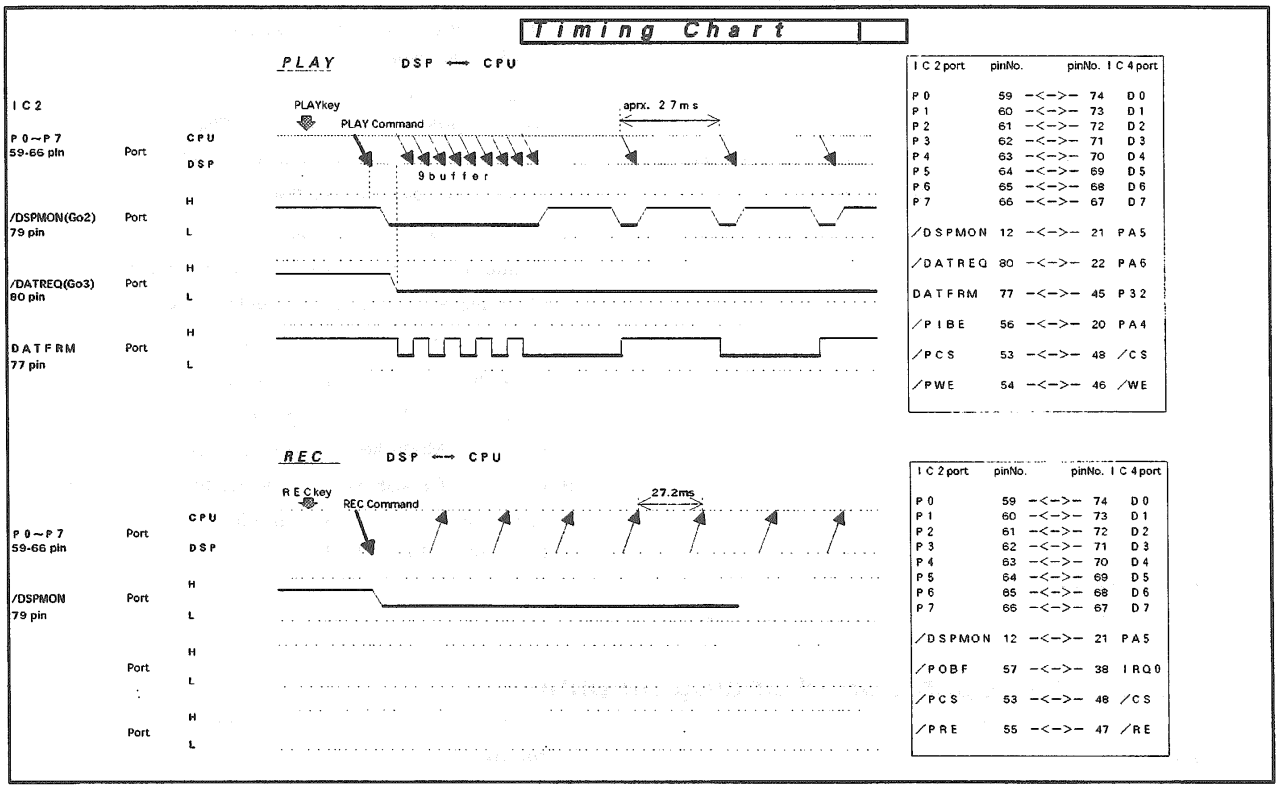
For each output waveform of IC1, IC2, IC3 and IC4, refer to the circuit diagrams.

[ ] mark is the terminal port of IC's

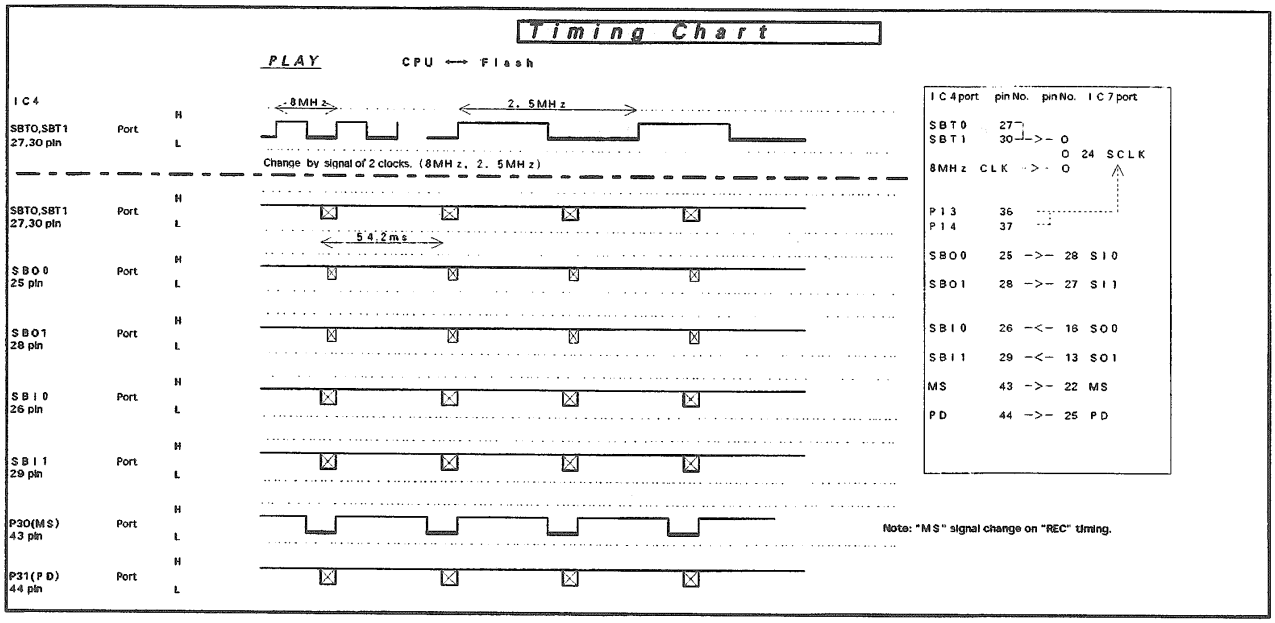
3.5. Timing Chart 1



3.6. Timing Chart 2



3.7. Timing Chart 3



4 Operation Check Mode

Use the followings as your reference to your repair services.

When any abnormalities occur during the Operation Check Mode, check the circuit and make necessary remedies. (Short-circuited, broken wire, poor soldering; IC power supply: low voltage of Vdd; poor oscillation of X'tal; etc.)

4.1. Operation check for the whole set unit

Most of the parts' operation in the unit can be checked with this mode.

< Check items >

- "ON/OFF" operation of slide switches (SW5, SW6, SW7).
- Display of LCD (All sections lit, Upper section, Middle section, Lower section, 7-segment section)
- REC LED operation
- REC operation
- PLAY operation
- Erase operation

< Conditions >

Set all slide switches to their factory-set positions, and start checking.

- SW5/HOLD SW: Set to HOLD side.
- SW6/Speed Control SW: Set to OFF side.
- SW7/Mode Change SW: Set to File Lock side.

< Checking procedures >

1. Pressing the ERASE key and the 10-sec Repeat key simultaneously, connect the power supply.
2. The unit then enters the Operation Check Mode, and the REC LED will blink.
3. Slide the slide switch to the reverse direction to their factory-set position and check the display of LCD.
   - SW5 -- Upper LCD section turns off
   - SW6 -- Middle LCD section turns off.
   - SW7 -- Lower LCD section turns off.
4. Rotate the select dial key and check the display of LCD.
   - The display of 7-segment section changes from 0 to 9.
5. Press the REC key to start recording.
6. Press the REC key again to stop recording.
7. Press the Mode key to start playback.
8. Press the Mode key again to stop playback.
9. Press the ERASE key to activate the erase operation.
10. Press the select dial key and finish checking. (The REC LED will blink and turn off.)

4.2. Check the operation of analog amplifier

Analog signal sections can be inspected.

< Check items >

- Microphone amplifier
- Power amplifier
- CODEC circuit section
- Switch operation in the DSP (Software related section)

< Conditions >

Remove the power supply batteries and lithium batteries (for backups), and start checking.

< Checking procedures >

1. Connect (short-circuit) between 31 pin and GND of IC4, and connect the power supply. (Refer to the disassemble diagrams.)
2. Press the REC key to start recording.
3. The circuits will operate and output the microphone input to the power amplifier. (Recording signals' routes: microphone amplifier -- A/D converter -- DSP inside SW -- D/A converter -- power amplifier)
4. At this time, howling sound is output from the unit's speaker.
5. Press the REC key again to stop recording.
6. Turn off the unit to finish checking.

*It is recommended to format (initialize) the Flash Memory when this check is finished. Refer to the Troubleshooting Guide for its formatting procedure.

Note:

If formatted, all recorded data in the Flash Memory will be cleared.

4.3. Check the recorded data by playing back

This mode is to respond the user demand for playback the previously erased data.

< Check items >

Playback of the recorded data which was erased previously by ERASE operation.

(This is not possible after the Flash Memory is formatted.)

< Conditions >

Remove the power supply batteries and lithium batteries (for backups), and start checking.

< Checking procedures >

1. Pressing the ERASE key and the 10-sec Repeat key simultaneously, connect the power supply.
2. The unit enters the Operation Check Mode, and plays back from the beginning of the Flash Memory without any conditions. (60 minutes)
   - Set the playback level to recording sensitivity 3 or the like, and keep it.
   - No key operation is possible other than PLAY/STOP key.
   - The file link information will not be checked, so data recorded in thin, weak sound will not be played back as continuous sound.
3. Turn off the unit and finish checking.

Note:

This mode is to play back the recorded data with conditions that customers request reproduce or play back the recorded data which they erased before, and the recorded data certainly exist somewhere within 60 minutes unless the data has not been overwritten.

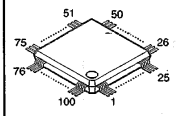
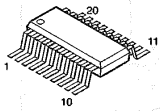
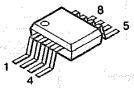
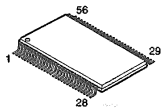
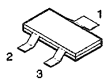
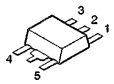
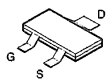
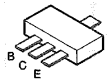
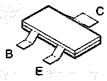
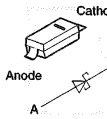
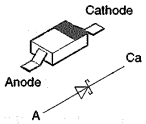
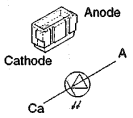
However, in case the customer has recorded thin, weak sounds repeatedly, the data is stored different area by every second. Therefore, reproducing these data is virtually impossible.

6 Schematic Diagram

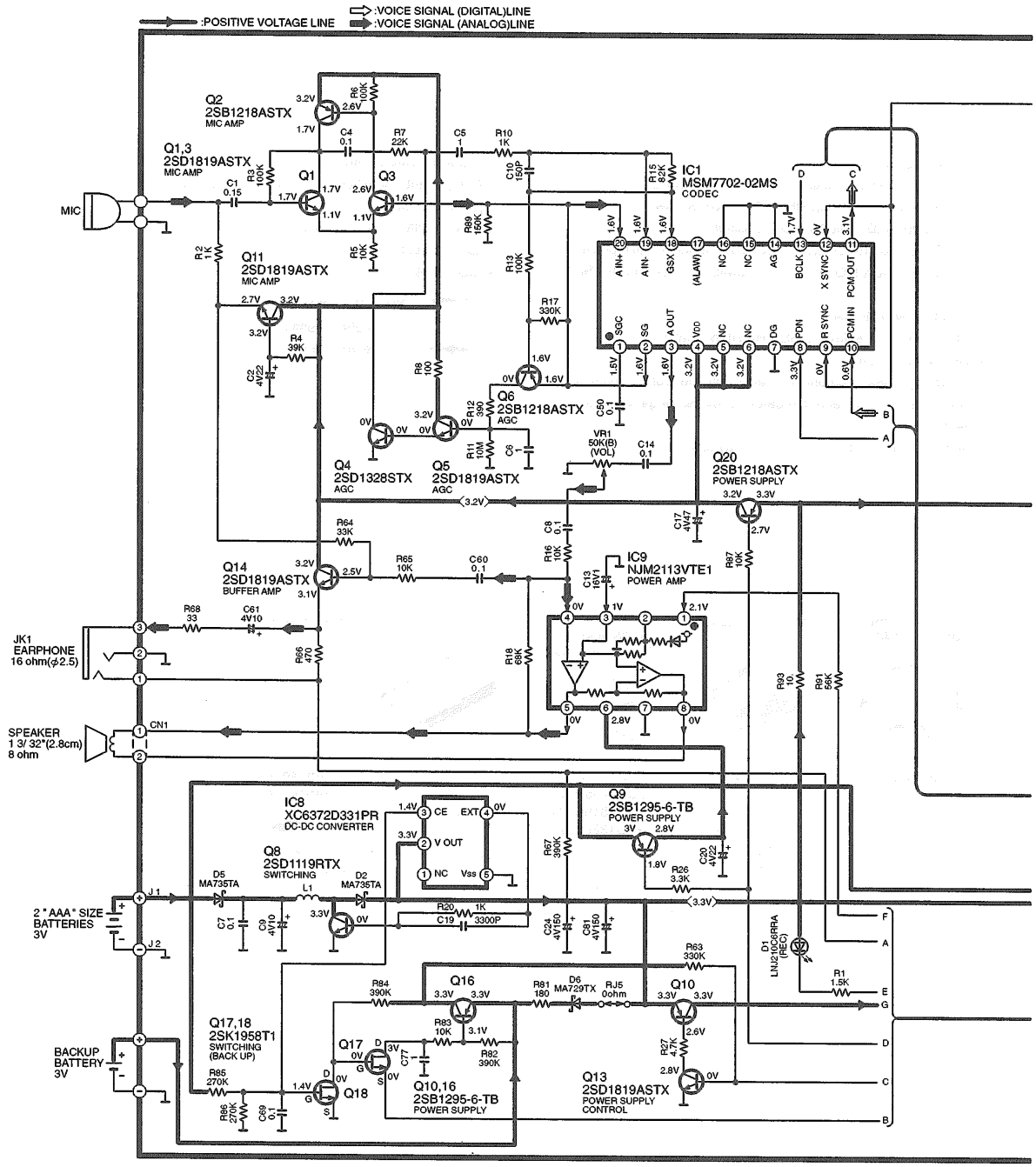
Notes:

- S2 : Erase(ERASE) switch.
- S3 : Play/select/stop dial(PLAY/SEL/STOP) switch.
- S4 : Recording start/stop(REC START/STOP) switch.
- S5 : Hold(HOLD) switch to "ON" position.
- S6 : Speed control(SPEED CONTROL) switch to "ON" position.
- S7 : Mode select(MODE SELECT) switch to "CLOCK/MIC SET" position.
- S9: Mode(MODE) switch.
- S11: 10 second review(10 SEC REVIEW) switch
- VR1: Volume control.
- DC voltage measurements are taken with electronics voltmeter. The negative terminal of the battery provides negative meter connection point.
  No mark ... Recording, ( ) .... Playback

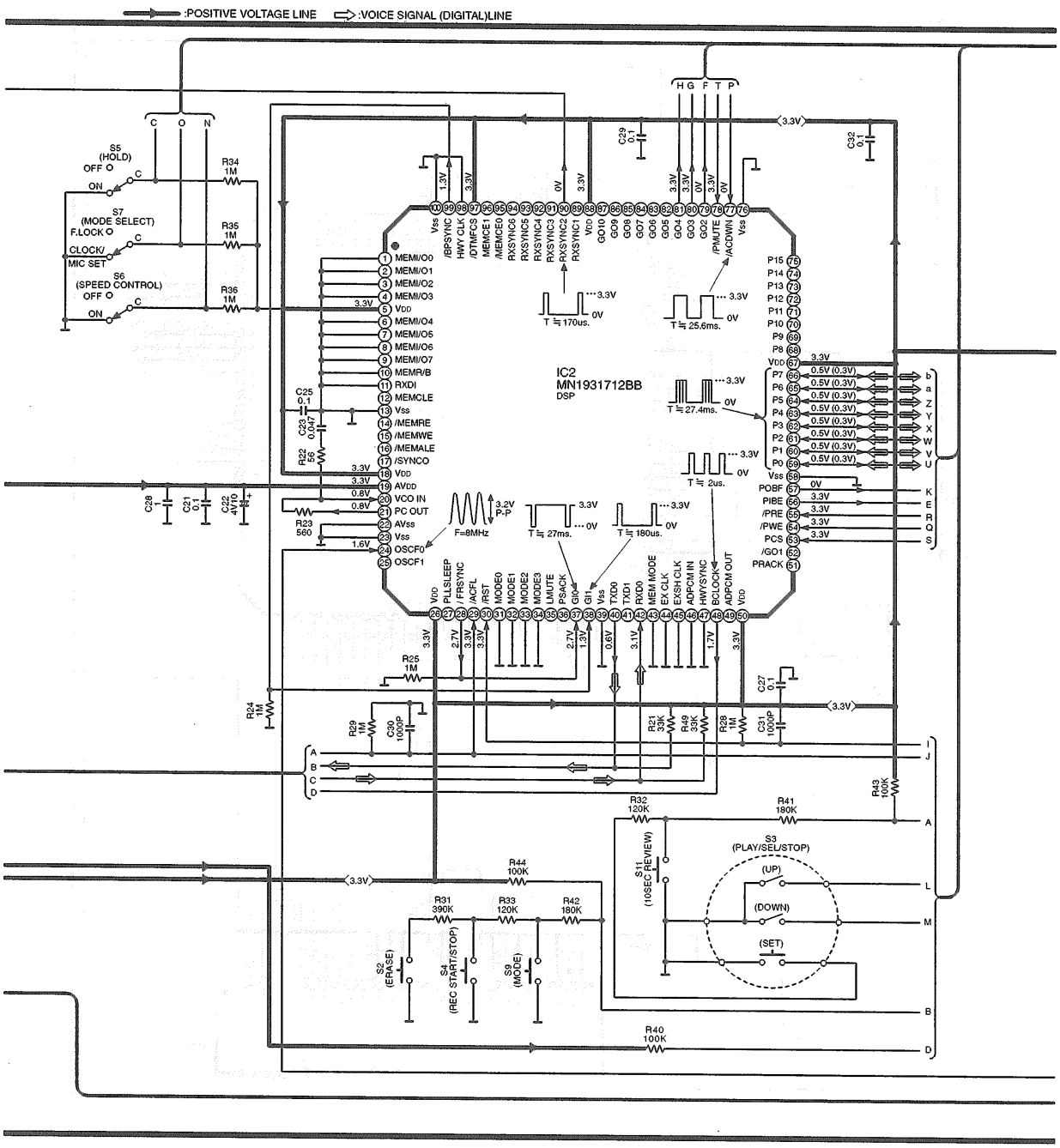
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety.
  When replacing any of these components, use only manufactue's specified parts.
- Signal lines
  ➡ : Voice signal (analog) line
  ⇨ : Voice signal (digital) line
  ➡ : Positive voltage line

MN1931712BB MN101C16ACA 	MSM7702-02MS 	NJM2113VTE1 TC7WU04FUT2L TC7W126FUT2L 	SDTB-16A 	XC61AN2002MR 	XC6372D331PR 
2SK1958T1 	2SD1119RTX 	2SB1218ASTX 2SB1295-6-TB 2SD1819ASTX 2SD1328STX 	MA735TA 	MA728TA MA729TA 	LNJ210C6RRA 

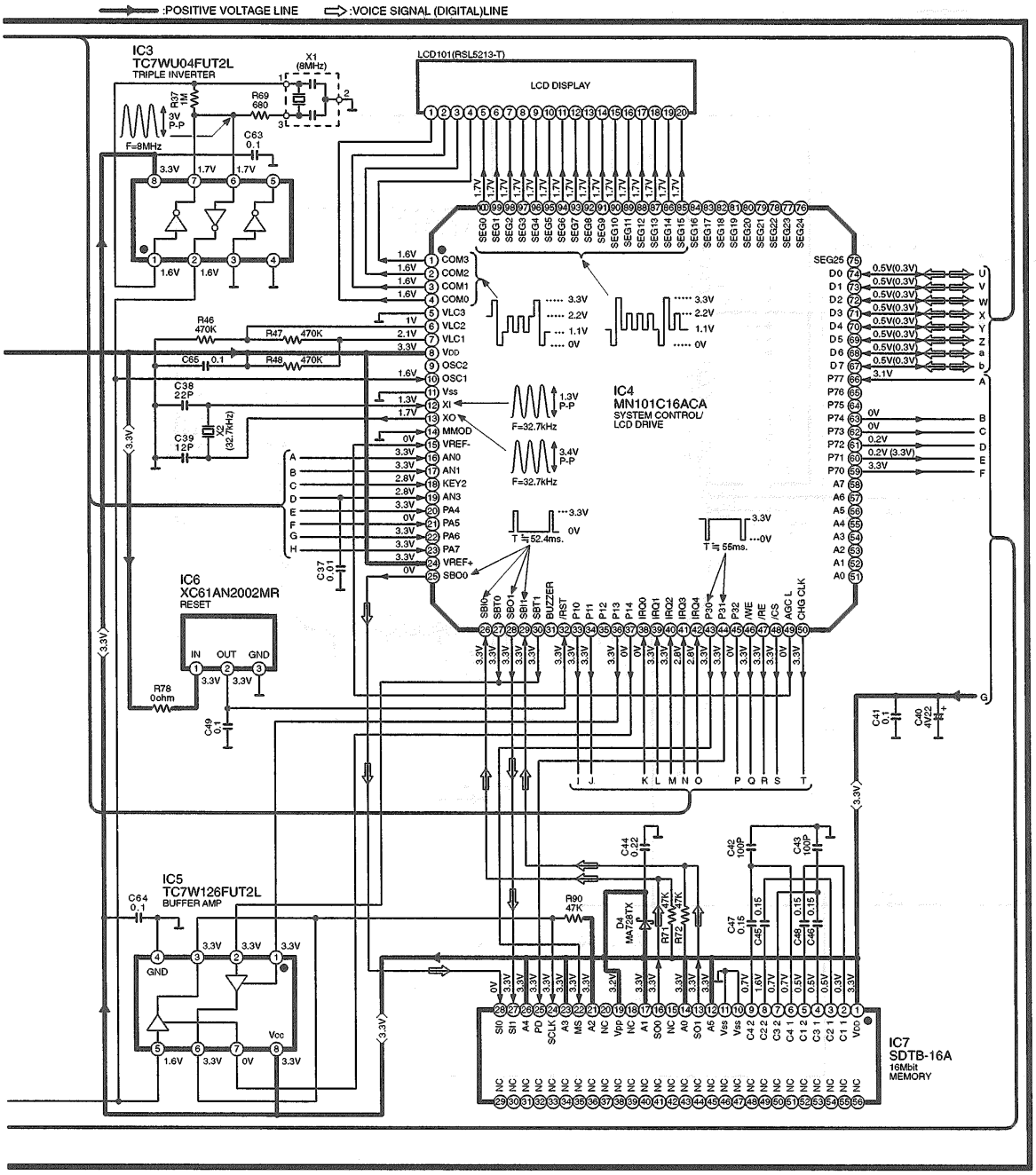
6.1. MAIN CIRCUIT



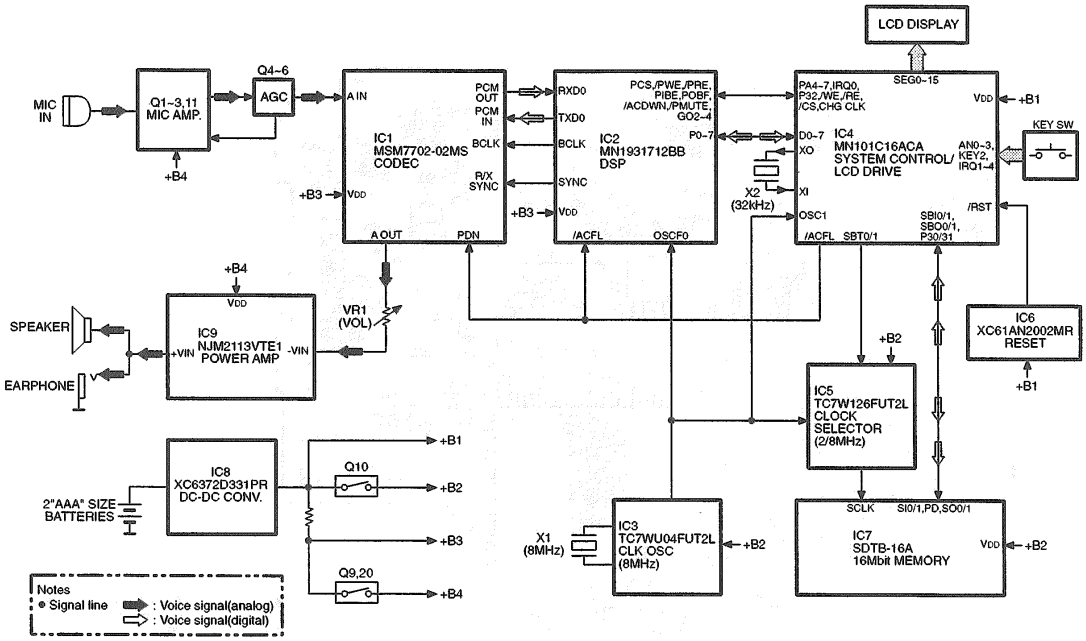
6.2. MAIN CIRCUIT



6.3. MAIN CIRCUIT



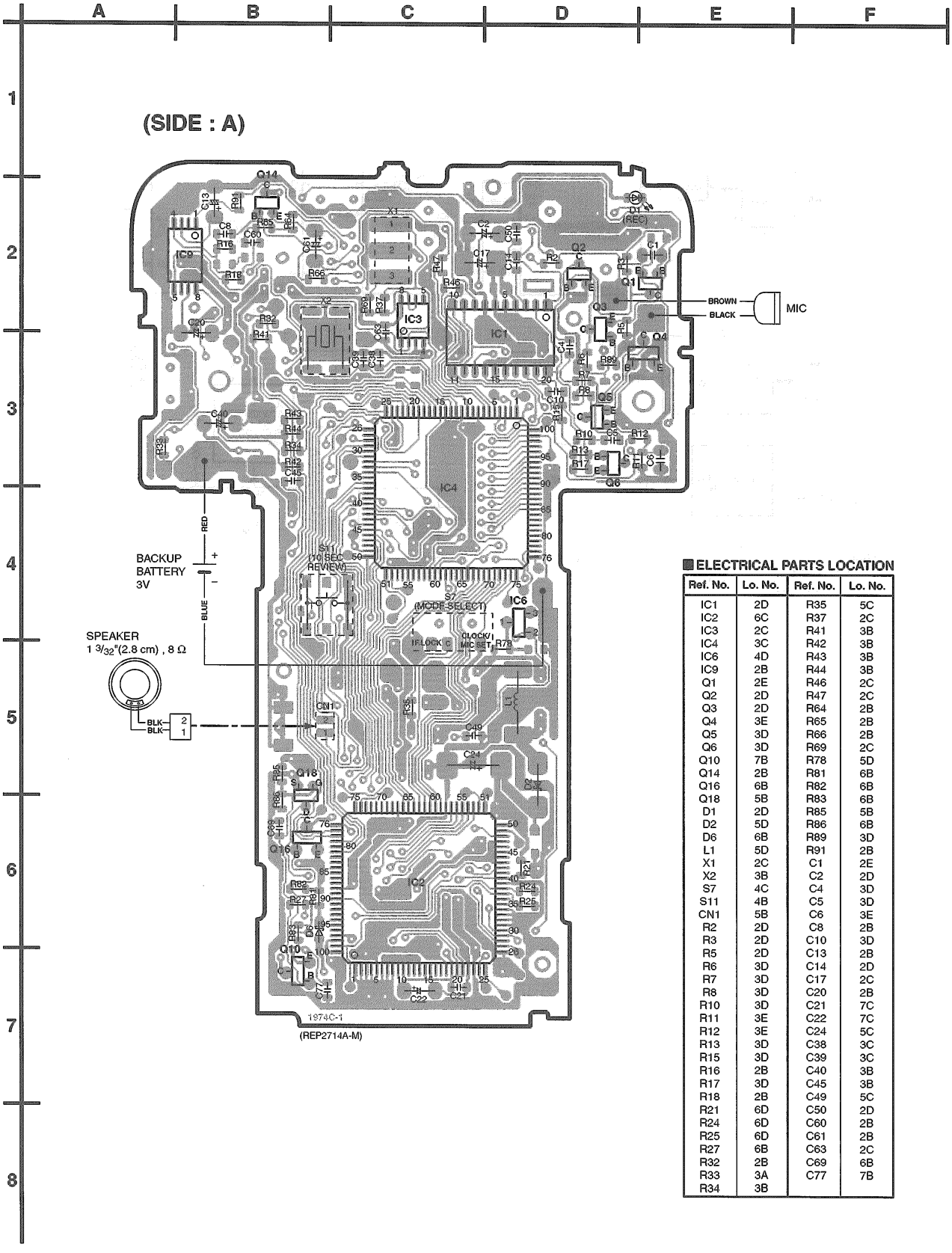
7 Block Diagram



8 Printed Circuit Board Diagram

8.1. MAIN P.C.B.

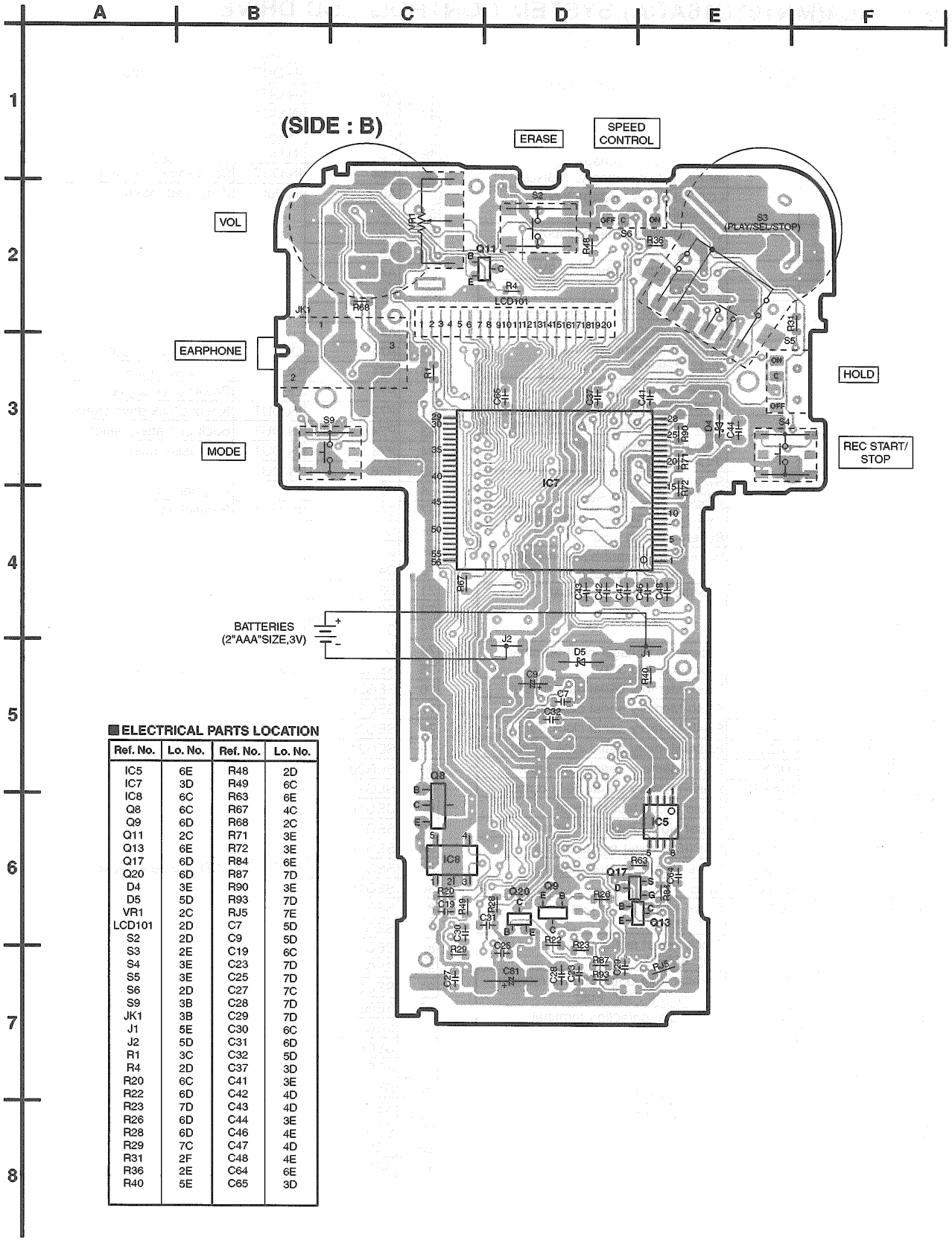
• This circuit board diagram may be modified at any time with the development of new technology.



■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.
IC1	2D	R35	5C
IC2	6C	R37	2C
IC3	2C	R41	3B
IC4	3C	R42	3B
IC6	4D	R43	3B
IC9	2B	R44	3B
Q1	2E	R46	2C
Q2	2D	R47	2C
Q3	2D	R64	2B
Q4	3E	R65	2B
Q5	3D	R66	2B
Q6	3D	R69	2C
Q10	7B	R78	5D
Q14	2B	R81	6B
Q16	6B	R82	6B
Q18	5B	R83	6B
D1	2D	R85	5B
D2	5D	R86	6B
D6	6B	R89	3D
L1	5D	R91	2B
X1	2C	C1	2E
X2	3B	C2	2D
S7	4C	C4	3D
S11	4B	C5	3D
CN1	5B	C6	3E
R2	2D	C8	2B
R3	2D	C10	3D
R5	2D	C13	2B
R6	3D	C14	2D
R7	3D	C17	2C
R8	3D	C20	2B
R10	3D	C21	7C
R11	3E	C22	7C
R12	3E	C24	5C
R13	3D	C38	3C
R15	3D	C39	3C
R16	2B	C40	3B
R17	3D	C45	3B
R18	2B	C49	5C
R21	6D	C50	2D
R24	6D	C60	2B
R25	6D	C61	2B
R27	6B	C63	2C
R32	2B	C69	6B
R33	3A	C77	7B
R34	3B		

8.2. MAIN P.C.B.



■ ELECTRICAL PARTS LOCATION

Ref. No.	Lo. No.	Ref. No.	Lo. No.
IC5	6E	R48	2D
IC7	3D	R49	6C
IC8	6C	R63	6E
Q8	6C	R67	4C
Q9	6D	R68	2C
Q11	2C	R71	3E
Q13	6E	R72	3E
Q17	6D	R84	6E
Q20	6D	R87	7D
D4	3E	R90	3E
D5	5D	R93	7D
VR1	2C	RJ5	7E
LCD101	2D	C7	5D
S2	2D	C9	5D
S3	2E	C19	6C
S4	3E	C23	7D
S5	3E	C25	7D
S6	2D	C27	7C
S9	3B	C28	7D
JK1	3B	C29	7D
J1	5E	C30	6C
J2	5D	C31	6D
R1	3C	C32	5D
R4	2D	C37	3D
R20	6C	C41	3E
R22	6D	C42	4D
R23	7D	C43	4D
R26	6D	C44	3E
R28	6D	C46	4E
R29	7C	C47	4D
R31	2F	C48	4E
R36	2E	C64	6E
R40	5E	C65	3D

9 Terminal Function of IC's

9.1. IC4(MN101C16ACA):SYSTEM CONTROL/ LCD DRIVE

No.	Mark	I/O Division	Function
1	COM3	OUT	LCD segment signal outputs
2	COM2		
3	COM1		
4	COM0		
5	VLC3	---	LCD reference voltage input terminal (Connected to DGND)
6	VLC2	---	LCD reference voltage input terminal (1.1V)
7	VLC1	---	LCD reference voltage input terminal (2.2V)
8	VDD	---	Power supply terminal (3.3V)
9	OSC2	OUT	(Not used, open)
10	OSC1	IN	Main system clock input (f=8MHz)
11	VSS	---	DGND terminal
12	XI	IN	Crystal oscillator terminal (f=32.768kHz)
13	XO	OUT	
14	MMOD	IN	Mode select terminal (Connected to DGND)
15	VREF-	IN	Reference voltage input terminal
16	AN0	IN	Switch detection terminal (PLAY/STOP,10SREP)
17	AN1	IN	Switch detection terminal (MODE,REC,ERASE)
18	KEY2	IN	Switch detection terminal (HOLD)
19	AN3	IN	Battery voltage input
20	PA4	IN	Parallel data input-buffer monitor ("L": Full , "H": Empty)
21	PA5	IN	DSP(IC2) monitor terminal
22	PA6		
23	PA7		
24	VREF+	IN	Reference voltage input terminal (Connected to 3.3V)
25	SBO0	IN/OUT	Flash-Memory serial data output
26	SBI0	IN/OUT	Flash-Memory serial data input
27	SBT0	IN/OUT	Flash-Memory serial clock output
28	SBO1	IN/OUT	Flash-Memory serial data output
29	SBI1	IN/OUT	Flash-Memory serial data input
30	SBT1	IN/OUT	Flash-Memory serial clock output
31	BUZZER	IN	Audio circuit test terminal
32	/RST	IN	Reset signal input ("L": Reset)
33	P10	IN/OUT	DSP(IC2) reset signal output
34	P11	IN/OUT	Power control signal output
35	P12	IN/OUT	Beep output
36	P13	IN/OUT	Clock select signal output ("H": 2MHz)
37	P14	IN/OUT	Clock select signal output ("H": 8MHz)
38	IRQ0	IN	Parallel data output-buffer monitor ("L": Empty , "H": Full)
39	IRQ1	IN	Select dial detection terminal
40	IRQ2	IN	
41	IRQ3	IN	Switch detection terminal (SPEED CONTROL)
42	IRQ4	IN	Switch detection terminal (MODE)
43	P30	IN/OUT	Flash-Memory control signal output
44	P31	IN/OUT	
45	P32	IN/OUT	DSP(IC2) control signal outputs
46	/WE	IN/OUT	
47	/RE	IN/OUT	
48	/CS	IN/OUT	
49	P53	IN/OUT	VREF- signal output
50	P54	IN/OUT	Sampling-clock select output
51	A0	In/Out	(Not used, open)
52	A1		
53	A2		
54	A3		
55	A4		
56	A5		
57	A6		
58	A7		
59	P70	OUT	Mute signal output ("H": Mute)
60	P71	OUT	LED drive signal ("L": Light)
61	P72	OUT	Power drive signal ("L": ON)
62	P73	IN/OUT	8MHz-Clock drive signal ("L": OFF)
63	P74	IN/OUT	Back-up battery select ("L": ON)
64	P75	IN/OUT	(Not used, open)
65	P76	IN/OUT	
66	P77	IN	Earphone detect circuit terminal
67	D7	IN/OUT	Parallel data ports
68	D6		
69	D5		
70	D4		
71	D3		
72	D2		
73	D1		
74	D0		
75	SEG25	OUT	(Not used, open)
76	SEG24		
77	SEG23		
78	SEG22		
79	SEG21		
80	SEG20		
81	SEG19		
82	SEG18		
83	SEG17		
84	SEG16		
85	SEG15	OUT	LCD segment signal outputs
86	SEG14		
87	SEG13		
88	SEG12		
89	SEG11		
90	SEG10		
91	SEG9		
92	SEG8		
93	SEG7		
94	SEG6		
95	SEG5		
96	SEG4		
97	SEG3		
98	SEG2		
99	SEG1		
100	SEG0		

9.2. IC2(MN1931712BB):DIGITAL SIGNAL PROCESSOR

No.	Mark	I/O Division	Function
1	MEMI/O0	IN/OUT	(Not used, Connected to DGND)
2	MEMI/O1		
3	MEMI/O2		
4	MEMI/O3		
5	VDD	---	Power supply terminal (3.3V)
6	MEMI/O4	IN/OUT	(Not used, Connected to DGND)
7	MEMI/O5		
8	MEMI/O6		
9	MEMI/O7		
10	MEMR/B		
11	RXD1	IN	
12	MEMCLE	OUT	(Not used, open)
13	VSS	---	DGND terminal
14	/MEMRE	OUT	(Not used, open)
15	/MEMWE		
16	/MEMALE		
17	/SYNC0		
18	VDD	---	Power supply terminal (3.3V)
19	AVDD	---	Power supply terminal (3.3V)
20	VCOIN	IN	VCO control signal input
21	PCOUT	OUT	Phase comparated signal output
22	AVSS	---	AGND terminal
23	VSS	---	DGND terminal
24	OSCF0	IN	Clock input terminal (f=8MHz)
25	OSCF1	OUT	(Not used, open)
26	VDD	---	Power supply terminal (3.3V)
27	PLLSLEEP	IN	(Not used, open)
28	/FRSYNC	OUT	Frame Sync. Output
29	/ACFL	IN	Power control signal input
30	/RST	IN	Reset terminal
31	MODE0	IN	Mode control terminal (Connected to DGND)
32	MODE1		
33	MODE2		
34	MODE3		
35	LMUTE	IN	(Not used, open)
36	PSACK		
37	GI0	IN	Frame Sync. Input
38	GI1	IN	Sub frame Sync. Input
39	VSS	---	DGND terminal
40	TXD0	OUT	Serial data output
41	TXD1	OUT	(Not used, open)
42	RXD0	IN	Serial data input
43	MEMMODE	IN	(Not used, Connected to DGND)
44	EXCLK		
45	EXSHCLK		
46	ADPCMIN		
47	HWYSYNC		
48	BCLOCK	OUT	Serial bit clock output
49	ADPCMOUT	OUT	(Not used, open)
50	VDD	---	Power supply terminal (3.3V)
51	PRACK	OUT	(Not used, open)
52	/GO1	OUT	(Not used, open)
53	/PCS	IN	Parallel chip select input
54	/PWE	IN	Parallel write signal input
55	/PRE	IN	Parallel read signal input
56	PIBE	OUT	Parallel input-buffer monitor ("L": Full , "H": Empty)
57	POBF	OUT	Parallel output-buffer monitor ("H": Full , "L": Empty)
58	VSS	---	DGND terminal

No.	Mark	I/O Division	Function
59	P0	IN/OUT	Parallel data terminal
60	P1		
61	P2		
62	P3		
63	P4		
64	P5		
65	P6		
66	P7		
67	VDD	---	Power supply terminal (3.3V)
68	P8	IN/OUT	(Not used, open)
69	P9		
70	P10		
71	P11		
72	P12		
73	P13		
74	P14		
75	P15		
76	VSS	---	DGND terminal
77	/ACDWN	IN	Control signal input
78	/PMUTE	IN	Sampling-clock select input
79	GO2	OUT	Parallel monitor signal output
80	GO3		
81	GO4		
82	GO5	OUT	(Not used, open)
83	GO6		
84	GO7		
85	GO8		
86	GO9		
87	GO10		
88	VDD	---	Power supply terminal (3.3V)
89	RXSYNC1	OUT	(Not used, open)
90	RXSYNC2	OUT	Sync. Signal output
91	RXSYNC3	OUT	(Not used, open)
92	RXSYNC4		
93	RXSYNC5		
94	RXSYNC6		
95	/MEMCE0		
96	/MEMCE1		
97	/DTMFCS	IN	(Not used, Connected to 3.3V)
98	HWYCLK	IN	(Not used, Connected to DGND)
99	/SBFSYNC	OUT	Sub frame Sync. Output
100	VSS	---	DGND terminal

9.3. IC1(MSM7702-02MS):CDEC

No.	Mark	I/O Division	Function
1	SGC	---	Signal ground capacitor terminal
2	SG	---	Signal ground
3	AOUT	OUT	Analogue output
4	VDD	---	Power supply terminal (3.3V)
5	NC	---	(Not used, open)
6			
7	DG	---	Digital ground (Connected to DGND)
8	PDN	IN	Power down signal input
9	RSYNC	IN	Receive Sync. Input
10	PCMIN	IN	PCM input
11	PCMOUT	OUT	PCM output
12	XSYNC	IN	Transmission Sync. Input
13	BCLK	IN	Serial bit clock input
14	AG	---	Analogue ground (Connected to AGND)
15	NC	---	(Not used, open)
16			
17			
18	GSX	---	Analogue gain adjustment terminal
19	AIN-	IN	Analogue input
20	AIN+	IN	Analogue input (Connected to SG)

10 Replacement Parts List

Note:

Important safety notice:

Components identified by ⚠ mark have special characteristics important for safety.

Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.

When replacing any of components, Be sure to use only manufacturer's specified parts shown in the parts list.

The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)

Parts without these indications can be used for all areas.

Remote Control Ass'y: Supply period for three years from termination of production.

Warning: This product uses a laser diode. Refer to caution statements on page 1.

Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads (pF) F=Farads (F)

Resistance values are in ohms, unless specified otherwise, 1k=1,000 (OHM), 1M=1,000k (OHM)

[M] indicates in Remarks columns parts that are supplied by MESA.

The "<IA>" marks in Remarks indicate language of instruction manual.

<IA> : English

10.1. Replacement Parts List

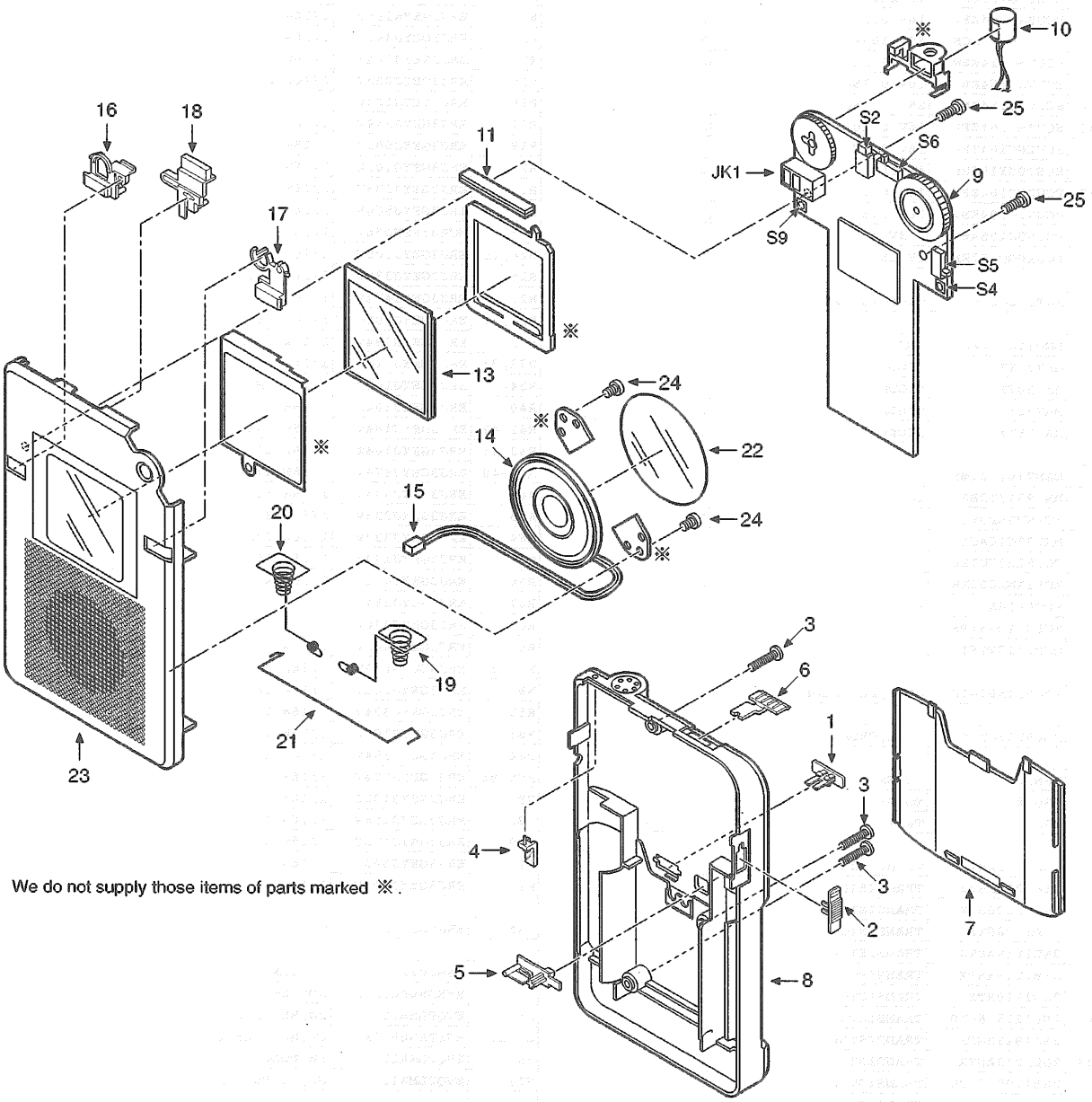
Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
1	RGV0230-K	KNOB,PLAY/SEL/STOP	1	
2	RGV0231-K	KNOB,HOLD	1	
3	RHQ0051-K	SCREW	3	
4	RGL0420-Q	PANEL,LIGHT	1	
5	RGU1673-K	BUTTON,10 SEC REVIEW	1	
6	RGV0232-K	KNOB,SPEED CONTROL	1	
7	RKK0115-S	BATT.COVER	1	
8	RKS0290B-S	REAR CABINET	1	
9	RFKDRDR60P-S	JOG SW ASS'Y,PLAY/STOP	1	
10	RJM0016	MICROPHONE	1	
11	RMG0496-H	ZEBRA GUM	1	
13	RSL5213-T	LCD	1	
14	RAS3P13-U	SPEAKER	1	
15	REX0932	WIRE	1	
16	RGU1669-1S	BUTTON,MODE	1	
17	RGU1670-R	BUTTON,REC START/STOP	1	
18	RGU1671-K	BUTTON,ERASE	1	
19	RJC40015	BATT.TERMINAL(+)	1	
20	RJC80017	BATT.TERMINAL(-)	1	
21	RJC94013	BATT.TERMINAL(+/-)	1	
22	RMZ0466	SHEET	1	
23	RYK0859-S	FRONT CABINET ASS'Y	1	
24	XQN2+CQ3	SCREW	2	
25	XTNR2+5CFN	SCREW	2	
A1	RQT4606-P	INSTRUCTION MANUAL	1	(P)<IA>

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C1	ECUV1C154KBN	16V 0.15U	1	
C2	ECST0GY226RR	4V 22U	1	
C4	ECUZNC104ZFV	16V 0.1U	1	
C5	ECUVNA105ZFV	10V 1U	1	
C6	ECUVNA105KBN	10V 1U	1	
C7	ECUZNC104ZFV	16V 0.1U	1	
C9	RCST0GA106RE	4V 10U	1	
C10	ECUV1H151KBV	50V 150P	1	
C13	ECST1CY105RR	16V 1U	1	
C14	ECUZNC104ZFV	16V 0.1U	1	
C17	ECST0GX476R	4V 47U	1	
C19	ECUV1H332KBV	50V 3300P	1	
C20	ECST0GY226RR	4V 22U	1	
C21	ECUZNC104ZFV	16V 0.1U	1	
C22	ECST0GY106RR	4V 10U	1	
C23	ECUVNC473KBV	16V 0.047U	1	
C24	RCSX0GC157RE	4V 150U	1	
C25	ECUZNC104ZFV	16V 0.1U	1	
C27	ECUZNC104ZFV	16V 0.1U	1	
C28	ECUV1C105ZFN	16V 1U	1	
C29	ECUZNC104ZFV	16V 0.1U	1	
C30,31	ECUV1H102KBV	50V 1000P	2	
C32	ECUZNC104ZFV	16V 0.1U	1	
C37	ECUV1E103KBV	25V 0.01U	1	
C38	ECUV1H220KCV	50V 22P	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
C39	ECUV1H120KCV	50V 12P	1	
C40	ECST0GY226RR	4V 22U	1	
C41	ECUZNC104ZFV	16V 0.1U	1	
C42,43	ECUV1H101KCN	50V 100P	2	
C44	ECUVNC224KBN	16V 0.22U	1	
C45	ECUVNA154KBV	10V 0.15U	1	
C46-48	ECUV1E154ZFN	25V 0.15U	3	
C49,50	ECUZNC104ZFV	16V 0.1U	2	
C60	ECUZNC104ZFV	16V 0.1U	1	
C61	ECST0GY106RR	4V 10U	1	
C63-65	ECUZNC104ZFV	16V 0.1U	3	
C69	ECUV1C104KBV	16V 0.1U	1	
C77	ECUV0J105KBV	6.3V 1U	1	
C81	RCSX0GC157RE	4V 150U	1	
CN1	RJT120C02T	CONECTOR(2P)	1	
D1	LNJ210C6RRA	LED	1	
D2	MA735TX	DIODE	1	
D4	MA728TX	DIODE	1	
D5	MA735TX	DIODE	1	
D6	MA729TX	DIODE	1	
IC1	MSM7702-02MS	IC	1	
IC2	MN1931712BB	IC	1	
IC3	TC7WU04FUT2L	IC	1	
IC4	MN101C16ACA	IC	1	
IC5	TC7W126FUT2L	IC	1	
IC6	XC61AN2002MR	IC	1	
IC7	SDTB-16A	IC	1	
IC8	XC6372D331PR	IC	1	
IC9	NJM2113VTE1	IC	1	
JK1	RJJ23TK01-1H	JACK,EARPHONE	1	
L1	RL09U028T-T	COIL,CHOKE	1	
P1	RPN1140	COVER	1	(P)
P2	RPQ0890	MOUNT	1	(P)
P3	RPN1139	TRAY	1	(P)
Q1	2SD1819ASTX	TRANSISTOR	1	
Q2	2SB1218ASTX	TRANSISTOR	1	
Q3	2SD1819ASTX	TRANSISTOR	1	
Q4	2SD1328STX	TRANSISTOR	1	
Q5	2SD1819ASTX	TRANSISTOR	1	
Q6	2SB1218ASTX	TRANSISTOR	1	
Q8	2SD1119RTX	TRANSISTOR	1	
Q9,10	2SB1295-6-TB	TRANSISTOR	2	
Q11	2SD1819ASTX	TRANSISTOR	1	
Q13,14	2SD1819ASTX	TRANSISTOR	2	
Q16	2SB1295-6-TB	TRANSISTOR	1	
Q17,18	2SK1958T1	TRANSISTOR	2	
Q20	2SB1218ASTX	TRANSISTOR	1	
R1	ERJ3GEYJ152V	1/16W 1.5K	1	
R2	ERJ3GEYJ102Z	1/16W 1K	1	
R3	ERJ3GEYJ104V	1/16W 100K	1	
R4	ERJ3GEYJ393V	1/16W 39K	1	
R5	ERJ3GEYJ103Z	1/16W 10K	1	
R6	ERJ3GEYJ104Z	1/16W 100K	1	
R7	ERJ3GEYJ223V	1/16W 22K	1	

Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
R8	ERJ3GEYJ101V	1/16W 100	1	
R10	ERJ3GEYJ102Z	1/16W 1K	1	
R11	ERJ3GEYK106V	1/16W 10M	1	
R12	ERJ3GEYJ391V	1/16W 390	1	
R13	ERJ3GEYJ104Z	1/16W 100K	1	
R15	ERJ3GEYJ823V	1/16W 82K	1	
R16	ERJ3GEYJ103Z	1/16W 10K	1	
R17	ERJ3GEYJ334V	1/16W 330K	1	
R18	ERJ3GEYJ683V	1/16W 68K	1	
R20	ERJ3GEYJ102Z	1/16W 1K	1	
R21	ERJ3GEYJ333V	1/16W 33K	1	
R22	ERJ3GEYJ560V	1/16W 56	1	
R23	MCR03PZHJ561	1/16W 560	1	
R24,25	ERJ3GEYJ105V	1/16W 1M	2	
R26	ERJ3GEYJ332V	1/16W 3.3K	1	
R27	ERJ3GEYJ472V	1/16W 4.7K	1	
R28,29	ERJ3GEYJ105V	1/16W 1M	2	
R31	ERJ3GEYJ394V	1/16W 390K	1	
R32,33	ERJ3GEYJ124V	1/16W 120K	2	
R34-37	ERJ3GEYJ105V	1/16W 1M	4	
R40	ERJ3GEYJ104Z	1/16W 100K	1	
R41,42	ERJ3GEYJ184V	1/16W 180K	2	
R43,44	ERJ3GEYJ104Z	1/16W 100K	2	
R46-48	ERJ3GEYJ474V	1/16W 470K	3	
R49	ERJ3GEYJ333V	1/16W 33K	1	
R63	ERJ3GEYJ334V	1/16W 330K	1	
R64	ERJ3GEYJ333V	1/16W 33K	1	
R65	ERJ3GEYJ103Z	1/16W 10K	1	
R66	ERJ3GEYJ471V	1/16W 470	1	
R67	ERJ3GEYJ394V	1/16W 390K	1	
R68	ERJ3GEYJ330V	1/16W 33	1	
R69	ERJ3GEYJ681V	1/16W 680	1	
R71,72	ERJ3GEYJ473V	1/16W 47K	2	
R81	ERJ3GEYJ181V	1/16W 180	1	
R82	ERJ3GEYJ394V	1/16W 390K	1	
R83	ERJ3GEYJ103Z	1/16W 10K	1	
R84	ERJ3GEYJ394V	1/16W 390K	1	
R85,86	ERJ3GEYJ274V	1/16W 270K	2	
R87	ERJ3GEYJ103Z	1/16W 10K	1	
R89	ERJ3GEYJ154V	1/16W 150K	1	
R90	ERJ3GEYJ473V	1/16W 47K	1	
R91	ERJ3GEYJ563V	1/16W 56K	1	
R93	ERJ3GEYJ100V	1/16W 10	1	
RJ5	ERJ6GEY0R00	CHIP JUMPER	1	
S2	RSG0022-A	SW,ERASE	1	
S3	RFKDRDR60P-S	JOG SW ASS'Y	1	
S4	EVQPLMA15	SW,REC START/STOP	1	
S5-S7	RSS2A009-1A	SW,MODE SELECT	3	
S9	EVQPLMA15	SW,MODE	1	
S11	EVQPLMA15	SW,10 SEC REVIEW	1	
VR1	EVUT2KA20B54	VR,VOL	1	
X1	RSXY8M00M07T	CERAMIC OSC	1	
X2	RSXC32K7L04T	XTAL,32K	1	

10.2. Cabinet Parts Location



We do not supply those items of parts marked ※.

Ref. No.	Part No.	Part Name & Description	Pcs.	Remarks
1	RGV0230-K	KNOB, PLAY/SEL/STOP	1	
2	RGV0231-K	KNOB, HOLD	1	
3	RHQ0051-K	SCREW	3	
4	RGL0420-Q	PANEL, LIGHT	1	
5	RGU1673-K	BUTTON, 10 SEC REVIEW	1	
6	RGV0232-K	KNOB, SPEED CONTROL	1	
7	RKK0115-S	BATT. COVER	1	
8	RKS0290B-S	REAR CABINET	1	
9	RFKDRDR60P-S	JOG SW ASS'Y, PLAY/STOP	1	
10	RJM0016	MICROPHONE	1	
11	RMG0496-H	ZEBRA GUM	1	
13	RSL5213-T	LCD	1	

Ref. No.	Part No.	Part Name & Description	Pcs.	Remarks
14	RAS3P13-U	SPEAKER	1	
15	REX0932	WIRE	1	
16	RGU1669-1S	BUTTON, MODE	1	
17	RGU1670-R	BUTTON, REC START/STOP	1	
18	RGU1671-K	BUTTON, ERASE	1	
19	RJC40015	BATT. TERMINAL(+)	1	
20	RJC80017	BATT. TERMINAL(-)	1	
21	RJC94013	BATT. TERMINAL(+/-)	1	
22	RMZ0466	SHEET	1	
23	RYK0859-S	FRONT CABINET ASS'Y	1	
24	XQN2+CQ3	SCREW	2	
25	XTNP2+5CFN	SCREW	2	