

# SINGLE CHANNEL MINI-EXCHANGE

- a community development technology-

## A PAPER PRESENTATION

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## **ABSTRACT:**

We are preparing for a future where new platforms and service architectures enable the virtual highways- mobile, fixed lines, cable and internet- to converge seamlessly; empowering people to communicate much more freely, boundlessly, independent of time or space. This is the concept of Single channel Mini-exchange.

A system that extends telephone services to remote area, uses access to Digital telecommunication equipment, eliminates communication delay as well as quick link is of top priority.

By implementation, the system is expected to provide congestion in the telephone path that is not subject to incessant interruption as is the case with conventional process.

## **INTRODUCTION**

Communication is essential to human progress. It allows people to expand their horizons, capture new exciting opportunities and exercise greater degree of freedom and choice.

Telecommunication development in the rural areas is marked by a lot of short comings. There is indeed a remarkable difference between planned targets and their realization. The greatest problem is the fact that I.T. Experts and Engineers are confined in developed countries and see no great prospects in developing countries. We all need a complete and confident exchange of multimedia information able to fascilitate and promote the development of Electronic Communications and Networks. Such as the Internet. This is my utmost goal of embracing the concept of Single Channel Mini- Exchange as a Community Development Technology.

## **AIMS**

The primary aims of the Single Channel Mini-exchange include:

- Telephone Loop conversion.
- Provision of Telephone service at Remote areas.
- Access to IDD fascilities.
- Access to Internet fascilities.
- Provision of acceptable replica of the information at the destination.

It is interesting to note here that the localizaion of the telephone is paramount to Gobalization of the telephone system. Acase study whereby the telephone system is inadequate in the remote areas brings to null the effective implementation of the Global System on Mobile Communication.

Some selected Trend data and examples from a Report, which still possess a true picture of the Telephone Industry:

- 75% of the world's Telephones are Installed in eight Industrialized Countries.
- Around 80% of the world's people have neither a phone nor regular access to one.
- Sweden has a 'Teledensity' (Telephone per 100 people) rating of 68 and the U.S.A. rating 57.
- There are more mobile phones in Sao Paulo, Brazil than Paris, France.
- About 80% of Kenya's people live in places that have no phone.
- A Chinese study concluded that USD 12 Million Invested in telecommunications would lead to an increase in a National income of US 160 Million dollars over 10 years.

Source: "Telecommunications - Development and the market: The promises and the problems "

PANOS Media Briefing No 23 March 1997.

## **WORKABILITY**

Many of the problems and delay usually encountered by a subscriber when calling a distant area are reduced to mere shadows by the provision of a link between the subscriber and the distant exchange without passing through the Switching network of a local exchange. Such link can be realized by the application of such circuitry as this being discussed. The nature of which provides for the looping of dialing tone from another exchange outside the location of the caller.

The distant exchange sees the caller as its own subscriber and not that of the local exchange but still requires:

- Two wire Channel from the MDF to IDF in the transmission room.
- The services of a base transmission equipment as well as a repeater station from Microwave link.
- The distant exchange from where the tone is looped.
- Interface with Digital Transmission equipment.

## **DESIGN ANALYSIS**

The Single Channel Mini-exchange circuit comprises of the subscriber- end circuit and exchange-end circuit. The major idea behind the design is that of the possibility of converting the normal 2-wire terminal of the telephone set into a 4-wire terminal for termination at the channel circuit and vice versa, and also the conversion of the 2-wire terminal from the distant exchange into a 4-wire terminal for conversion at the channel circuit and vice versa.

An additional signaling is provided to transmit the signaling voltages.- Dialing tone, ac ringing voltages, and dc ringing tone- by this each of the modules (circuits) is capable of:

- Transmittng Speech through 2-wire.
- Receiving Speech through 2-wire.
- Transmitting Signaling Voltages through the M-wire.
- Receiving Signaling through the E-wire.

## **OPERATIONS IN BRIEF**

### **Subscribers circuits**

When the handset is lifted the 2-wire terminal is short, subsequently earth signal flows through the transformer with -48dc voltage standing at the other terminals, the relay make, closing the contacts. The closing of these contacts causes the lightening of the LED. Indicating that the module is on traffic as well as the transmission of the earth signal through the M-wire into the signal input unit of the channel circuit which is later transmitted by microwave to the distant exchange. The distant exchange, on seeing this transmitted earth voltage, sends a signal that is received and heard as dialing tone.

During signaling reception, earth signal from the channel card enters the subscriber's module through the E-wires; which causes the relay to make transferring the contacts and thereby connecting the ringer which alerts the subscriber of a call.

### **Exchange circuits**

The transmitted earth signal from the 2-wire of the subscriber's module is received at the E-wire of the exchange module; relay operates closing contacts. The closure ensures the lightening of LED indicating that the line is on traffic.

As soon as the relay closes, the exchange senses the drop across and sends a 90ac signal through the capacitor to the bridge rectifier, which gives a 42v dc output to operate the relay, leading to the making of the contact and thus causing speech circuit to be open during signaling.

## **AREAS OF APPLICATION**

Presently there is a wide range of application of such a system, few of which are outline below, although the aim of this presentation is to see the future improvement at a wider scope especially as a Community Development Technology where telecommunication facilities is deluded.

These includes:

- Uninterrupted link.
- Quick link.
- Business Transaction in eliminating the risk of accidents.
- Direct link.
- Health and other emergency situations.

## **CONCLUSION**

Every telecommunication based project is an interesting one, because it helps to bridge the gap and bring to proximity the subscribers. The effective application of this project sincerely has all it takes to satisfy the subscriber in this age of increasing need for a reliable telecommunication networks.

It therefore becomes timely to recommend the application of the design to great IT Experts for better performance and subscriber's satisfaction; and until we achieve this community development, we still cannot boast of total accomplishment in the telecommunication world.

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