ORDER NO. KM49304510C2

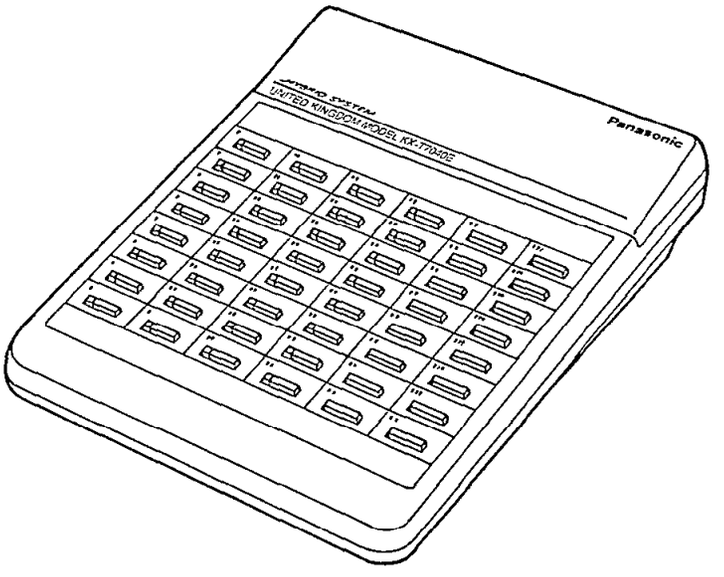
Service Manual

and Technical Guide

DSS CONSOLE

KX-T7040E

(for United Kingdom)



■ **SPECIFICATIONS**

Dimensions:	172 (W)×78 (H)×240 (D) mm ($6^{25}/_{32}$"×$3^{1}/_{16}$"×$9^{7}/_{16}$")
Weight:	550 g (1 lb 3.4 oz.)

Design and specifications are subject to change without notice.

Panasonic

When you mention the serial number, write down the 11 digits. The serial number may be found on the label affixed to the bottom of the unit.

TABLE OF CONTENTS

LOCATION OF CONTROL

The KX-T7040E provides 32 Direct Station Selection (DSS) button with a Busy Lamp Field (BLF) and 16 Programmable Feature buttons.

Programmable Feature Buttons:
Once these buttons are programmed, they let you access various functions with one-touch operation.

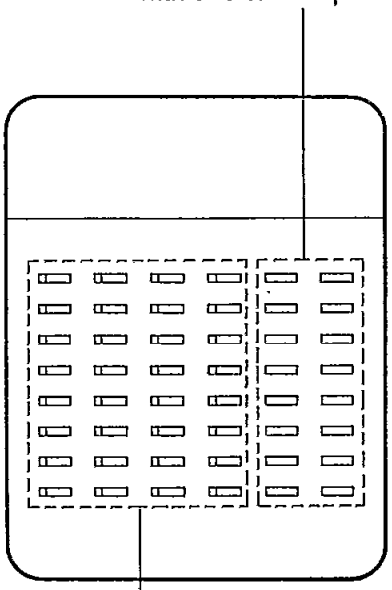


Fig. 1

DSS Buttons with a Busy Lamp Field:
To access an extension, simply press a DSS button. The BLF indicates the current status of corresponding extension.
These buttons also can be assigned for One-Touch dialing buttons.

CONNECTION

The KX-T7040E Direct Station Selection (DSS) Console requires an Electronic Modular Switching System (EMSS) Proprietary Telephone (the KX-T7020E, KX-T7050E, KX-T7130E etc.) for proper operation.

The KX-T7040E and the EMSS Proprietary Telephone will be placed side by side on your desk.

Note:
- The KX-T7040E must be connected to the EMSS Control Unit.
- Each console requires an EMSS Proprietary Telephone for programming.
- For connection, please refer to the EMSS Control Unit Manual.

DISASSEMBLY INSTRUCTIONS

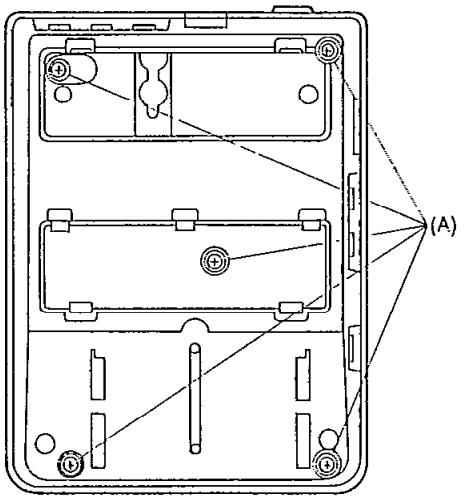


Fig. 2

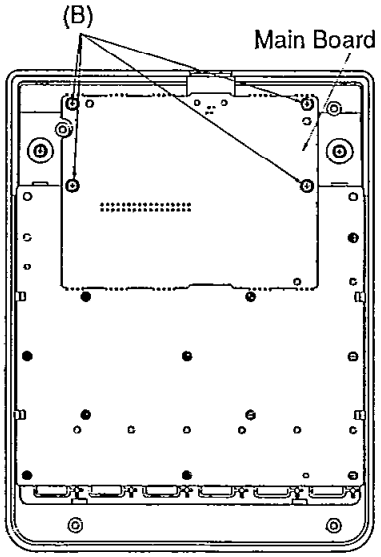


Fig. 3

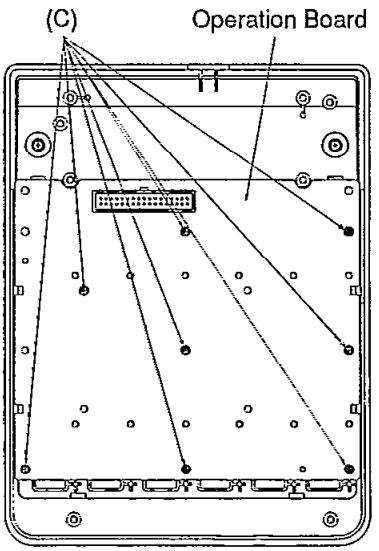


Fig. 4

Ref. No.	Procedure	Shown in Fig.	To remove —.	Remove —.
1	1	2	Lower Cabinet	Screw (3×14) ..... (A)×5
2	1, 2			
3	1~3	3	Main Board	Screw (3×10) ..... (B)×4
4	1~4	4	Operation Board	Screw (2.3×8) ..... (C)×8

FOR SERVICE TECHNICIANS

Note the following items when exchanging the LEDs (Ref. No. D601~632) of Dial P.C. Board.

1. Do not use LED again which is removed from P.C. Board.
2. Use soldering iron (less than 15 W) for exchanging LED.
3. Do not heat LED more than 2 seconds.
4. Do not move LED after solder.

EXTENSION CORD CONNECTING METHOD

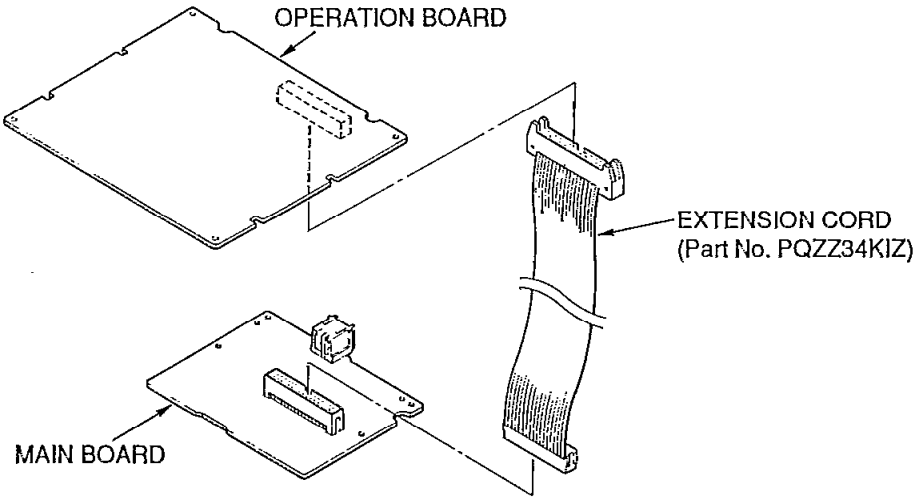
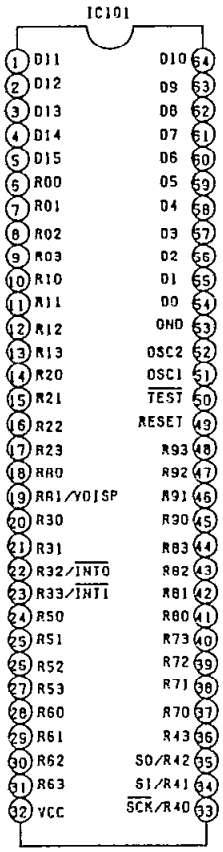


Fig. 5

IC DATA

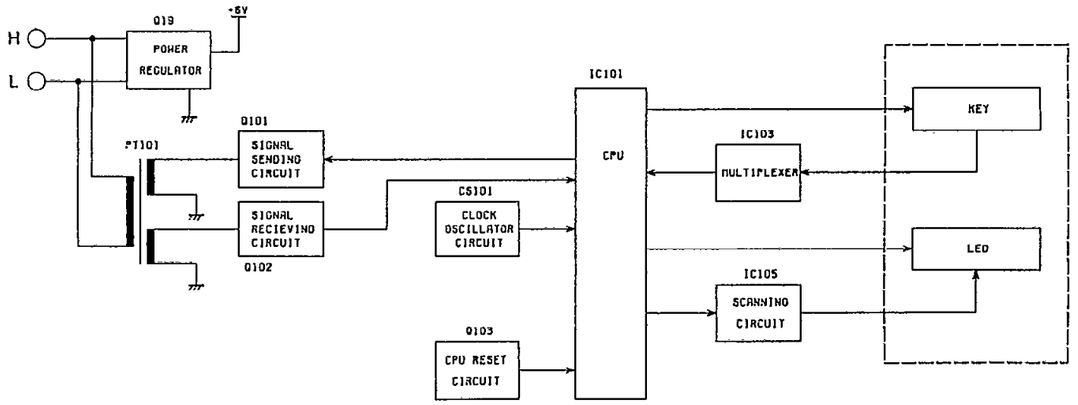


IC101: PQVI4045SF76
Program ROM: 4K Byte (4 bit)
Internal RAM: 1K bit
Clock Frequency: 2.5 MHz
Power Supply Voltage: 2.7–6 V

Pin No.	Mark	Function	High	Low
1	D11	LED Control Out put	ON	OFF
2	D12	LED Control Output	ON	OFF
3	D13	LED Control Output	ON	OFF
4	D14	LED Control Output	ON	OFF
5	D15	LED Control Output	ON	OFF
6	R00	LED Control Output	ON	OFF
7	R01	LED Control Output	ON	OFF
8	R02	LED Control Output	ON	OFF
9	R03	LED Control Output	ON	OFF
10	R10	Vcc	---	---
11	R11	Vcc	---	---
12	R12	Vcc	---	---
13	R13	Vcc	---	---
14	R20	Not Used	---	---
15	R21	Not Used	---	---
16	R16	Not Used	---	---
17	R17	Not Used	---	---
18	RA0	Data Input	Disable	Enable
19	RA1/VDISP	Ground	---	---
20	R30	Key Input	Disable	Enable
21	R31	Key Input	Disable	Enable
22	R32/INT0	Interrupt Input	Stadby	Active
23	R33/INT1	Interrupt Input	Stadby	Active

Pin No.	Mark	Function	High	Low
24	R50	Key Data Input	Disable	Enable
25	R51	Key Data Input	Disable	Enable
26	R552	Key Data Input	Disable	Enable
27	R53	Key Data Input	Disable	Enable
28	R60	Key-Scan Output	Normal	Active
29	R61	Key-Scan Output	Normal	Active
30	R62	Key-Scan Output	Normal	Active
31	R63	Key-Scan Output	Normal	Active
32	Vcc	(+) Power Source Terminal	---	---
33	SCK/R40	Interrupt Input	Disable	Enable
34	S1/R41	Not Used	---	---
35	S0/R42	Not Used	---	---
36	R43	Not Used	---	---
37	R70	Not Used	---	---
38	R71	Not Used	---	---
39	R72	Not Used	---	---
40	R73	Not Used	---	---
41	R80	Not Used	---	---
42	R81	Not Used	---	---
43	R82	Not Used	---	---
44	R83	Not Used	---	---
45	R90	Ground	---	---
46	R91	Ground	---	---
47	R92	Ground	---	---
48	R93	Ground	---	---
49	RESET	Reset	---	---
50	TEST	Test	---	---
51	OSC1	System Clock	---	---
52	OSC2	System Clock	---	---
53	GND	Ground	---	---
54	D0	Not Used	---	---
55	D1	LED Reset Signal Output	Active	Normal
56	D2	Ground	---	---
57	D3	Not Used	---	---
58	D4	Not Used	---	---
59	D5	Data Input Control	Normal	Active
60	D6	Data Input	Disable	Enable
61	D7	Data Output	Active	Normal
62	D8	LED Control Output	ON	OFF
63	D9	LED Control Output	ON	OFF
64	D10	LED Control Output	ON	OFF

BLOCK DIAGRAM



CIRCUIT OPERATIONS

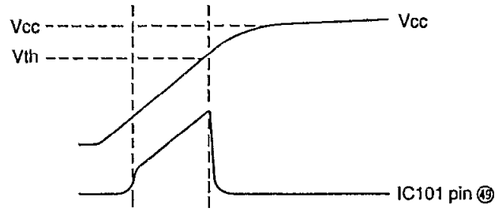
1. RESET CIRCUIT

Circuit Operation:

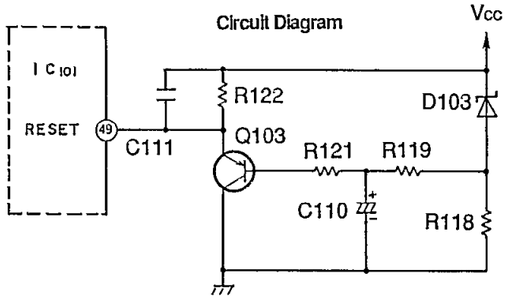
This circuit is used for transmission of a reset pulse to the CPU (IC101) at the following times, connecting the telephone line jack and switching on the EMSS. The timing chart is shown below.

Power ON→Q103 OFF→IC101 (Pin 49) high level→D103 ON→Q103 ON→IC101 (Pin 49) low level

Timing Chart



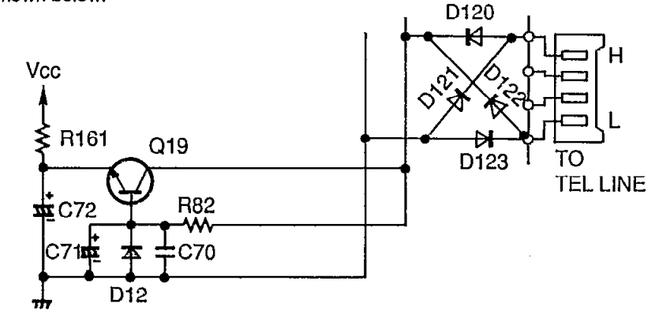
Circuit Diagram



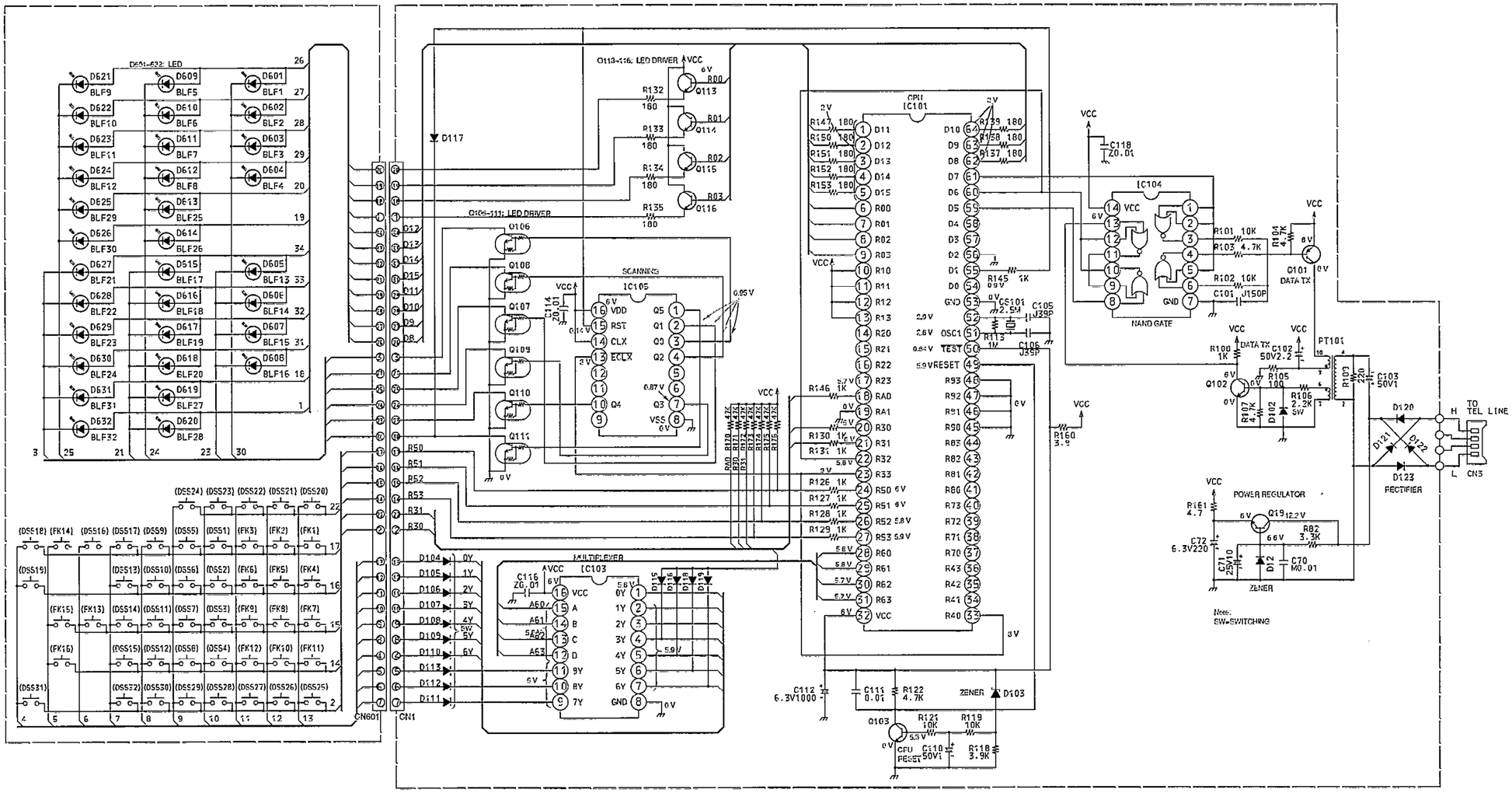
2. POWER SUPPLY CIRCUIT

Circuit Operation:

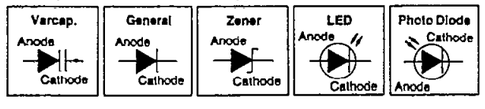
The DC voltage (max +16 V depending on EMSS unit) supplied to DSS Console via H/L lines is converted to +6 V by the voltage regulator circuit shown below.



SCHEMATIC DIAGRAM

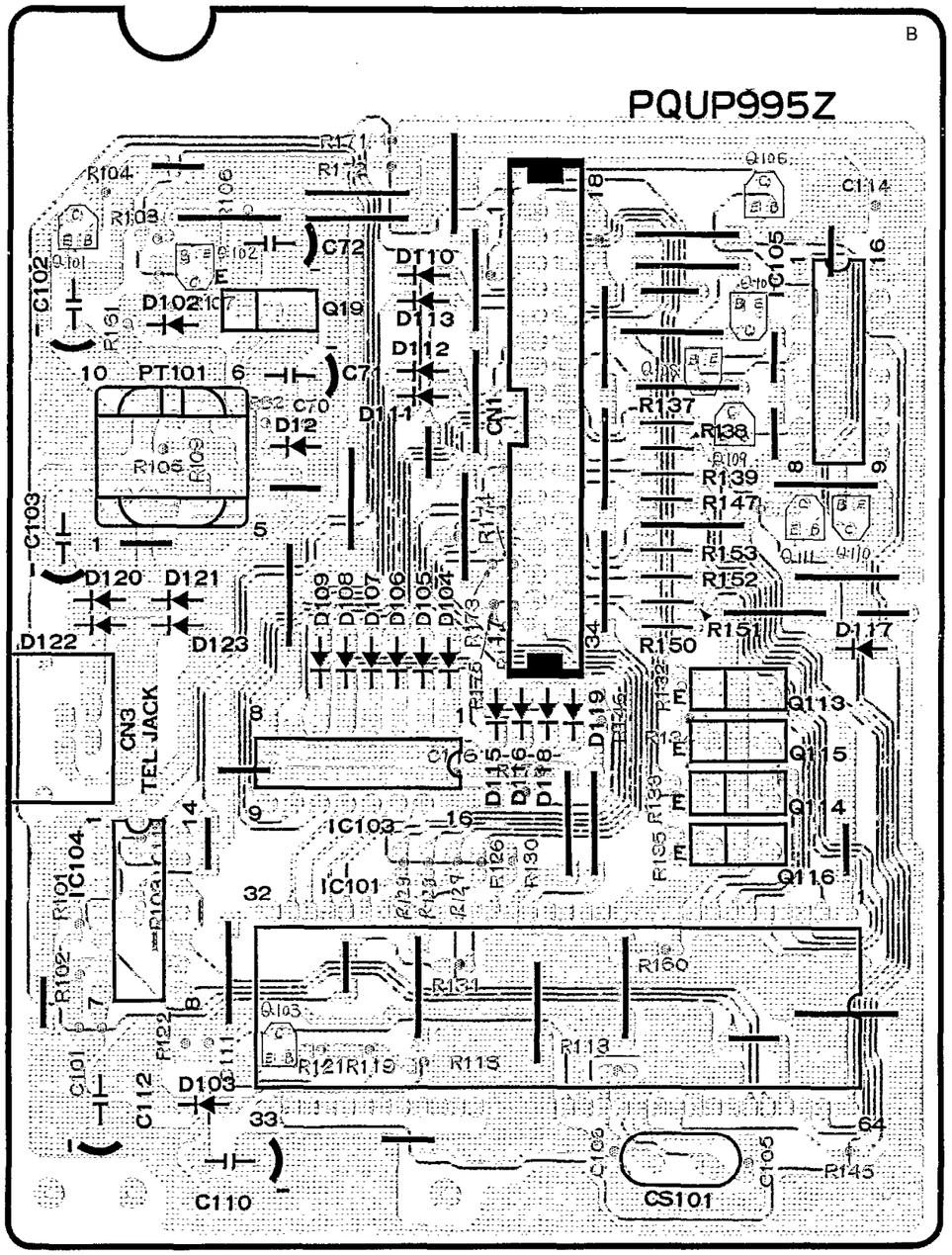


Note:

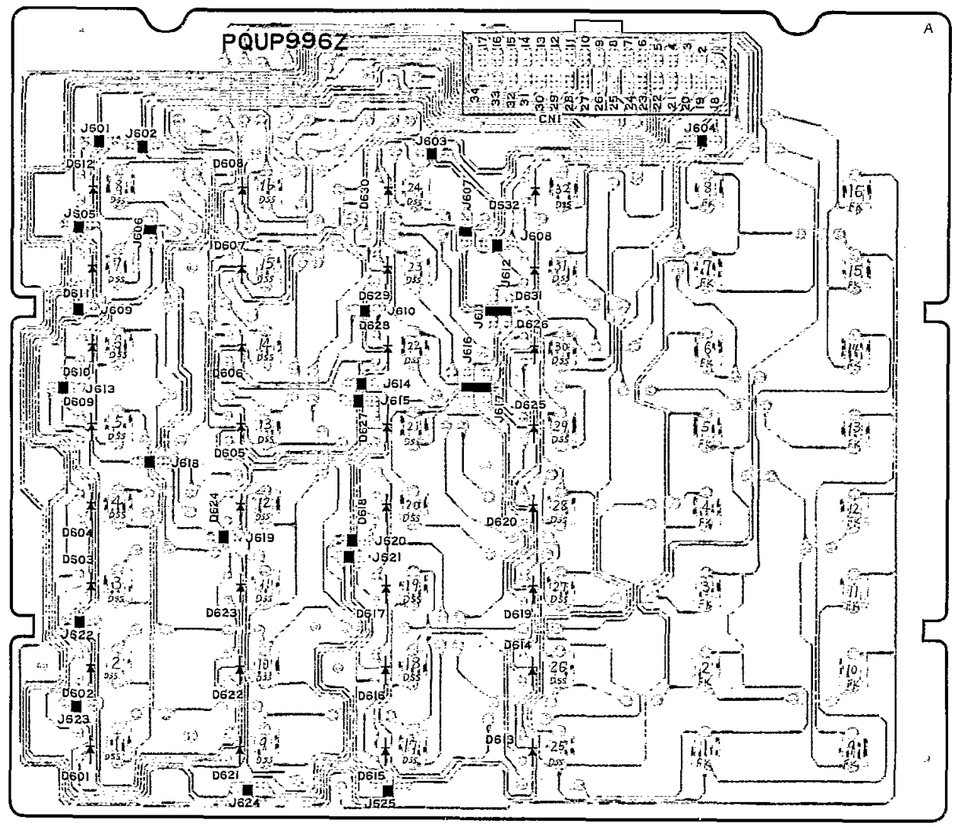
1. DC voltage measurements are taken with electrolytic voltmeter from negative line.
2. This schematic diagram may be modified at any time with the development of new technology.
3. 

PRINTED CIRCUIT BOARD

COMPONENT VIEW



COMPONENT VIEW



Notes: 1. The circuit shown in ▭ on the conductor indicates printed circuit on the back side of the printed circuit board.

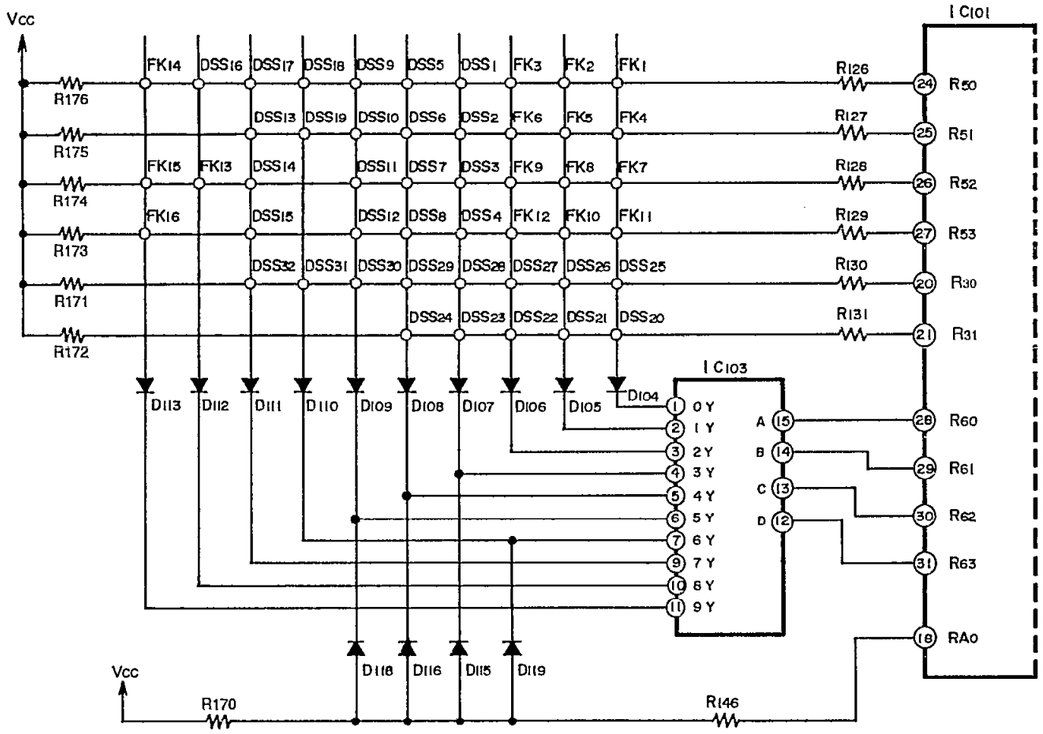
2. The circuit shown in ▭ on the conductor indicates printed circuit on the front side of the printed circuit board.

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

3. KEY INPUT CIRCUIT

Circuit Operation:
IC101 and IC103 are used to scan the key matrix and perform key decode. Ports 0Y–9Y of decode counter IC103 are brought to a low status sequentially by data supplied by ports R60–R63 of IC101. Ports R50–R53, R30–R31, normally high, are brought to a low level when a key is pressed and its relevant column has been taken low. (See timing chart.) Thus IC101 performs key decode.

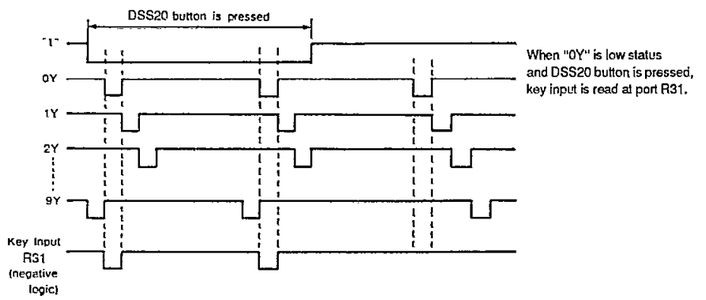
Circuit Diagram



Key Input Control Timing Chart

Logic of IC103

	INPUT				OUTPUT									
No.	A	B	C	D	0Y	1Y	2Y	3Y	4Y	5Y	6Y	7Y	8Y	9Y
0	L	L	L	L	L	H	H	H	H	H	H	H	H	H
1	H	L	L	L	H	L	H	H	H	H	H	H	H	H
2	L	H	L	L	H	H	L	H	H	H	H	H	H	H
3	H	H	L	L	H	H	H	L	H	H	H	H	H	H
4	L	L	H	L	H	H	H	H	L	H	H	H	H	H
5	H	L	H	L	H	H	H	H	H	L	H	H	H	H
6	L	H	H	L	H	H	H	H	H	H	L	H	H	H
7	H	H	H	L	H	H	H	H	H	H	H	L	H	H
8	L	L	L	H	H	H	H	H	H	H	H	H	L	H
9	H	L	L	H	H	H	H	H	H	H	H	H	H	L



When "0Y" is low status and DSS20 button is pressed, key input is read at port R31.

4. DATA COMMUNICATION CIRCUIT

Function:
The data communication circuit provides a path for information exchange between the EMSS and EMSS proprietary telephone, which is used for transmitting such items as key input information and LED/LCD control.

Circuit Operation:
After receiving an IRQ signal from the EMSS, the EMSS proprietary telephone sends key input information (max. 19 pulses). The EMSS proprietary telephone then receives LED control information etc. from the EMSS and returns an acknowledge signal.

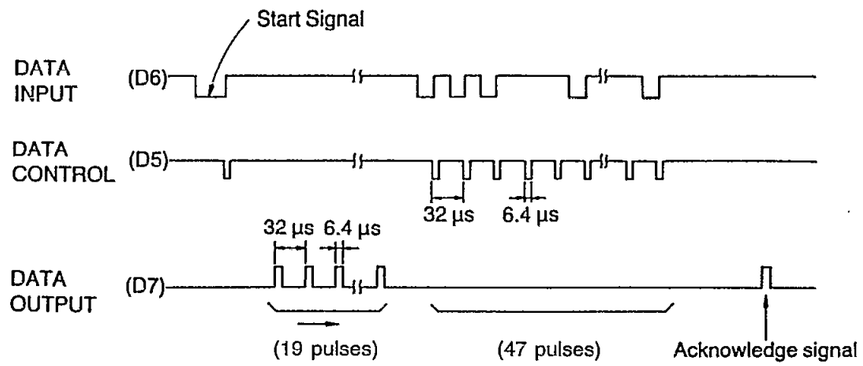
1) Reception
The data from the DSS is received via the H and L line along the path shown below.

H, L Line →PT101→ R106 → Q102 → IC104 → IC101 pin 60

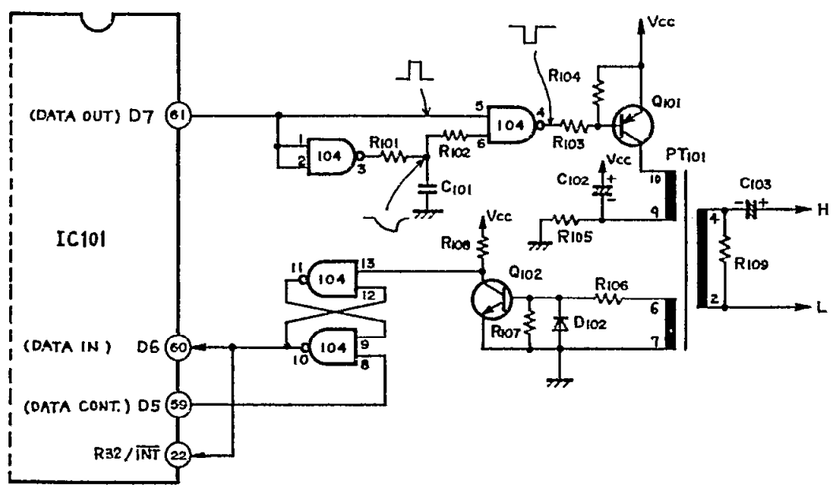
2) Transmission
The data to the DSS console is transmitted along the following path.

IC101 pin 61 → IC104 → R103 → Q101 → PT101 → H, L Line

Timing Chart



Circuit Diagrqam

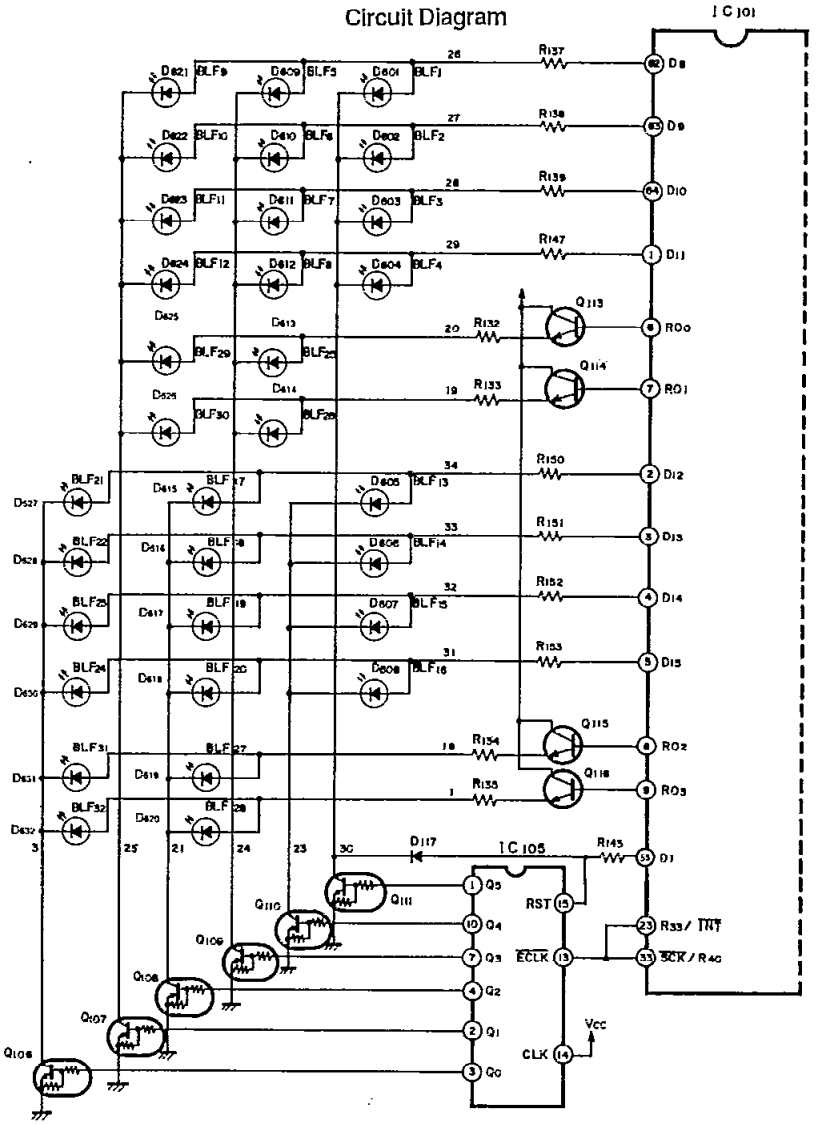


5. LED CIRCUIT

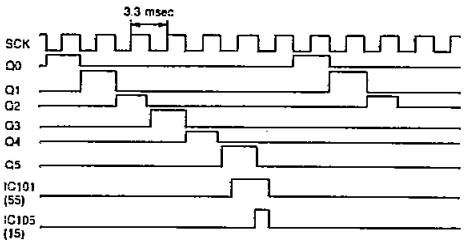
Circuit Operation:

The status of the LED's in the matrix is controlled by the outputs of IC101 and IC105. Transistors Q106–Q111 are sequentially turned on by IC105 which is reset every 6 clock cycles using port D1 from IC101. This is shown in timing chart below. To illuminate an LED, a high level is output from the relevant port of IC101 (port D8–D15, R01–R03) at the same time as the corresponding column is taken low by IC105, Q106–Q11.

Circuit Diagram

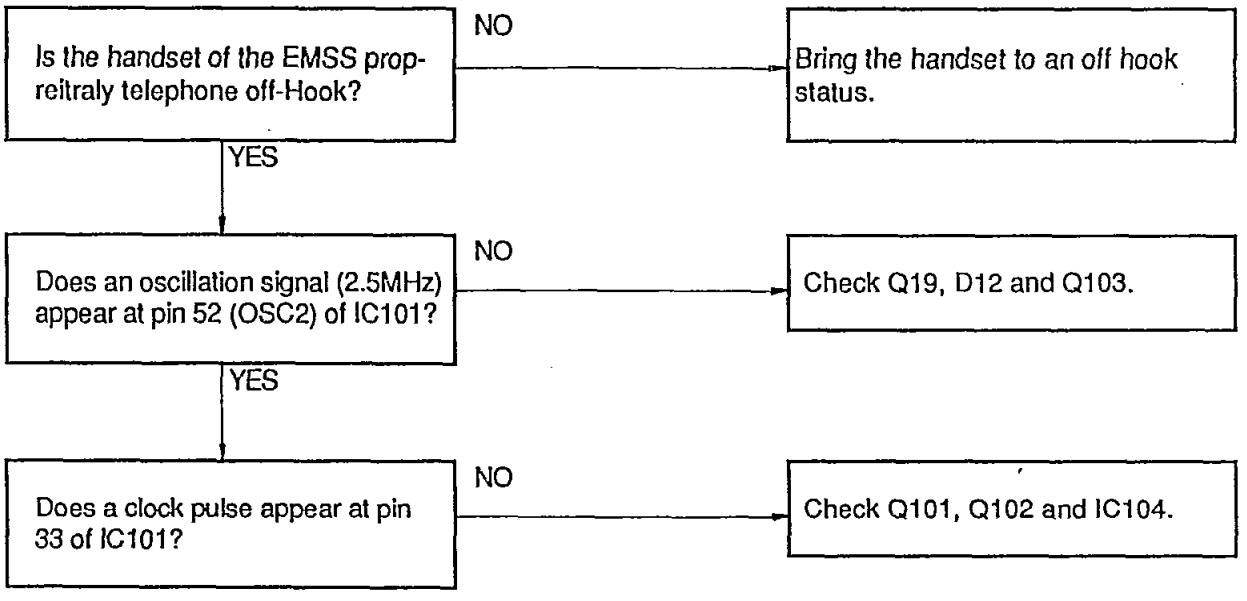


Timing Chart

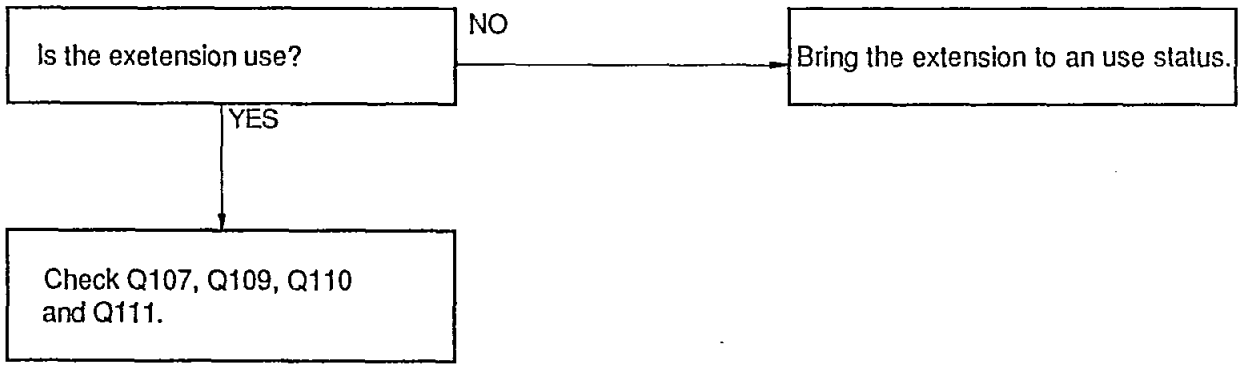


TROUBLESHOOTING GUIDE

1) NO OPERATION



2) LED DOES NOT LIGHT



ACCESSORIES AND PACKING MATERIALS

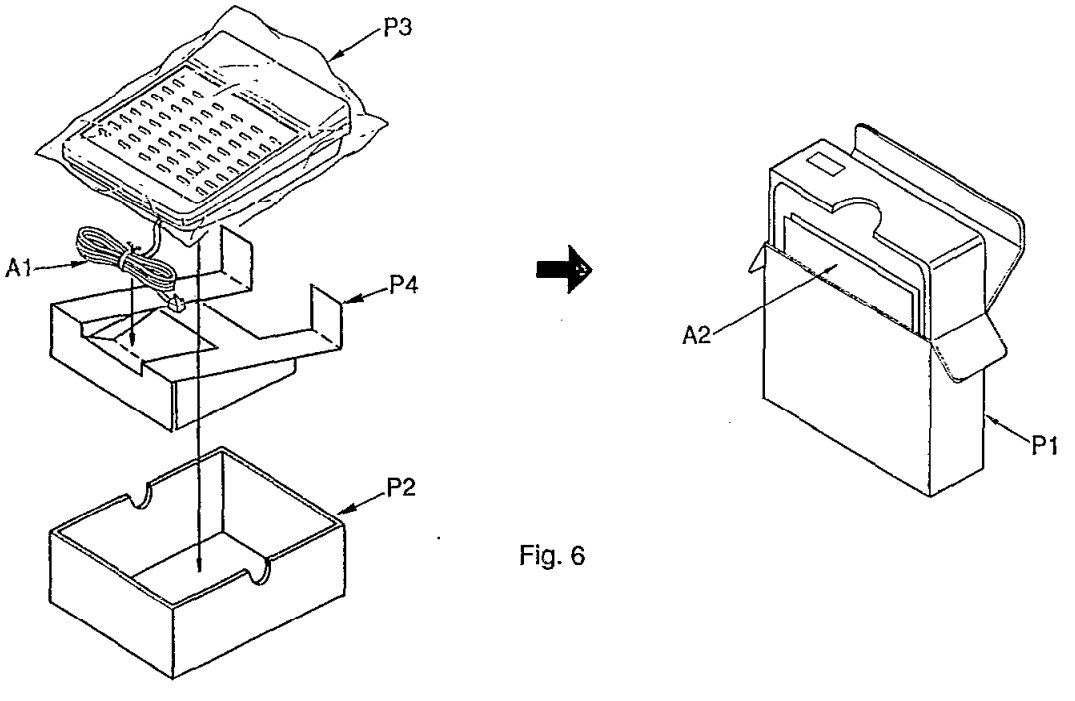
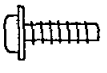


Fig. 6

CABINET AND ELECTRICAL PARTS LOCATION

ACTUAL SIZE OF SCREWS

Ref. No.	Figure	Part No.
Ⓐ		XTW26+8F
Ⓑ		XTW3+S10P
Ⓒ		XTW3+S14P

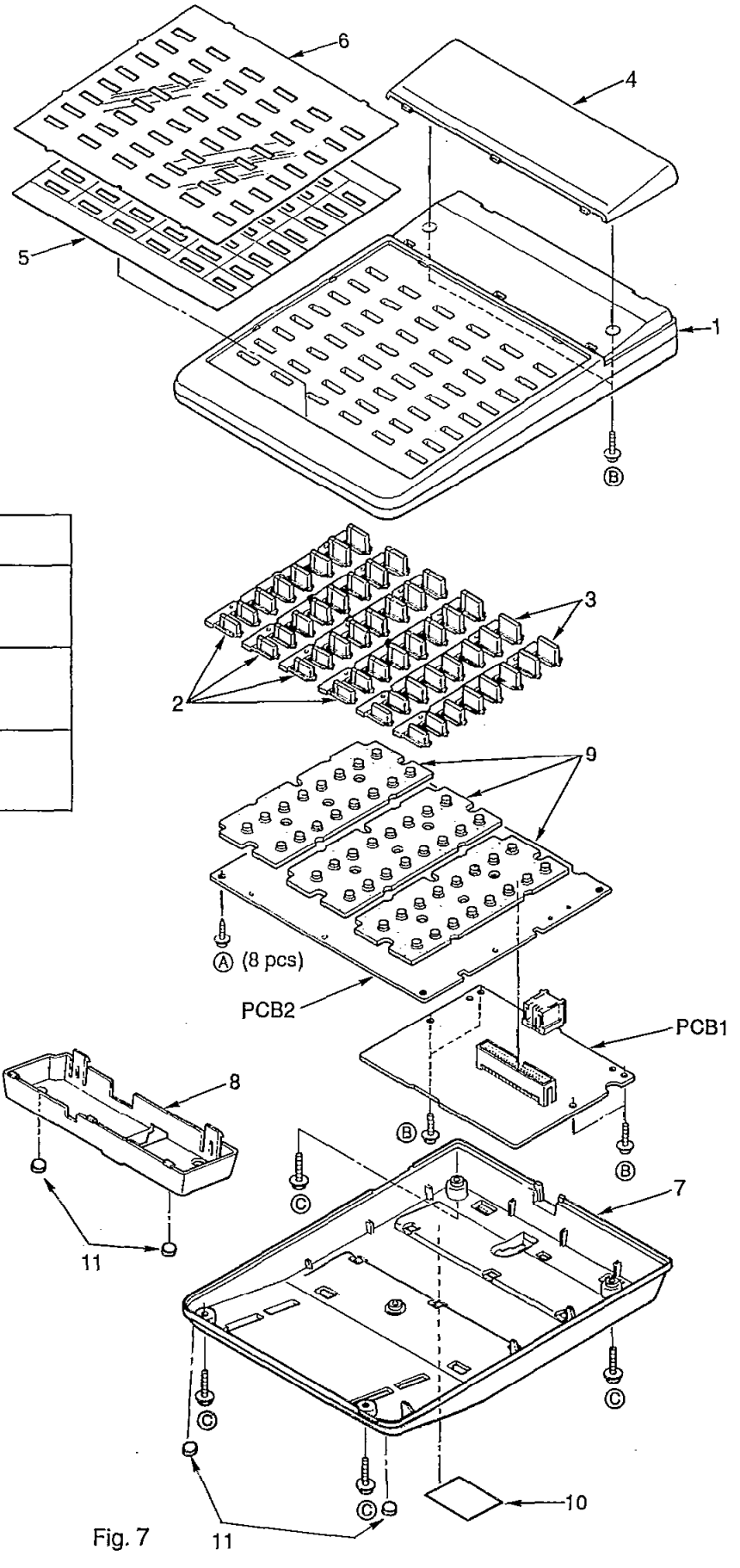


Fig. 7

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REPLACEMENT PARTS LIST

Model KX-T7040E

Notes:
1. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
2. The S mark indicates service standard parts and may differ from production parts.
3. Important safety notice.
Components identified by the ⚠ mark special characteristics important for safety. When replacing any of these components, use only manufacturer's specified 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
		CABINET AND ELECTRICAL PARTS		
1	PQKM217Y81	UPPER CABINET		1
2	PQBCX201Z1	BUTTON, DSS		4
3	PQBCX202Z1	BUTTON, PROGRAMMABLE FEATURE		2
4	PQGG94V	GRILLE		1
5	PQHP5129Z1	TEL. NO. CARD		1
6	PQHR5410Z	TRANSPARENT PLATE		1
7	PQKF188X81	LOWER CABINET		1
8	PQKL37Z81	STAND		1
9	PQSE123Z	KEY SWITCH		3
10	PQGT10297Z	NAME PLATE	⚠	1
11	PQHG316Z	FOOT RUBBER		4
		ACCESSORIES AND PACKING MATERIALS		
A1	PQJA87T	TELEPHONE CORD	⚠	1
A2	PQQX10147Y	INSTRUCTION BOOK	⚠	1
P1	PQPK10236Z	GIFT BOX		1
P2	PQPN10199Z	CUSHION		1
P3	XZB26X40A01	PROTECTION COVER		1
P4	PQPN10200Z	ACCESSORY BOX		1
		MAIN BOARD PARTS		
PCB1	PQWP1T7040EU	MAIN BOARD ASS'Y (RTL)		1
		(ICs)		
IC101	PQVI4045SF76	IC		1
IC103	PQVITC7H42P	IC	S	1
IC104	PQVITC4011BP	IC	S	1
IC105	PQVITC4017BP	IC	S	1
		(TRANSISTORS)		
Q19	2SD2136	TRANSISTOR(SI)		1
Q101	2SB1218A	TRANSISTOR(SI)	S	1
Q102,103	2SD1819A	TRANSISTOR(SI)	S	2
Q106-111	PQVTDTC143E	TRANSISTOR(SI)		6
Q113-116	PQVTJC501QAM	TRANSISTOR(SI)		4

Ref. No.	Part No.	Part Name & Description		Pcs
		(DIODES)		
D12	MA4068	DIODE(SI)		1
D102	1SS131	DIODE(SI)		1
D103	MA4039	DIODE(SI)		1
D104-113	1SS131	DIODE(SI)		10
D114	Not Used			
D115-123	1SS131	DIODE(SI)		9
		(CRYSTAL OSCILLATOR)		
CS101	PQVCX2500N9	CRYSTAL OSCILLATOR		1
		(TRANSFORMER)		
PT101	ETE13K24AY	TRANSFORMER		1
		(CAPACITORS)		
C70	PQCUV1H103KB	0.01		1
C71	ECEA1VKS100	10	S	1
C72	ECEA1AU221	220	S	1
C101	PQCUV1H151JC	150P		1
C102	ECEA1HKS2R2	2.2		1
C103	ECEA1HKS010	1		1
C104	Not Used			
C105,106	PQCUV1H390JC	39P		2
C110	ECEA1HKS010	1		1
C111	PQCUV1H103KB	0.01		1
C112	ECEA0JU102	1000		1
C113	Not Used			
C114	PQCUV1H103KB	0.01		1
C115	Not Used			
C116	PQCUV1H103KB	0.01		1
C117	Not Used			
C118	PQCUV1H103KB	0.01		1
		(RESISTORS)		
R82	PQ4R10XJ332	3.3K		1
R101,102	PQ4R10XJ103	10K		2
R103,104	PQ4R10XJ472	4.7K		2
R105	PQ4R10XJ101	100		1
R106	PQ4R10XJ222	2.2K		1
R107	PQ4R10XJ472	4.7K		1
R108	PQ4R10XJ102	1K		1
R109	PQ4R10XJ221	220		1
R110-112	Not Used			
R113	PQ4R10XJ105	1M		1
R118	PQ4R10XJ392	3.9K		1
R119	PQ4R10XJ103	10K		1
R120	Not Used			
R121	PQ4R10XJ103	10K		1
R122	PQ4R10XJ472	4.7K		1
R126-131	PQ4R10XJ102	1K		6
R132-135	PQ4R10XJ181	180		4
R137-139	ERDS2TJ181	180		3
R145,146	PQ4R10XJ102	1K		2
R147	ERDS2TJ181	180		1
R148,149	Not Used			
R150-153	ERDS2TJ181	180		4
R160	PQ4R10XJ3R9	3.9		1
R161	PQ4R10XJ4R7	4.7		1
R170-176	PQ4R10XJ473	47K		7
		(CONNECTOR & JACK))		
CN1	PQJP34D30Y	CONNECTOR, 34P		1
CN3	PQJJ1TB26Z	JACK, TEL.		1
		OPERATION BOARD PARTS		
PCB2	PQWP2T7040EU	OPERATION BOARD ASS'Y (RTL)		1
		(DIODES)		
D601-632	LN1261C	LED		32
		(CONNECTOR)		
CN601	PQJS34X33Y	CONNECTOR, 34P		1

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