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Using V.35 to ISDN Backup on Xstream

Description and recommended use

1   Description

This feature is for a selectable backup mode for the Zephyr Xstream, in which the unit will detect a failure in V.35 mode and automatically connect to the far end in ISDN mode, to avoid prolonged loss of audio.

This mode is enabled through a front panel menu item labeled "ISDN Backup," with choices of "Disabled" or "Dial Setup 0"…"Dial Setup 9". When the mode is "Disabled" the unit will function normally as described in the current User's Manual for the product. This menu is used in conjunction with another new menu item called "Redial which must be set to a value greater than 0 for the ISDN backup mode to work.

If the Backup Mode is turned "**ON**", the unit will behave as follows (see Figure 1):

If an incoming ISDN call occurs during a connection, the unit checks the user setting for "Auto Ans" mode in the TEL menu. If this option is not set to [ALL] or [ISDN] then the unit will ignore the incoming call and continue operation. If Auto Answer is [ALL] or [ISDN] the unit will check to see if backup mode is turned ON. If so, the unit will disconnect from V.35, switch to ISDN mode, and answer the call. It will then use the settings stored in Autodial #0 (or other Auto dial indicated) to configure the sample rate, Transmit mode, and Receive mode. The unit will resume normal ISDN mode operation until the user disconnects the calls and changes the *Interface* setting on the Xstreams back to Split *V.35 or Single V.35*.

Assuming there is no incoming ISDN call, the unit will monitor the *LOCK* status the decoder as well as the status of the V.35 *Carrier Detect* lead (sometimes referred to as "CD," "Receive Line Signal Detect" or "RLSD"). If the unit loses *LOCK* or *Carrier Detect,* for x seconds (as set under *Redial*, the Xstream switches to ISDN mode.

Next the contents of the *Dial Setup* set for *ISDN Backup* is examined. If there is/are phone number(s) in the *Dial Setup*, the unit will dial them. If the *Dial Setup* "includes" Codec settings these will be set according to the settings in the *Dial Setup*. If there are codec settings, but no phone number, the unit will switch to those settings and simply wait for an incoming ISDN call. If include is set to *Number* (thereby not including codec information) and there is nothing entered in the specified *Dial Setup*, the unit will remain in the encode/decode modes last used in ISDN mode and wait for an incoming call.

If a BUSY result occurs when the Xstream attempts to dial out, the unit will continue to redial the same numbers until a connection is made or the unit is changed out of ISDN mode (or rebooted).

NOTE: It is entirely possible for data circuits to have high error rates without loss of *Carrier Detect*. For this reason we monitor *Lock* since, in the case of very high error rates, *Lock* will be lost, and can therefore trigger the backup procedure.
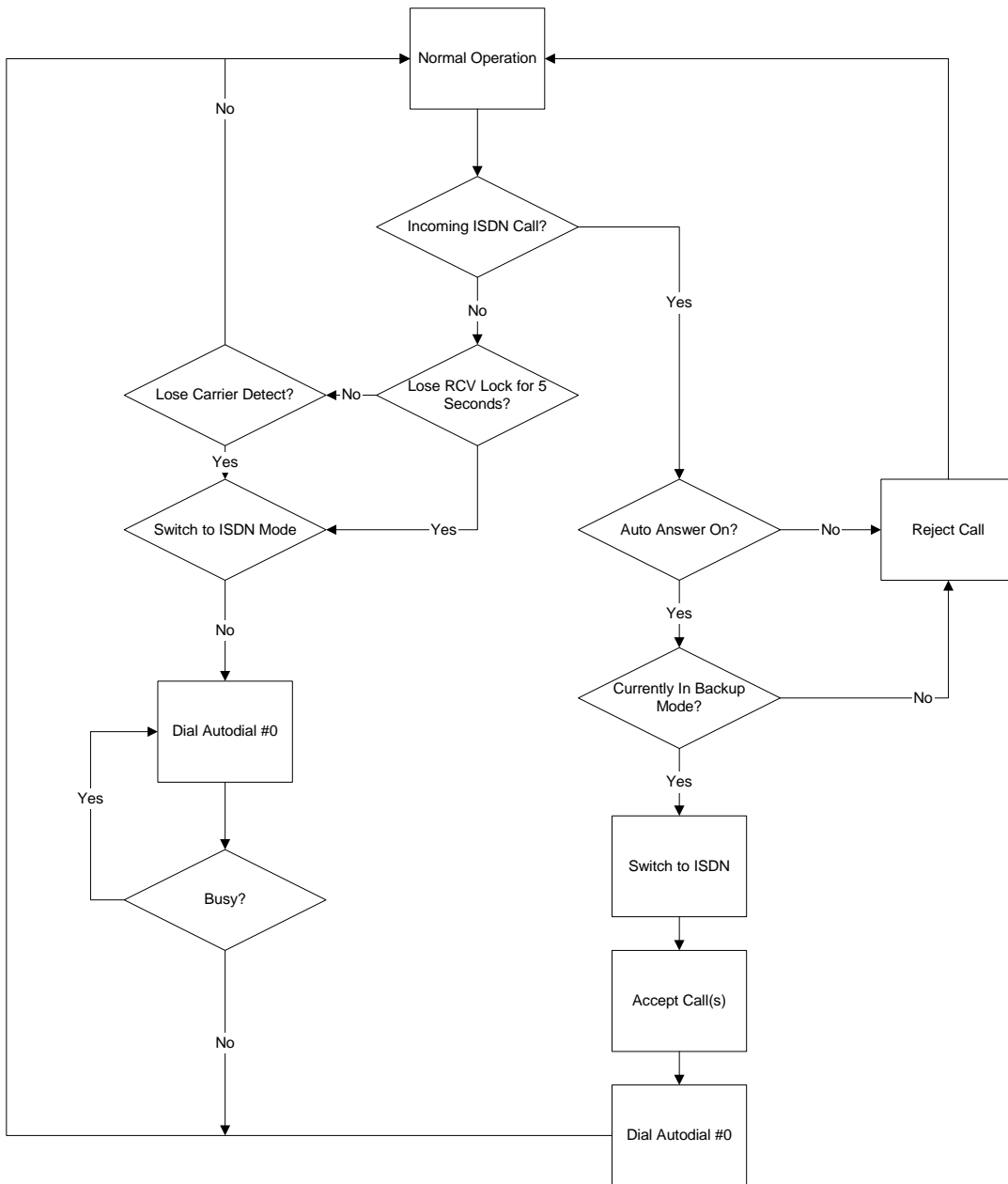
Figure 1

2 Recommended Use

The ISDN Backup mode is intended to allow automatic ISDN backup when the Xstream's V.35 port(s) is used for critical applications such as Studio Transmitter Links. If one understands how the system works (see section 1) there are a number of ways it can be used, however we make the following recommendations for the best performance. We will assume stereo operation in our examples.

One-way Applications

In this scenario, there is no audio in one of the two directions. In this case we'll deliberately misconfigure the receive mode of sending unit so that it will never achieve lock. This prevent needless triggering of the backup process.

Step-by-Step Configuration for One-way applications

1. Configure the two Xstreams for the intended V.35 application, and connect to the data lines. Generally an AAC stream will be used in such applications. Deliberately misconfigure the *Transmit* mode of the **receiving** unit and the *Receive* mode of the **sending** unit. Confirm correct operation and audio performance. Confirm that that the receiving unit has *LOCK* and that the sending unit **does not** have *LOCK*. Next perform the following steps on both units.

2. In the *TEL* menu, change the network from the chosen *V.35* mode to *ISDN*.

3. Configure the ISDN line parameters (*SPID* 1 & 2, *MSN/DN* 1 & 2, & *Telco*)

4. In the *CODEC* menu, configure the codec parameters. Choose a suitable *Transmit* mode on the sending unit, and the corresponding *Receive* mode on the receiving unit. Set both units to the same *Bitrate* & *Sample* rate.

5. Verify that the receiving unit can dial the sending unit using ISDN (using both lines 1 & 2). Once connected, verify that that the receiving unit has *LOCK*.

6. Drop the previously established calls.

7. **On the sending uni**t: Press *AUTO* and press <0> <0> to show the first *DIAL SETUP*. Choose *EDIT* and press *SEL*. Enter a name such as "ISDN_Backup". Make sure the *Number 1* & *Number 2* fields are empty. Set *Include* to "Number & Codec". Choose *Save* to save the Setup.

8. **On the sending unit**: Press *AUTO* and press <0> <0> to show the first *DIAL SETUP*. Choose *EDIT* and press *SEL*. Enter a name such as "ISDN_Dial". Enter the ISDN telephone numbers for the **sending unit** in the *Number 1* & *Number 2* fields respectively. Set *Include* to "Number & Codec". Choose *Save* to save the Setup.

9. **On both units**: Set the following in the *TEL* menu:
    *   Auto Ans = ISDN
    *   Redial = 2
    *   ISDN backup = Dial Setup 0

10. **On the receiving unit**: Press *AUTO* <0> <0> *AUTO* and verify that the *Dial Setup* is correctly configured (unit should be able to connect and should lock). Drop both calls.

11. You are now ready to switch to V.35 operation with backup. On each unit go to the *TEL* menu and change from *ISDN* to the proper *V.35* mode for your intended operation.

See below for information on restoring operation after backup.

Two-way Applications

In this scenario, there is audio in both of the two directions.

Step-by-Step Configuration for Two-way applications

1. Configure the two Xstreams for the intended V.35 application, and connect to the data lines. Generally an AAC stream will be used in such applications. Confirm correct operation and audio performance. Next perform the following steps on both units.

2. In the *TEL* menu, change the network from chosen *V.35* mode to *ISDN*.

3. Configure the ISDN line parameters (*SPID* 1 & 2, *MSN/DN* 1 & 2, & *Telco*)

4. In the *CODEC* menu, configure the codec parameters. Choose suitable *Transmit* modes on each unit, and the corresponding *Receive* mode on the other unit. Set both units to the same *Bitrate* & *Sample* rate.

5. Verify that each unit can dial the other unit using ISDN (using both lines 1 & 2). Once connected, verify that that each unit has *LOCK*.

6. Drop the previously established calls.

7. **On unit A**: Press *AUTO* and press <0> <0> to show the first *DIAL SETUP*. Choose *EDIT* and press *SEL*. Enter a name such as "ISDN_Backup". For *Number 1* enter the ISDN telephone number for unit B's *Line 1*. Make sure the entry for *Number 2* is blank. Set *Include* to "Number & Codec". Set *Mode* to *Zephyr*. Choose *Save* to save the Setup.

8. **On unit B**: Press *AUTO* and press <0> <0> to show the first *DIAL SETUP*. Choose *EDIT* and press *SEL*. Enter a name such as "ISDN_Backup". For *Number 2* enter the ISDN telephone number for unit B's *Line 2*. Make sure the entry for *Number 1* is blank. Set *Include* to "Number & Codec". Set *Mode* to *Zephyr*. Choose *Save* to save the Setup.

9. **On both units**: set the following in the *TEL* menu:
   - Auto Ans = ISDN
   - Redial = 2
   - ISDN Backup = Dial Setup 0

10. **On both unit at the same time**: Press *AUTO* <0> <0> *AUTO* and verify that the *Dial Setup* is correctly configured (unit should be able to connect, and after both connections have been established, both units should lock). Drop both calls.

11. You are now ready to switch to V.35 operation with backup. On each unit go to the *TEL* menu and change from *ISDN* to the proper *V.35* mode for your intended operation.

See below for information on restoring operation after backup.

Restoring operation after ISDN backup

1. First test the data line to make sure it is working properly. First look for abnormal status indicators on the CSU/DSU. If a bit error rate tester is available, disconnect the CSU/DSU from the Xstream and run bit error rate tests using various test patterns. If the line does not achieve an error rate of 1x10 E-7, or less, it is not suitable for use.

2. Once the line is verified as working, reconnect the V.35 connector(s) to the Xstream.

3. **On one of the two units:** Drop the ISDN calls by pressing *DROP* 4 times slowly. Verify the ISDN status returns to *Ready* for both lines.

4. **On both units:**
   - Drop the go to the *TEL* menu and change from *ISDN* to the proper *V.35* mode for your intended operation.

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