Product Description

[1] General:

This product is a facsimile equipment for PSTN and transmits/receives documents in the G3 mode of operation. It has a Cordless Telephone(Cordless Handset), and also has a Telephone Answering Machine function.

This product is named Facsimile, Model UX-CL220, and Cordless Handset may have Model Number of UX-CL220K (suffix "K" is optional, so may be followed by K, or no suffix.)

Specification for Facsimile:

No.	Items	Description
1	Applicable Telephone Line	Public Switched Telephone Network
2	Compatibility	ITU-T (CCITT) G3 mode
3	Configuration	Half-Duplex, Desktop Transceiver
4	Compression Scheme	MH, MR, MMR
5	Recording System	Thermal Transfer Recording
6	Modem Speed	14,400 bps with automatic fallback to lower speed
7	Power Requirements	120V ac, 60Hz, 100W, 1.4A
8	Operating Environment	5 to 35ºC
9	Humidity	25 – 85% RH

Specification for DSSS Cordless Phone:

No.	Items	Description
1	Frequency Range	2404.8 – 2475.0MHz
2	Frequency Tolerance	1ppm
3	Number Of Channel	40CH
4	Channel Spacing	1.8MHz
5	Access Method	FDMA-TDD（Frequency Division Multiple Access, Time Division Duplex)
6	Spread Method	DSSS (Direct Sequence Spread Spectrum）
7	Chip Rate	12chips/bit
8	Data Transfer Rate	100kbps
9	Rate Of Base Band Data	1200kbps
10	Modulation Method	DBPSK (Differential Binary Phase Shift Keyed)

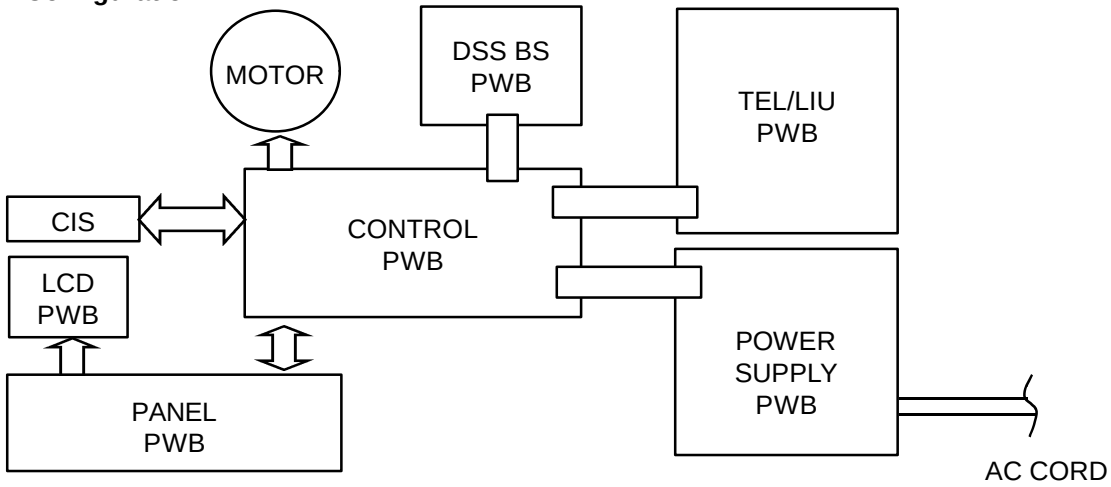
[2] Circuit Description: Facsimile Part

1. General Description

The compact design of the control PWB is obtained by using CONEXANT fax engine in the main control section and high density printing of surface mounting parts.

Each PWB is independent according to its function as shown in Fig. 1.

2. PWB Configuration



1) Control PWB

The Control PWB controls peripheral PWBs, mechanical parts, transmission, and performs overall control of the unit.

This machine employs a 1-chip modem (SCE214V) which is installed on the control PWB.

2) TEL/LIU PWB

This PWB controls connection of the telephone line to the unit.

3) Power Supply PWB

This PWB provides voltages of Vreg(+5V) and +24V to the other PWBs.

4) Panel PWB

The Panel PWB allows input of the operation keys.

5) LCD PWB

This PWB controls the LCD display.

6) Interface PWB

This PWB connect Control PWB with Panel PWB.

3. Operation Description

Operational descriptions are given below:

- **Transmission Operation**

When a document is loaded in stand-by mode, the state of the document sensor is sensed via the 1 chip fax engine (SCE214V). With depression of the START key in the off-hook state, transmission takes place. Then, the procedure is sent out from the modem and the motor is rotated to move the document down to the scan line. In the scan processor, the signal scanned by the CIS is sent internal image processor and the AD converter to convert the analog signal into binary data. This binary data is transferred from the scan processor to the image buffer within the RAM and encoded and stored in the transmit buffer of the RAM. The data is then converted from parallel to serial form by the modem where the serial data is modulated and sent onto the line.

- **Receive Operation**

There are two ways of starting reception, manual and automatic. Depression of the START key in the off-hook mode in the case of manual receive mode, or CI signal detection by the automatic receive mode.

First, the SCE214V controls the procedure signals from the modem to be ready to receive data. When the program goes into phase C, the serial data from the modem is converted to parallel form in the modem interface of the 1 chip fax engine (SCE214V) which is stored in the receive buffer of the RAM. The data in the receive buffer is decoded software-wise to it as binary image data in the image buffer. The data is DMA transferred to the recording processor within the SCE214V which is then converted from parallel to serial form to be sent to the thermal head. The data is printed line by the SCE214V which is assigned to control the motor rotation and strobe signal.

- **Copy Operation**

To make a copy on this facsimile, the COPY key is pressed when the machine is in stand-by with a document on the document table and the telephone set is in the on-hook state. First, depression of the COPY key advances the document to the scan line. Similar to the transmitting operation, the image signal from the CIS is converted to a binary signal in the DMA mode via the 1 chip fax engine (SCE214V) which is then sent to the image buffer of the RAM. Next, the data is transferred to the recording processor in the DMA mode to send the image data to the thermal head which is printed line by line. The copying takes place as the operation is repeated.

- **RF Block Description**

The communication using radio is performed TDD operation between the sets of keeping a common system ID.
The system ID is stored nonvolatile memory of each set.
The ID code are kinds of 2 ^ 24.

Transmission
Voice signal is inputted from microphone and headset is adjusted the level of signal and converted from analog signal to digital signal in the CODEC, and is sent to Merlin (Baseband IC).
In Merlin, the inputted signal is converted ADPCM data and scrambled by XORed PN sequence.
The scrambled signal is differentially encoded and spreaded.
A 12chip spreading code is used to meet FCC part 15.247 requirements for a DSS(Digital Spread Spectrum) system.
The spreaded signal is modulated by BPSK(Binary Phase Shift Keying) and is sent to RF109(2.4GHz Digital Spread Spectrum Transceiver).
RF109 generates the Local Oscillator(LO) frequencies using a PLL(Phase Look Loop) frequency synthesizer and external 2.4GHz VCO(Voltage Controlled Oscillator).
The baseband signal from Merlin is mixed LO frequency.
The mixed signal pass through Matching Network Circuits and is sent to RF110(RF Power Amplifier).
The Amplified signal in RF110 pass through Antenna Matching Circuit and is sent to Antenna.

Reception
The signal from radio pass through BPF (Band Pass Filter) of 2.4GHz band width and is sent to RF109.
RF109 adjust the level of signal in LNA（Low Noise Amplifer) and downconverted to Baseband I/Q signals.
Baseband I/Q signals is sent to the Merlin and despread, demodulated and descrambled to ADPCM data.
The ADPCM data is converted analog signal in CODEC.

Channel Number	Channel Center Frequency (MHz)	Channel Number	Channel Center Frequency (MHz)
1	2404.8	21	2440.8
2	2406.6	22	2442.6
3	2408.4	23	2444.4
4	2410.2	24	2446.2
5	2412.0	25	2448.0
6	2413.8	26	2449.8
7	2415.6	27	2451.6
8	2417.4	28	2453.4
9	2419.2	29	2455.2
10	2421.0	30	2457.0
11	2422.8	31	2458.8
12	2424.6	32	2460.6
13	2426.4	33	2462.4
14	2428.2	34	2464.2
15	2430.0	35	2466.0
16	2431.8	36	2467.8
17	2433.6	37	2469.6
18	2435.4	38	2471.4
19	2437.2	39	2473.2
20	2439.0	40	2475.0