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MUTING THE V.23 BACK CHANNEL
DESIGN A HALF DUPLEX V.23 MODEM WITH Z02201/Z02922

INTRODUCTION

The back channel (75 bps) in the ITU V.23 recommendation is specified as optional. The Zilog Z02201/Z02922 data pumps provide the back channel as the default condition. The Z02201/Z02922 data pumps do allow for muting of the back channel by the controller. This note will explain how the back channel can be successfully muted by the controller.

V.23 1200 BPS RECEIVE (NO BACK CHANNEL)

When the data pump is configured to receive at 1200 bps, the 75 bps back channel is the transmitting channel. In this configuration, the controller needs to set the TXSQLCH bit in the DPCTRL RAM location. This mutes the 75 bps back channel. A normal originate mode auto-handshake can then be used.

V.23 1200 BPS TRANSMIT (NO BACK CHANNEL)

When the data pump is transmitting using the 1200 bps mode, the 75 bps back channel is the receiving channel. In this case, the controller work is a little bit more complicated. This is because in the auto handshake mode, the data pump will normally look for the 75 bps carrier before transmitting the 1200 bps data. In this case the manual handshake mode is used. To do this the following steps are performed:

1. Set the CONFIG RAM location to 0413H (hex). This sets the data pump to the manual V.23 handshake mode transmitting at 1200 bps.

2. Set TRNCTRL to 5. This forces datamode.

3. Reset DPCTRL bit 6. This forces the 1200 bps transmission to begin even though no back channel has been detected. You are now in datamode and can transfer data. Make sure that the transmitter is unsquelched. This can be done by resetting the TXSQLCH bit in DPCTRL.

4. Wait for 50 ms for the other side to train up on the carrier. You may have to wait longer if the other side is doing an automode startup (i.e. cycling through different modes before settling).

The example code on the following page illustrates how to mute the V.23 back channel.

V.23 1200 BPS RECEIVE (NO BACK CHANNEL)

```
#define DPCTRL 0x1FA
#define TXSQLCH 0x8000
#define MDMSTATUS 5                    // Modem status register (R5)
#define CDET 0x2
unsigned char T_ms                     // Millisecond countdown timer


/* do V.23 Rx 1200 */
void do_V23rx1200() {
    int ltemp;                          // 16 bit temporary variable.

    ltemp = read_DSP_RAM(DPCTRL);      // Squelch the transmitter.
    ltemp |= TXSQLCH;
    write_DSP_RAM(DPCTRL, ltemp);
    write_DSP_RAM(CONFIG, 0x4014);     // Set V.23 originate 1200 bps rx.
    while (!(inp(MDMSTATUS) & CDET));// Wait for carrier detect.
    return;
}
```

V.23 1200 BPS TRANSMIT (NO BACK CHANNEL)

```
#define XFSKDATA 5
#define CONFIG 0x1FF
#define TRNCTRL 0x1FE
#define DPCTRL 0x1FA
#define TXSQLCH 0x8000
#define CDET 0x2
unsigned char T_ms // Millisecond countdown timer


/* do V.23 Tx 1200 */
void do_V23tx1200() {
    int ltemp;                          // 16 bit temporary variable


    write_DSP_RAM(CONFIG, 0x413);       // Set for V.23 1200 Tx manual
    write_DSP_RAM(TRNCTRL, XFSKDATA);   // mode and go into data mode.
    ltemp = read_DSP_RAM(DPCTRL);       // Tell the data pump NOT to
    ltemp &= ~0x40;                     // wait for a received tone.
    ltemp &= ~TXSQLCH;                  // Unsquelch the transmitter
    write_DSP_RAM(DPCTRL, ltemp);       // before going online.
    T_ms = 50;                          // Wait 50 ms for the
    while (T_ms);                       // other side to go online.
    return;                             // We can send data now.
}
```

CONCLUSION

By enabling the manual handshake mode, and following the basic code exemplified above, muting of the 75 bps back channel in V.23 operation becomes much easier than trying to use the traditional auto-handshake method.

The Z02201/Z02922 offers this flexibility by providing a simpler alternative. By utilizing the data pump feature, the Z02201/Z02922 allows successful muting of the V.23 back channel.

Written by SoftArt Microsystems, Inc.

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Zilog, Inc.
910 East Hamilton Avenue, Suite 110
Campbell, CA 95008
Telephone (408) 558-8500
FAX 408 558-8300
Internet: http://www.zilog.com