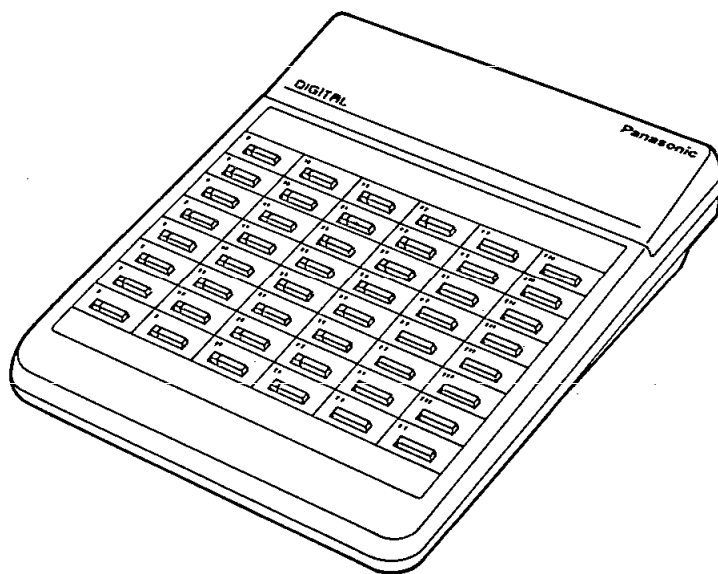


Service Manual

and Technical Guide

DIGITAL DSS CONSOLE
FOR DIGITAL SUPER HYBRID SYSTEM

KX-T7240C



■ SPECIFICATIONS

Dimensions: 172 (W)×78 (H)×240 (D) mm
(6²⁵/₃₂"×3¹/₁₆"×9⁷/₁₆")

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.

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LOCATION OF CONTROL

The KX-T7240 provides 32 Direct Station Selection (DSS) buttons with Busy Lamp Field (BLF) and 16 Programmable Feature buttons.

Programmable Feature (PF) Buttons:
These buttons once programmed, let you access various functions with one-touch operation.

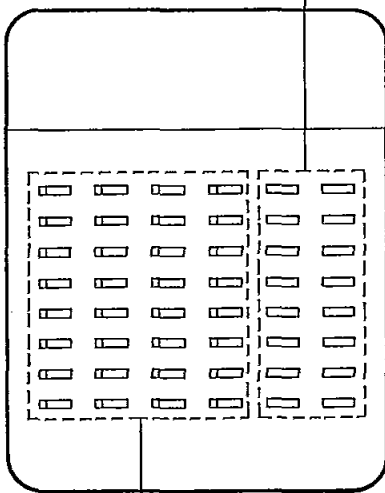


Fig. 1

DSS Buttons with Busy Lamp Field (BLF):
To access an extension, simply press a DSS button. The BLF indicates the current status of the corresponding extension. When a line is busy, an indicator of a DSS lights red. These buttons also can be assigned for one-touch dialing.

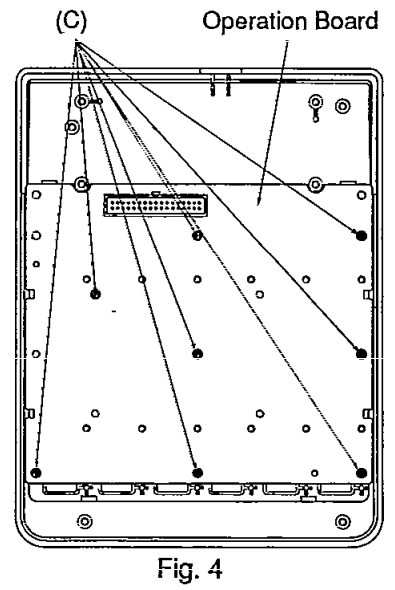
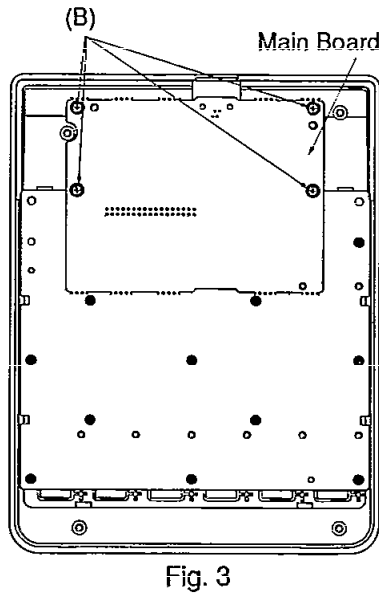
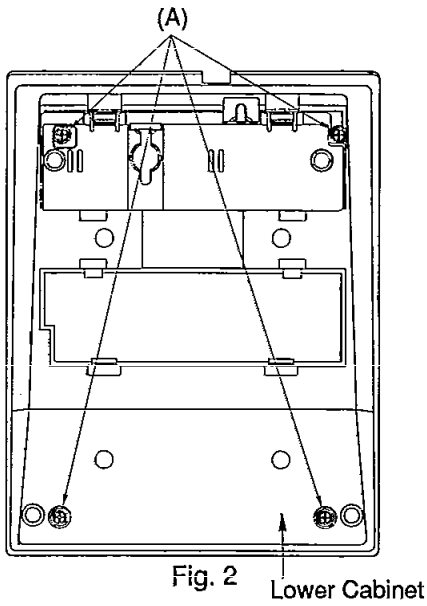
CONNECTION

The KX-T7240 Direct Station Selection (DSS) Console requires a Panasonic Digital Proprietary Telephone for proper operation.

Note:

- The KX-T7240 must be connected to the EMSS Control Unit.
- Each console requires an EMSS Proprietary Telephone.
- A standard telephone can not be utilized in conjunction with the KX-T7240.
- For connection, please refer to the EMSS Control Unit Manual.

DISASSEMBLY INSTRUCTIONS



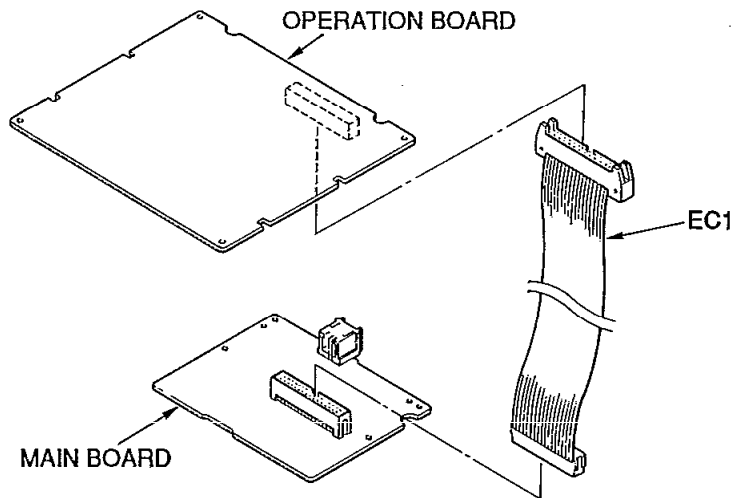
Ref. No.	Procedure	Shown in Fig. —	To remove —.	Remove —.
1	1	2	Lower Cabinet	Screw (3x14) (A)x5
2	1, 2			
3	1-3	3	Main Board	Screw (3x10) (B)x4
4	1-4	4	Operation Board	Screw (2.6x8) (C)x8

FOR SERVICE TECHNICIANS

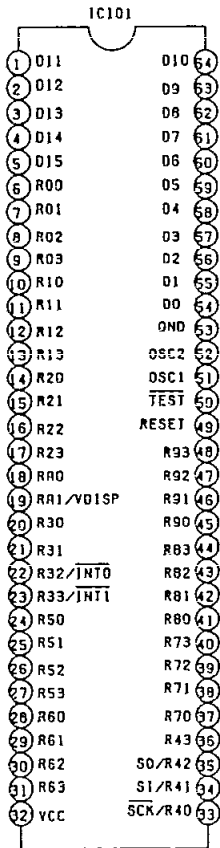
Note the following items when exchanging the LEDs (Ref. No. D601-632) of Dial P.C. Board.

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



IC DATA

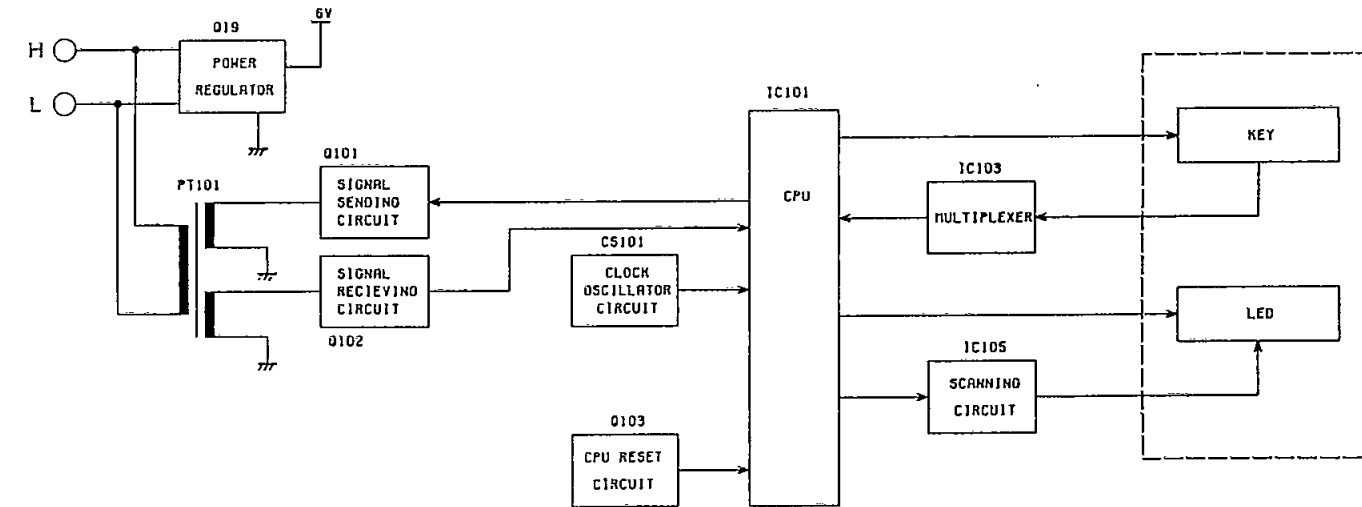


IC101: PQVI4045SF76
 Program ROM: 4K Byte (4 bit)
 Internal RAM: 1K bit
 Clock Frequency: 2.5 MHz
 Power Supply Voltage: 2.7-6 V

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



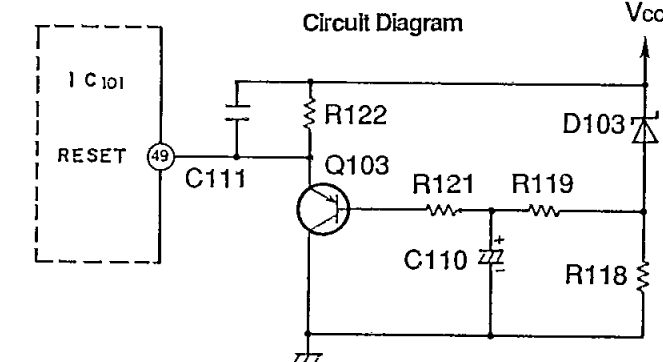
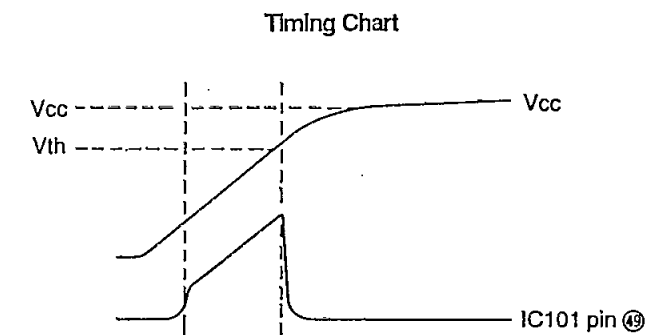
CIRCUIT OPERATIONS

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, circuit operation. The timing chart is shown below.

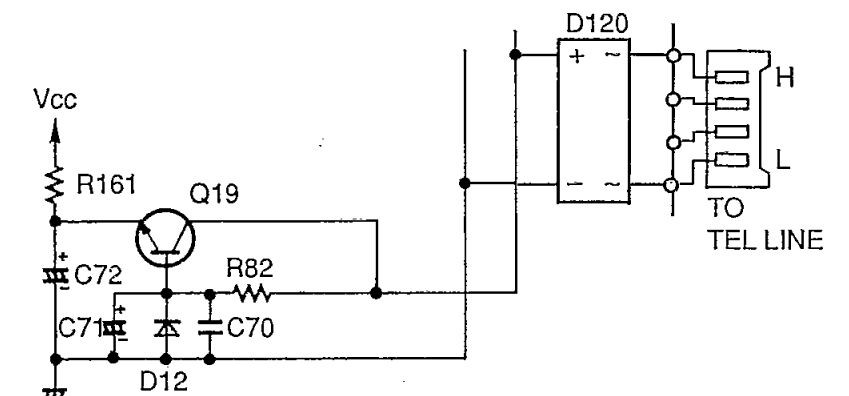
Power ON → Q103 ON → IC101 (pin 49) low level



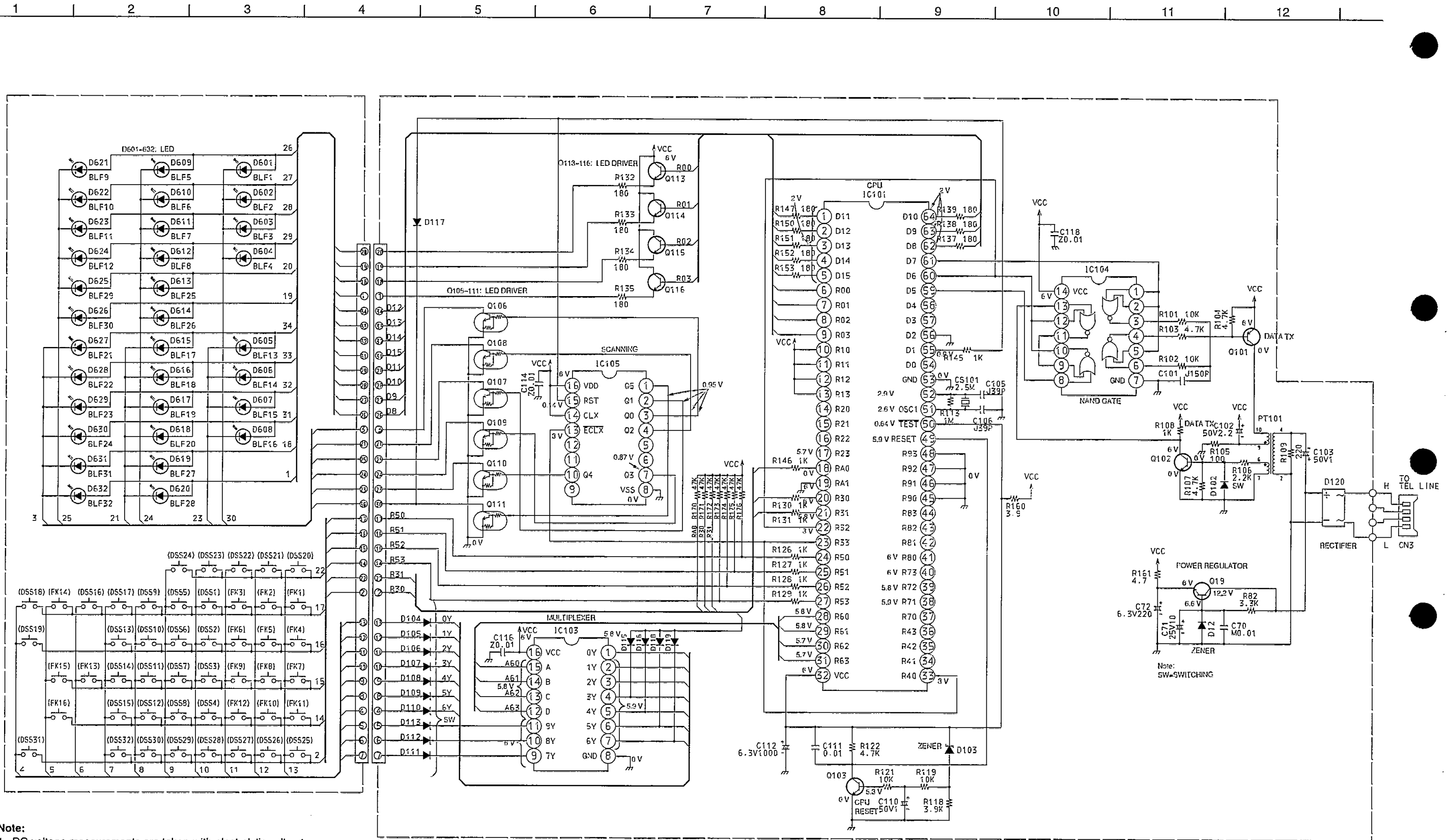
2. POWER SUPPLY CIRCUIT

Circuit Operation:

The +16V DC, provided from the DSS console is converted to +6V by the voltage regulator circuit composed of Q19, R82 and D12 etc.

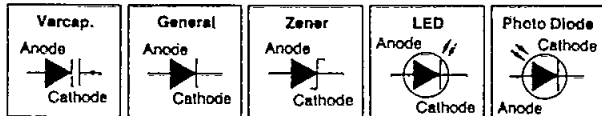


SCHEMATIC DIAGRAM



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.



1 2 3 4 5 6 7 8 9 10 11 12

A
B
C
D
E
F
G
H

IC101

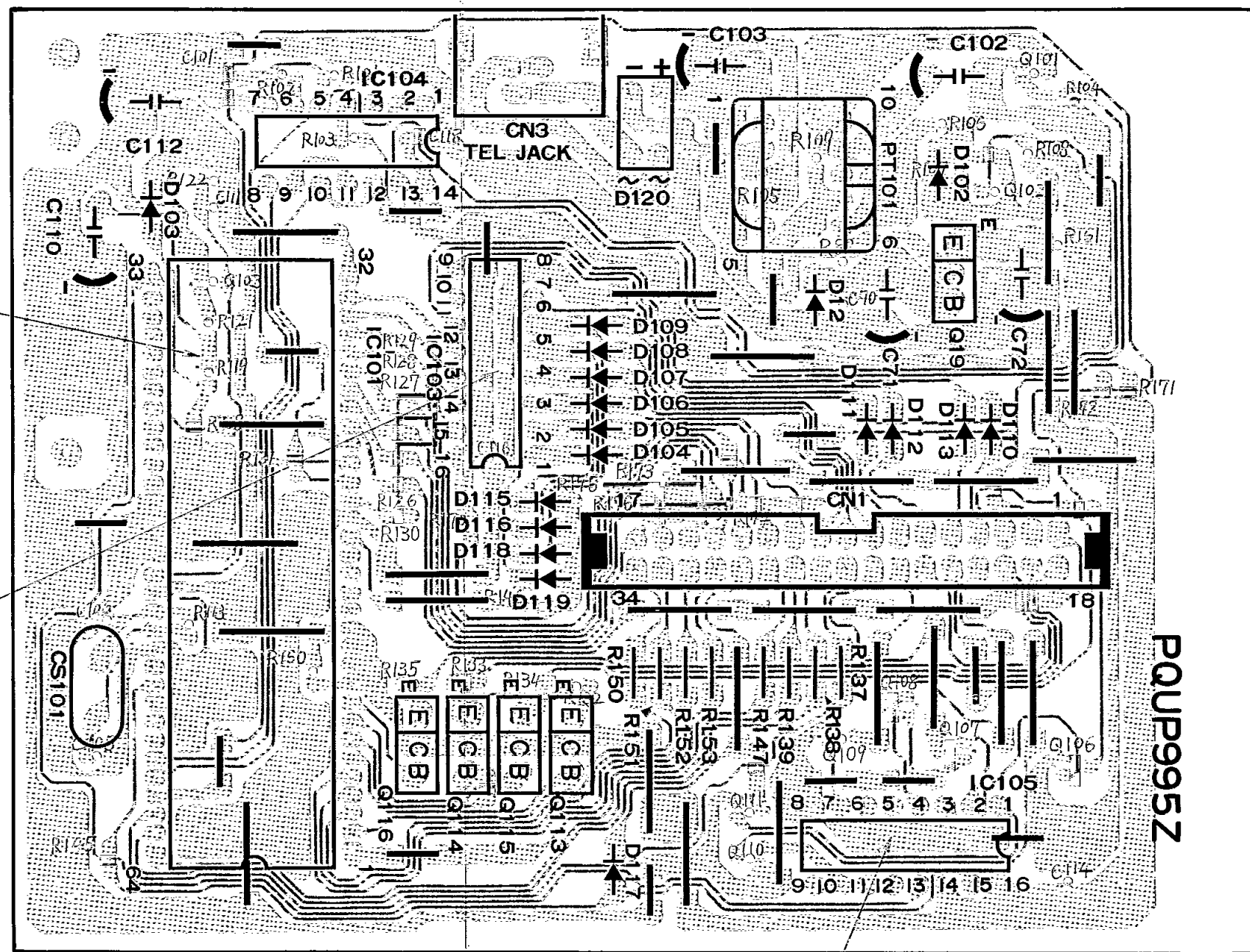
Pin No.	Voltage (V)
1-5	2
17	5.7
19	0
20, 21	6
22	5.8
23	3
28, 29	5.8
30, 31	5.7
32	6
33	3
38	5.9
39	5.8
40, 41	6
49	5.9
50	0.64
51	2.6
52	2.9
53	0
55	0.9
62-64	2

IC103

Pin No.	Voltage (V)
1	5.8
2-7	5.9
8	0
9-11	6
12-15	5.8
16	6

IC105

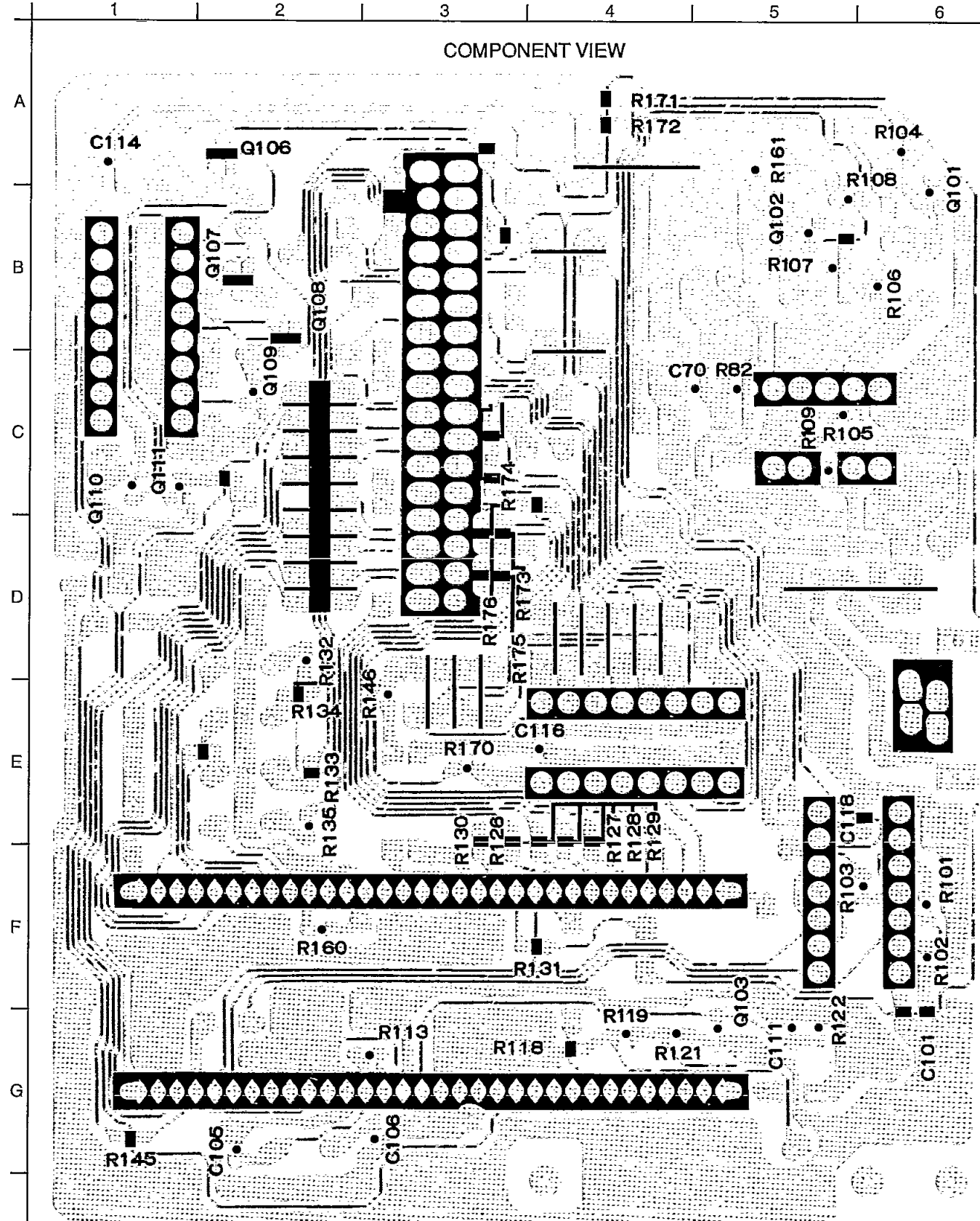
Pin No.	Voltage (V)
1-4	0.95
7	0.87
8	0
13	3
15	0.14
16	6



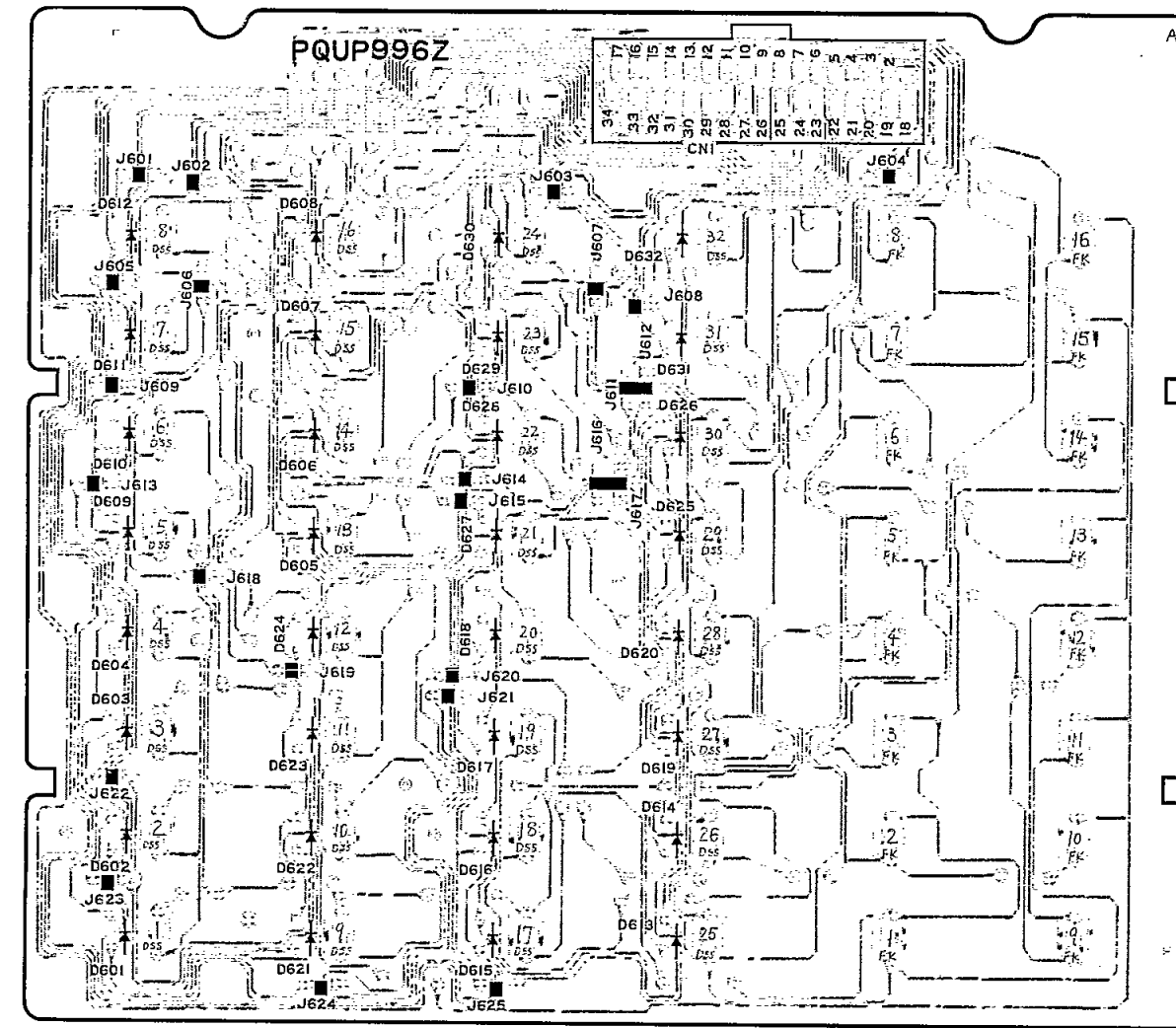
PQP995Z

PRINTED CIRCUIT BOARD

COMPONENT VIEW



COMPONENT VIEW



- Notes: 1. The circuit shown in [dashed line] on the conductor indicates printed circuit on the back side of the printed circuit board.
 2. The circuit shown in [solid line] 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:

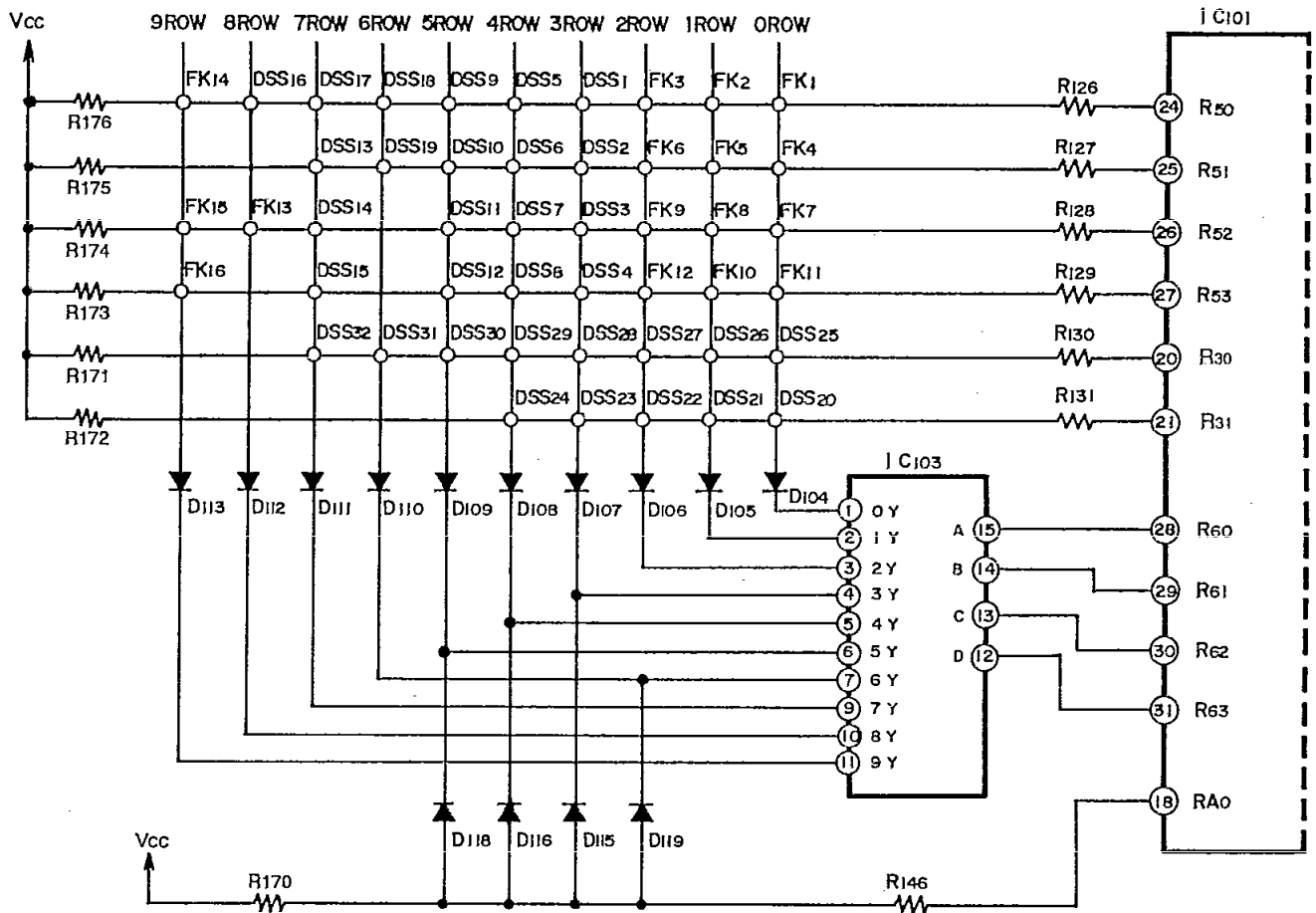
The I/O ports R50 to R53 of IC101 are used with alternate switching, and they are used as input ports as in the case of the key input.

1) Key Input Circuit

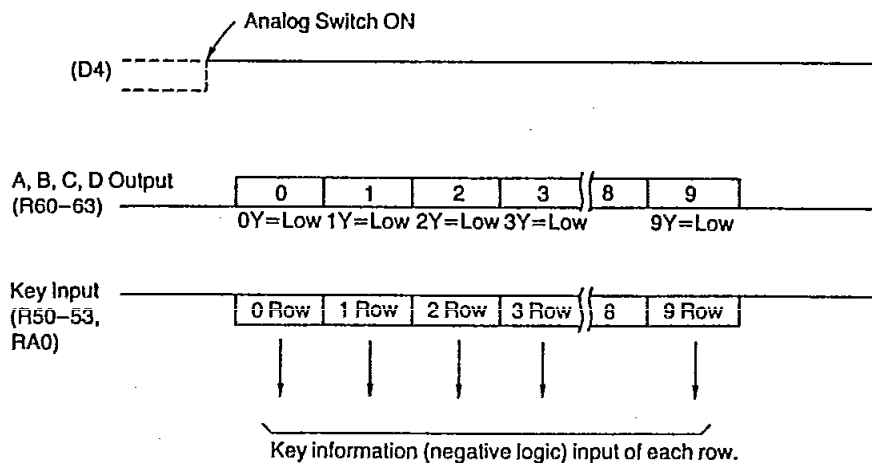
Sequential input information (negative logic) from the DSS console is executed by dynamic scanning.

The ports 0Y to 9Y of IC103 are brought to low status consecutively, by the pulse sent from the ports R60 to R63 of IC101. If a key is pressed, the input of key-in information is executed by ports R50 to R53.

Circuit Diagram



Key Input Control Timing Chart



4. DATA COMMUNICATION CIRCUIT

Function:

The data communication circuit serves the following functions:
 Information exchanger between EMSS and DSS console, key input information as well as data for the LED control, etc. this information is continuously exchanged at all times.

Circuit Operation:

When the DSS console receives an IRQ signal from the EMSS and after sending the key input information (19 pulses) to the EMSS and receiving data (47 pulses) for LED control, etc. The DSS console will return to the EMSS an acknowledge signal.

1) Reception

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

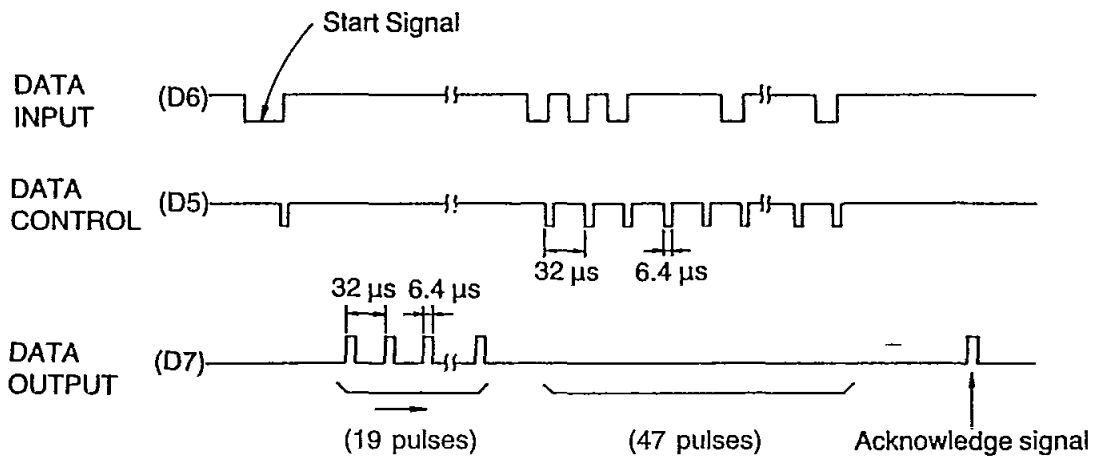
H, L Line → PT101 → R106 → Q102 → IC104 → IC101 pin 60

2) Transmission

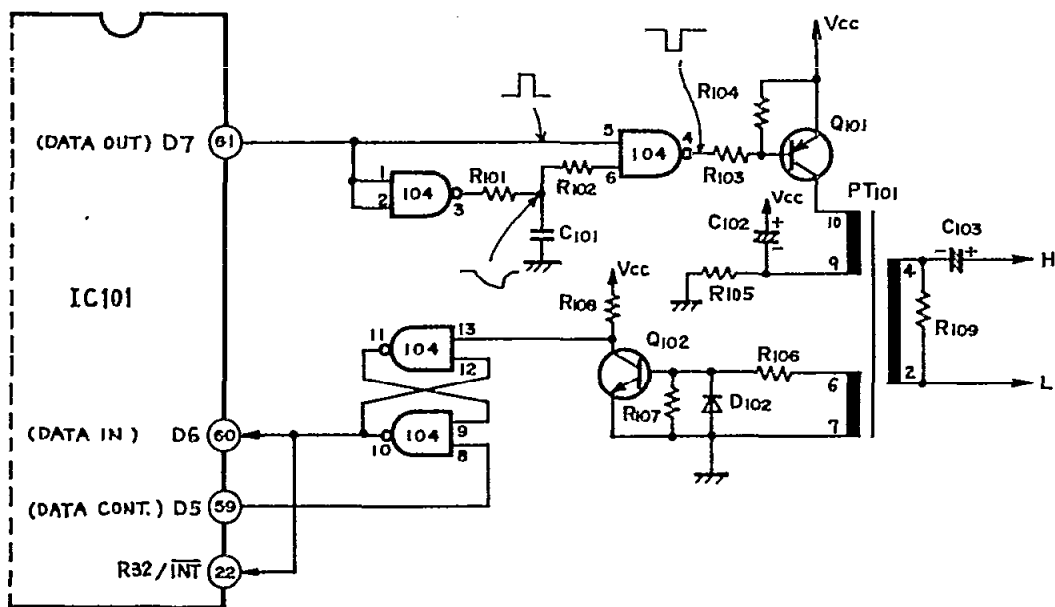
The data to the DSS console is transmitted along the following path.

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

Timing Chart



Circuit Diagram



5. LED CIRCUIT

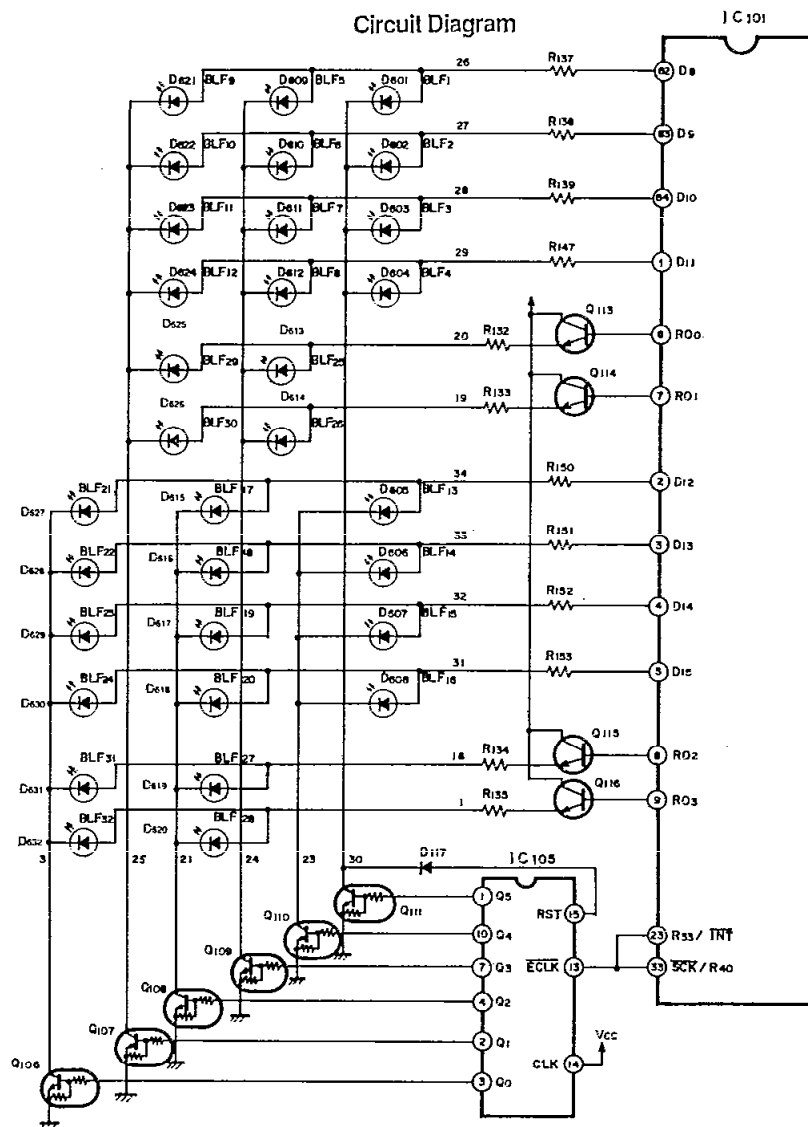
Circuit Operation:

The LED executes dynamic lighting for the status indicators, and control is executed by the output ports Q0 to Q5 (column) of the decode counter(IC105) and D8 to D15, R00 to R03 of IC101.

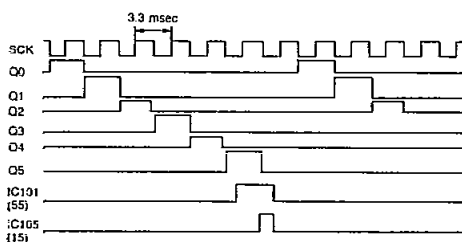
When data transmission between the EMSS and the DSS console is started, a fixed pulse(T=3.3msec, 1/2 duty) is output continuously from the SCK terminal of IC101, and this pulse is counted, and the output of IC105 is shifted sequentially from Q0, Q4 and Q5. When Q5 becomes a high is output at the same time from pin 55 of IC101.

When the level on IC105(Q5) changes from a high to a low by the next pulse, pin 15 of IC105 becomes a high, so that the counter is reset, and output again will be executed sequentially from Q0.

On the other hand, D8 to D15, R00 to R03 of IC101 output pulses, and the lighting of the lighting of the LED is controlled by the timing of the outputs of IC105.

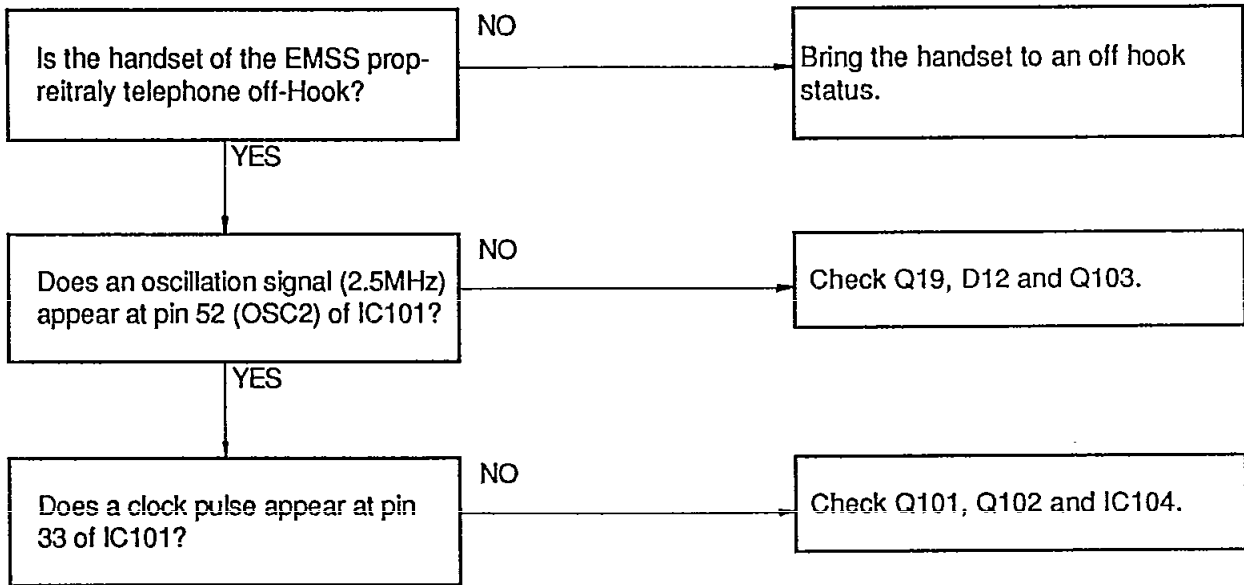


Timing Chart

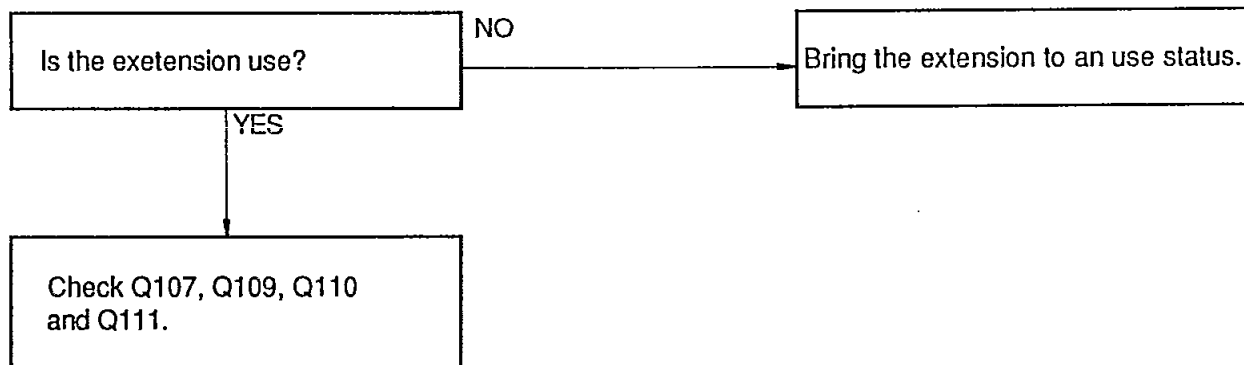


TROUBLESHOOTING GUIDE

1) NO OPERATION



2) LED DOES NOT LIGHT



ACCESSORIES AND PACKING MATERIALS

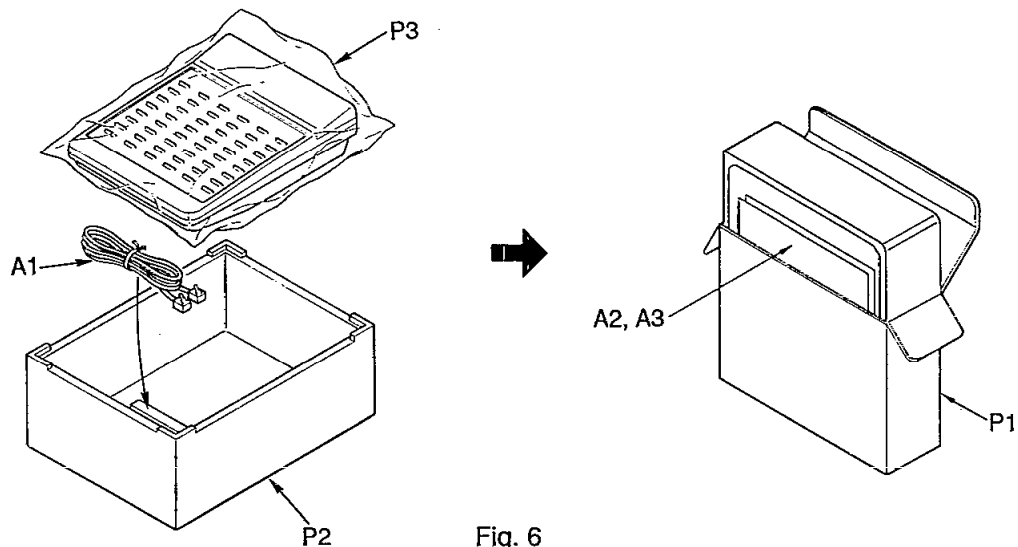


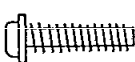


Fig. 6

CABINET AND ELECTRICAL PARTS LOCATION

ACTUAL SIZE OF SCREWS

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

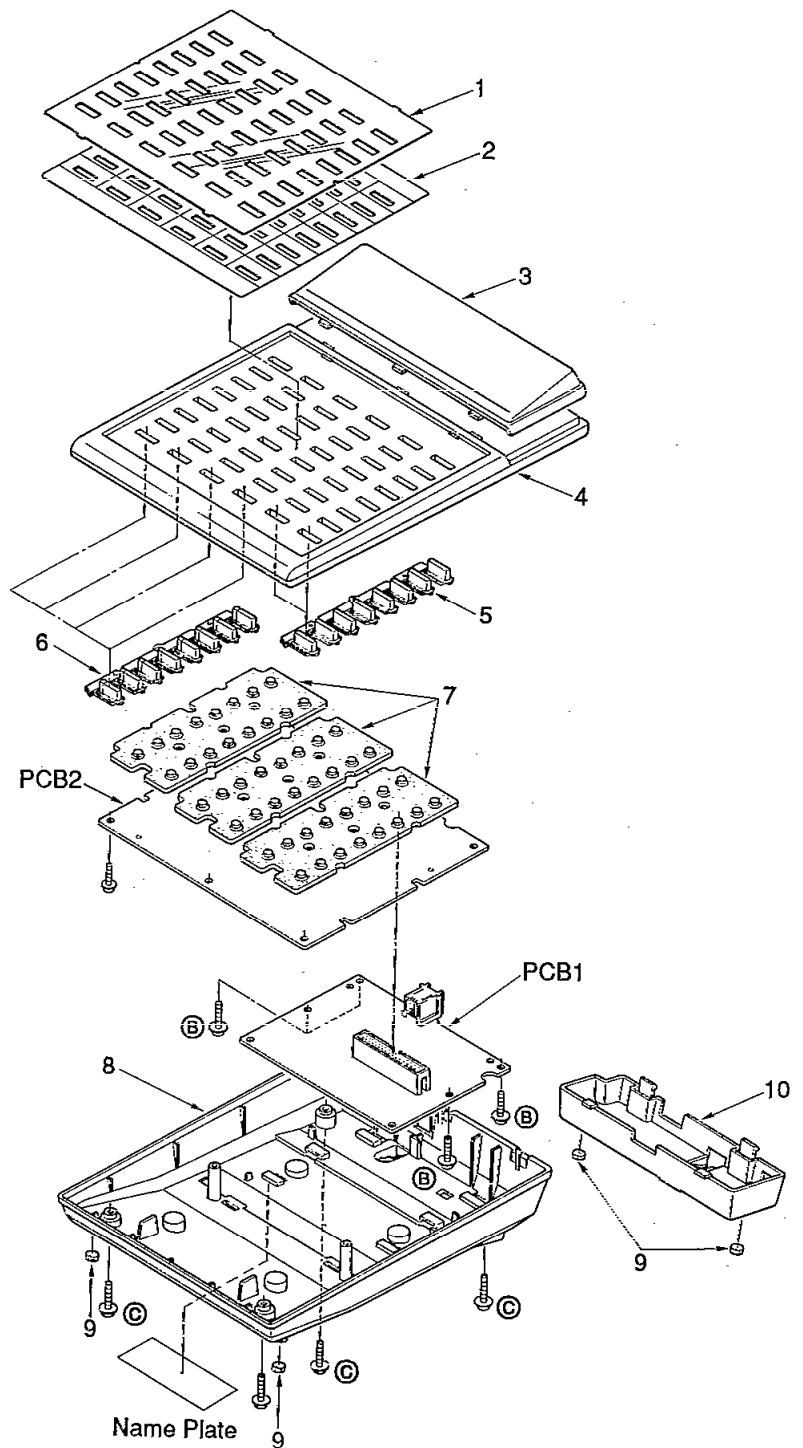


Fig. 7

This replacement parts list is for CANADA version only.

Refer to the simplified manual (cover) for other areas.

REPLACEMENT PARTS LIST				Ref. No.	Part No.	Part Name & Description	Pcs																																																					
Model KX-T7240C				Q105	Not Used																																																							
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 dependent 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. 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 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>ERC:Solid</td> <td>ERX: Metal Film</td> <td>PO4R: Carbon</td> </tr> <tr> <td>ERD: Carbon</td> <td>ERG: Metal Oxide</td> <td>ERS: Fusible Resistor</td> </tr> <tr> <td>PQRD: Carbon</td> <td>ER0: Metal Film</td> <td>ERF: Cement Resistor</td> </tr> </table> Wattage <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>10,16;1/8W</td> <td>14,25;1/4W</td> <td>12;1/2W</td> <td>1;1W</td> <td>2;2W</td> <td>3;3W</td> </tr> </table> *Type & Voltage of Capacitor Type <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>ECFD: Semi-Conductor</td> <td>ECCD, ECKD, ECBT, PQCBC : Ceramic</td> </tr> <tr> <td>ECQS: Styrol</td> <td>ECQE, ECQV, ECQG : Polyester</td> </tr> <tr> <td>PQCUV: Chip</td> <td>ECEA, ECSZ : Electrolytic</td> </tr> <tr> <td>ECQMS: Mica</td> <td>ECQP : Polypropylene</td> </tr> </table> Voltage <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ECQ Type</th> <th>ECQG Type</th> <th>ECSZ Type</th> <th colspan="3">Others</th> </tr> <tr> <td>1H: 50V</td> <td>05: 50V</td> <td>0F: 3.15V</td> <td>0J :6.3V</td> <td>1V :35V</td> <td></td> </tr> <tr> <td>2A: 100V</td> <td>1:100V</td> <td>1A: 10V</td> <td>1A :10V</td> <td>50,1H:50V</td> <td></td> </tr> <tr> <td>2E: 250V</td> <td>2:200V</td> <td>1V: 35V</td> <td>1C :16V</td> <td>1J :63V</td> <td></td> </tr> <tr> <td>2H: 500V</td> <td></td> <td>0J: 6.3V</td> <td>1E, 25: 25V</td> <td>2A :100V</td> <td></td> </tr> </table>				ERC:Solid	ERX: Metal Film	PO4R: Carbon	ERD: Carbon	ERG: Metal Oxide	ERS: Fusible Resistor	PQRD: Carbon	ER0: Metal Film	ERF: Cement Resistor	10,16;1/8W	14,25;1/4W	12;1/2W	1;1W	2;2W	3;3W	ECFD: Semi-Conductor	ECCD, ECKD, ECBT, PQCBC : Ceramic	ECQS: Styrol	ECQE, ECQV, ECQG : Polyester	PQCUV: Chip	ECEA, ECSZ : Electrolytic	ECQMS: Mica	ECQP : Polypropylene	ECQ Type	ECQG 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		Q106-111	PQVTDTC143E	TRANSISTOR(SI)	6
				ERC:Solid	ERX: Metal Film	PO4R: Carbon																																																						
				ERD: Carbon	ERG: Metal Oxide	ERS: Fusible Resistor																																																						
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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																																																								
Q112	Not Used																																																											
Q113-116	2SC1740S	TRANSISTOR(SI)	4																																																									
D12	MA4068	(DIODES) DIODE(SI)	1																																																									
D102	1SS131	DIODE(SI)	1																																																									
D103	MA4039	DIODE(SI)	1																																																									
D104-113	1SS131	DIODE(SI)	10																																																									
D114	Not Used																																																											
D115-119	1SS131	DIODE(SI)	5																																																									
D120	PQVDS1YB40F1	DIODE(SI)	1																																																									
CS101	PQVCX2500N9	(CRYSTAL OSCILLATOR) CRYSTAL OSCILLATOR	1																																																									
PT101	ETE13K24AY	(TRANSFORMER) TRANSFORMER	1																																																									
C70	PQCUV1H103KB	(CAPACITORS) 0.01	S 1																																																									
C71	ECEA1VKS100	10	S 1																																																									
C72	ECEA1AU221	220	S 1																																																									
C101	PQCUV1H151JC	150P	S 1																																																									
C102	ECEA1HKS2R2	2.2	S 1																																																									
C103	ECEA1HKS010	1	S 1																																																									
C104	Not Used																																																											
C105	PQCUV1H390JC	39P	S 1																																																									
C106	PQCUV1H390JC	39P	S 1																																																									
C107-109	Not Used																																																											
C110	ECEA1HKS010	1	S 1																																																									
C111	PQCUV1H103KB	0.01	S 1																																																									
C112	ECEA0JU102	1000	S 1																																																									
C113	Not Used																																																											
C114	PQCUV1H103KB	0.01	S 1																																																									
C115	Not Used																																																											
C116	PQCUV1H103KB	0.01	S 1																																																									
C117	Not Used																																																											
C118	PQCUV1H103KB	0.01	S 1																																																									
R82	PQ4R10XJ332	3.3K	S 1																																																									
R101	PQ4R10XJ103	10K	S 1																																																									
R102	PQ4R10XJ103	10K	S 1																																																									
R103	PQ4R10XJ472	4.7K	S 1																																																									
R104	PQ4R10XJ472	4.7K	S 1																																																									
R105	PQ4R10XJ101	100	S 1																																																									
R106	PQ4R10XJ222	2.2K	S 1																																																									
R107	PQ4R10XJ472	4.7K	S 1																																																									
R108	PQ4R10XJ102	1K	S 1																																																									
R109	PQ4R10XJ221	220	S 1																																																									
R110-112	Not Used																																																											
R113	PQ4R10XJ105	1M	S 1																																																									
R114-117	Not Used																																																											
R118	PQ4R10XJ392	3.9K	S 1																																																									
R119	PQ4R10XJ103	10K	S 1																																																									
R120	Not Used																																																											
R121	PQ4R10XJ103	10K	S 1																																																									
R122	PQ4R10XJ472	4.7K	S 1																																																									
R123-125	Not Used																																																											
R126-131	PQ4R10XJ102	1K	S 6																																																									
R132-135	PQ4R10XJ181	180	S 4																																																									
R136	Not Used																																																											
R137-139	ERDS2TJ181	180	S 3																																																									
R140-144	Not Used																																																											
R145	PQ4R10XJ102	1K	S 1																																																									
R146	PQ4R10XJ102	1K	S 1																																																									
R147	ERDS2TJ181	180	S 1																																																									
R148-149	Not Used																																																											
R150-153	ERDS2TJ181	180	S 4																																																									
R154-159	Not Used																																																											
R160	PQ4R10XJ3R9	3.9	S 1																																																									
R161	PQ4R10XJ4R7	4.7	S 1																																																									
R170-176	PQ4R10XJ473	47K	S 7																																																									

This replacement parts list is for CANADA version only.

Refer to the simplified manual (cover) for other areas.

Ref. No.	Part No.	Part Name & Description	Pcs
CN1 CN3	PQJP34D30Y PQJJ1TB26Z	(CONNECTOR & JACK) CONNECTOR, 34P JACK, TEL.	1 1
OPERATION BOARD PARTS			
PCB2	PQWP2T7240C	OPERATION BOARD ASS'Y (RTL)	1
D601-632	LN1261C	(DIODES) LED	32
CN601	PQJS34X33Y	(CONNECTOR) CONNECTOR, 34P	1
FIXTURES AND TOOL			
EC1	PQZZ34K1Z	EXTENSION CORD, 34P Note: Extension cords are useful for servicing. (They make servicing easy.)	1

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