

## **SUBSCRIBER IDENTITY UNIT TO MAIN DISTRIBUTION FRAME IN SRI LANKA TELECOM (PLC)**

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### **ABSTRACT**

Sri Lanka Telecom PLC (SLT) is the largest telecommunication service provider in Sri Lanka. The company provides a variety of domestic and corporate services which includes fixed and wireless telephony, internet access and IT services to domestic, public & business sector customers. Main Distribution Frame (MDF) is the main part of the Sri Lanka Telecom PLC. That is the place which connects the customer side and the exchange side. It is the main location that provides the connection to the Public Switching Telephone Network (PSTN) and Asymmetric Digital Subscriber Line (ADSL). Sri Lanka Telecom uses a clarity data base in test room and MDF section which is like a heart of the Sri Lanka Telecom (PLC). This database consists all the data of the subscribers like the Distribution point (DP), the cabinet numbers, the MDF tab block location etc. But unfortunately this database is not accurate. The accuracy of this database is very important to provide the effective and efficient service to the customer. The research area is based on this MDF section and it is attempted to minimize the faults which occurs from incorrect data.

**Keywords:** *Main Distribution Frame, Clarity, Tab block, Dual tone multi frequency*

### **1.0 INTRODUCTION**

The Sri Lanka Telecom Outside Plant Maintenance Center (OPMC) has many divisions which are important to provide a good service to their customers and they are Code Division Multiple Access (CDMA), Asymmetric Digital Subscriber Line (ADSL), New connection section. Other sections are not directly dealing with the customers. But, they act the most important part to provide a satisfactory service to the customer like Main Distribution Frame (MDF), transmission section and cable development section. All the telecom customers' details are saved in a database which is called as clarity database used in test room and MDF. It is very important to the MDF and maintains section. But sometimes this database is not fully accurate. When a technical person tries to rectify a fault or provides a new connection to customer or disconnects a customer line, he faces

with many difficulties due to the problems in database. One such problem is the wrong customer MDF tab block location. At such an instant, currently, they use the test phone and the MDF Caller Line Identity (CLI) unit to verify the customer location by referring the customer telephone number. In this study, it is aimed to design a call generator which can be replaced for the test phone and planned to connect the CLI unit separately.

## 2.0 EXPERIMENTAL

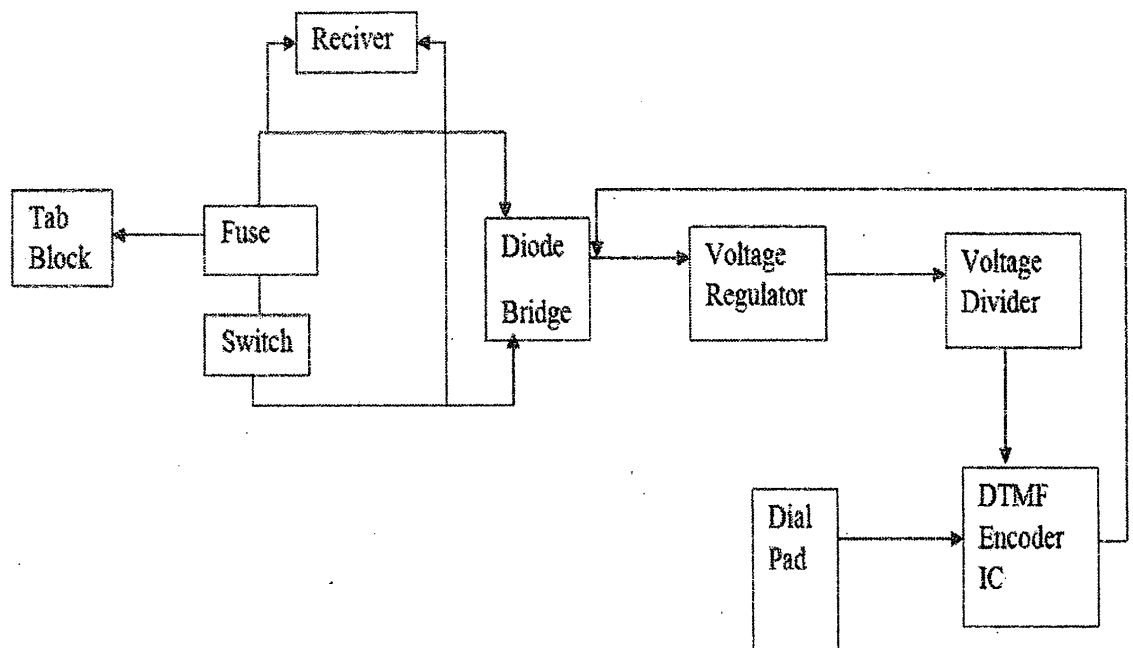


Figure 1: Block diagram of the circuit

### Preparing the circuit

The Dual Tone Multi Frequency (DTMF) technology was used all telephones for generating a call. The DTMF frequencies were handled by call switching process<sup>1</sup>. The circuit designed in this study was developed by using the DTMF encoder UM 91214IC and connecting to the dial pad.UM91214 has four series. The UM91214A IC was used in this circuit design<sup>2</sup>. The power that needs to work the IC was supplied from the tab block. The circuit and the tab block was connected using the fuse. The fuse was disconnecting the underground side and it was directly connected with the exchange side. This 8 V AC voltage was converted to the DC voltage by using a diode bridge. The 7805 voltage regulator was reduced the ~8 V line voltage to 5 V. The voltage divider circuit was divided 5 V into ratio of 2:1 and supplied ~3 V to UM91214 IC as an operating voltage. The MDF

telephone number was dialed, DTMF encoder IC was encoded the frequencies according to the dialed number .The DTMF encoder output was connected to the diode bridge. The voltage of the diode bridge was varied according to the DTMF encoder output and it sent to the exchange as the voltage variation. The exchange was switched call for the subscriber. By using the CLI unit which was connected to the MDF it is possible to obtain the subscriber telephone number. The ON/OFF switch was used as the cradle switch which has the telephone. The switch was ON (off hook mode of normal telephone) the dial tone passes through the telephone line and ready to accept a call.

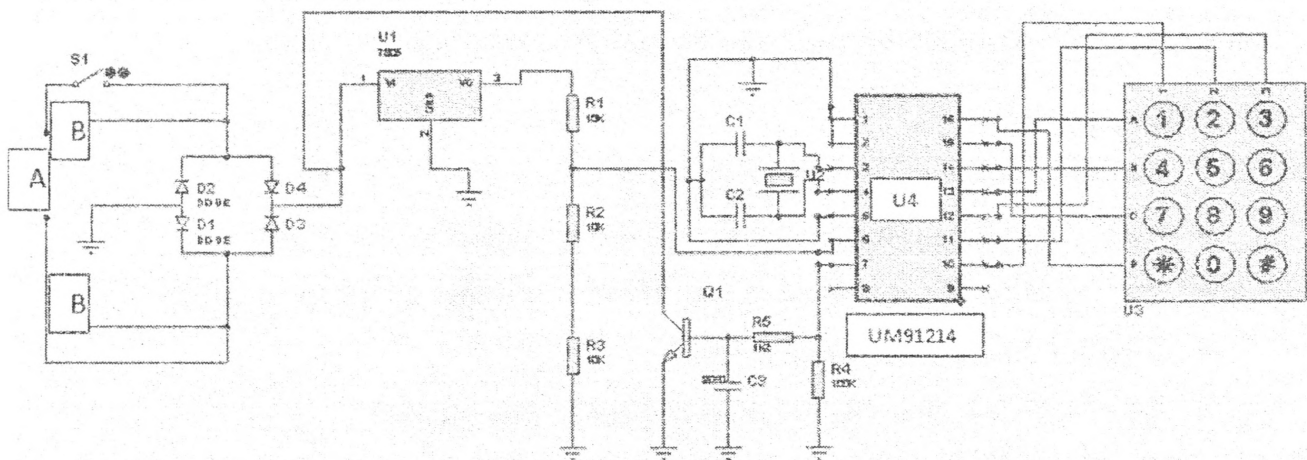


Figure 2: Circuit diagram

S1	-ON/OFF switch	D1,D2,D3,D4	-1N4007 diode
U1	-LM7805	R1,R2,R3	-10 K resistors
R4	-100 K resistor	R5	-1.2 K resistor
C1,C2	-15 µF capacitors	C3	-20*10 <sup>-3</sup> µF capacitor
U2	-3.58 MHz crystal	U3	-Dial pad
U4	-UM91214 DTMF encoder IC	Q1	-8050 transistor
B	-Connected to the receiver	A	-Connected to the fuse

### 3.0 RESULTS AND DISCUSSION

When a customer reports a fault to 1212, technical people have to identify the correct location of the customer in MDF to repair the fault. In this study, a device was built up which can obtain the customer telephone number standing in one place. By using this

equipment a call can be taken to the MDF telephone & the customer telephone number can be checked by using the CLI unit.

When a telephone is in off hook mode, the telephone line voltage is  $\sim 8$  V. When it is in on hook mode, the telephone line voltage is  $\sim 48$  V<sup>3</sup>. The dial tone must available in the telephone line to make a call. The dial tone passes through the telephone line when it is in the off hook mode. The receiver was used to hear the dial tone.

The PIC 16F877A microcontroller can be used as a dial pad after loading a suitable program code which helps it to function as a dial pad. But the problem is writing the program using the unique MDF telephone number. So that program is unique to that particular MDF. In other words, it can be used in one specific MDF only.

### 3.1 Advantages

- Easier to use than the normal test phone
- Can obtain the customer telephone number standing in one place
- Only one person is needed to identify the customer telephone number
- Smaller than the normal test phone
- More efficient than the previous or present day method

### 3.2 Disadvantage

- Can only use for one specific MDF

## 4.0 CONCLUSION

There need to have a sound knowledge about the DTMF technology and the special tones like dial tone, busy tone etc. and the basic telephone call routing process. Because these are the basic concepts that used to develop the circuit designed .The circuit was prepared using DTMF encoding method, call routing process, voltage regulation and diode bridge methods. The circuit designed in the study was very easier to use than the test phone. This design can be developed to get all the customer's telephone numbers in a tab block at one time by using the PIC microcontroller after loading a suitable program.

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