ORDER NO. KM49111863C2

Service Manual

and Technical Guide

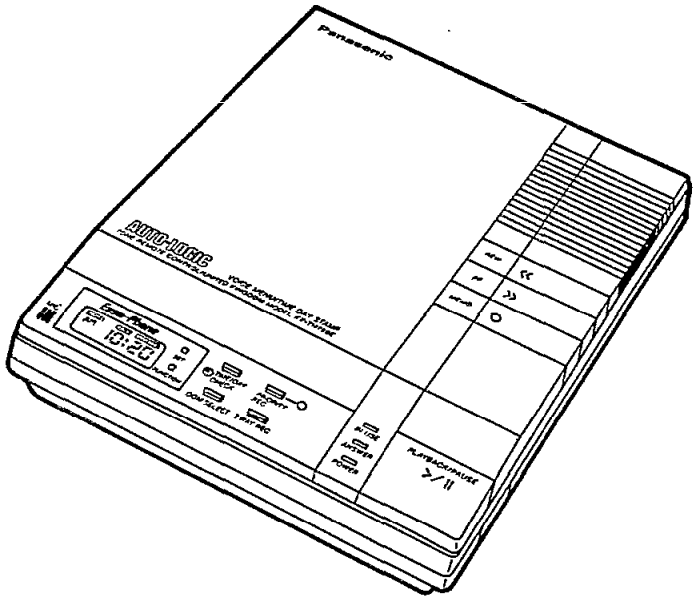
Telephone Equipment

Easa-Phone

AUTOMATIC TELEPHONE
ANSWERING SYSTEM

KX-T1476BE

(for United Kingdom)



■ SPECIFICATIONS

Power Source:	AC adaptor (13.5 V, DC)/KX-A11BEXE
Outgoing Message (OGM):	C15 regular cassette 2 Mode (OGM 1, 2)
Incoming Message (ICM):	C-60 regular cassette: selectable recording times (1 MIN/VOX)
Tape Deck:	Logic control dual cassette system
Ring Control:	2/4/Auto
Power Output:	350 mW max. across the monitor speaker
Monitor Speaker:	2" PM dynamic (8 ohms)
Microphone:	Condenser microphone
Connection:	BT TEL Jack, DC-IN jack
Dimensions:	$6^{9}/_{16}" \times 2^{5}/_{32}" \times 8^{17}/_{32}"$ [167 (W) × 55 (H) × 217 (D)] mm
Weight:	1 lb 15.75 oz (900 g)

Design and specifications are subject to change without notice.

Panasonic

When referring to the serial number, supply all 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

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LOCATION OF CONTROLS

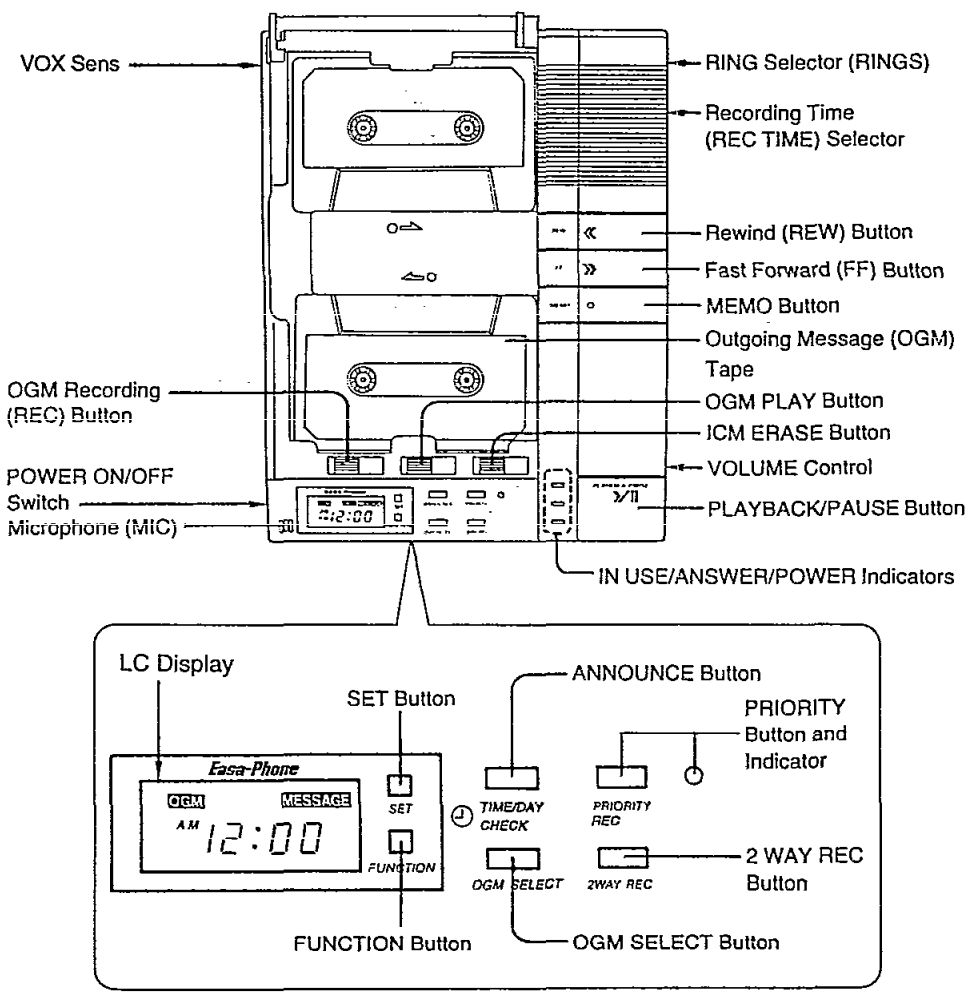


Fig. 1

DISASSEMBLY INSTRUCTIONS

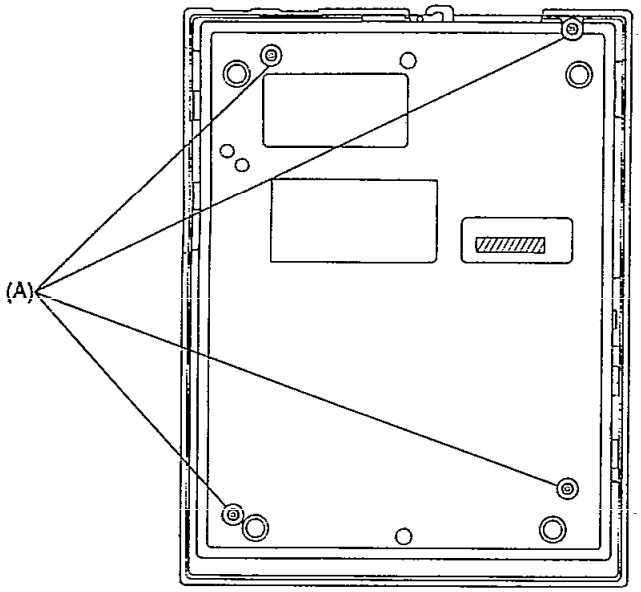


Fig. 2

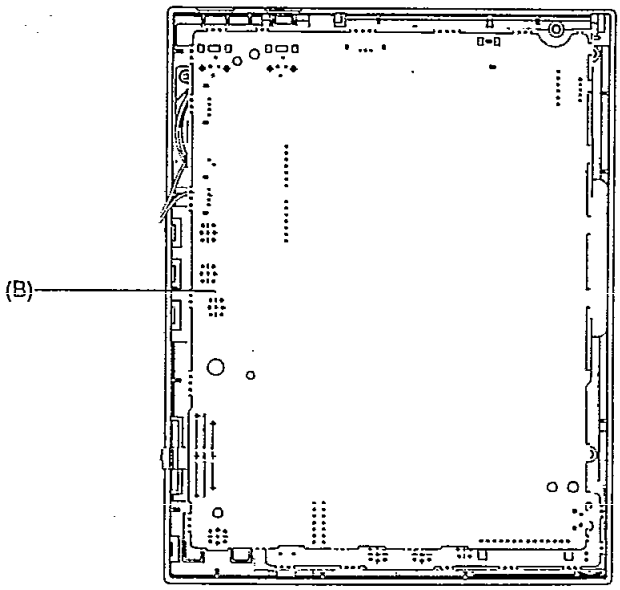


Fig. 3

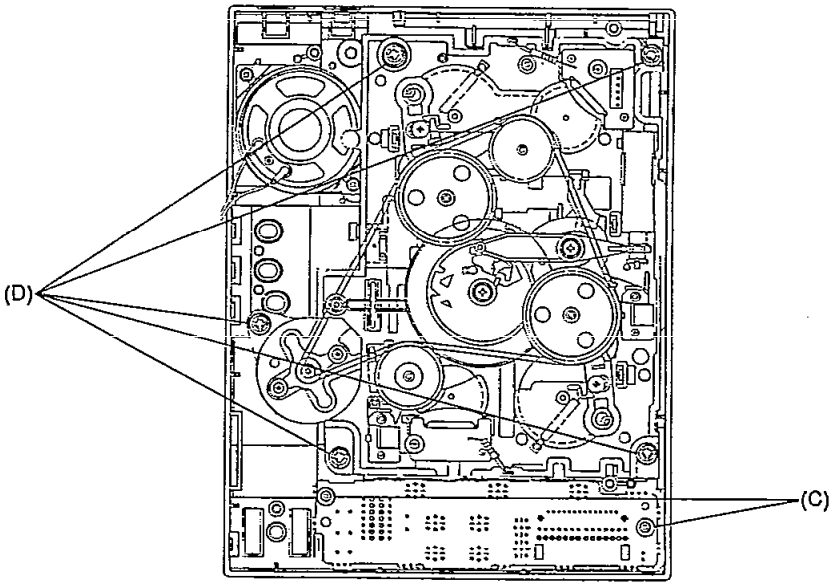
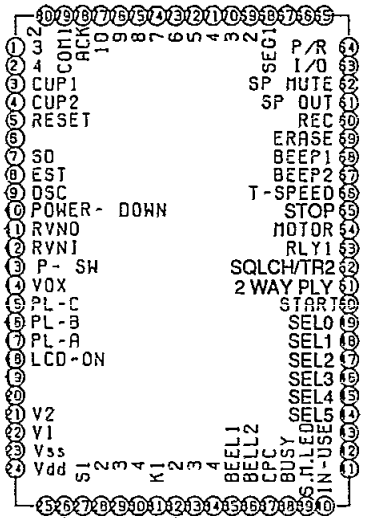


Fig. 4

Procedure	To remove —.	Remove —.	Shown in Fig.—.
1	Lower Cabinet	Screws (3 x 16) ..... (A) x 4	2
2	Printed Circuit Board	Remove the main P.C.Board..... (B)	3
3		Sub. P.C.Board (3 x 10) ..... (C) x 2	4
4	Cassette Deck	Screws (3 x 10) ..... (D) x 5	4

CPU DATA



Part No.: PQVI8641507
Power Supply: 5±0.1 V
Program ROM: 4K × 16 bit
Inside Data RAM: 256 × 4 bit

Pin No.	Function	High	Low
1	Common (LCD)		
2	Common (LCD)		
3	CUP1		
4	CUP2		
5	RESET	Active	
6	------		
7	SD	Active	
8	EST		
9	DSC		
10	Power Down		
11	RVN (OGM)		Active
12	RVN (ICM)		
13	Position SW	Deck On	Deck Off
14	VOX	Diable	Enable
15	Plunger-C	Active	
16	Plunger-B		
17	Plunger-A		
18	LCD-ON	LCD-OFF	LCD-ON
19	OSC1		
20	OSC2		
21	V2		
22	V1		
23	Vss		GND
24	Vdd	Vdd	
25	Clock		
26	Clock		
27	KEY IN	Key In	
28	KEY IN		
29	KEY IN		
30	KEY IN		
31	KEY IN		
32	KEY IN		
33	KEY IN		
34	KEY IN		
35	BELL		Bell In
36	------		
37	CPC	CPC In	
38	BUSY	BUST	
39	PMSG LED	OFF	ON
40	IN USE LED	OFF	ON

Pin No.	Function	High	Low
41	Answer LED	OFF	ON
42	Power LED	OFF	ON
43	------		
44	ADR, strobe	Strobe On	Strobe Off
45	ADR, strobe		
46	ADR, strobe		
47	ADR, strobe		
48	ADR, strobe		
49	ADR, strobe		
50	START	Active	
51	2 WAY relay	Active	
52	TR2	Active	
53	RLY1	Active	OFF
54	MOTOR		OFF
55	------		OFF
56	Tape Speed	High Speed	Normal
57	BEEP2		
58	BEEP1		
59	Erase	Active	OFF
60	REC Play	Play	Rec
61	SP Out	Active	
62	SP Mute	Mute On	Mute Off
63	ICM OGM	ICM	IGM
64	Play Rec	Rec	Play
65	Mic	Active	OFF
66	Line In		
67	Line Out		
68	Segment (LCD)		
69	Segment (LCD)		
70	Segment (LCD)		
71	Segment (LCD)		
72	Segment (LCD)		
73	Segment (LCD)		
74	Segment (LCD)		
75	Segment (LCD)		
76	Segment (LCD)		
77	Segment (LCD)		
78	ACK	Active	
79	Common (LCD)		
80	Common (LCD)		

BLOCK DIAGRAM

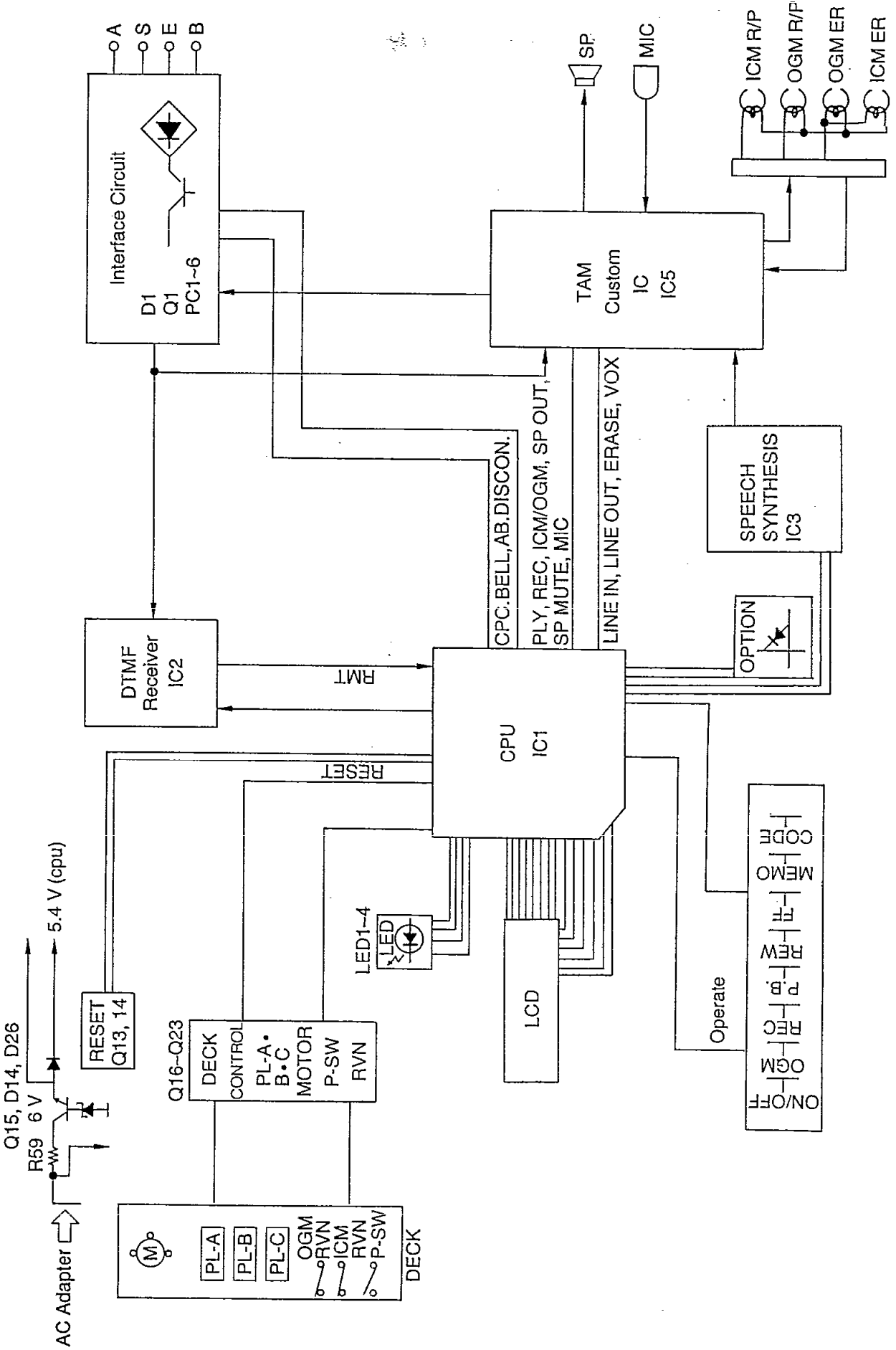


Fig. 5

ACCESSORIES AND PACKING MATERIALS

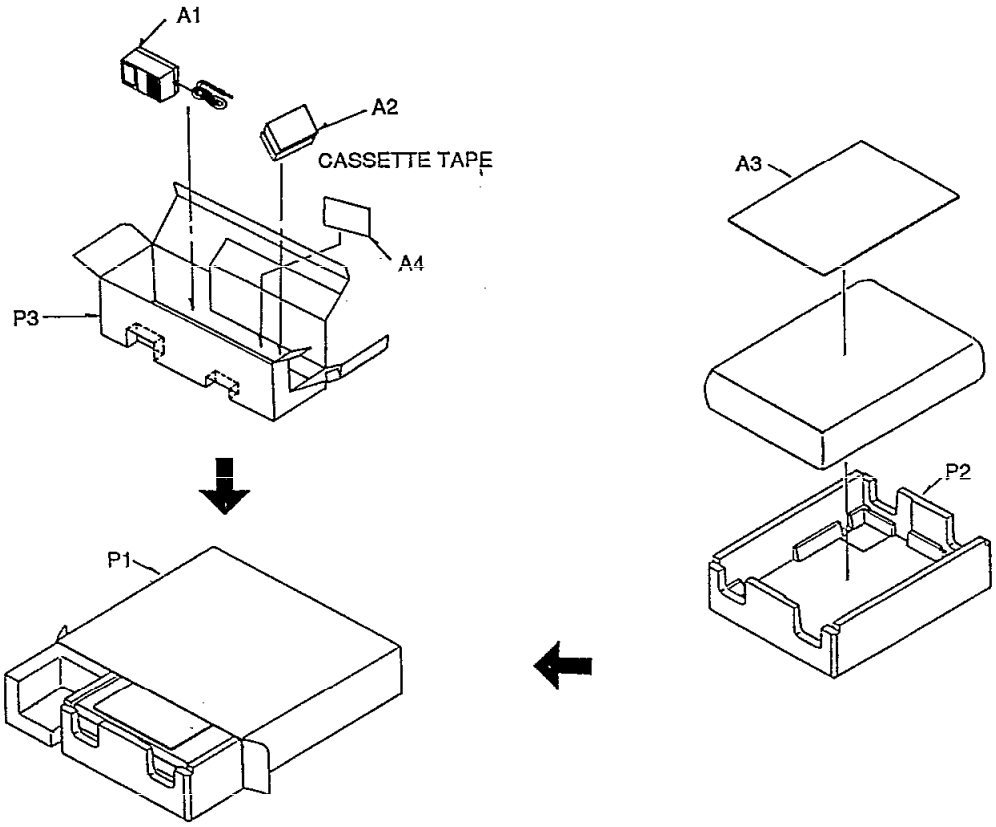


Fig. 6

CONNECTION

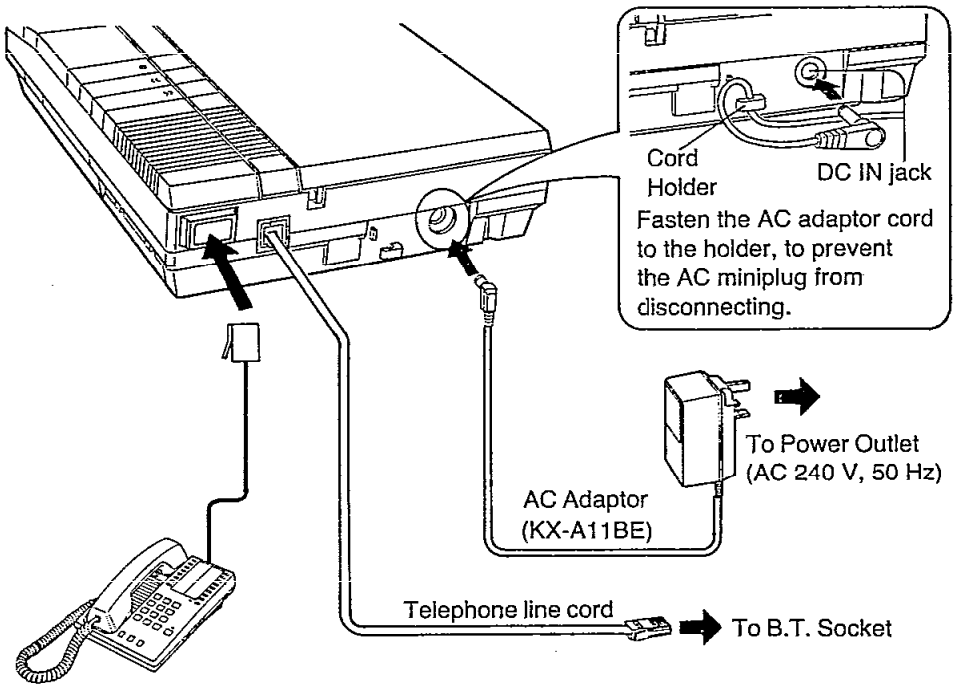


Fig. 7

IC BLOCK DIAGRAM

AN6180NK

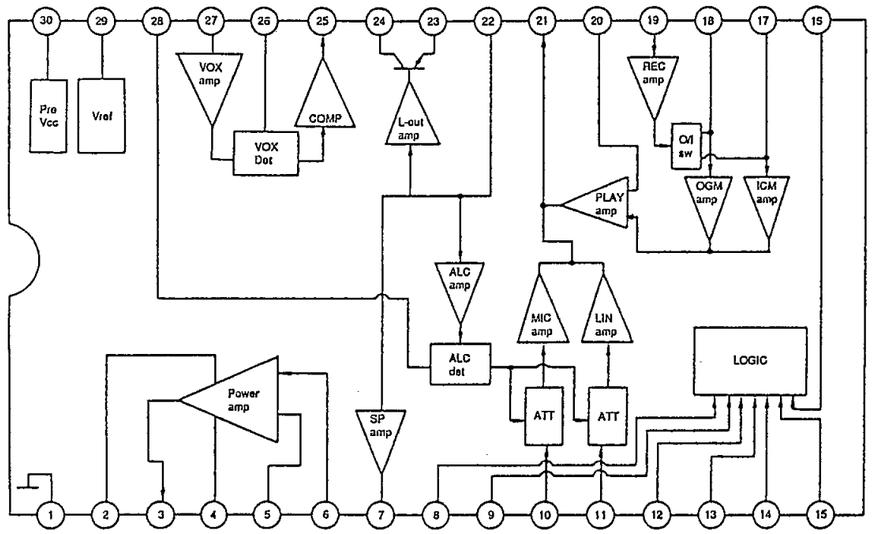
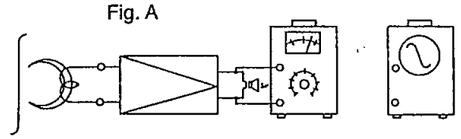
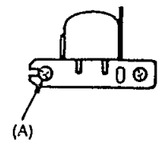


Fig. 8

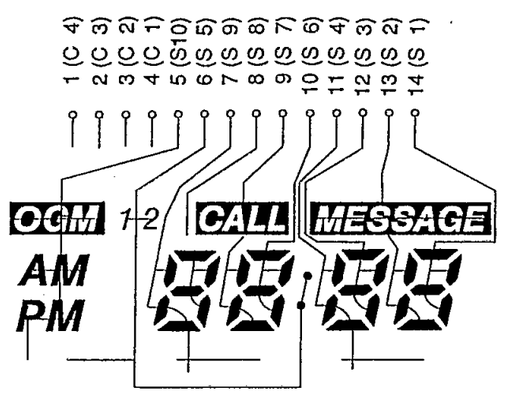
MEASUREMENT AND ADJUSTMENT METHOD

Notes: 1. Make sure the heads are clean.
2. Make sure the capstan and pressure roller are clean.
3. Room temperature for measuring and adjusting: 68±9°F (20±5°C)
4. Test equipments are not treated as replacement parts.

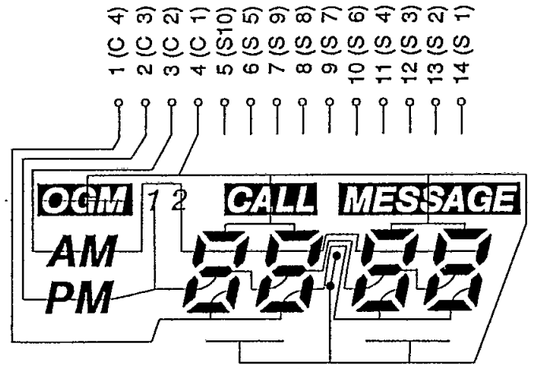
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Head azimuth adjustment	**A. Record/playback head for incoming message cassette** 1. Playback test tape (QZZCWAT 3 kHz) 2. Adjust screw (A) shown in fig. B for maximum output at SP terminal. (Test equipment connection is shown below.) Fig. A  Test tape Playback mode VTVM Oscilloscope **B. Record/Playback head for outgoing message cassette** 1. Playback test tape (PQJN17Z 3 kHz) 2. Adjust screw (A) shown in fig. B for maximum output at SP terminal. (Test equipment connection is shown in fig. A)	· Record/playback head for incoming message and outgoing message.  Fig. B

INTERNAL CIRCUIT OF LCD DISPLAY

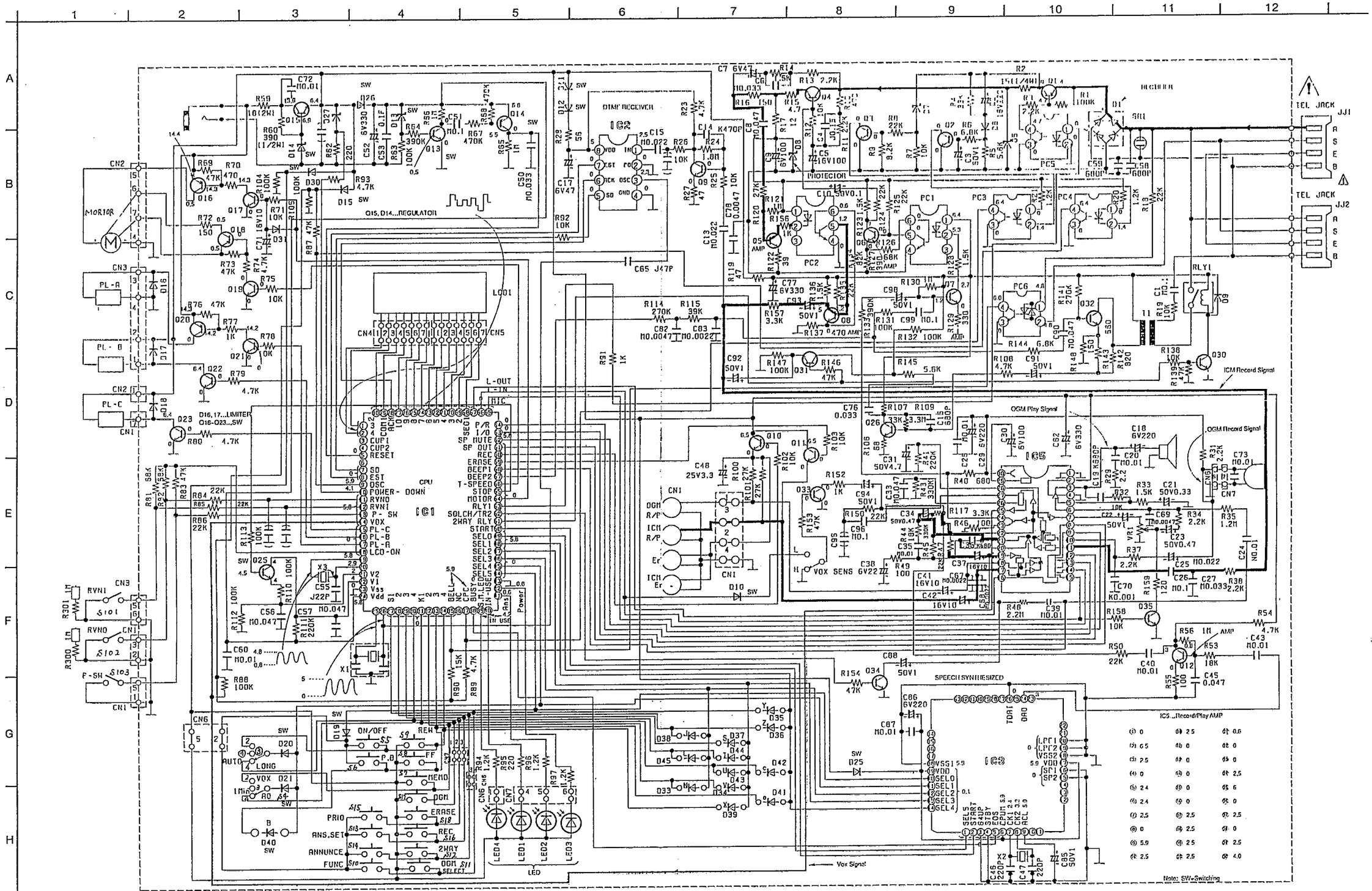
Segment



Common

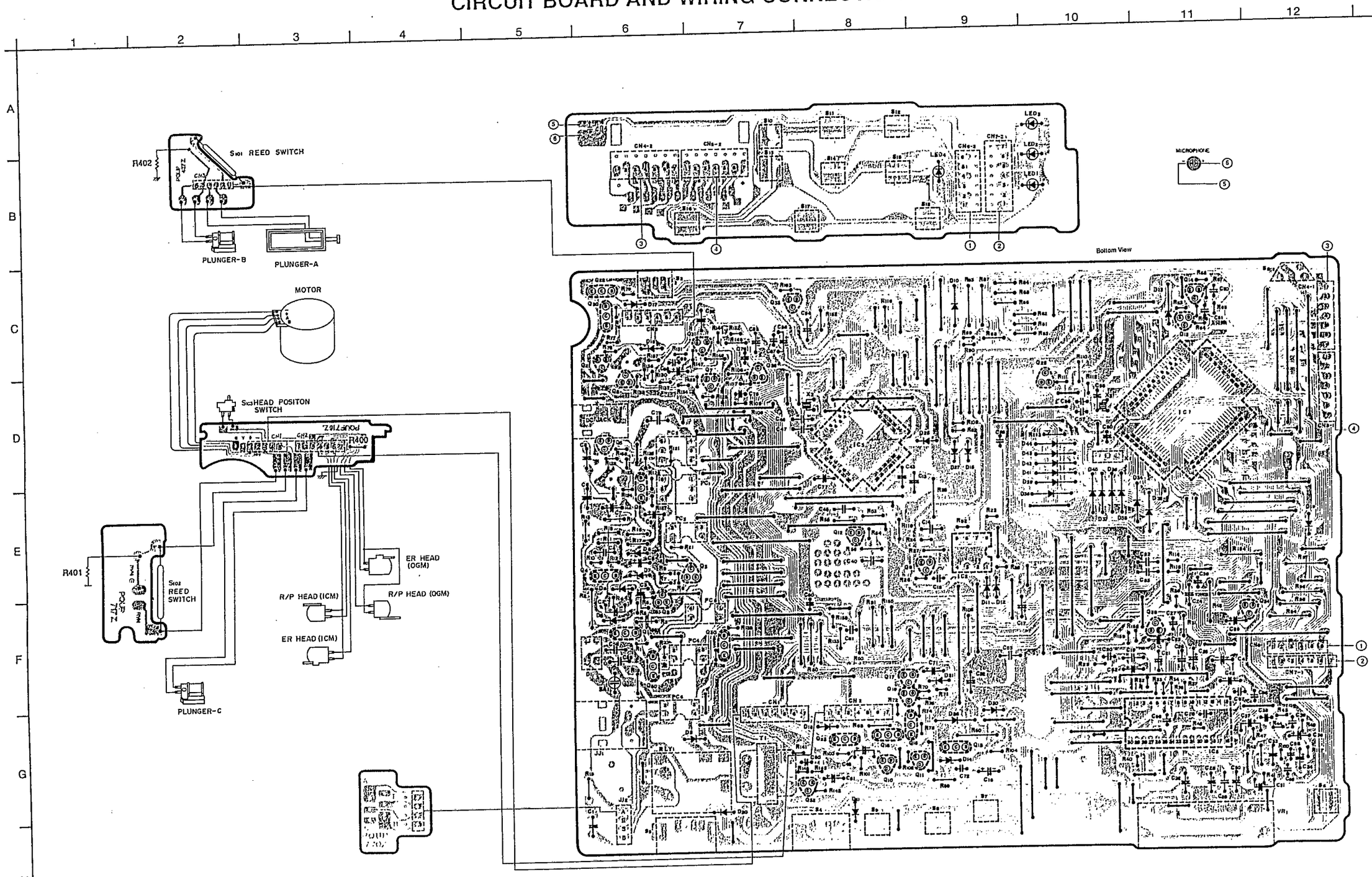


SCHEMATIC DIAGRAM



9 10

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

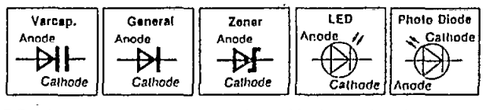


Note:
This circuit board may be modified at any time with the development of new technology.

■ FOR SCHEMATIC DIAGRAM

1. S1 Auxiliary Leads switch.
2. S2 CPC selector switch in "A" position.
3. S3 Ring selector switch in "AUTO" position.
4. S4 Recording time selector switch in "VOX" position.
5. S5 Power ON/OFF switch.
6. S6 Playback/Pause switch.
7. S7 Memo button.
8. S8 Fast Forward button.
9. S9 Rewind button.
10. S10 Function button.
11. S11 OGM select button.
12. S12 2way Rec button.
13. S13 Set button.
14. S14 Announce button.
15. S15 Priority button.
16. S16 OGM recording button.
17. S17 OGM play button.
18. S18 ICM erase button.
19. S101 Reed switch.
    , S102
20. S103 Head position switch.
21. DC voltage measurements are taken with electronic voltmeter from negative line.
22. *This schematic diagram may be modified at any time with the development of new technology.*

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



DC voltage measurements are taken with electronic voltmeter from negative voltage line.
"ANS SET" Standby position.

EXTENSION CABLE CONNECTING METHOD

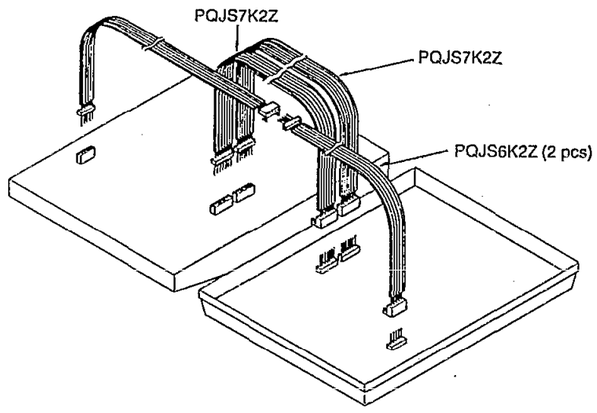


Fig. 11

CIRCUIT OPERATIONS

Note:
The circuit diagram may be modified at any time with the development of new technology.

■ INTERFACE

Circuit Operation:

• OFF-HOOK CONDITION

In the idle mode, pin 53 of IC1 Low is to cuts the DC current and decreases the ring load. When a ring voltage appears at the A and S leads (when the telephone rings), the AC ring voltage is transferred as follows:
A → R18 → PC6 → S to close the telephone line loop and PC6 → pin 35 of IC1 for processing through the unit.
Once the CPU detects the ring signal, thus providing an off-hook condition (active DC current flow through the circuit Q1 PC5 turns on) and the following signal flow is for the voice signal.
A → D1 → Q1 → R2 → Q4 → R12 → C5→ B.

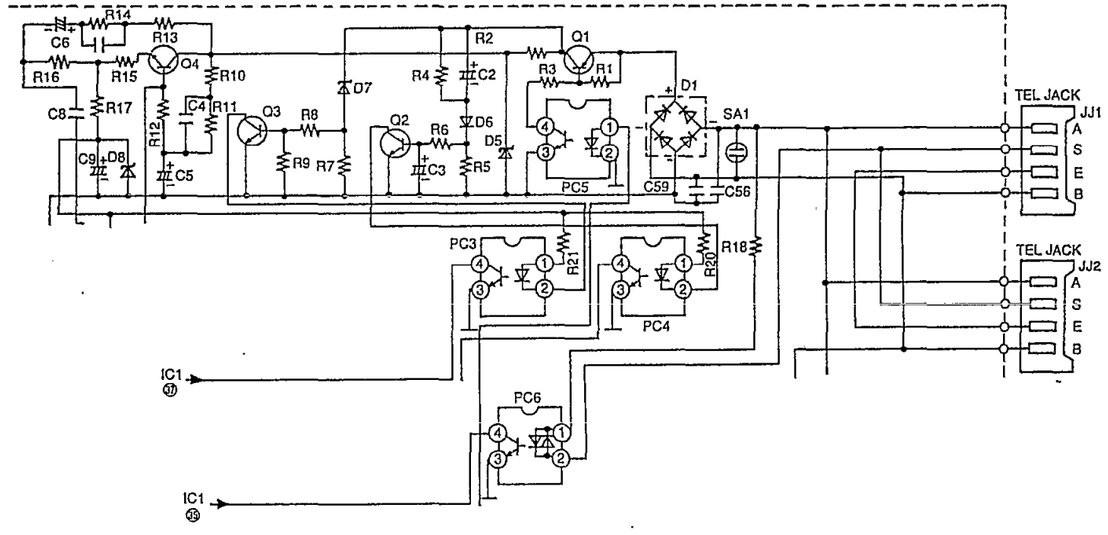
• ON-HOOK CONDITION

When pin 35 of IC1 becomes "L", Q1 and PC5 turns OFF, hence Q1 is connected to cut the DC current and the voice signal.
The unit is consequently is in an on-hook condition.

• SPECIFICATIONS

In the on-hook state (idle), the current flows between the telephone line and the unit is as follows:
A → R18 → PC6 → S.
The AC interface impedance is over 100 kΩ, thus, satisfying telephone company requirements.
SA1 provides surge protection.

Circuit Diagram

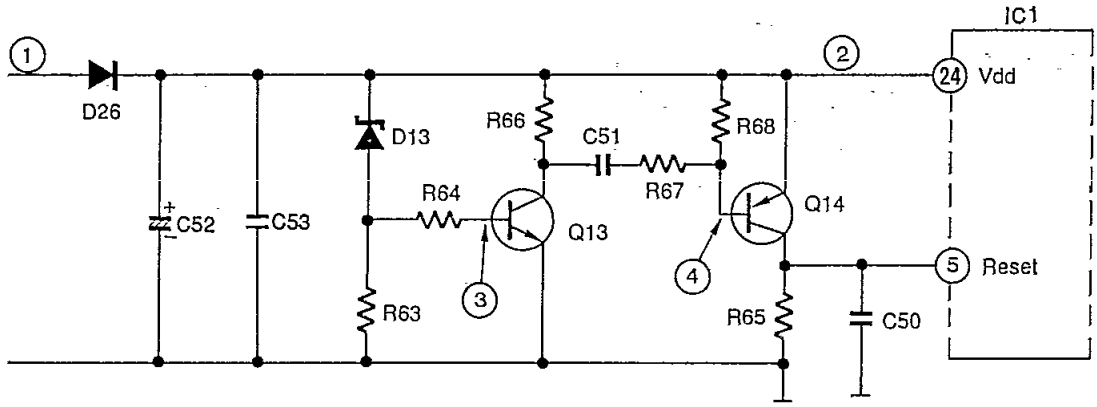


■ INITIALIZING CIRCUIT

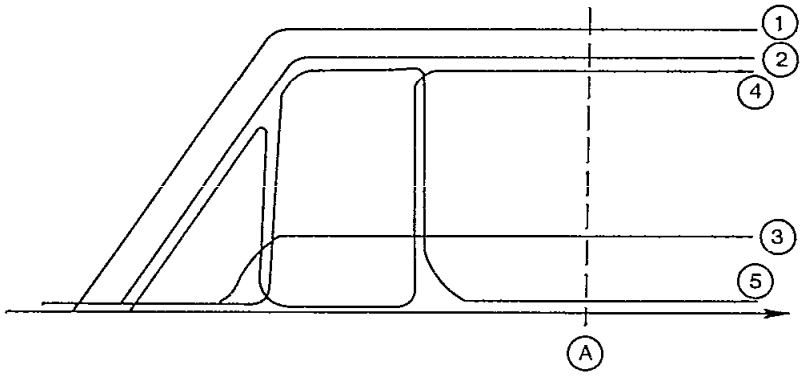
Function:
This circuit is used for to initialize the microcomputer when it incorporates an AC adaptor.

Circuit Operation:
When the AC Adaptor is inserted into the unit, then the voltage is shifted by D26 and power is supplied to the CPU.
The set can operate beyond point Ⓐ in the circuit voltage diagram.

Circuit Diagram



Circuit Voltage



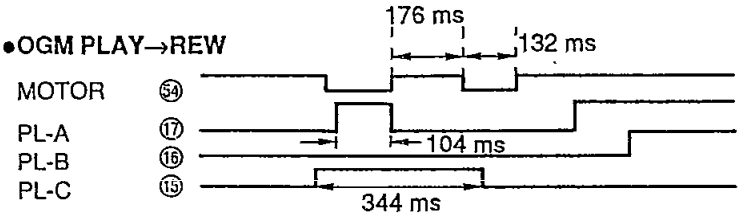
■ TAPE TRANSPORT CONTROL

Circuit Operation:
The timing for the plunger and motor which are used to operate the deck is as shown in the timing chart.

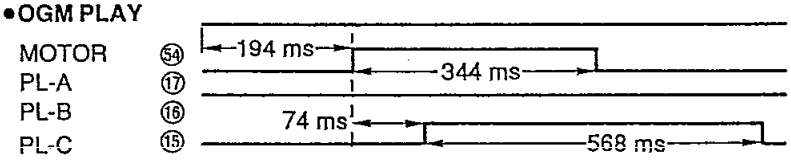
Timing Chart

•OGM REC

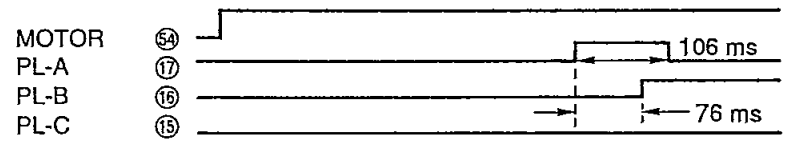
•OGM PLAY→REW



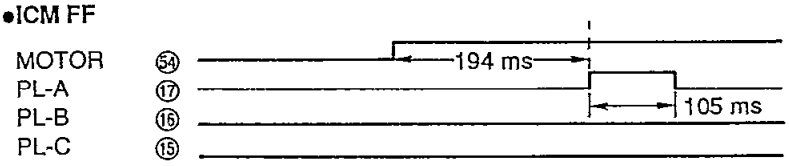
•OGM PLAY



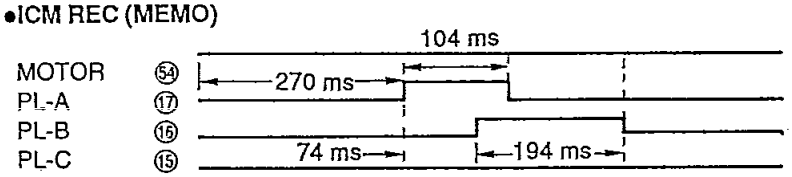
•ICM REW



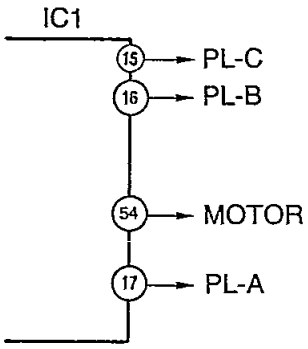
•ICM FF



•ICM REC (MEMO)



Circuit Diagram



■ PLAYBACK CIRCUIT (OGM, ICM MESSAGE)

Circuit Operation:
The playback signal for OGM and ICM MESSAGE is selected by IC5.

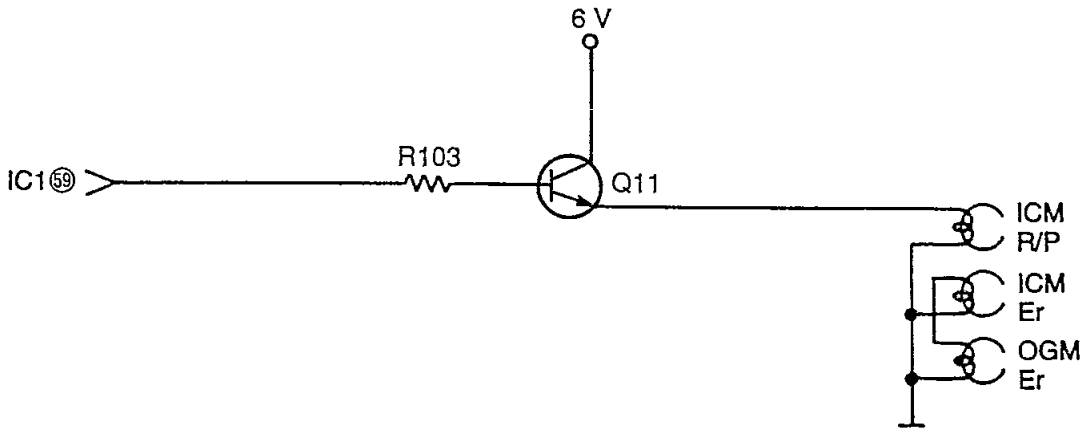
- ICM
  ICM R/P → C42 → pin 17 of IC5 → pin 21 of IC5 → C34 → R117 → pin 22 of IC5 → pin 7 of IC5 → C22 → VR1 → C23 → R34 → pin 6 of IC5 → pin 3 of IC5 → C18 → SPEAKER.
- OGM
  OGM R/P → C41 → pin 18 of IC5

Circuit Diagram .....See page 20

■ QUICK ERASE CIRCUIT

Circuit Operation:
When Q11 is ON, DC current flows to ICM R/P Head.
If the erace switch is turned on, DC current will flow as follows:
Pin 59 of IC1 (High Level) → R103 → base of Q11 (Q11 is ON) → ICM R/P Head

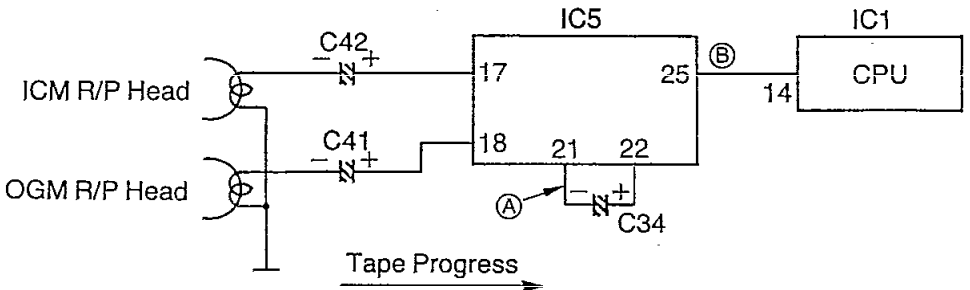
Circuit Diagram



■ END OF OGM DETECTING CIRCUIT

Circuit Operation:
When the Stop Button is pressed upon completion of OGM recording, no sound signals is recorded on the tape.
A no-sound detection system is used during play back. If a no-sound condition exists for 2 seconds, the CPU detects the OGM end by the output of Vox Circuit (Fig. C).

Circuit Diagram



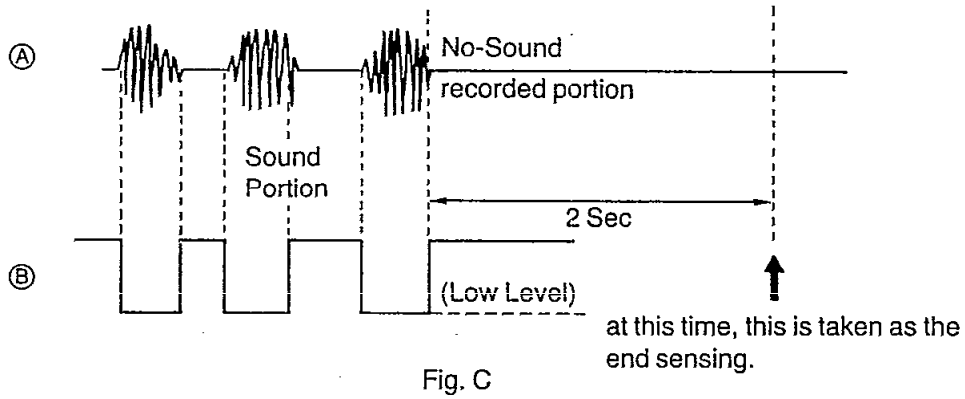


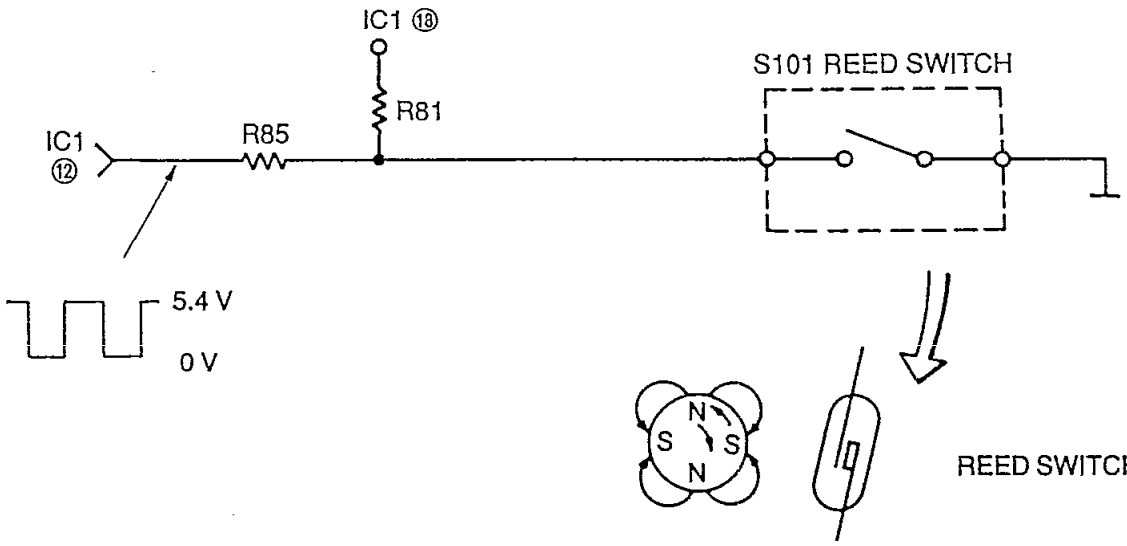
Fig. C

■ ICM TAPE ROTATION DETECTING CIRCUIT

Circuit Operation:
When there are changes in the direction of the magnetic field caused by the rotation of the four-pole ferrite magnet they are detected by the Reed Switch. This output is added to the microcomputer input.

Reed Switch → R85 → pin 12 of IC1

Circuit Diagram



■ RECORDING CIRCUIT (OGM, ICM)

Circuit Operation:
(Recording signals)
Recording signals from the telephone line or MIC are selected by IC5.
The recording signal flows as follows:
Mic → C25, R37 → pin 10 of IC5 → pin 21 of IC5 → C34 → R47 → C37 → pin 19 of IC5 → pin 17 of IC5 → C42 → ICM Head.

Telephone Line → R38 → C26 → pin 11 of IC5 → pin 18 of IC5 → C41 → OGM Head.

(Signal)
The beep tone is generated by IC1.
The beep tone of the ICM recording (from pin 58 of IC1) is processed to the ICM recording head via C39 and R48.

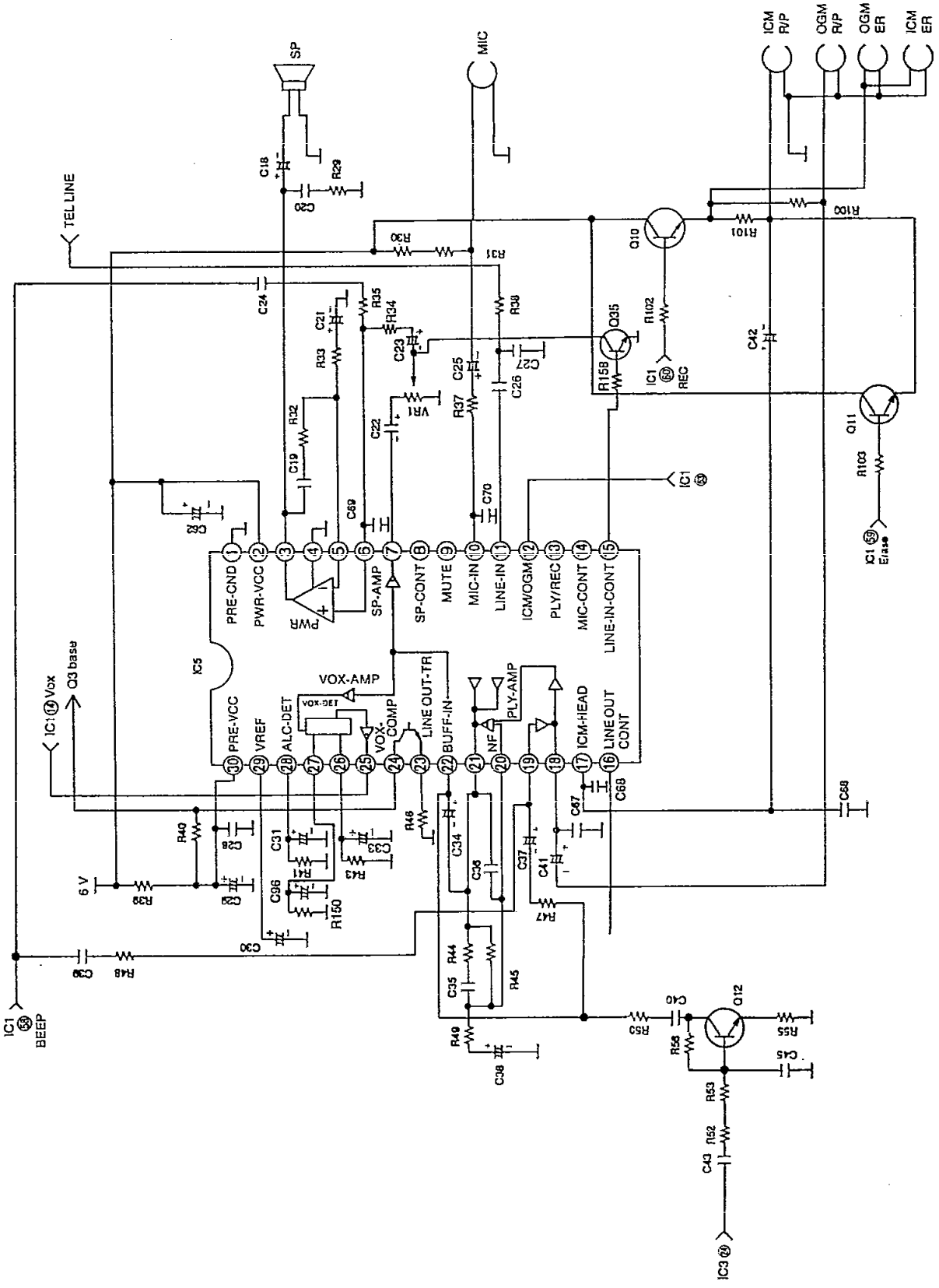
(Erase)
When in the Recording mode, pin 59 of IC1 is High.
The voltage is applied to the Erase Head, thus the Erase Head is activated.
The bias current is applied to the R/P Head via Q10, R100 and R101.
The DC current flows is as follows;
6V DC → Q10 turns ON (High level, pin 60 of IC1) → collector of Q10 → emitter of Q10 → Erase Head.

■ SPEECH SYNTHESIS SIGNAL CIRCUIT

• Audio speaker monitor source:
In the circuit diagram, the audio signal from pin 64 of IC3 takes the following path to the monitoring speaker.
Pin 24 of IC3 → C43 → R53 → Q12 → C40 → R50 → pin 22 of IC5 → pin 7 of IC5 → C22 → VR1 → C23 → R34 → pin 6 of IC5 → pin 3 of IC5 → C18 → Speaker.

• Audio record signal source
Pin 24 of IC3 → C43 → R53 → Q12 → C40 → R50 → R47 → C37 → pin 19 of IC5 → pin 17 of IC5 → C42 → ICM Head.

Circuit Diagram



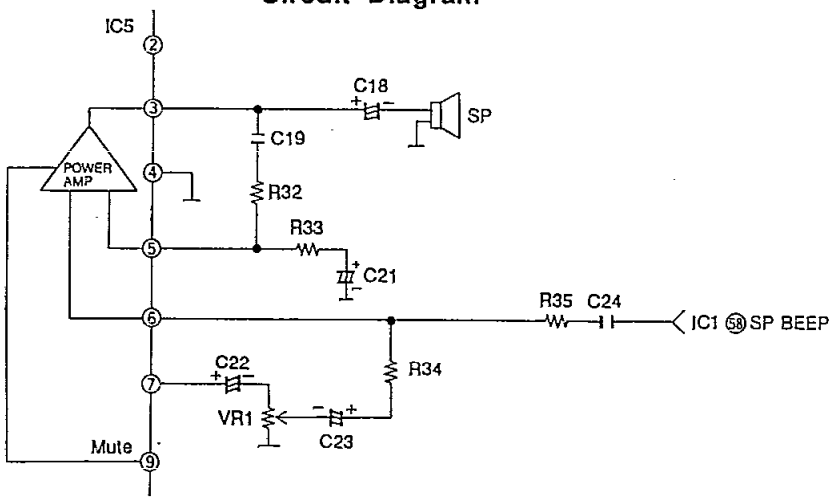
■ MONITOR AND SPEAKER MUTE CIRCUIT

Circuit Operaion:
The monitor signal flows as is as follows:
The Line signal and Head signal are amplified by IC5 in each mode. Then these signals appear at pin 7 of IC5.

Pin 7 of IC5 → C22 → VR1 → C23 → R34 → pin 6 of IC5 → pin 3 of IC5 → C18 → Speaker.

The speaker beep tone path: pin 58 of IC1 → C24 → R35 → IC5 (pin 6~3) → C18 → Speaker.

Circuit Diagram

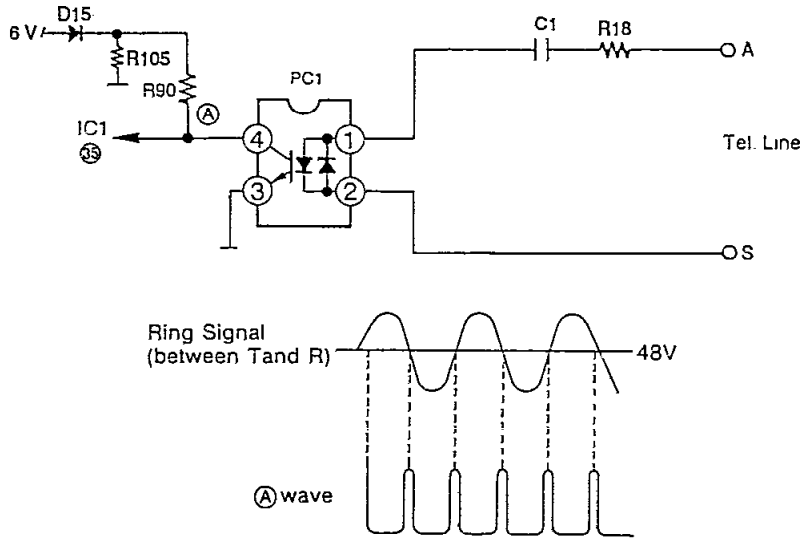


■ RING DETECTOR CIRCUIT

Function:
This circuit activates the CPU to respond to the ring signal from the telephone line during the ANSWER mode operation.

Circuit Operation:
This ring signal flows through A → R18 → pin 1 of PC6 → pin 2 of PC6 → S, hence photocoupler PC6 pin 4~3 will turn ON. As a result, pin 35 of IC1 goes Low, indicating that Ring Signal was inputted.

Circuit Diagram

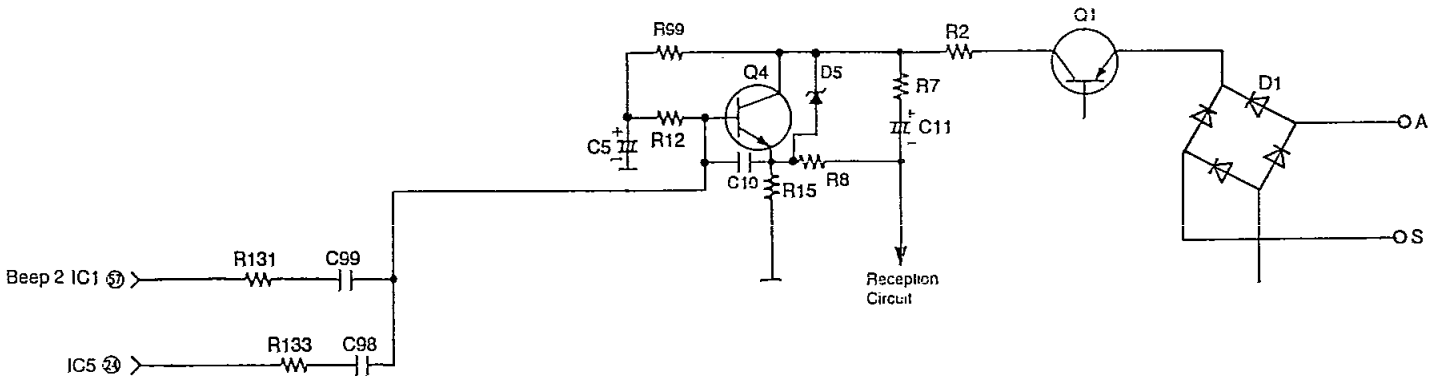


■ LINE OUTPUT CIRCUIT

Each of signals are sent to the telephone line as follows.

- (Beep Tone) → pin 57 of IC1 → R114 → R115 → R131 → C99 → base of Q4 → collector of Q4 → R2 → Q1 → D1 →Telephone Line.
- (Tape Playback Signal) pin 24 of IC5 → R133 → C98 ——┘

Circuit Diagram



■ CPU (CALLING PARTY CONTROL) DETECTOR CIRCUIT

Function:

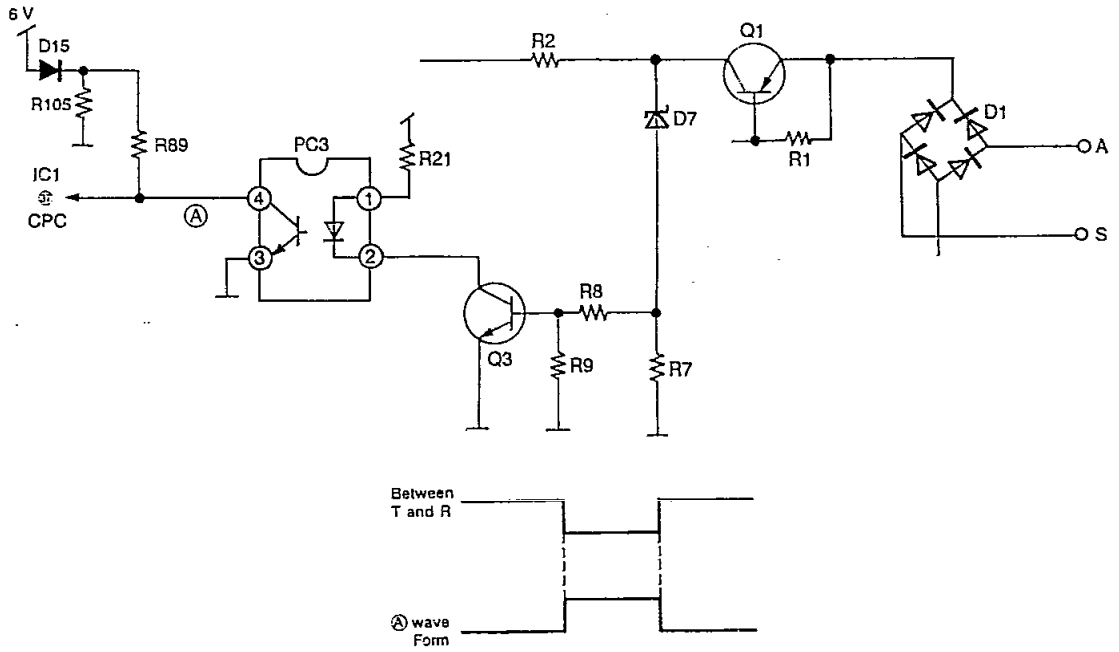
The CPU DETECTOR complements the unit's shut off, in the ANSWER mode, after the caller hangs up. At this time, the CPU DETECTOR takes over.

The CPU DETECTOR senses the temporary disconnection of the telephone line which occurs after the caller hangs up.

Circuit Operation:

When the unit seizes a line, current will flows through D1, R2, Q4 and R12. Then current will flow to the base of Q3 via D7, R8, causing Q3 to turn ON. As a result, pin 37 of IC3 will go LOW. If then the line is momentarily cut, line current will cease to flow, and Q4 will turn OFF. Consequently pin 37 of IC1 will go High, hence this condition will be detected.

Circuit Diagram



■ VOX CIRCUIT

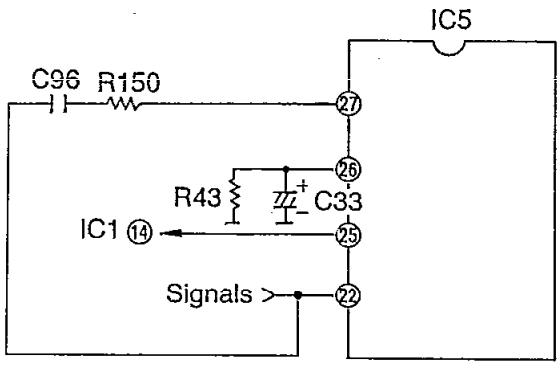
Function:

The VOX circuit is designed to detect cyclic signals in which the signal ON for 100 msec. 1 sec, continuous sounds and no sound at all.
After detection, the CPU issues an instruction that makes VOX operation possible.
This means that when a telephone call has ended, the phone is reset and is ready to receive the next call.

Circuit Operation:

The VOX Signal flow as follows:
Pin 22 of IC5 → pin 25 of IC5 → pin 14 of IC1 (Vox).

Circuit Diagram



■ POWER SUPPLY CIRCUIT

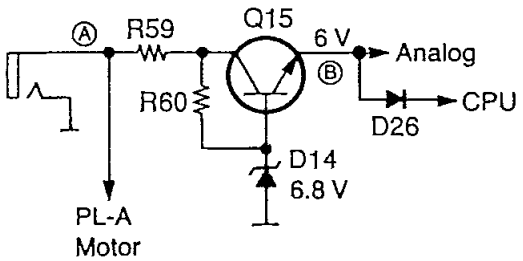
Function:

Power from the AC adaptor passes through the 1- stage regulating block consisting of Q15 and provides system voltages of 6 V.

Circuit Operation:

Power from the AC adaptor is supplied directly to the plunger (Ⓐ). Q15 is the first stage regulated power supply. The voltage at point Ⓑ is regulated to 6V by the 6.8V zener voltage of D14. The 6V voltage is shifted by D26 to 5.4V which is used to power CPU, etc.

Circuit Diagram

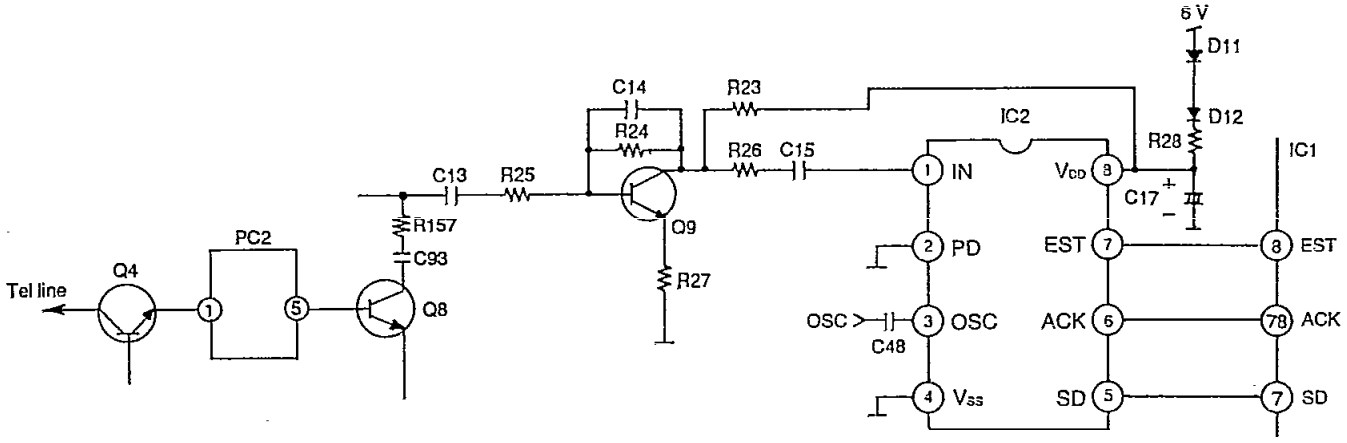


■ REMOTE SIGNAL DETECTOR CIRCUIT

Circuit Operation:

A remote control signal is used with the dual-tone multiple-frequency (DTMF) signal.
The remote signal input from Telephone line, Q4, PC2 passes through Amplifire (Q9, C13, R25), via R26 and C15, and is inputted to pin 1 of IC2.
The DTMF signal is inputted to IC2 which changes the 4 bit serial data and inputs it to pin 7 of IC1.

Circuit Diagram



■ AUTO DISCONNECT CIRCUIT

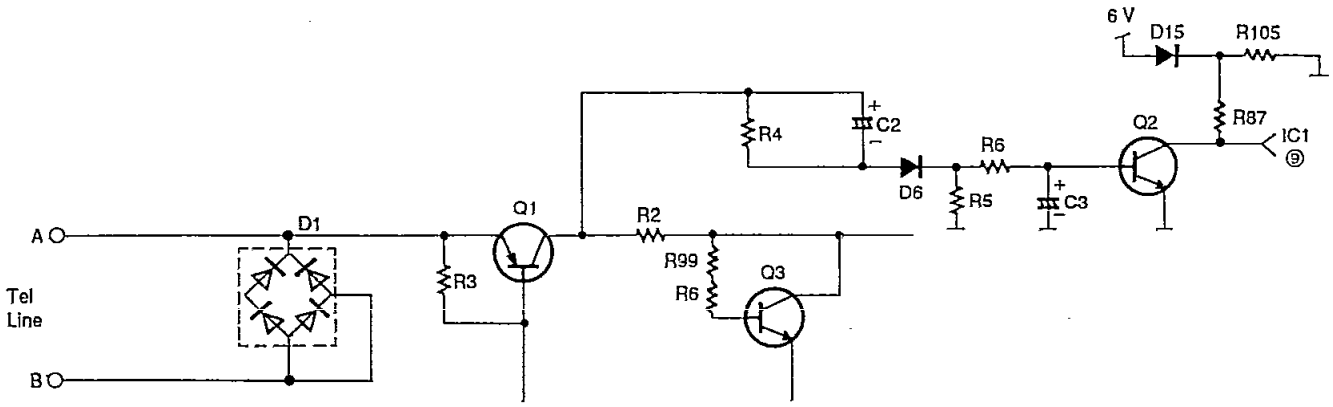
Function:

This circuit is used to detect the fact that another telephone connected to the same line is OFF-HOOK while the unit is in a receiving status or OGM transmitting status.

Circuit Operation:

A → D1 → Q1 → C2 → R6 → Q2. During this interval, C2 charges, and the base of Q2 becomes High, causing Q2 to go ON.
If a parallel-connected telephone goes put into an OFF HOOK status, current ceases to flow to C2, and the base of Q2 becomes Low, causing Q2 to go OFF.
However, the system is designed so that if the voltage fluctuation is small, the charging and discharging of C2 has no effect on the system.
When a line is connected, Q2 goes ON, and PC4 goes ON, causing pin 9 of IC1 to go Low. When the line is disconnected, Q2 goes OFF, causing pin 9 of IC1 to go High.

Circuit Diagram



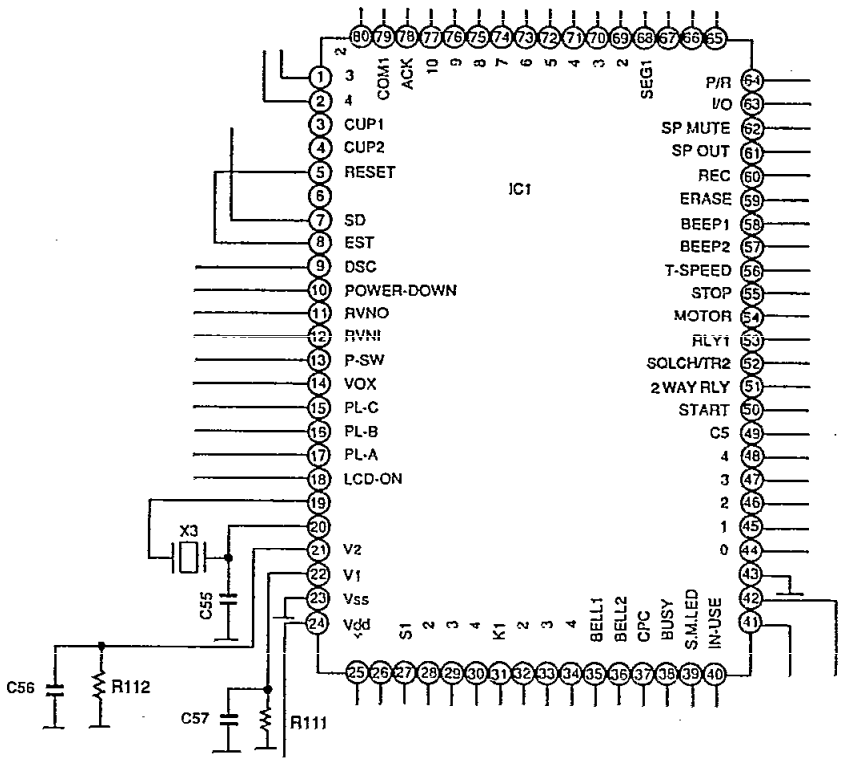
■ DISPLAY CIRCUIT

IC1 drives the LCD.
When the power down is High, the voltage for the LCD indication will be produced through C63, C56 and C57.

Vdd=Vdd V1=2/3 Vdd V2=1/3Vdd

Vdd=5V. The voltage of 5V will be provided to the LCD.
There are clock oscillation consisting of X3 and C55.
When Vdd voltage is more than 2V, clock oscillation stop.

Circuit Diagram



HOW TO REPLACE FLAT PACKAGE IC

■ PREPARATION

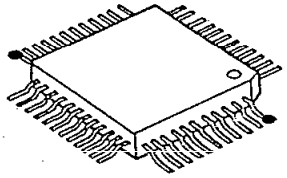
- SOLDER ..... Sparkle Solder 115A-1, 115B-1
  OR
  Almit Solder KR-19, KR-19RMA
- Soldering iron ..... Recomended power consumption will be between 30w to 40w.
  Temperature of Copper Rod 662 ±50° F (350 ±10° C)

  (An expert may handle 60~80w iron, but beginner might damage foil by overheating)
- Flux ..... HI115 Specific gravity 0.863

  (Original flux will be replaced daily.)

■ PROCEDURE

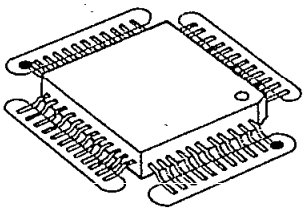
1. Temporary fix FLAT PACKAGE IC by Soldering on marked 2pins.



●.....Temporary soldering point.

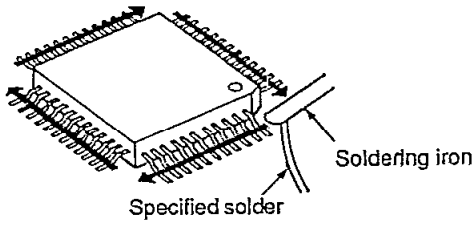
*Most important matter is accurate setting of IC to the corresponding soldering foil.

2. Apply flux for all pins of FLAT PACKAGE IC.



.....Flux

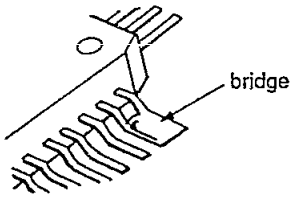
3. Solder employing specified solder to direction arrow, as slide the soldering iron.

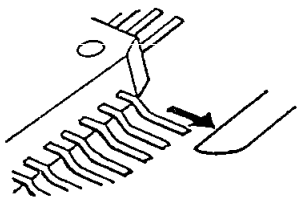


■ MODIFICATION PROCEDURE OF BRIDGE

1. Re-solder slightly on bridging portion.

2. Remove remained solder along pins employing soldering iron as shown in below Figure.





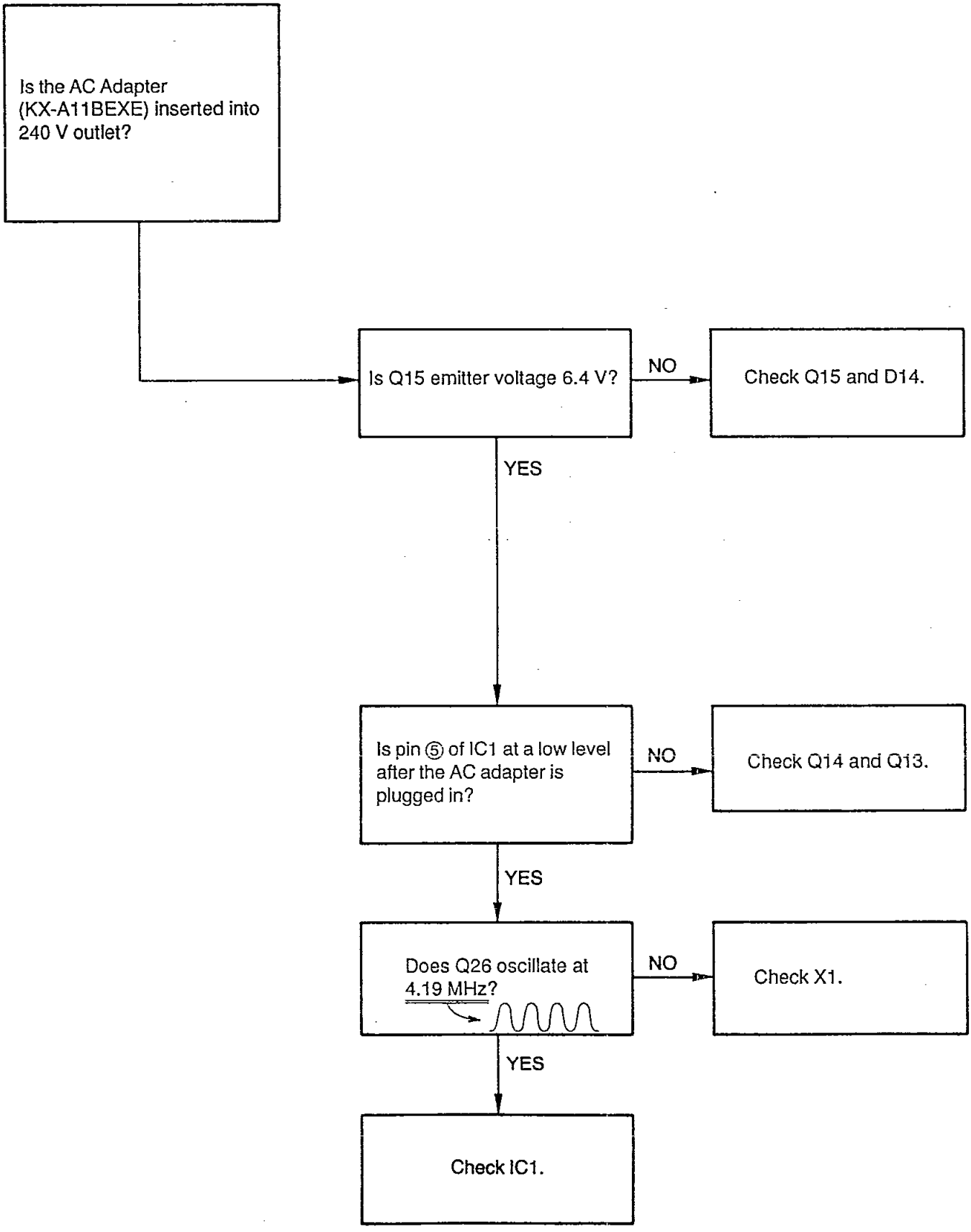
TROUBLE SHOOTING GUIDE

1) SERVICE HINTS

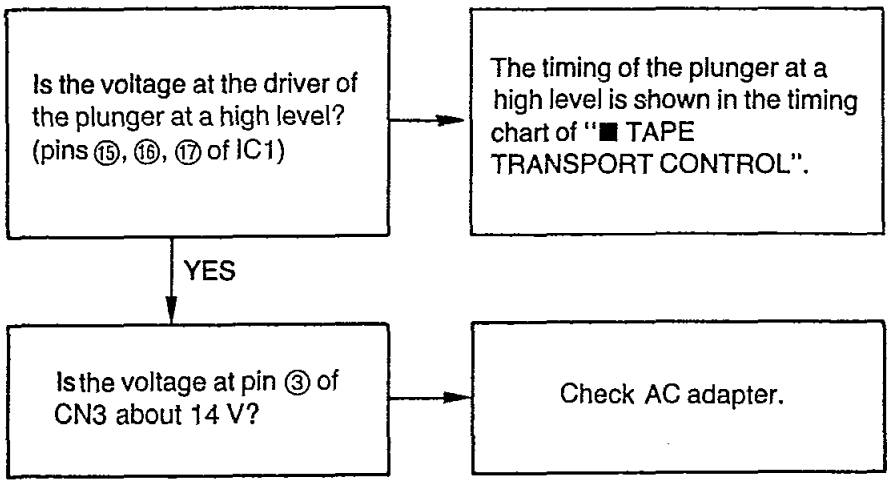
SYMPTOM	CURE
Unit will not respond to remote.	Check IC1, IC2 and Q9.
Will not answer.	Check PC6, R18 and C6.
OGM/ICM has distorted audio.	Check Speaker.
Would not record OGM and OGM stops after 3 second.	Check IC5.
Hangs up when OGM starts.	Check Q2. For bad solder joints.
Dead from factory.	Check Q15, R59, R60 and D14.
Take up Reel M15 does not turn.	M38 needs to be changed.
Will not record OGM at end of message beep.	Check IC1 and IC5.
No function.	Check Q13 and Q14.
Heads stuck out of position on OGM or ICM.	Check Pop M7(Head Assy) back into place.
Motor turns on and off constantly.	Check Q16 and Q17.
OGM clicks on then off.	Check Q20 and Q21 drive transistors.
ICM eats tapes.	Small belt off or is not on lower side of tension pulley.
No power.	Check R59 for open or heat also check D14 causing R60 to heat.
Will not Record or Play incoming message.	Check M1 record Head.
Head stock in OGM position.	Mechanical reposition of M6 Head Base Assembly.
Plunger A is not functioning.	Check Q20 and Q21.
OGM comes on for a second then goes to ICM.	Remove and straighten bent arm M7.
No Erasing on ICM or OGM causing double recording.	Check Q10 and pin 2 of CN1.
OGM will not stay long enough.	Check solder contacts arround IC1 and IC5.
When machine is in message mode to play back the massages, it will not back up and reset to the beginning of the messages. Will not cue and review.	Check D17.

2) FUNCTIONS DO NOT OPERATE.

Note:
Flowing voltage 4.8 V and current 40 mA from the circuit.



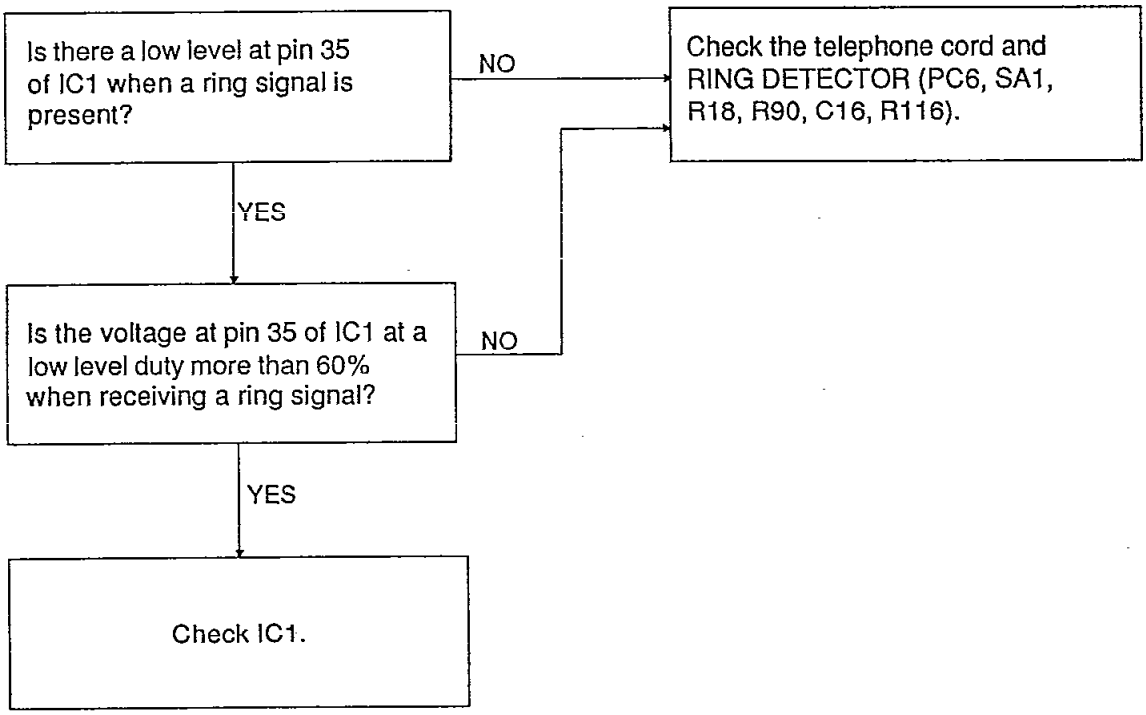
3) THE PULL OF PLUNGER IS POOR OR NONE AT ALL.



4) OGM END MARK DETECT
Check the Vox Circuit.

5) FAST ERASE DOES NOT WORK
Check Q11 and IC1.

6) DOES NOT ANSWER TELEPHONE CALL



7) •ICM CONTINUES TO RECORD AFTER THE CALLER HANGS UP.
•END OF MESSAGE IS CLIPPED WHEN CALLER HANGS UP.

When caller hangs up, the KX-T1476BE can detect the following 4 signal type.

A. CPC pulse.
B. Dial tone or other continuous tones.
C. Silence.
D. Cycle signals.

A. Check CPC DETECTOR CIRCUIT (Q4, R9, R90, Q4, IC1).
B., C, D.
Check VOX DETECTOR CIRCUIT (pin 25 of IC5, pin 14 of IC1, R43, C33, R42, C32).

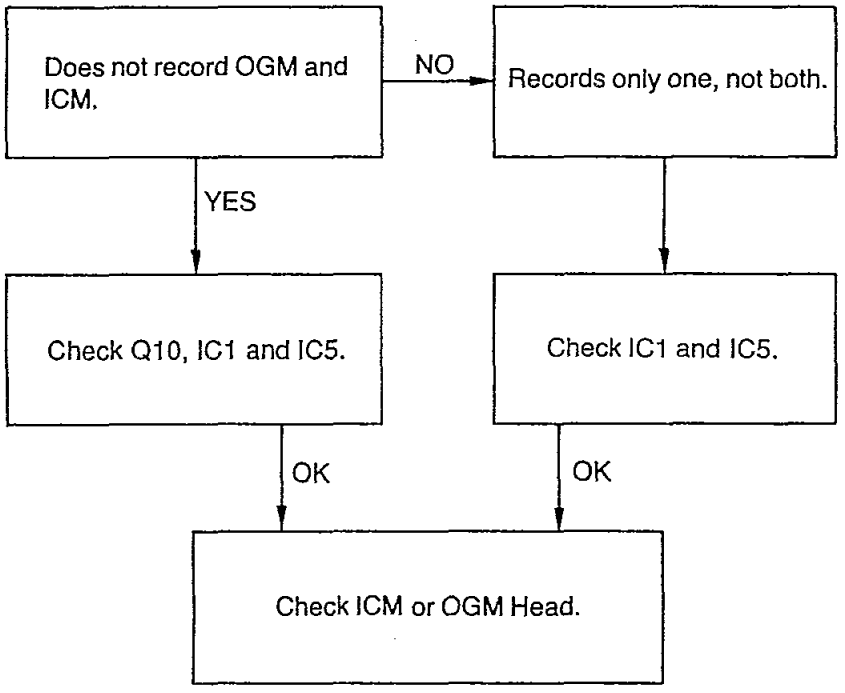
8) REMOTE CONTROLLER DOES NOT WORK OR RESPONSE IS POOR.
The following are considered to be causes for no remote reception:

A. The security code may not be the same as set on the unit.
B. High distortion in LINE OUTPUT CIRCUIT causing interference between the transmitting signal and the remote signal.
C. Excessive loss in telephone line.

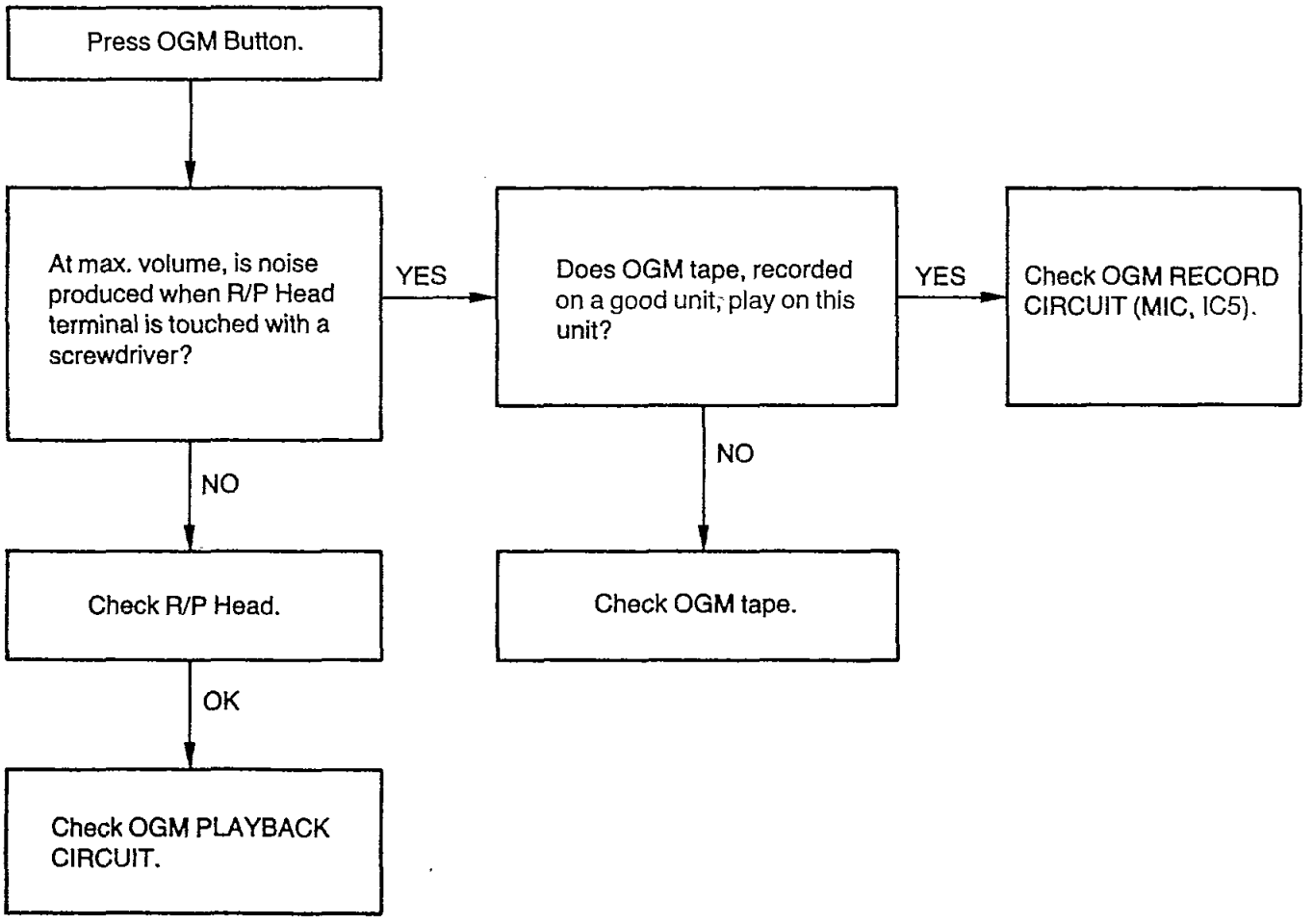
A. Check the security code of the unit.
B. Check LINE OUTPUT CIRCUIT (Q3).
C. Test on a telephone line known to be working properly.

If all of the above check N.G., check the remote signal detect circuit (IC1, IC2).

9) DOES NOT RECORD



10) LOW OR NO OGM PLAYBACK



MECHANICAL PARTS LOCATION

Ref. No.	Part No.
Ⓐ	XSN26+W4FS
Ⓑ	XTN2+10W
Ⓒ	XTN2+6W
Ⓓ	XTN2+8J
Ⓔ	XTW26+5LF
Ⓕ	XSB2+6FU
Ⓖ	XTW26+8F
Ⓗ	XTW3+S10M
Ⓘ	XTW26+6F

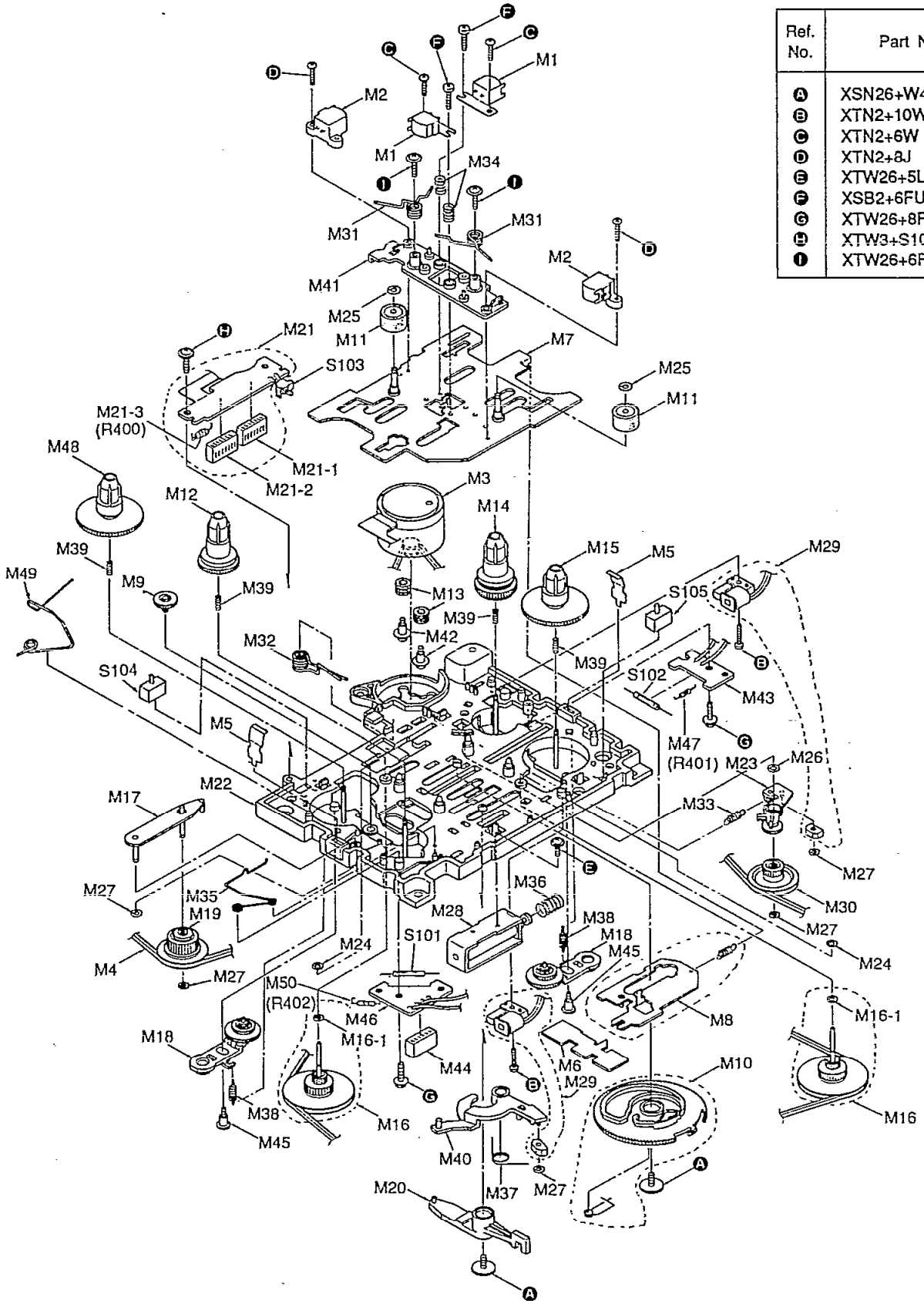


Fig. 10

Specifications

Playback torque	35~60 g • cm
Fast forward torque	85~180 g • cm
Rewind torque	85~180 g • cm

CABINET AND ELECTRICAL PARTS LOCATION

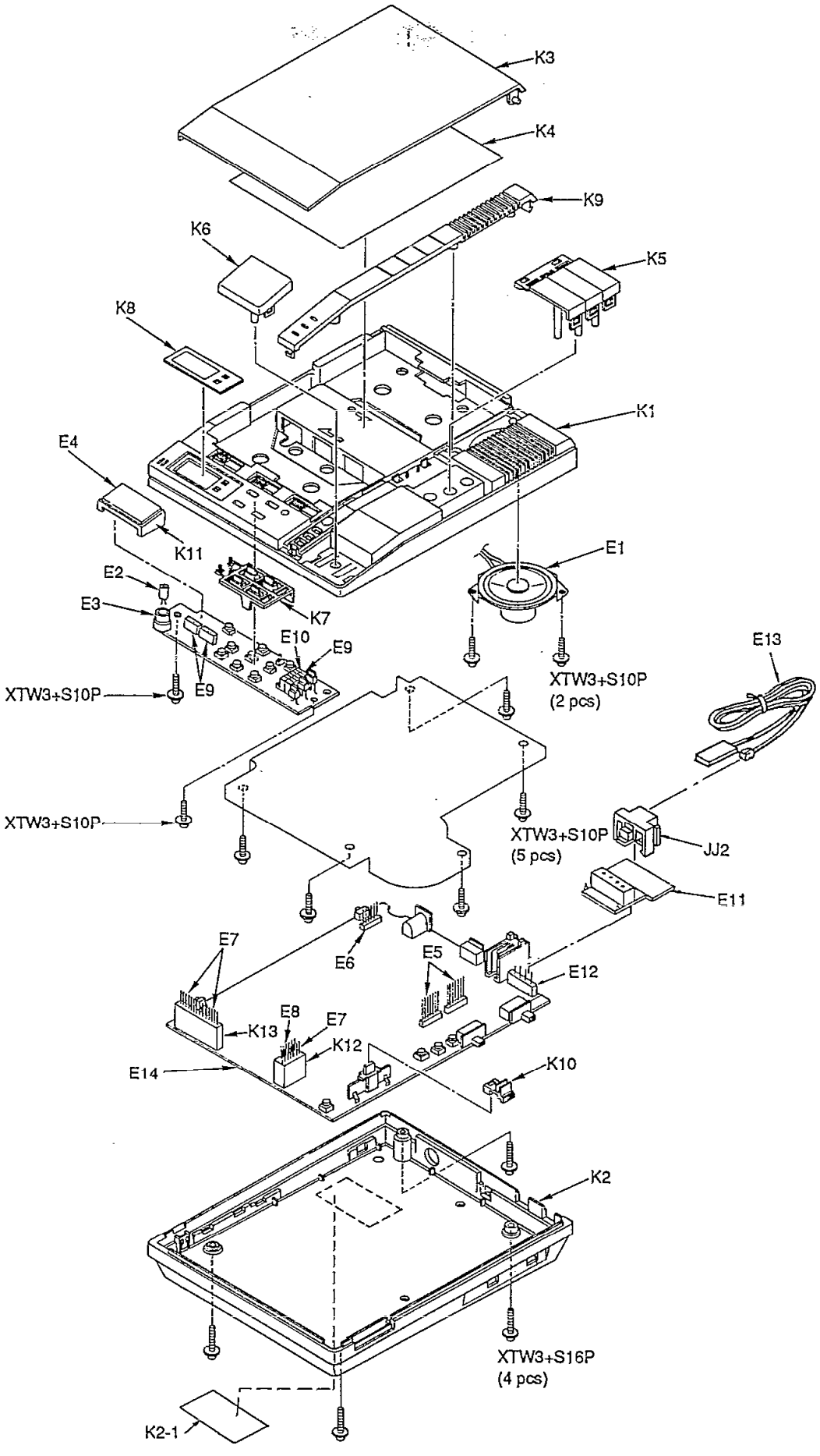


Fig. 13

REPLACEMENT PARTS LIST

Model KX-T1476BE

Notes:

1. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
2. Important safety notice.
   Components identified by the ⚠ mark special characteristics important for safety. when replacing any of these components, use only manufacture's specified parts.
3. The S mark indicates service standard parts and may differ from production parts.
4. RESISTORS & CAPACITORS
   Unless otherwise specified.
   All resistors are in ohms(Ω) k=1000Ω,M=1000kΩ
   All capacitors are in MICRO FARADS(μF) P=μμF
   *Type &Wattage of Resistor
   Type

ERC:Solid	ERX:Metal Film	PQ4R:Carbon
ERD:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
PQRD:Carbon	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor
Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,PQCBC : Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG : Polyster
PQCUV:Chip	ECEA,ECSZ : Electrolytic
ECQMS:Mica	ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V	05: 50V	0F:3.15V	0J :6.3V	1V :35V
2A:100V	1:100V	1A:10V	1A :10V	50,1H:50V
2E:250V	2:200V	1V:35V	1C :16V	1J :63V
2H:500V		0J:6.3V	1E,25:25V	2A :100V

Ref. No.	Part No.	Part Name & Description	Pcs
		MECHANICAL PARTS	
M01	PQJH1E6Z	MAGNETIC HEAD	2
M02	PQJH6E4Z	MAGNETIC HEAD	2
M03	PQFM10001Z	DC MOTOR	1
M04	PQFB18Z	ANGULAR BELT	1
M05	PQFD77Z	SPRING	2
M06	PQFD85Z	METAL PARTS	1
M07	PQFZ10002Z	CHASSIS	1
M08	PQFD9915Z	METAL PARTS	1
M09	PQFG55Z	GEAR	1
M10	PQFG9906Y	GEAR	1
M11	PQFI1007Z	ROLLER	2
M12	PQFR9915Z	REEL TABLE	1
M13	PQFI4Z	RUBBER PARTS	2
M14	PQFR9916Z	REEL TABLE	1
M15	PQFR9917Z	REEL TABLE	2
M16	PQFF9910Z	WHEEL	2
M16-1	PQFN12Z	WASHER	3
M17	PQFD9908Y	LEVER	1
M18	PQFR9918Y	ARM	2
M19	PQFQ9904Y	PULLEY	1
M20	PQFY9906Z	LEVER	1
M21	PQFZ9912Z	PRINTED CIRCUIT BOARD	1
M21-2	PQJS7B30Z	CONNECTOR	2
M21-3	PQRDS2TJ563	CARBON FILM RESISTOR	1
M22	PQFC9911Z	CHASSIS	1
M23	PQFR9919Y	ARM	1
M23	PQFR9919Y	ARM	1
M24	PQFN16Z	WASHER	2
M25	PQFN51Z	WASHER	2
M27	PQFN7Z	WASHER	5
M28	PQFP119Z	PLUNGER	1
M29	PQFP121Z	PLUNGER	2
M30	PQFQ32Z	PULLEY	1
M31	PQFS115Z	SPRING	2
M32	PQFS117Y	SPRING	1
M33	PQFS118Y	SPRING	1
M34	PQFS119Z	SPRING	2
M35	PQFS121Z	SPRING	1
M36	PQFS140Z	SPRING	1
M37	PQFS87Z	SPRING	1
M38	PQFS88Y	SPRING	2
M39	PQFS90Z	SPRING	4
M40	PQFW49Z	LEVER	1
M41	PQFW10001Z	PLASTIC PARTS	1
M42	PQHD4Z	SCREW	2
M43	PQUP963Z	PRINTED CIRCUIT BOARD	1
M44	PQJS6B30Z	CONNECTOR	1
M45	PQHD18Z	SCREW	2
M46	PQUP962Z	PRINTED CIRCUIT BOARD	1
M47	PQRD250TJ105	CARBON FILM RESISTOR	2
M48	PQFR9920Z	REEL TABLE	1
M49	PQFS126Z	SPRING	1
		INTEGRATED CIRCUITS, TRANSISTORS & DIODES	
IC1	PQVI8641507	IC	1
IC2	PQVIMT3074AE	IC	1
IC3	PQVIT8802B25	IC	1
IC5	AN6181NK	IC	1
Q1	2SA1627	TRANSISTOR(SI)	1
Q2,3,5,7 ,8~13,17 ,19,21,25, ,26,31~35	2SD1819A	TRANSISTOR(SI)	20
Q4	PQVTKSD261CY	TRANSISTOR(SI)	1
Q6,22,23 ,30	2SC3330	TRANSISTOR(SI)	4
Q14	2SB1216A	TRANSISTOR(SI)	1
Q15	2SD2136	TRANSISTOR(SI)	1
Q16,20	2SB1322	TRANSISTOR(SI)	2
Q18	2SA933	TRANSISTOR(SI)	1
D1	PQVDS1YB40F1	DIODE(SI)	1
D5	MA4180	DIODE(SI)	1
D6,11,12 ,15,19,21 ,25,30,31	MA165	DIODE(SI)	9
D7	MA4036	DIODE(SI)	1
D8	MA4039	DIODE(SI)	1
D9,16~18	1SS119	DIODE(SI)	4
D10,44	1S1588	DIODE(SI)	2
D13	MA4051	DIODE(SI)	1
D14	PQVDMTZ6R8	DIODE(SI)	1
D20	RLS71	DIODE(SI)	1
D26	1S2076	DIODE(SI)	1
D27	PQVDHZS2B1	DIODE(SI)	1
LED1	PQVDSLZ251B7	LED	1
LED2	PQVDSLZ151B5	LED	1
LED3	PQVDSLZ151B5	LED	1
LED4	PQVDSLZ190B1	LED	1
		SWITCHES	
S2	PQSS2A16Y	Switch, CPC	1
S3, 4	PQSS3A17Z	Switch, Rings, REC Time	2
S5	EVQ-QSH04K	Switch, ON/OFF	1
S6~18	EVQ12405K	Switch, MEMO, FF, REW , Playback/Pause, OGM Select etc.	13
S101, 102	PQSE17Y	Switch, Reed (for Deck)	2
S103	PQSH1A17Z	Switch, Head Position (for Deck)	1
		JACKS	
JJ1	PQJJ1TB13Z	Jack, Telephone	1
JJ2	PQJJ1J5Z	Jack,BT TEL	1
JJ3	PQJJ1B4Y	Jack, DC IN	1

Ref. No.	Part No.	Part Name & Description		Pcs
		OTHERS		
PC1,2	PQVITLP631A	Photo Electric Transducer	S	2 ⚠
PC3,4	PQVIPC871K	Photo Electric Transducer	S	2 ⚠
PC5	PQVIPC851K	Photo Electric Transducer	S	1 ⚠
PC6	PQVIPC814K	Photo Electric Transducer	S	1 ⚠
T1	PQLT3E2A	Trasformer		1 ⚠
SA1	PQVDSAE310F1	Varistor	S	1
VR1	PQVAL204A14A	Variable Resistor	S	1
RLY1	PQSL115Z	Relay		1
X1	PQVBT4.19G1	Ceramic Filter		1
X2	PQVBT7.68T1	Ceramic Filter		1
X3	PQVCL3276N6Z	Crystal Oscillator		1
		CABINET PARTS		
K 1	PQKM170R92	Upper Cabinet Assembly		1
K 2	PQYF1039P0	Lower Cabinet Assembly		1
K 2-1	PQGT1289Z	Name Plate		1 ⚠
K 3	PQGP100X	Cassette Lid		1
K 4	PQQT5169Z	Indication Label		1
K 5	PQBCX130Z2	Button, MEMO, REW, FF		1
K 6	PQBC239Z1	Button, Playback/Pause		1
K 7	PQBCX131Z2	Button, Set, Function, Announce , Priority, OGM Select, 2Way REC		1
K 8	PQHR5210X	LCD Cover		1
K 9	PQGG81Z1	Grille		1
K10	PQBD139Z	Knob		1
K11	PQHR9321Z	LCD Holder		1
K12	PQHR9322Z	Spacer, Connector (for CN6-1,7-1)		1
K13	PQHR9323Z	Spacer, Connector (for CN4-1,5-1)		1
		ELECTRICAL PARTS		
E1	PQAS5P05Z	SPEAKER		1
E2	PQJM120Z	BUILTIN-MICROPHONE		1
E3	PQHG503Z	RUBBER PARTS		1
E4	PQADB9434AZ	Liquid Crystal Display		1
E5	PQJP7D80Z	Connector (7 pin) [CN1, CN2]		2
E6	PQJP6D14Z	Connector (6 pin) [CN3]		1
E7	PQJP7D86Z	Connector (7 pin) [CN4-1,5-1,7-1]		3
E8	PQJP6D86Z	Connector (6 pin) [CN6-1]		1
E9	PQJS7X41Z	Connector Socket [CN4-2,5-2,7-2]		3
E10	PQJS6X41Z	Connector Socket [CN6-2]		1
E11	PQUP770Z	PRINTED CIRCUIT BOARD		1
E12	PQJP4D99Z	Connector (4 pin) (JJ2)		1
E13	PQJA87T	Telephone Cord		1 ⚠
E14	PQWP1476BEXE	PRINTED CIRCUIT BOARD		1
		ACCESSORIES		
A1	KX-A11BEXE	AC Acaptor		1 ⚠
A2	PQJN1P15AV	Cassette Tape		1
A3	PQQX6368Z	Instruction Book		1 ⚠
A4	PQQX9773Z	Dial Card		1
		PACKING MATERIALS		
P1	PQPK1516Z	Gift Box		1
P2	PQPN977X	Cushion		1
P3	PQPN1279Z	Accessory Box		1

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
		RESISTORS			
R1	PQ4R10XJ104	100K	R11	ERDS2TJ222	2.2K
R2	ERDS1TJ150	15	R12	PQ4R10XJ103	10K
R3	ERDS2TJ222	2.2K	R13	ERDS2TJ222	2.2K
R4	PQ4R10XJ333	33K	R14	ERDS2TJ152	1.5K
R5	PQ4R10XJ562	5.6K	R15	ERDS2TJ4R7	4.7
R6	PQ4R10XJ682	6.8K	R16	ERDS2TJ151	150
R7	PQ4R10XJ103	10K	R17	ERDS2TJ120	12
R8	PQ4R10XJ223	22K	R18	PQRD12VJ223	22K
R9	PQ4R10XJ822	8.2K	R19	PQRD12VJ103	10K
R10	PQ4R10XJ471	470	R20	PQ4R10XJ122	1.2K

Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
R21	PQ4R10XJ122	1.2K	R97	ERD25TJ122	1.2K
R22	Net Uset		R98	Net Uset	
R23	PQ4R10XJ472	4.7K	R99	Net Uset	
R24	PQ4R10XJ185	1.8M	R100	PQ4R10XJ273	27K
R25	ERD25TJ103	10K	R101	PQ4R10XJ273	27K
R26	PQ4R10XJ103	10K	R102	PQ4R10XJ103	10K
R27	ERDS2TJ470	47	R103	ERD25TJ103	10K
R28	PQ4R10XJ560	56	R104	PQ4R10XJ104	100K
R29	PQ4R10XJ2R2	2.2	R105	PQ4R10XJ104	100K
R30	Net Uset		R106	ERDS2TJ680	68
R31	ERDS2TJ222	2.2K	R107	PQ4R10XJ333	33K
R32	PQ4R10XJ103	10K	R108	PQ4R10XJ472	4.7K
R33	PQ4R10XJ152	1.5K	R109	PQ4R10XJ335	3.3M
R34	PQ4R10XJ222	2.2K	R110	ERDS2TJ104	100K
R35	PQ4R10XJ125	1.2M	R111	PQ4R10XJ224	220K
R36	Net Uset		R112	PQ4R10XJ104	100K
R37	PQ4R10XJ222	2.2K	R113	ERDS2TJ104	100K
R38	PQ4R10XJ222	2.2K	R114	PQ4R10XJ154	150K
R39	Net Uset		R115	PQ4R10XJ393	39K
R40	PQ4R10XJ681	68	R116	Net Uset	
R41	PQ4R10XJ224	220K	R117	PQ4R10XJ332	3.3K
R42	Net Uset		R118	Net Uset	
R43	ERDS2TJ334	330K	R119	ERDS2TJ470	47
R44	PQ4R10XJ183	18K	R120	PQ4R10XJ273	27K
R45	PQ4R10XJ334	330K	R121	PQ4R10XJ105	1M
R46	PQ4R10XJ101	100	R122	PQ4R10XJ390	39
R47	PQ4R10XJ223	22K	R123	PQ4R10XJ152	1.5K
R48	ERD25TJ225	2.2M	R124	PQ4R10XJ223	22K
R49	PQ4R10XJ101	100	R125	PQ4R10XJ223	22K
R50	ERD25TJ223	22K	R126	PQ4R10XJ683	68K
R51	Net Uset		R127	PQ4R10XJ391	390
R52	Net Uset		R128	PQ4R10XJ152	1.5K
R53	ERDS2TJ183	18K	R129	PQ4R10XJ331	330
R54	PQ4R10XJ472	4.7K	R130	PQ4R10XJ105	1M
R55	ERDS2TJ101	100	R131	PQ4R10XJ224	220K
R56	ERDS2TJ105	1M	R132	PQ4R10XJ104	100K
R57	Net Uset		R133	ERDS2TJ474	470K
R58	Net Uset		R134	PQ4R10XJ823	82K
R59	PQRQM2VJ180	18	R135	PQ4R10XJ223	22K
R60	ERDS1TJ391	390	R136	PQ4R10XJ152	1.5K
R61	Net Uset		R137	PQ4R10XJ471	470
R62	PQ4R10XJ221	220	R138	PQ4R10XJ103	10K
R63	PQ4R10XJ104	100K	R139	PQ4R10XJ473	47K
R64	PQ4R10XJ394	390K	R140	Net Uset	
R65	PQ4R10XJ105	1M	R141	PQ4R10XJ274	270K
R66	PQ4R10XJ105	1M	R142	PQ4R10XJ821	820
R67	PQ4R10XJ474	470K	R143	PQ4R10XJ561	560
R68	PQ4R10XJ474	470K	R144	PQ4R10XJ682	6.8K
R69	ERDS2TJ473	47K	R145	ERDS2TJ682	6.8K
R70	PQ4R10XJ471	470	R146	ERDS2TJ473	47K
R71	PQ4R10XJ103	10K	R147	PQ4R10XJ104	100K
R72	PQ4R10XJ151	150	R148	PQ4R10XJ151	150
R73	PQ4R10XJ473	47K	R149	Net Uset	
R74	PQ4R10XJ472	4.7K	R150	PQ4R10XJ223	22K
R75	PQ4R10XJ103	10K	R151	Net Uset	
R76	PQ4R10XJ473	47K	R152	ERDS2TJ102	1K
R77	PQ4R10XJ102	1K	R153	PQ4R10XJ473	47K
R78	PQ4R10XJ103	10K	R154	ERD25TJ473	47K
R79	PQ4R10XJ472	4.7K	R156	PQ4R10XJ102	1K
R80	ERD25TJ472	4.7K	R157	PQ4R10XJ332	3.3K
R81	ERDS2TJ683	68K	R158	PQ4R10XJ103	10K
R82	ERDS2TJ683	68K	R159	PQ4R10XJ121	120
R83	ERDS2TJ473	47K			
R84	ERDS2TJ223	22K			
R85	ERDS2TJ223	22K			
R86	ERDS2TJ223	22K			
R87	ERD25TJ473	47K			
R88	ERDS2TJ104	100K			
R89	PQ4R10XJ472	4.7K			
R90	PQ4R10XJ153	15K			
R91	ERD25TJ102	1K			
R92	PQ4R10XJ103	10K			
R93	ERD25TJ472	4.7K			
R94	ERD25TJ122	1.2K			
R95	ERD25TJ221	220			
R96	ERD25TJ122	1.2K			

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Ref. No.	Part No.	Value	Ref. No.	Part No.	Value
CAPACITORS					
C1	ECQE2E104KZ	0.1	C76	PQCUV1E333MD	0.033
C2	ECEA1CU221	220	C77	ECEA0JKA331	330
C3	ECEA1HKS010	1	C78	ECKDKC472KB	0.0047
C4	ECQV1H154JZ	0.15	C79	Net Uset	
C5	ECEA1CKS101	100P	C80	Net Uset	
C6	ECFD1C333KD	0.033	C81	Net Uset	
C7	ECEA1EU470	47	C82	PQCBC1C472MX	0.0047
C8	ECFD1E473KD	0.047	C83	PQCBC1C222MX	0.0022
C9	ECEA1CK101	100	C84	Net Uset	
C10	ECEA1HKS0R1	0.1	C85	ECEA1HKS010	1
C11	Net Uset		C86	ECEA1AU221	220
C12	Net Uset		C87	PQCUV1H103KB	0.01
C13	ECUV1H223MD	0.022	C88	ECEA1HU010	1
C14	PQCBC1H471KB	470P	C89	Net Uset	
C15	PQCUV1H223KB	0.022	C90	PQCUV1E473MD	0.047
C16	Net Uset		C91	ECEA1HU010	1
C17	ECEA0JKS470	47	C92	ECEA1HKS010	1
C18	ECEA1AU221	220	C93	ECEA1HKS010	1
C19	PQCBC1H681KB	680P	C94	ECEA1HKS010	1
C20	PQCUV1H103KB	0.01	C95	Net Uset	
C21	ECEA1HKSR33	0.33	C96	PQCUV1E104MD	0.1
C22	ECEA1HKS010	1	C97	Net Uset	
C23	ECEA1HKSR47	0.47	C98	ECEA1HKS010	1
C24	PQCBC1C103MY	0.01	C99	PQCUV1E104MD	0.1
C25	ECFD1E223KD	0.022			
C26	ECFD1C104KD	0.1			
C27	PQCUV1E333MD	0.033			
C28	PQCBC1C103MY	0.01			
C29	ECEA1AU221	220			
C30	ECEA1AU101	100			
C31	ECEA1HKS4R7	4.7			
C32	Net Uset				
C33	ECFD1E473KD	0.047			
C34	ECEA1HUR47	0.47			
C35	PQCUV1H103KB	0.01			
C36	PQCUV1H681JC	680P			
C37	ECEA1HU100	10			
C38	ECEA0JU220	22			
C39	PQCUV1H103KB	0.01			
C40	PQCBC1C103MY	0.01			
C41	ECEA1CKS100	10			
C42	ECEA1CKS100	10			
C43	PQCBC1C103MY	0.01			
C45	ECUV1H473MD	0.047			
C46	PQCBC1H221KB	220P			
C47	PQCBC1H221KB	220P			
C48	ECEA1HKS3R3	3.3			
C49	Net Uset				
C50	PQCUV1E333MD	0.033			
C51	PQCUV1E104MD	0.1			
C52	ECEA0JKA331	330			
C53	EECFM5R5104	0.1			
C54	Net Uset				
C55	ECUV1H220JC	22P			
C56	PQCUV1E473MD	0.047			
C57	PQCUV1E473MD	0.047			
C58	ECKD2H681KB	680P			
C59	ECKD2H681KB	680P			
C60	PQCUV1H103KB	0.01			
C61	Net Uset				
C62	ECEA0JKA331	330			
C63	Net Uset				
C64	Net Uset				
C65	PQCUV1H470JC	47P			
C66	Net Uset				
C67	PQCUV1H222KB	0.0022			
C68	PQCUV1H222KB	0.0022			
C69	PQCUV1H472KB	0.0047			
C70	PQCUV1H102J	0.001			
C71	ECEA1CKS100	10			
C72	PQCUV1H103KB	0.01			
C73	PQCUV1H103MD	0.1			
C74	Net Uset				
C75	PQCUV1H681JC	680P			

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