Zaxcom Miniature Digital Recorder User's Manual

ZFR100

ZFR800

Firmware Version: **6.10**

Updated: 2009-08-11 - 13:12

Zaxcom

230 West Parkway, Unit 9, Pompton Plains, NJ 07444 USA
Tel: 973-835-5000 Fax: 973-835-6633
Email: ***info@zaxcom.com*** Website: ***www.zaxcom.com***

Maintained by: Ray M. Owen, Production Sound Mixer

Table of Contents

Table of Figures

Table of Tables

Chapter 1 – Topics that apply to both units

What's Included with the ZFR100

- 1 – media slot dust plug
- 1 – belt clip
- 1 – blue Zaxcom storage/carrying case
- user manual on CD-ROM

Options

- TCR100 – Receive timecode and remote control signals from the optional IFB100
- TRX10 – Receive audio portion of IFB100 transmission (requires EA100 or STAxxx for monitoring IFB audio)
- TCA100 – Timecode adapter
- STA100 – Stereo adapter
- STA150 – Stereo adapter
- EA100 – Earpiece adapter
- IFB100 – Timecode/Remote Control Transmitter

What's Included with the ZFR800

- 1 – blue Zaxcom storage/carrying case
- user manual on CD-ROM

Options

- Shure microphone capsule(s)

User Manual Conventions

Throughout this manual, the following conventions are used:

- **STAxxx** – refers to the STA100 and STA150.
- **Cycle the power** – refers to turning power to the unit 'OFF', waiting a few seconds and then turning the power 'ON'.
- **{p.##}** – refers to the page number on which the item can be found.
- **MiniSD card** – refers to any approved card in ***Table 1-1*** {p.9}.

System Features

- Fault tolerant broadcast quality recording
- 96 hours of audio directly on a 16 GB removable MiniSD card
- Audio recording at 24 bits/48 kHz
- Supports both record/stop and continuous loop recording
- Backlit graphic liquid crystal display
- Frequency selectable highpass filter
- Selectable peak limiter
- Lightweight rugged design
- Integrated TC reader/generator accurate to 1 frame in 6 hours
- Efficient keypad for one-handed operation
- Integrated timecode reception (ZFR100 only)
- RF remote control of recorders (ZFR100 only):
  - Audio gain (Raise/Lower)
  - Recording (Start/Stop)
- Battery runtime:
  - ZFR100 – up to twenty hours on two AA Lithium batteries
  - ZFR800 – up to ten hours on one CR123 battery
  - IFB100 – no internal batteries, always runs on external power
- Size and weight: (H x W x D – while looking at the screen)
  - ZFR100 – 3.31" x 2.3" x 0.65" – 84 mm x 58 mm x 17 mm – 4.0 oz – 113g
  - ZFR800:
    - Body – 6.12" x 1.5" – 155 mm x 38 mm – 8.2 oz – 232g
    - Capsule (ex.) – 3.0" x 3.0" – 76 mm x 76 mm – 4.9 oz – 139g
  - IFB100 – 3.44" x 3.88" x 0.9" – 87 mm x 99 mm x 23 mm – 6.0 oz – 170g

Menu System

The user interface for each unit consists of a Liquid Crystal Display with 3 keys, as follows:

- **MENU** – Menu page/function select: press once to move to the next menu page.
- **INC** (up arrow) – Increment the current parameter selected by the **MENU** key.
- **DEC** (down arrow) – Decrement the current parameter selected by the **MENU** key.

Each menu has several pages allowing you to change configuration settings. All of these settings are stored in Flash ROM immediately after making the change.

Figure 1-1 ZFR100 Front View

Media

Some of the units read from and/or record to a MiniSD card, which is inserted into the media slot. All of the transmitters use a MiniSD card to update the unit's firmware. To be safe, you must use approved media:

Media	Manufacturer's ID	Approved?
SanDisk & Transcend 4GB SDHC MiniSD		**YES**
ALL Dane-Elec		**NO**
SanDisk 2GB MiniSD (retail packaging)	SDSDM-2048-A10M	**YES**
SanDisk 2GB MiniSD (bulk packaging)	SDSDM-2048, Bulk	**YES**
ALL SanDisk MicroSD (with MiniSD adapter)		**YES**
ALL SanDisk Ultra		**NO**
ALL SanDisk Ultra II		**NO**
Transcend 2GB (x80) MiniSD	TS2GSDM80	**YES**
ALL Transcend (x45)		**NO**
Transcend 4GB MiniSD	TS4GSDM80	**YES**
Any brand that prints the info on a sticker applied to the chip		**NO**

Table 1-1 Approved vs. Unapproved Media

IMPORTANT: To use any 4GB card, V5.53 or greater is required

If unapproved media is used, it can become jammed in the MiniSD socket and damage it.

CAUTION: Damage resulting from using unapproved media is not covered by the warranty.

Do **not** use SanDisk Ultra II cards. Formatting one of them may make it unusable.

Battery Installation

Each unit may require one or two batteries.

CAUTION: Always observe the correct battery polarity. The negative contact on the battery is always connected to the spring contact.

Never use any battery that is missing insulation on its body. If you do, it can cause a short circuit in the battery compartment, causing damage to the unit.

Battery Life

IMPORTANT: If operating using internal batteries, it is recommended that you use only Lithium or rechargeable NiMH. Any other battery chemistry including Alkaline and Ultra batteries have a substantially reduced runtime compared to Lithium or NiMH cells. This is true for all Zaxcom units.

External Power

Some of the units can be powered from an external power source. The external power connection is a 2.5 mm (0.1") barrel connector. The center pin is positive. The connector for the STA100 and IFB100 is the 760K.

Common Settings for Associated IFB Transmitter and Receivers

The following settings must agree, to allow associated IFB transmitters and receivers to work together, (this assumes that the same or compatible versions have been installed in all units):

IFB Receiver side		IFB Transmitter side	
Extended Menu		**Extended Menu**	
IFB Format page	{p.24}	*IFB Format page*	{p.43}
IFB Enable page	{p.24}		
Remote Control Group ID page	{p.26}	*Remote Control Group ID page*	{p.44}
		Standard Menu	
Remote Control Unit ID page	{p.27}	*Remote Unit ID page*	{p.40}
IFB Frequency page	{p.24}	*IFB Frequency page*	{p.42}

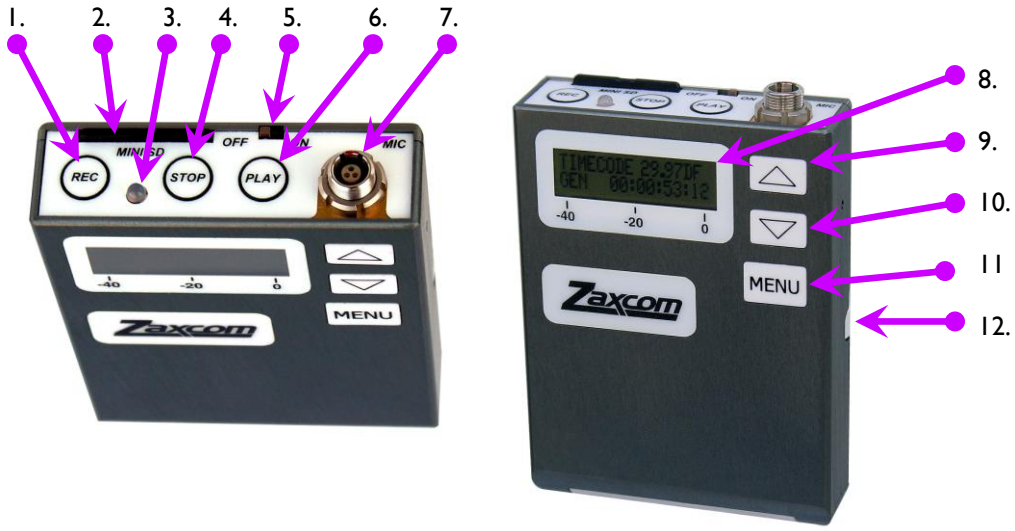
Table 1-2 Compatible IFB Settings

Chapter 2 – Digital Wireless System Transmitters

This chapter is intended to quickly familiarize you with the functions of each of the Digital Wireless System transmitters and was written based on firmware version **6.10.**

Getting to Know Your ZFR100 Bodypack Recorder

The ZFR100 uses two AA batteries (Lithium or NiMH).



1. **REC** Key
2. MiniSD Media Slot
3. Power/Record LED
4. **STOP** Key
5. Power Switch
6. **PLAY** Key
7. Microphone/Timecode Input
8. LCD Screen
9. **INC** Key
10. **DEC** Key
11. **MENU** Key
12. Battery Door and Compartment (on back)

Figure 2-1 ZFR100 Top and Front Views

Compatible Lavs

RF Resistant Lavs

Use one of the following microphone models:

Brand	Model	Voltage	Notes
Countryman	B6	1.5	
Countryman	B3		
Countryman	E6 omni		
Countryman	EMW	1.5	Specify for use with Zaxcom
DPA	4063-BMZ	3	Use only the Zaxcom 3.3 V model
Sanken	COS-11D		
Sennheiser	MKE-2 Platinum	3	
Sennheiser	MKE-2 Gold	3	New model – YES. Older models – NO
Shure	WL50	5	
Sony	ECM77		
Tram	TR-50		
Voice Tech.	VT401HS		
Voice Tech	VT506		
Voice Tech.	VT910		

Table 2-1 Compatible RF Resistant Lavalier Microphones

Additional microphones will be added to this list after a review of their 3.3v power performance and RF interference susceptibility has been completed.

Non-RF Resistant Lavs

Use one of the following microphone models:

Brand	Model	Voltage	Notes
Audio-Technica	892*CL4	3	
Audio-Technica	898*L4	3	
Audio-Technica	899*L4	3	
Countryman	Isomax Instrument M2H*W3	3	Hypercardioid
Countryman	Isomax Instrument M2C*W3	1.5	Cardioid
DPA	Headband 4067	3	Other headband requires 5 volts

Table 2-2 Compatible Non-RF Resistant Lavalier Microphones

Additional microphones will be added to this list after a review of their 3.3v performance.

General

The ZFR100 has an unbalanced microphone input accessed through a 3-pin micro-LEMO connector. You can use an unbalanced dynamic microphone or a powered lavaliere. It is recommended that you use 3-wire lavalieres with separate pins for ground, audio and power.

When using a Line-level input, an inline pad is required on the standard dynamic microphone input cable (XLR-3 to 3-pin micro-LEMO).

When using a phantom powered microphone with the ZFR100, you must use an external 48 VDC power supply.

NOTE: Once upon a time, the Denecke 48V power supply could damage the now discontinued Goldline transmitter's preamp. This is NOT the case with the ZFR100.

Device Interface

IFB Antenna

CAUTION: The antenna is located behind the white rubber panel on the bottom of the unit. Don't place anything in front of this area that could block reception. Also, don't allow anything to press in on this area, the antenna and/or receiver could be damaged.

RECORD key

Pressing it puts it into RECORD mode. While in RECORD mode, pressing it for less than 1 second closes the current file and immediately starts recording in a new file. The green LED blinks to confirm the creation of a new file. This is done to mark a point in time to make it easier to find in post-production.

PLAY key

Pressing it replays the last recording from its beginning.

STOP key

Pressing it puts the unit into STOP mode.

INC key

Pressing it while in STOP mode, advances 2-3 seconds in the current recorded segment. If you continue pressing it you will eventually advance to the next recorded segment.

DEC key

Pressing it while in STOP mode, moves backward 2-3 seconds in the current recorded segment. If you continue pressing it, you will eventually move backward to the beginning of the current recorded segment. If you press it again, you will move to the end of the previous recorded segment.

ON/OFF Switch – Internal/External Power Switch

The Power switch is intentionally set below the frame of the recorder to prevent accidentally turning it 'OFF' during use.

When the Zaxcom Stereo Adapter is connected, the ON/OFF switch becomes an internal or external power select switch.

Switch Position	No Stereo Adapter Installed	Stereo Adapter Installed
'ON'	'ON'	Internal Power
'OFF'	'OFF'	External Power

Table 2-3 Power Switch Positions

ZFR100 Configuration Menus

There are ten **Standard** and twenty **Extended** menu pages, as follows:

Standard Menu		Extended Menu	
Transport Control page	{p.18}	Highpass Filter page	{p.23}
Audio Gain page	{p.19}	Limiter page	{p.23}
Highpass Filter page	{p.19}	Record Format page	{p.23}
Limiter page	{p.19}	IFB Format page	{p.24}
Timecode Frame-rate page	{p.19}	IFB Enable page	{p.24}
Timecode Jam Mode page	{p.20}	IFB Voting Enable page	{p.24}
Timecode Source page	{p.20}	IFB Frequency page	{p.24}
Earpiece Source page	{p.20}	Power-up Mode page	{p.25}
Media Erase & Format page	{p.20}	Media Erase & Format page	{p.25}
Lock page	{p.21}	Timecode Jam Mode page	{p.26}
		Timecode Source page	{p.26}
		Timecode Output Enable page	{p.26}
		Remote Control Group ID page	{p.26}
		Remote Control Unit ID page	{p.27}
		Expander page	{p.27}
		Dynamics page	{p.27}
		ADC Location page	{p.28}
		Battery Type page	{p.29}
		Recording Mode page	{p.29}
		Track Name page	{p.29}

Table 2-4 ZFR100 Standard & Extended Menus

Each time the **MENU** key is pressed, the menu advances to the next page, in sequence.

Getting to Know Your ZFR800 Handheld Recorder

The ZFR800 uses a single CR123 battery.

Uses screw-on microphone capsules made by Shure™ and Neumann™. Be aware that to use a Neumann capsule, a special adapter is required. Check with Zaxcom Sales for price and availability.

1. Mic Capsule
2. Mic Body
3. Capsule Contacts
4. Body Contact Pins
5. Pad Switch (10 dB)
6. 1/8" headphone monitor jack
7. MiniSD Media Slot
8. Battery Door (power switch inside)
9. **RECORD** Key
10. **MENU** Key
11. **DEC** Key
12. **INC** Key
13. LCD Screen

Figure 2-2 ZFR800 Side, Mic Capsule, Body Threaded End, Body Antenna End & Barrel Views

Device Interface

Media Slot

This slot holds a MiniSD card for local recording. To insert a card, with the screen facing you, turn the card so the finger contacts are facing away from you and down toward the slot. Insert it into the slot and press it down until you here a slight click. To remove it, press it in until you hear the same click again.

Record Key

While in STOP mode, press it for more than 1 sec to go into RECORD mode. While in RECORD mode, press it for less than 1 second to continue recording in a new file. Also while in RECORD mode, press it for more than 1 sec to go into STOP mode.

Unit Power Switch

Located inside the battery compartment, in the opposite end from the antenna.

ZFR800 Configuration Menus

There are seven **Standard** and ten **Extended** menu pages, as follows:

Standard Menu		Extended Menu	
Transport Control page	{p.18}	*Highpass Filter page*	{p.23}
Audio Gain page	{p.19}	*Limiter page*	{p.23}
Highpass Filter page	{p.19}	*Power-up Mode page*	{p.25}
Limiter page	{p.19}	*Media Erase & Format page*	{p.25}
Timecode Frame-rate page	{p.19}	*Timecode Output Enable page*	{p.26}
Media Erase & Format page	{p.20}	*Expander page*	{p.27}
Lock page	{p.21}	*Dynamics page*	{p.27}
		Battery Type page	{p.29}
		Recording Mode page	{p.29}
		Track Name page	{p.29}

Table 2-5 ZFR800 Standard & Extended Menus

Each time the **MENU** key is pressed, the menu advances to the next page, in sequence.

Common Recorder Standard Menu

Normal Startup Sequence (without any card inserted)

NOTE: several optional pages appear and are explained in this sequence. Each is present in the other startup sequences. They have not been include in those sequences for economy of space.

```
LCD
SYNTH AB
```

```
LOWER POWER MODE
IFB IS OFF      0
```

(Optional page – only appears if Low Power mode is fully enabled.)

```
PCB REVB    BBBB
VER A-AAA  (CC)
```

(**PCB REVB** – indicates the printed-circuit board is revision "B".)
(**A–AAA** – indicates the currently installed firmware version.)
(**BBBB** – Programmable logic device revision code.
'0000'=no timecode input '0150'=timecode input available.)
(**(CC)** – indicates which options are available:
00=none, 01=Record, 02=IFB, 03=IFB & Record.)

```
***NO CARD***
```

```
NAME:
DDDDDDDD
```

(**DDDDDDDD** – displays the "Name" entered in the Extended Menu.
The factory default is "SN:" followed by the unit serial number.)

```
ZAXCOM    VA-AAA
ZFR100    SN:ZZZZZ
```

(**ZZZZZ** – indicates the recorder's serial number.

```
STOP 00:00:00:00
000:
```

```
  LOW BATTERY
1.60V
```

(Be aware, if you get this alert,
the unit may not go into RECORD mode.)

(This page appears when the battery has to be changed.)

Normal Startup Sequence (with a formatted card inserted)

```
LCD
SYNTH AB
```

```
PCB REVB   BBBB
VER A-AAA (CC)
```

```
FOUND SD CARD
EEEEEEEEEE
```

(**EEEEEEEEEE** – Indicates the size of the card i.e. 2 GBYTES or 512 MBYTES)

```
SIZELBA 1
SEG F _
```

(Optional screen – occurs if the recording was not correctly closed.)
(**F** – indicates how many previous recording(s) were found.)

```
FOUND F SEGS
MODE=GGGGGGG
```

(**GGGGGGG** – indicates which Record Format is set in the Extended Menu.)

```
ZAXCOM   VA-AAA
ZFR100   SN:ZZZZZ
```

```
STOP 00:00:00:00
000:
```

(The unit does not go into auto-record once it has completed its boot-up sequence.)

Transport Control page

```
STOP 00:00:00:00
000:
```

Page purpose: This is the default page at startup and displays the following information:

- Recorder mode
- Current timecode
- Current recording segment
- Current audio level

Recorder Modes (top line, left side):

- **STOP** – Recording is stopped (accompanied by 1 beep).
- **LREC** – Recording is started and Loop Record mode is enabled (accompanied by 2 beeps).
- **REC** – Recording is started and Non-Loop Record mode is enabled (accompanied by 2 beeps).
- **WAIT** – May appear just before going into record, or if the card is ejected while recording.

Timecode based on the current mode (top line, right side; hours : minutes : seconds : frames):

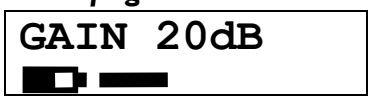
- While in STOP mode – displays the location where playback will start.
- While in PLAY mode – displays the current location as the segment plays back.
- While in RECORD mode – displays the timecode coming from the generator.

Current recording segment (bottom line, left side):
Currently the maximum number of recording segments that can be on any one card is 254.

Current audio level at the pre-amp: measured in dBFS with zero on the far right side

The current playback timecode is displayed in the transport control page.

Audio Gain page



Page purpose: This page adjusts the mic gain, using the **INC** or **DEC** key.

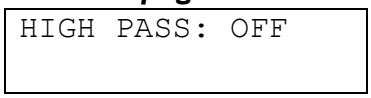
Parameters: (value range: **0** to **52**, step: **2**)

When audio is applied to the microphone input, the LCD indicates the signal strength using a bar graph displayed horizontally from left to right (-40 to 0 dBFS). The gain should be set so that the meter is peaking between -20 and -10 dBFS. This is about half way between the -20 and 0 dBFS markings below the meter. If no microphone is connected, the bar graph remains blank.

The recorder features a digitally controlled analog limiter that is situated before the A/D converter. This prevents the A/D convertor from clipping by automatically attenuating the mic gain when excessive audio is detected.

The limiter engages before the signal exceeds the digital capabilities of the signal path. The limiter activates at -6 dBFS. The gain level should be set low enough to prevent it from engaging, even when talent is screaming.

Highpass Filter page

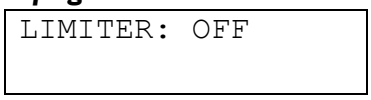


Page purpose: This page maintains the cutoff frequency for the highpass filter.

Parameters:

- (value range: **30** to **220Hz**, step: **10**)
- **OFF**

Limiter page



Page purpose: This page enables/disables the limiter function.

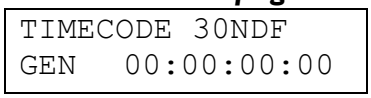
Parameters: **[OFF]** \ **[ON]**

NOTE: This page applies to the mic input only. It does not come into play for the STAxxx.

When the input signal is too high for the gain setting, it is clipped and results in distortion and popping. The limiter is used to prevent clipping by beginning to engage around -10 dBFS. When using a microphone, normally you would enable the limiter. However, if the input signal is coming from a mixer that is using a limiter, you should disable this limiter.

Since it is implemented in the digital domain, the automatic limiter may engage even when you don't hear any substantial audio. The purpose of the limiter is to prevent the mic preamp from over-driving the A/D converter, so the limiter operates on audio before it has been processed by the highpass filter. If there is a massive amount of low frequency audio content being filtered out, such as wind noise, you may hear the effects of the limiter without hearing the audio that caused the limiter to engage. If this occurs, the gain is set too high and you must reduce it to below the level that triggers the limiter.

Timecode Frame-rate page



Page purpose: This page sets the frame-rate used to record audio on the inserted MiniSD card and displays the timecode as it is being recorded.

Parameters: **[23.98]** / **[24]** / **[25]** / **[29.97NDF]** / **[29.97DF]** / **[30NDF]** / **[30DF]**

Timecode Jam Mode page

```
TC JAM MODE:
MANUAL (OFF)
```

Page purpose: This page maintains how received timecode will be used.

Parameters:

- **AUTO-LOAD** – start and stop the recorder, based on the ***Timecode Source page*** {p.20} selection:
  - If an IFB100 is being used - when the IFB100 timecode starts and stops.
  - If an STAxxx/TCA100 is being used and the timecode source is connected to it when the timecode source starts and stops.
- **AUTO-JAM** – continuously jams timecode, based on the ***Timecode Source page*** selection.
- **MANUAL (OFF)** – jam timecode once, based on the ***Timecode Source page*** selection.

Timecode Source page

```
TC SOURCE:
IFB (RF)
```

Page purpose: This page maintains which input to use as the timecode source.

Parameters:

- **SIDE CONNECTOR** – Accept a timecode source connected to the attached STAxxx's side connector.
- **IFB (RF)** – Accept a timecode source connected to the IFB100.
- **AUDIO INPUT** – Accept a timecode source connected to the Audio Input connector.

Earpiece Source page

```
IFB EARPIECE:
IFB RX AUDIO
```

Page purpose: **ZFR100 ONLY –** This page establishes the source for the audio being monitored during operation.

Parameters:

- **IFB MIX ALL** – the earpiece receives its audio from both the media and the IFB receiver.
- **IFB RX AUDIO** – the earpiece receives its audio from the IFB receiver.
- **REC/PLAY** – the earpiece receives its audio from the media.

Media Erase & Format page

```
PRESS UP KEY 5X
TO ERASE CARD
```

```
SUCCESS (REBOOT)
#### MBYTES
```

```
FORMAT FAILED
ERROR ##
```

Page purpose: This page erases and formats a MiniSD card.

This must be done before the card can be used (or to erase the contents) in the recorder.

To Format a Card:

1. Before formatting the card, enter the name (***Track Name page*** {p.29}) to be used for this card.
2. With the power 'OFF', insert the memory card into the media slot with the label to the back of the unit. Press it all the way in; it will lock down.
3. Press and hold the **MENU** key while the recorder is powered up.
4. Repeatedly press the **MENU** key until the screen displays **PRESS UP KEY 5X TO ERASE CARD**.

5. Press the **INC** key 5 times. (displays **FORMATTING FAT32**)
6. Sometime later displays **ERASING SEGMENTS**.
7. And finally displays **SUCCESS #### MBYTES** or **FORMAT FAILED ERROR ##**, where **####** indicates the space on the card available for recording and **##** is one of the following error codes:

Error Code	Description
- 1	No SD card found
- 2	No FAT32 format found
- 3	Invalid SD card sector size

Table 2-6 Format Error Codes

Be sure the recorder displayed **SUCCESS #### MBYTES** before using it to record.
If the recorder displayed **FORMAT FAILED ERROR ##**, do not use the card in the recorder.

8. Once the Success message (see above) appears, you will need to reboot so the unit can mount the card.

To Recreate the Wrapper Files (will not destroy existing audio takes):

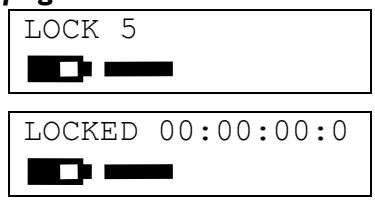
Repeat each of the steps above, but substitute the following for step 5:

5. Press the **DEC** key 9 times. (displays **FORMATTING FAT32**)

NOTE: The Recreate Function is available in 5.92 and later. "Wrapper Files" are everything on the card except the DELETE.ME file, which consists of the folder and the files in the folder,

IMPORTANT: This function will not work if you record audio and then delete the files. It only works if you initialize the card, then delete the wrapper files and then record audio on it.

Lock page



Page purpose: This page enables a lock function to prevent accidentally changing settings.

This page has a five-second countdown. After the timer expires, the display indicates **LOCKED**.

Locking the controls prevents accidently changing settings. As a safety feature, while the unit is locked, only the unlock combination is available.

Press the **INC** or **DEC** key to temporarily display the current battery voltage in place of the battery icon.

If you scan past the **LOCK** display to the next menu page, the **LOCK** will not engage.

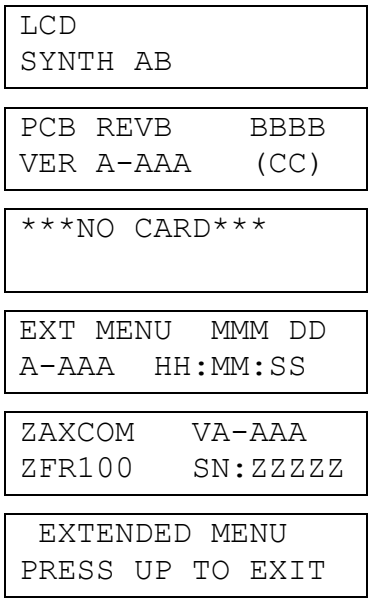
Unlocking the recorder

Simultaneously press the **MENU** and **INC** keys. Once it is unlocked, the screen will display the *Transport Control page* {p.18}. Powering down the unit will also clear the lock.

Common Recorder Extended Menu

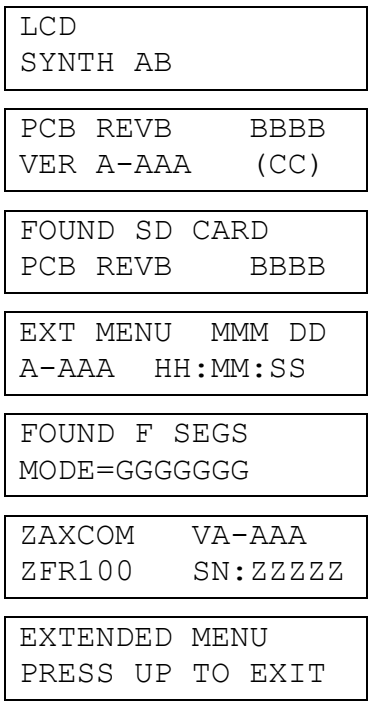
These menu pages contain parameters that are infrequently changed.

Extended Startup Sequence (without any card inserted)



(**MMM DD** – indicates the month and day the installed firmware was created.)
(**HH:MM:SS** – indicates the time of day the installed firmware was created.)

Extended Startup Sequence (with a formatted card inserted)



Entering the Extended Menu

Method 1.

1. Power down the recorder.
2. Press and hold the **MENU** key while powering up the unit.

Method 2.

1. Ensure the unit is turned 'ON' and in the Standard Menu.
2. Press the **MENU** key several times to get to the **LOCK** page.
3. Press the **DEC** key six times (the Factory Setup Menu is displayed).
4. Press the **INC** key once (the Extended Menu is displayed).

Exiting the Extended Menu

Cycle the power, or hold down the **MENU** key to get back to this page and press the **INC** key

NOTE: All changes are saved to Flash ROM as soon as they are committed.

Highpass Filter page

```
HIGH PASS: OFF
```

Page purpose: This page maintains the cutoff frequency for the highpass filter.

Parameters:

- (value range: **30** to **220Hz**, step: **10**)
- **OFF**

Limiter page

```
LIMITER: OFF
```

Page purpose: This page enables/disables the limiter function.

Parameters: [**OFF**] \ [**ON**]

NOTE: This page applies to the mic input only. It does not come into play for the STAxxx.

When the input signal is too high for the gain setting, it is clipped and results in distortion and popping. The limiter is used to prevent clipping by beginning to engage around -10 dBFS. When using a microphone, normally you would enable the limiter. However, if the input signal is coming from a mixer that is using a limiter, you should disable this limiter.

Since it is implemented in the digital domain, the automatic limiter may engage even when you don't hear any substantial audio. The purpose of the limiter is to prevent the mic preamp from over-driving the A/D converter, so the limiter operates on audio before it has been processed by the highpass filter. If there is a massive amount of low frequency audio content being filtered out, such as wind noise, you may hear the effects of the limiter without hearing the audio that caused the limiter to engage. If this occurs, the gain is set too high and you must reduce it to below the level that triggers the limiter.

Record Format page

```
RECORD FORMAT:
MONO(US)
```

Page purpose: This page maintains the recording format.

Parameters:

- **STEREO** – This setting records in stereo mode, when used with an attached stereo adapter (STAxxx).
- **MONO(US)** – This setting records in mono mode.

IMPORTANT: Any change made to this page requires a reboot before the new setting will take effect.

IFB Format page

```
IFB FORMAT:
LOW Q
```

Page purpose: ***ZFR100 ONLY –*** This page controls the quality of the received IFB signal.

Parameters:

- **HIGH Q** – enables high quality audio and disables timecode and remote control reception while still allowing local recording.
- **LOW Q** – enables reception of timecode, remote control signals and IFB audio if the unit is so equipped.

IMPORTANT: All units in the same group **MUST** use the same format to function correctly.

IMPORTANT: Any change made to this page requires a reboot before the new setting will take effect.

IFB Enable page

```
RXMODE=RX
RXED BLOCKS 000
```

Page purpose: This page enables/disables the IFB receiver.

Parameters: [**OFF**] \ [**RX**]

Disabling the IFB receiver will reduce power consumption by 20 mA and increase battery run time by ~10%.

IFB Voting Enable page

```
IFB VOTING:
NORMAL (OFF)
```

Page purpose: This page enables/disables the IFB Voting function.

Parameters: [**NORMAL (OFF)**] / [**2 TXERS (ON)**]

To use this function, you will need a second IFB100 that is also connected by audio cable to your cart and placed some distance away in the direction you expect Talent to travel. Set the frequency of this second IFB to 2 MHz (+ 0.002 GHz on the ***IFB Frequency page*** {p.42}) above the first unit. Also be sure to set the ***IFB Frequency page*** {p.24} on the Audio Recorder(s) (i.e. ZFR100) to the lowest frequency assigned to the two IFB100s.

In operation, the first IFB100 will be closer to (or on) your cart and the second IFB100 will be some distance away to cover the area you anticipate using. While the audio recorder(s) (i.e. ZFR100) is within range of the first IFB100, it will be receiving IFB audio on that lower IFB frequency. Once the ZFR100 has gone out-of-range of the first IFB and gone into-range of the second IFB, the ZFR100 IFB receiver will switch to receiving on the frequency assigned to the second IFB. If over time, the unit moves out-of-range of the second IFB and back into-range of the first IFB, the ZFR100 will once again start receiving on the first IFB's assigned frequency.

IFB Frequency page

```
IFB FREQ: 2.403
RX BLOCKS: 0000
```

Page purpose: This page maintains the IFB receiver's center frequency.

Parameters: (value range: **2.403** to **2.475** GHz, step: **0.001**)

Power-up Mode page

```
POWER UP MODE:
  UNLOCKED
```

Page purpose: This page sets whether or not the unit will power up with the keys locked

Parameters:

- **LOCKED** – The keys are locked upon power-up.
- **UNLOCKED** – The keys are unlocked upon power-up.

This page works like the *Lock page* {p.21}. The only difference is that while the unit is locked using ***Power-up Mode***, every time it is powered up, the keys will be locked and it will be necessary to unlock them before you can view/change anything.

Unlocking the recorder

Simultaneously press the **MENU** and **INC** keys. Once it is unlocked, the screen will display the *Transport Control page* {p.18}.

Media Erase & Format page

```
PRESS UP KEY 5X
TO ERASE CARD
```

```
SUCCESS (REBOOT)
#### MBYTES
```

```
FORMAT FAILED
ERROR ##
```

Page purpose: This page erases and formats a MiniSD card.

This must be done before the card can be used (or to erase the contents) in the recorder.

To Format a card:

1. Before formatting the card, enter the name (*Track Name page* {p.29}) to be used for this card.
2. With the power 'OFF', insert the memory card into the media slot with the label to the back of the unit. Press it all the way in; it will lock down.
3. Press and hold the **MENU** key while the recorder is powered up.
4. Repeatedly press the **MENU** key until the screen displays **PRESS UP KEY 5X TO ERASE CARD**.
5. Press the **INC** key 5 times. (displays **FORMATTING FAT32**)
6. Sometime later displays **ERASING SEGMENTS.**
7. And finally displays **SUCCESS #### MBYTES** or **FORMAT FAILED ERROR ##**, where **####** indicates the space on the card available for recording and **##** is one of the following error codes:

Error Code	Description
- 1	No SD card found
- 2	No FAT32 format found
- 3	Invalid SD card sector size

Table 2-7 Format Error Codes

   Be sure the recorder displayed **SUCCESS #### MBYTES** before using it to record.
   If the recorder displayed **FORMAT FAILED ERROR ##**, do not use the card in the recorder.
8. Once the Success message (see above) appears, you will need to reboot so the unit can mount the card.

To Recreate the wrapper files (will not destroy existing audio takes):

Repeat each of the steps above, but substitute the following for step 5:

5. Press the **DEC** key 9 times. (displays **FORMATTING FAT32**)

NOTE: The Recreate Function is available in 5.92 and later. The Wrapper Files are everything on the card except the DELETE.ME file, which consists of the folder and the files in the folder,

IMPORTANT: This function will not work if you record audio and then delete the files. It only works if you initialize the card, then delete the wrapper files and then record audio on it.

Timecode Jam Mode page

```
TC JAM MODE:
MANUAL (OFF)
```

Page purpose: This page maintains how received timecode will be used.

Parameters:

- **AUTO-LOAD** – start and stop the recorder, based on the ***Timecode Source page*** {p.26} selection:
  - If an IFB100 is being used - when the IFB100 timecode starts and stops.
  - If an STAxxx/TCA100 is being used and the timecode source is connected to it when the timecode source starts and stops.
- **AUTO-JAM** – continuously jams timecode, based on the ***Timecode Source page*** selection.
- **MANUAL (OFF)** – jam timecode once, based on the ***Timecode Source page selection***.

Timecode Source page

```
TC SOURCE:
IFB (RF)
```

Page purpose: This page maintains which input to use as the timecode source.

Parameters:

- **SIDE CONNECTOR** – Accept a timecode source connected to the attached STAxxx's side connector.
- **IFB (RF)** – Accept a timecode source connected to the IFB100.
- **AUDIO INPUT** – Accept a timecode source connected to the Audio Input connector.

Timecode Output Enable page

```
TIMECODE OUTPUT:
OFF
```

Page purpose: This page enables/disables timecode output and specifies the output connector.

Parameters:

- **ON: OUTRIGHT** – Sends timecode to the attached STAxxx's timecode output connection.
- **ON: OUTLEFT** – Sends timecode to the headphone output.
- **OFF** – Timecode is not output.

Remote Control Group ID page

```
REMOTE CONTROL
GROUP ID=1
```

Page purpose: This page identifies which IFB100 can remotely control this recorder.

Parameters: (value range: 0 to 99, step: 1)

It is highly desirable to have all transmitters and recorders in a given group assigned to the same IFB100.

Remote Control Unit ID page

```
REMOTE CONTROL
UNIT ID=001
```

Page purpose: This page maintains the number used to uniquely identify this recorder.

Parameters:

- (value range: **0** to **200**, step: **1**)
- **ALL**

When using the IFB100, this identifier is used to remotely control one specific unit out of the entire group. This information is also useful in Post to identify the unit since it is recorded in the BWF metadata.

Expander page

EXPANDER

Page purpose: This page maintains the info used to expand the recorder's dynamic range.

Parameters: To enter this page, press the **INC** or **DEC** key, "**PARMS**" is displayed on the right. To move to the next parameter, momentarily press the **MENU** key. To exit this page, press the **MENU** key for 1 second.

	Factory Setting
• **PARMS:** [**OFF**] / [**ON**]	**OFF**
• **RATIO:** (value range: **1:1.01** to **1:4.00**, step: **.01**)	**1:1.30**
• **THRESH:** (value range: **0** to **−96dB**, step: **1**)	**-40dB**
• **REDUCE:** (value range: **0** to **−36dB**, step: **1**)	**-6dB**
• **SPEED:** [**SLOW**] / [**NORMAL**] / [**FAST**]	**SLOW**

Dynamics page

DYNAMICS

Page purpose: ***ADVANCED USERS ONLY!*** This page controls a compressor effect that will decrease the gain during loud passages.

Parameters: To enter this page, press the **INC** or **DEC** key, "**PARMS**" is displayed on the right. To move to the next parameter, momentarily press the **MENU** key. To exit this page, press the **MENU** key for 1 second.

	Factory Setting
• **PARMS:** [**OFF**] / [**ON**]	**OFF**
• **SIDECHAIN:** [**IN**] / [**LP1**] / [**LP2**] / [**HFB**]	**IN**

Side chain selection. This parameter selects the audio used to control the dynamics, specifically it selects the audio feed to the dynamics peak detector. The options are:

- **HFB**: Input audio to the mic high-passed
- **LP2**: Input audio to the mic low passed more
- **LP1**: Input audio to the mic low passed
- **IN**: Input audio to the mic

Note that this selection does not change the audio that is being processed by the dynamics, rather it changes the audio signal used to determine the level or "loudness" of the audio.

- **SPEED:** [SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST] **SLOW**
  Controls the decay speed of the peak detector used by the dynamics processing.
- **ATTACK:** [SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST] **SLOW**
  Controls the amount of gain slewing which will general slow up the response to attack transients only.
- **CMP RATIO:** (value range: 1.0:1 to 5.0:1, step: .1) **3.0:1**
  Compressor ratio. Sets the compressor ratio i.e. 2.0:1 means for every 1 dB above the compressor threshold the gain will be reduced 2 dB
- **CMP THRESH:** (value range: 0 to −96dB, step: 1) **-20dB**
  Compressor threshold. Sets the threshold below which grain reduction occurs according to the compressor ratio setting.
- **CMP KNEE:** (value range: 0 to 20dB, step: 1) **0dB**
  Compressor soft knee setting. Sets the "depth" of the compressor's soft knee. A soft knee of 6 dB will result in more gradual gain reduction in the 6 dB range over the compressor's set threshold. Note that settings below 6 dB have very little effect.
- **EXP RATIO:** (value range: 1:1.00 to 1:4.00, step: .01) **1:1.10**
  Expander ratio. Sets the expansion ratio i.e. 1:2.0 means for every 1 dB below the expander threshold the gain will be reduced 2 dB.
- **EXP THRESH:** (value range: 0 to −96dB, step: 1) **-40dB**
  Expander threshold. Sets the threshold below which gain reduction occurs according to the expander ratio setting.
- **REDUCE:** (value range: 0 to −36dB, step: 1) **-12dB**
  Maximum amount of expander gain reduction. Sets an absolute limit on the amount of gain reduction caused by the expander.
- **GAIN:** (value range: 0 to 30dB, step: 1) **0dB**
  Make up gain setting. Used to compensate for the gain reduction caused by the action of the compressor.

Dynamics comprises both a compressor and an expander, which operate jointly.

The compressor in Dynamics can perform mild or extreme compression and features a soft knee for more transparent operation. The expander in Dynamics can perform subtle or extreme noise reduction.

Note that the Dynamics processing is done before the existing Expander (which is still functional). Thus, the expander can be used as a stand-alone noise gate while the dynamics can shape the sound as desired.

ADC Location page

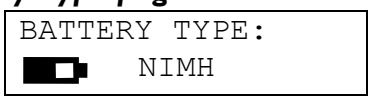
Page purpose: This page indicates where the analog to digital conversion (ADC) is performed.

Parameters:

- **STA-150** – AD conversion is done in the attached STA-150.
- **STA-100** – AD conversion is done in the attached STA-100.
- **INTERNAL** – AD conversion is done internally for use with the mic input connector.

NOTE: External only applies when an STAxxx is attached.

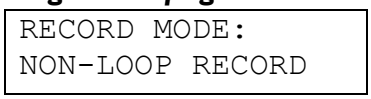
Battery Type page



Page purpose: This page adjusts the algorithm used to display the remaining battery capacity.

Parameters: [**LITHIUM**] / [**ALKALINE**] / [**NIMH**]

Recording Mode page

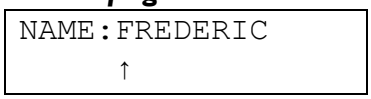


Page purpose: This page maintains the Recording mode.

Parameters:

- **NON-LOOP RECORD** – Once the media has filled up, recording stops and **FULL** is displayed. This prevents over-writing any portion of the audio.
- **LOOP RECORD** – Once the media has filled up, the new audio will begin over-writing the oldest audio on the card.

Track Name page



Page purpose: This page maintains the name applied to the MiniSD card and to the audio's metadata.

Parameters: To move to the next character, momentarily press the **MENU** key. To change the designated character position, press the **INC** or **DEC** key. To exit this page, press the **MENU** key for 1 second.

_____ (max: 8 chars, char = **0** to **9**, space, **A** to **Z**)

The name entered into the recorder becomes part of the name of the audio files generated by the unit and is also included in the metadata of the BWF file. When powered up, this name appears in the recorder's screen after several seconds.

To set/change the name, do the following:

1. Press the **INC** or **DEC** key to change the character in the current position.
2. Press the **MENU** key to proceed to the next character.
3. When finished, press and hold the **MENU** key to leave this function or cycle the power to resume normal operation.

Common Recorder Independent Operations

Display a Detailed Startup Sequence

Press and hold the **DEC** key during power-up.

Detailed Startup Sequence (without any card inserted)

```
LCD
SYNTH AB
```

```
PCB REV B    BBBB
VER A-AAA   (CC)
```

```
***NO CARD***

```

```
NAME:
DDDDDDDD
```

```
NAME:
AUDIO CC
```

```
ZAXCOM   VA-AAA
ZFR100   SN:ZZZZZ
```

```
STOP 00:00:00:00
000:
```

Detailed Startup Sequence (with a formatted card inserted)

```
LCD
SYNTH AB
```

```
PCB REV B    BBBB
VER A-AAA   (CC)
```

```
FOUND SD CARD
EEEEEEEEEE
```

```
NAME:
DDDDDDDD
```

```
SIZELBA 1
SEG F _
```

```
FOUND F SEGS
MODE=GGGGGGG
```

```
FOUND F SEGS
AUDIO S GGGG
```

```
ZAXCOM   VA-AAA
ZFR100   SN:ZZZZZ
```

```
STOP 00:00:00:00
000:
```

Chapter 3 – Recording Audio using the Miniature Digital Recorder

Recording Format

The MiniSD card is formatted using the FAT32 file system. While recording, the unit places all recorded audio in a single file on the media.

The FAT32 file system can be read on both Windows and Mac OS computers. However, the single file generated by the recorder can only be understood by the ***Zaxcom Transfer and Conversion utility*** {p.48}. It converts the file into a format (Broadcast Wave Format = BWF), that is useable in Post. This utility is available to anyone for free from the Zaxcom website.

Recording Mode

The audio can be recorded in Loop Recording mode or Non-Loop Recording mode.

In **Loop Recording** mode (indicated by **LREC** in the ***Transport Control page*** {p.18}), as the card fills-up, it eventually loops back to the beginning of the card and records over the oldest material. To prevent audio from being erased, do not exceed the recording length of the media (see ***Table 3.1 – Available Recording Time*** {p.31}).

In **Non-Loop Recording** mode (indicated by **REC** in the ***Transport Control page*** {p.18}), as soon as the card is full, recording ceases and the screen displays **FULL**.

Media Capacity

You can use MiniSD cards ranging in size from 128 MB to 16 GB. The 16 GB MiniSD card records a single track of audio for 96 hours without erasing any recorded audio on the card. Available recording times are as follows:

MiniSD Size	Available Recording Time
128 MB	45 minutes
256 MB	1.5 hours
512 MB	3 hours
1 GB	6 hours
2 GB	12 hours
4 GB	24 hours
8 GB	48 hours
16 GB	96 hours

Table 3-1 Available Recording Time

IMPORTANT: The unit will **NOT** record onto the card if it was not present when the recorder was powered up, if it was removed while the power was 'ON' or if the LOW BATTERY page is being displayed. If the card was ejected while the power was 'ON', the card must be reinserted before its power is cycled, in order to resume recording.

Dual Color LED

The dual color LED on top of the unit indicates the recorder's transport status:

Color	Indication
Solid Green	Stop or Playback mode
Green and flickers Red	Record mode
Solid Red	Recording connection lost. The card may have been ejected, is full or was not formatted correctly.

Table 3-2 Recorder LED Indications

NOTE: The colors for Stop and Connection Lost are determined by the selection made in the ***Hardware Options page***. Start the unit without a card installed. If the LED is red, pick the other **`LED ON (NORMAL)`** selection.

Recording Operation

This section describes the steps necessary to record audio.

Formatting the MiniSD Card

Many MiniSD cards are sold preformatted; however, you must reformat it in the recorder prior to recording on it. Only cards formatted in the recorder will work correctly.

To prepare a MiniSD for use, or to erase the contents before reuse, perform the format procedure on the ***Media Erase & Format page*** {p.20}.

Upon completion of the formatting process, the following files remain on the card (example based on a 2GB card):

SN01752 (This folder's name initially defaults to the recorder's serial #, thereafter it is the ***Track Name*** {p.29} entered in the Extended Menu.)
- ZBLK0000.ZAX (size = 1,048,576 KB)
- ZBLK0001.ZAX (size = 932,684 KB)
- ZDIR.ZZZ (size = 538 KB)

DELETE.ME (size = 512 KB)

The ZBLK****.ZAX files store the recording segments, and the ZDIR.ZZZ file stores metadata about each segment (i.e.: pointer into the .ZAX file, associated start timecode, recorder name, etc.)

The DELETE.ME file can in fact be deleted. Doing this frees up enough room for a copy of the firmware.

CAUTION: Do not delete any other files from the card. Doing so will prevent it from working correctly. If for some reason you proceed to delete the wrapper files, follow the instructions ***To recreate the wrapper files*** {p.21}.

NOTE: If you move a recorder to another actor and enter the new actor/character name, the folder name will remain the same and any audio from the new actor will be stored in the same folder. The metadata will contain the correct name.

IMPORTANT: If it is important to you that the Track Name folder is correct, prepare a card for each actor/character and have it follow each actor. This does not eliminate the need to change the track name, so the correct name appears in the metadata.

Current Timecode and Frame-rate Display

The current timecode generator value and frame-rate appear on the ***Timecode Frame-rate page*** {p.19}.

Jamming Timecode into the Recorder

While the recorder is being jammed, it identifies the timecode rate and type, and sets itself to that rate.

NOTE: The recorder's timecode accuracy is approximately 1 frame in 6 hours (1.54 PPM).

Jamming timecode on the recorder starts a new recording file. The Zaxcom conversion utility starts the transfer and conversion process at the point where the recorder's timecode was jammed.

NOTE: The recorder does not continue to keep timecode when it is powered down. Every time its power is cycled, it will be necessary to jam its internal-clock.

Manually Jamming TC with a Cable

Timecode can be jammed into the recorder by connecting the timecode source to the microphone input or using the stereo adapter. When timecode is connected, it takes the recorder approximately three (3) seconds to recognize the TC input. The screen display **TIME CODE** followed shortly by **JAMMED** when it is recognized. When the word **JAMMED** disappears, the timecode input source can be disconnected and normal operation can be resumed.

When using the mic input connector with a Mic-level source, the audio level of the timecode needs to be between -30 and -10 dBFS on the recorder's meter. Any level above -10 may cause clipping, which will prevent proper reading of timecode.

When using the mic input connector with a Line-level source, a Line-level to Mic-level cable should be used to attenuate the timecode signal out of a generator to the correct audio level.

When using the Line-level input connector (STAxxx/TCA100) with a Line-level source, a non-attenuating cable should be used.

In the transmitter {TRX9xx}, (Extended Menu) or recorder {ZFR100}, (Standard Menu):

a. Set the ***Timecode Jam Mode page*** {p.20} to **Manual**.
b. Set the ***Timecode Source page*** {p.20} to **SIDE CONNECTOR** or **AUDIO INPUT**. (as appropriate)

NOTE: The TRX800 cannot be jammed. Its timecode will always start at 00:00:00.

Continuously Jamming TC using the IFB100

1. In the transmitter {TRX9xx}, (Extended Menu) or recorder {ZFR100}, (Standard Menu):
   a. Set the ***Timecode Jam Mode page*** {p.20} to **AUTO-JAM**.
   b. Set the ***Timecode Source page*** {p.20} to **IFB (RF)**.
2. In the IFB100:
   a. Connect the TC source to the TC-IN connector.
   b. Set the ***Timecode Jam Mode page*** {p.20} to **AUTO-LOAD** or **AUTO-JAM**.
   c. Set the ***Timecode Source page*** {p.20} to **SIDE CONNECTOR**.

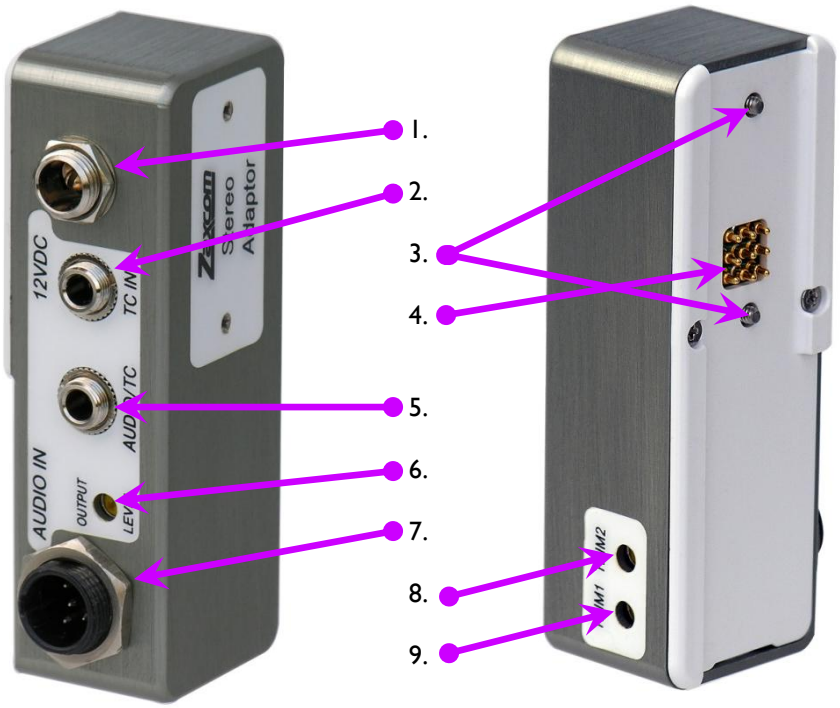
Automatically Starting and Stopping the Recording using Timecode from the IFB100

1. In the transmitter {TRX9xx}, (Extended Menu) or recorder {ZFR100}, (Standard Menu):
   a. Set the ***Timecode Jam Mode page*** {p.20} to **AUTO-LOAD**.
   b. Set the ***Timecode Source page*** {p.20} to **IFB (RF)**.
2. In the IFB100:
   a. Connect the TC source to the TC-IN connector.
   b. Set the ***Timecode Jam Mode page*** {p.20} to **AUTO-LOAD**.
   c. Set the ***Timecode Source page*** {p.20} to **SIDE CONNECTOR**.

Chapter 4 – ZFR100 Adapters

STA100 Stereo Adapter

The STA100 allows the unit to record in stereo from a Line-level source.



1. Power Connector
2. Timecode Input Connector
3. Screws to Attach to ZFR100
4. Electrical Contacts for ZFR100
5. Audio/Timecode Output Connector
6. Output Level Adjustment
7. TA-5M Audio Input Connector
8. Level Trim for Channel #2 (right)
9. Level Trim for Channel #1 (left)

Figure 4-1 STA100 Front & Back Views

Installation

The STAxxx attaches to the ZFR100 with two screws.

Tighten the two screws, alternating between them, until the adapter and recorder are tightly connected.

CAUTION: Do not over-tighten the screws.

Connect a Line-level source to the TA-5M connector. The Line-level input needs to be between -6 and +8 dBu.

Adjusting the Input Level

Output tone from a mixer and adjust the 2 input pots so the meter on the LCD screen is at a level of -20 dBFS. The stereo adapter does not have a limiter function so it is important not to overdrive or clip the input of the stereo adapter.

Powering the STAxxx

Connection of 12 VDC power to the stereo adapter is optional. If no power source is connected to the STAxxx, it operates from the recorder's internal battery.

Using an External Power Source

When the 12 VDC input is connected to a power source, it supplies power to the recorder when its power switch is in the 'OFF' position.

If batteries are installed in the recorder and external power is connected, the unit will not be able to power down unless an external power switch is available to remove the external power.

Using the STAxxx to Power the Recorder

The adapter can be used to power the recorder while it is in Mono mode and using a Mic-level input.

The Audio/Timecode Output Connection

The audio output connection is used to monitor the audio functions of its host unit or to allow timecode to pass through the STAxxx. The recorder's output setting (***Timecode Output Enable page*** {p.26}) determines if audio or timecode is sent through the output.

Timecode Input

The timecode input is used to jam the recorder's timecode generator. If the auto-load function (***Timecode Jam Mode page*** {p.26}) is enabled, the timecode input of the stereo adapter can be used.

Operation of the STAxxx

For the stereo adapter to operate, the recorder must select the stereo setting (***Record Format page*** {p.23}) and external ADC (***ADC Location page*** {p.28}) must be selected.

Host Unit functions

Selecting the stereo setting causes the recorder to combine the two input signals together and transmit them on one frequency. The ADC selection: **INTERNAL** – selects the internal mic input, **EXTERNAL** – selects the stereo adapter audio.

Figure 4-2 STA100 attached to ZFR100

STA150 Stereo Adapter

Figure 4-3 STA150 & STA150 attached to ZFR100

The STA150 is based on the STA100. The difference: the cables exit from the side, instead of out of the back.

EA100 Earpiece Adapter

Figure 4-4 EA100 alone & EA100 attached to ZFR100

The EA100 is used for monitoring audio (IFB or from the recording) when attached to the side of a ZFR100.

TCA100 Timecode Adapter

Figure 4-5 TCA100 attached to ZFR100 & TCA100

The TCA100 timecode adaptor provides a dedicated timecode input to the TRX900 (/AA) and ZFR100. This is especially helpful for using the auto-load feature manually (without the IFB100).

Chapter 5 – IFB100 IFB Transmitter

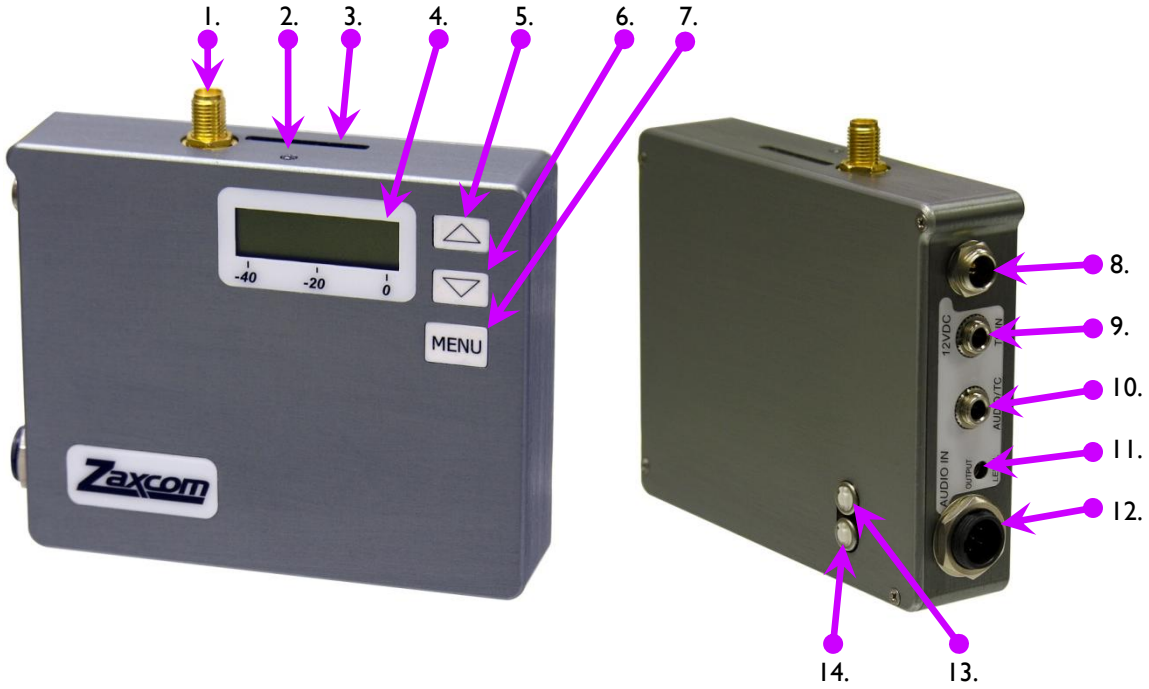
This chapter is intended to quickly familiarize you with the functions of the Zaxcom IFB100 IFB transmitter and was written based on firmware version **6.10.**

Getting to Know Your IFB Transmitter

It is a 100 mW RF transmitter designed to be used with the Zaxcom Digital wireless system. The IFB100 uses a digital spread spectrum signal to send and receive IFB audio, timecode and remote control signals. By using spread spectrum technology, the IFB is immune to interference. IFB audio has a range of approximately 150 feet, timecode and remote control commands have a range of approximately 500 feet.

In locations where multiple IFB100 units are used, you can set each TRX9xx or ZFR100 to a specific IFB100 unit.

The IFB100 contains a simple menu driven interface with minimal physical keys and connectors.



1. Antenna Connector (SMA)
2. Power LED
3. MiniSD Media Slot
4. LCD Screen
5. **INC** Key
6. **DEC** Key
7. **MENU** Key
8. External Power Input (8 to 18 VDC)
9. Timecode Input Connector (1/8" stereo)
10. Audio/timecode Output Connector (1/8" stereo)
11. Output Level Adjustment for Audio/timecode Output Connector
12. Audio Input Connector (TA-5M)
13. Left IFB Audio Input Trim
14. Right IFB Audio Input Trim

Figure 5-1 IFB100 Front & Side Views

Setting Up the IFB100

This section describes setting up the IFB100 for the first time.

Power Requirements

The IFB100 requires an external power source (8 to 18 VDC). Ideally, the source should be 12 VDC. Normal current draw is 125 mA at 12 VDC but a power supply needs to be capable of supplying at least 1 amp.

Audio Input

The two channel balanced audio input on the IFB100 has a TA-5M connector. The input audio range is -8 dBu to +4 dBu. You can configure the IFB100 to transmit a single channel or a mix of the two input channels.

IMPORTANT: When using the IFB100 for IFB audio transmission, an external 2.4 GHz antenna is strongly recommended. When using the supplied antenna directly mounted to the transmitter, it is possible the RF signal will interfere with the audio connected to it. The result being a 1kHz tone added to the audio being sent out. The supplied antenna is recommended for timecode and remote control transmission only.

Adjusting the Input Audio Level

The input audio level is preset by Zaxcom at +4 dBu. However, this level can be adjusted using the trim pots located on the outside of the unit. See the Side View in *Fig 5-1* {p.38}.

Timecode

Unless an external timecode source is present, the IFB100 outputs free-run timecode. When connected to an external timecode source, the timecode generator syncs with it.

IMPORTANT: A stereo plug is required for external timecode sync. Do **NOT** connect to the ring on the plug. **You cannot use a mono plug.** A mono plug will not destroy any components but it will short out the signal.

IFB100 Configuration Menus

The IFB100 uses a series of menus for configuration. These menus are similar to other Zaxcom wireless devices and behave in a similar fashion.

There are nine **Standard** and thirteen **Extended** menu pages, as follows:

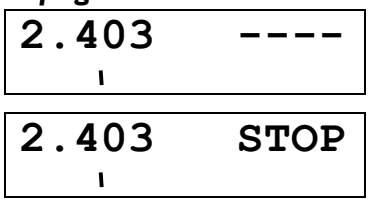
Standard Menu		Extended Menu	
Pacifier page	{p.40}	*Highpass Filter page*	{p.43}
Remote Audio Gain page	{p.40}	*Limiter page*	{p.43}
Remote Unit ID page	{p.40}	*IFB Format page*	{p.43}
Remote Audio Freq Chg page	{p.41}	*IFB Frequency page*	{p.43}
Remote Power Setting page	{p.41}	*Power-up Mode page*	{p.44}
Timecode Frame-rate page	{p.41}	*Timecode Jam Mode page*	{p.44}
IFB Frequency page	{p.42}	*Timecode Source page*	{p.44}
IFB Input Mix page	{p.42}	*Timecode Output Enable page*	{p.44}
Lock page	{p.42}	*Remote Control Group ID page*	{p.44}
		Remote Control Unit ID page	{p.45}
		IFB Tx Power page	{p.45}
		TV Channel Minimum page	{p.45}
		TV Channel Maximum page	{p.45}

Table 5-1 IFB100 Standard & Extended Menus

Each time the **MENU** key is pressed, the menu advances to the next page, in sequence.

IFB100 Standard Menu

Pacifier page



Page purpose: When you power up the unit, this page appears and displays the following information:

- Transmitter frequency,
- Audio level meter,
- Status of the IFB100 transport remote control.

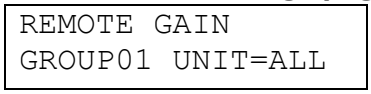
NOTE: For diagnostic purposes, you can press the **INC** or **DEC** key to read the Motherboard supply voltage.

Remotely Starting and Stopping the Transmitter Recorder

While in this page, pressing the **INC** or **DEC** key sends a Record or Stop command to all TRX9xx/ZFR100 units in the same group as the IFB100.

When setting the IFB input audio level, normal conversation should be around -20 dB.

Remote Audio Gain Change page



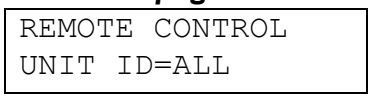
Page purpose: This page allows you to adjust the audio gain on the specified TRX9xx/ZFR100.

Pressing **INC** displays "**++**" and transmits a command to increase the gain setting, pressing **DEC** displays "**--**" and transmits a command to decrease the gain setting. Monitor the audio coming from the TRX9xx unit being adjusted to verify the gain setting change. The Remote Unit ID page can be set to ALL or a specific unit.

NOTE: If the TRX9xx/ZFR100 is not in range of the IFB or is on the fringe of coverage, the gain control command may have to be repeated.

IMPORTANT: Each time gain is increased or decreased, the level changes by 2 dB. The change **IS** noticeable if it is done while talent is speaking. What until talent has stopped talking before changing the level.

Remote Unit ID page



Page purpose: This page sets the unit you control when you use any of the remote control settings.

Parameters:

- (value range: 0 to 200, step: 1)
- **ALL**

Remote Audio Frequency Change page

```
REMOTE CH 512.0 *
UNIT ID=1 000
```

```
TX CH  WARNING
UNIT ID = ALL
```

Page purpose: This page sets the transmit frequency for the specified TRX9xx.

Parameters: (value range: (see *Table 5.2* {p.47}), step: .1) The frequency range is based on the frequency range selected in *TV Channel Minimum page* {p.45} and *TV Channel Maximum page* {p.45}.

The top example is what you should normally see. The bottom example is what you see if you have selected the ALL choice for Unit Code. Since it's a really BAD idea to command all transmitters to start using the same frequency, this warning basically reminds you to choose a specific unit.

While you are changing the frequency on the display, the command is not sent to the selected TRX9xx transmitter until you stop on a specific frequency for longer then 1.5 sec. This prevents the TRX9xx unit from transmitting on all channels between the old and new frequencies. The transmit counter, bottom line right three digits, will increment and an asterisk (*) will blink, for each message sent (several will be sent each time you press the **INC** or **DEC** button). If you are at the extreme edge of your range, you may need to take additional actions to get the change to take place (i.e. re-orient your antenna, have talent move closer, etc.).

Remote Power Setting Change page

```
REMOTE POWERMODE
0: POWER=ON
```

Page purpose: This page sets the power setting used by the specified TRX9xx.

Parameters:

- **6: POWER=LOW2** – Disables the RF Power Amplifier, RF Board and Mic Pre-amp. In most cases, you want to use **LOW2** if you are using the remote power setting. When using the **LOW2** setting, the TRX9xx draws half the current as the full power setting, saving battery life.
- **5: POWER=LOW1** – Disables the RF Power Amplifier in remote units.
- **4: POWER=ON** – Filler to prevent accidentally turning 'OFF' the remote unit's power.
- **3: POWER=ON** – Filler to prevent accidentally turning 'OFF' the remote unit's power.
- **2: POWER=ON** – Filler to prevent accidentally turning 'OFF' the remote unit's power.
- **1: POWER=ON** – Filler to prevent accidentally turning 'OFF' the remote unit's power.
- **0: POWER=ON** – Turns the remote unit's power fully 'ON'.

NOTE: If the TRX9xx is not in range of the IFB or is on the fringe of coverage, the power setting command may have to be repeated.

Timecode Frame-rate page

```
TIMECODE 30NDF
GEN  00:00:00:00
```

Page purpose: This page sets the frame-rate to be transmitted with the timecode.

Parameters: **[23.98] / [24] / [25] / [29.97NDF] / [29.97DF] / [30NDF] / [30DF]**

The IFB100's timecode generator is in Free-Run mode unless it is connected to a timecode source.

If an external timecode source is connected, the IFB100's internal timecode generator stays in sync with it. If a TRX9xx/ZFR100 is in Autoload mode, starting and stopping recording is controlled by the external source.

IFB Frequency page

```
IFB FREQ: 2.403
```

Page purpose: This page sets the IFB transmitter's center frequency.

Parameters: (value range: **2.403** to **2.475** GHz, step: **.001**)

The IFB100 should be adjusted with a **minimum** 2 MHz separation between channels. However, 8 MHz separation between channels is necessary when using the Zaxcom Voting System (ZVS).

If the ZVS is enabled, you need to allocate four adjacent channels, 2 MHz apart, for the IFB100s. For example, the ZVS would use 2.403 GHz, 2.405 GHz, 2.407 GHz and 2.409 GHz. This makes 2.411 GHz the next channel available for another ZVS group.

Using 2 MHz spacing, the IFB100 can simultaneously support 36 IFB channels.

Selecting the frequency

If interference is encountered, the range of the system is affected. If the range is less than 150 ft., go to a different channel at least 30 MHz away from the interfered channel.

There are many devices that use the 2.4 GHz band. The IFB100 should be able to operate interference free while other devices share the band. It is suggested that when operating in a new location that a range test be conducted before the unit is used for a production.

IFB Input Mix page

```
IFB INPUT MIX:
LR MONO MIX
```

Page purpose: This page selects which audio is sent to the IFB transmitter.

Parameters:

- **RIGHT ONLY** – the IFB transmitter audio source is the right channel
- **LEFT ONLY** – the IFB transmitter audio source is the left channel
- **LR MONO MIX** – the IFB transmitter audio source is a 50/50 mix of both audio input channels

Lock page

```
LOCK 5
     ı
```

```
LOCKED 00:00:00:0
     ı
```

Page purpose: This page enables a lock function to prevent accidentally changing settings.

This page has a five-second countdown. After the timer expires, the display indicates **LOCKED**.

Locking the controls prevents accidently changing settings. As a safety feature, while the unit is locked, only the unlock combination is available.

If you scan past the **LOCK** display to the next menu page, the **LOCK** will not engage.

Unlocking the transmitter

Simultaneously press the **MENU** and **INC** keys. Once it is unlocked, the screen will return to the *Pacifier page* {p.40}. Cycling the power will also clear the lock.

IFB100 Extended Menu

```
 EXTENDED MENU
PRESS UP TO EXIT
```

The IFB100 contains several menu pages that normally do not have to be changed on a regular basis. These items are placed in the Extended Menu.

Entering the Extended Menu

1. Power down the IFB100.
2. Press and hold the **MENU** key while powering it up.

Exiting the Extended Menu

Cycle the power, or hold down the **MENU** key to get back to this page and press the **INC** key.

NOTE: All changes are saved to Flash ROM as soon as they are committed.

Highpass Filter page

```
HIGH PASS: OFF
```

Page purpose: This page maintains the cutoff frequency for the highpass filter.

Parameters:

- (value range: **30** to **220Hz**, step: **10**)
- **OFF**

Limiter page

```
LIMITER: OFF
```

Page purpose: This page enables/disables the limiter function.

Parameters: **[OFF]** / **[ON]**

Since it is implemented in the digital domain, the automatic limiter may engage even when you don't hear any substantial audio. The purpose of the limiter is to prevent the mic preamp (connected to the TA-5M) from over-driving the A/D converter, so the limiter operates on audio before it has been processed by the highpass filter. If there is a massive amount of low frequency audio content being filtered out, such as wind noise, you may hear the effects of the limiter without hearing the audio that caused the limiter to engage. If this occurs, the gain is set too high and you must reduce it to below the level that triggers the limiter.

IFB Format page

```
IFB FORMAT:
LOW Q
```

Page purpose: This page controls the quality of the transmitted IFB signal.

Parameters:

- **HIGH Q** – Selects the high quality codec.
- **LOW Q** – Selects the standard quality codec.

IMPORTANT: All units (TRX9xx/ZFR100) in the same group **MUST** use the same format to function correctly.

IMPORTANT: Any change made to this page requires a reboot before the new setting will take effect.

IFB Frequency page

```
IFB FREQ: 2.403
```

Page purpose: This page sets the band the IFB transmitter uses.

Parameters: (value range: **2.403** to **2.475** GHz, step: **0.001**)

Power-up Mode page

```
POWER UP MODE:
  UNLOCKED
```

Page purpose: This page determines whether the keys will be consistently locked after power-up.

Parameters:

- **LOCKED** – The keys are locked upon power-up.
- **UNLOCKED** – The keys are unlocked upon power-up.

This page works like the ***Lock page*** {p.42}. The only difference is that while the unit is locked using ***Power-up Mode***, every time it is powered up, the keys will be locked and it will be necessary to unlock them before you can view/change anything.

Unlocking the IFB100

Simultaneously press the **MENU** and **INC** keys. Once it is unlocked, the screen will display the ***Pacifier page*** {p.40}.

Timecode Jam Mode page

```
TC JAM MODE:
AUTO-LOAD
```

Page purpose: This page maintains how received timecode will be used.

Parameters:

- **AUTO-LOAD** – start and stop the transmitter's recorder when the input, based on the ***Timecode Source page*** {p.44} selection, starts and stops.
- **AUTO-JAM** – jams timecode continuously, based on the ***Timecode Source page*** selection.
- **MANUAL (OFF)** – jam timecode once, based on the ***Timecode Source page*** selection.

Timecode Source page

```
TC SOURCE:
SIDE CONNECTOR
```

Page purpose: This page maintains which input to use as the timecode source.

Parameters:

- **SIDE CONNECTOR** – Accepts the timecode for syncing from the side connector.
- **IFB (RF)** – Does not apply to the IFB.
- **AUDIO INPUT** – Accepts the timecode for syncing from the Audio Input connector.

Timecode Output Enable page

```
TIMECODE OUTPUT:
OFF
```

Page purpose: This page enables/disables timecode output and specifies the output connector.

Parameters:

- **ON: OUTRIGHT** – Sends timecode to the timecode output connection on the side.
- **ON: OUTLEFT** – Not currently used (for future expansion)
- **OFF** – Timecode is not output.

Remote Control Group ID page

```
REMOTE CONTROL
GROUP ID=1
```

Page purpose: This page sets the Group ID # for this IFB100.

Parameters: (value range: **0** to **99**, step: **1**)

To use the remote control function, a group code must be selected. If it has not been selected, the IFB100 remote control is not enabled.

When setting the group code, be sure it is unique. This is very important when multiple wireless groups are in the same area, since any IFB100 on the same group code as yours can affect your TRX9xx/ZFR100 units. To avoid this, coordinate with others in the area and ensure everybody is on a separate group code.

Once the group code is set, multiple TRX9xx/ZFR100 units can be controlled remotely.

Remote Control Unit ID page

```
REMOTE CONTROL
UNIT ID=001
```

Page purpose: This page maintains the number used to uniquely identify this transmitter.

Parameters:

- (value range: **1** to **200**, step: **1**)
- **ALL**

When using the IFB100, this identifier is used to remotely control one specific unit out of the entire group. This information is also useful in Post to identify the unit since it is recorded in the BWF metadata.

IFB Transmitter Power page

```
IFB TX POWER: 7
```

Page purpose: This page sets the IFB transmitter power output.

Parameters: (value range: **7** to **0**, step: **1**) {**7** is full power.}

Use the lowest power setting for a given situation to conserve battery power.

TV Channel Minimum page

```
MIN FREQ: 560.0
(TVCHAN MIN 29)
```

Page purpose: This page maintains the frequency scan's starting channel.

Parameters: (value range: **16** to **99**, step: **1**)

It should be the same as the start of the unit's block. The exception is when you know you will only be able to use the frequencies associated with only one or two channels. This will prevent you from assigning an out-of-bound frequency.

TV Channel Maximum page

```
MAX FREQ: 590.0
(TVCHAN MAX 33)
```

Page purpose: This page maintains the frequency scan's ending channel.

Parameters: (value range: **16** to **99**, step: **1**)

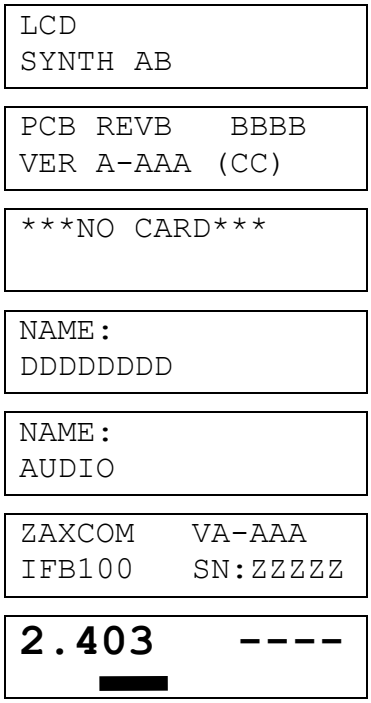
It should be the same as the end of the unit's block. The exception is when you know you will only be able to use the frequencies associated with only one or two channels. This will prevent you from assigning an out-of-bound frequency.

IFB100 Independent Operations

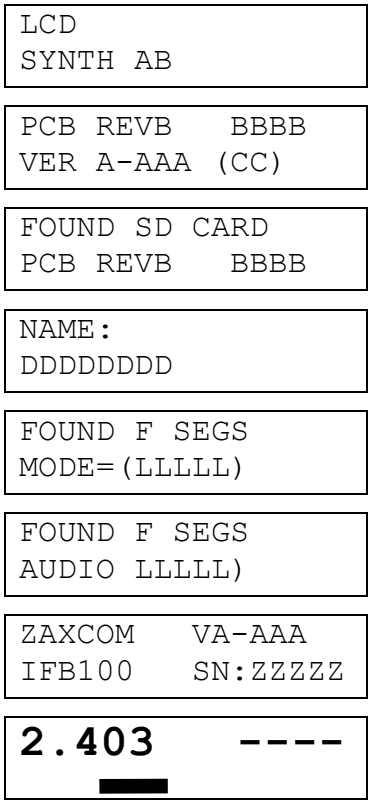
Display a Detailed Startup Sequence

Press and hold the **DEC** key during power-up.

Detailed Startup Sequence (without any card inserted)



Detailed Startup Sequence (with a formatted card inserted)



(**LLLLL** – indicates which IFB Format is set in the Extended Menu.)

Operating Frequencies

Audio

All audio transmitters and receivers operate on one of the following frequency blocks:

Block	Frequency Range	TV Blocks
20	518.000 to 542.000	22 to 25
21	536.000 to 572.000	25 to 30
22	560.000 to 590.000	29 to 33
23	590.000 to 614.000	34 to 37
24	614.000 to 644.000	38 to 42
25	638.000 to 668.000	42 to 46
26	662.000 to 692.000	46 to 50

Block	Frequency Range	TV Blocks
27	686.000 to 722.000	50 to 55
28	722.000 to 746.000	56 to 59
29	740.000 to 770.000	59 to 63
30	764.000 to 794.000	63 to 67
31	794.000 to 818.000	68 to 71
32	818.000 to 842.000	72 to 75
33	838.000 to 854.000	79 to 80

Table 5-2 Audio Frequency Block Information

IMPORTANT: As of 12 June 2009, the USA has phased out analog television. As a result, frequencies between 698.0 and 806.0 MHz are no longer available for use in the USA.

Only the frequencies in one specific block are available to a particular transmitter and its associated receiver. Coordinate with your dealer or Zaxcom to determine which block(s) are the best to use in your area(s).

Remote Control, Timecode and IFB Feed

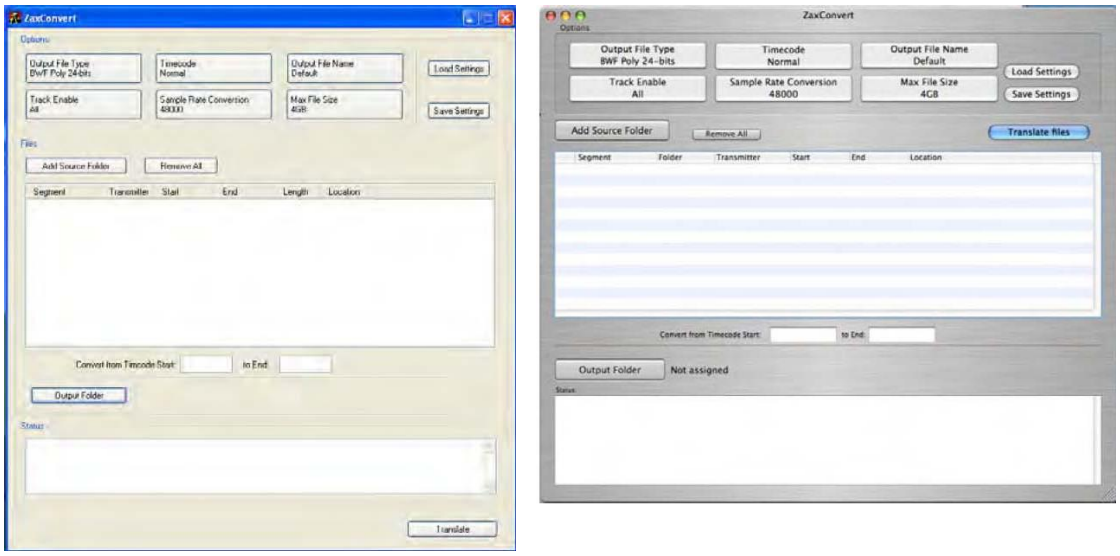
If the optional IFB feed and IFB remote control options are included, their frequency range is:

Current model for use Worldwide: 2.403 to 2.475 GHz

Chapter 6 – ZaxConvert Utility

About ZaxConvert

ZaxConvert software is available for both MS Windows and Mac OS X. The software is functionally identical on both operating systems. You must use the ZaxConvert software to convert the audio from .ZAX files to .WAV files.



Windows XP Mac OS X

Figure 6-1 ZaxConvert Windows & Mac Main screens

Using ZaxConvert

When you use ZaxConvert, you must first assign an output folder. Next, add your source folder. The following buttons contain additional options that are available when translating ZAX files to broadcast WAV files:

- Output File Type
- Timecode
- Sample-Rate Conversation
- Maximum File Size
- Output File Name
- Track Enable

When displayed on the main screen, the button shows the current setting.

Output File Type

This menu allows you to select the number of channels; bit-depth and output file type. In addition, if the Post facility is using a DV40, you can force a 48 kHz stamp to be used on the output files.

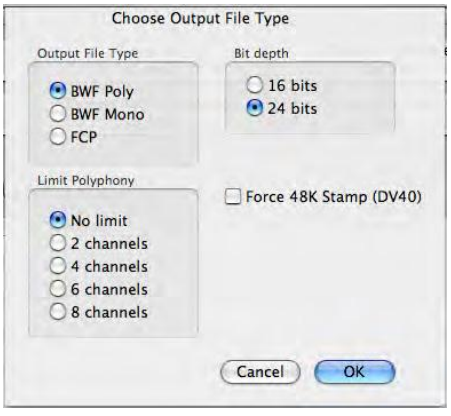


Figure 6-2 Choose Output File Type screen

Timecode

This menu allows you to pull-up or pull-down timecode or leave the timecode as it was set during audio recording.

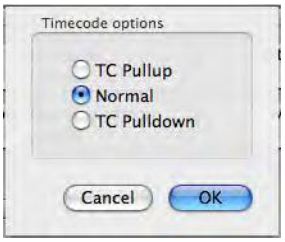


Figure 6-3 Timecode Options screen

Sample-Rate Conversion

This menu allows you to convert the sample-rate from the 48 kHz sample-rate used while recording.

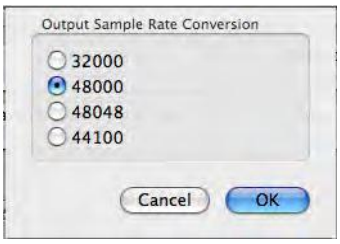


Figure 6-4 Output Sample Rate Conversion screen

Maximum File Size

This menu allows you to set the maximum file size of the audio tracks. This is useful when trying to place audio on media or when trying to limit the file size. Many audio applications can only handle files that are 2 GB or smaller due to limitations in the .WAV file format.

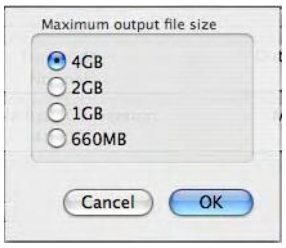


Figure 6-5 Maximum Output File Size screen

Output File Name

Reserved for future use.

Track Enable

Reserved for future use.

Chapter 7 – Equipment Specifications

ZFR100 Specifications

Recorder Audio

Dynamic Range	103 dB
Distortion	0.001%
Frequency Response	20 Hz to 16 kHz
Highpass Filter	'OFF' or 30 to 220 Hz, step: 10 (6 dB per octave)
Mic Power	3.3 VDC @ 10mA max
Mic Connector	3-pin micro-LEMO (mic side = FGB.00.303.CLAD.22)
Input Range	–60 to –24 dBu
Impedance	4.7 k ohms
ADC Bit-depth	24 bits
ADC Sampling-rate	48 kHz

Timecode Reader/Generator

Clock Accuracy	1.54 PPM (1 frame out in 6 hours)
Timecode Type	SMPTE
Timecode Frame-rates	23.98, 24, 25, 29.97NDF, 29.97DF, 30NDF, 30DF

Recording

Media	MiniSD card (Flash memory)
File Format	.ZAX
Recording Time	96 hours (16 GB card)

IFB Receiver (optional)

RF Frequency Range	2.403 to 2.475 GHz
RF Modulation	Digital Spread Spectrum
RF Frequency Step	0.001 GHz (1 MHz)
RF Bandwidth	1 MHz
Channel Separation	2 MHz
Sensitivity	-96 dBm
DAC Bit-depth	24 bit
DAC Rate	48 kHz
Frequency Response	20 Hz to 12 kHz
Output Impedance	8-ohm minimum

Physical

Weight	3.5 oz (99 grams) without battery
Dimensions (H x W x D)	3.31" x 2.3" x .65" (84 mm x 58 mm x 17 mm)
External Power (STAxxx)	9 to 18 VDC @ 125 mA
Internal Power (Battery)	up to 20 hours (two AA Lithium)
Display	Graphic LCD panel

ZFR800 Specifications

Recorder Audio

Dynamic Range	103 dB
Distortion	0.001%
Frequency Response	20 Hz to 16 kHz
Highpass Filter	'OFF' or 30 to 220 Hz, step: 10 (6 dB per octave)
Mic Power	9 VDC
Mic Connector	Compatible with Shure™ screw-on microphone capsules
Input Range	-60 to -30 dBu
Impedance	10 k ohms
ADC Bit-depth	24 bits
ADC Sampling-Rate	48 kHz

Timecode Reader/Generator

Clock Accuracy	1.54 PPM (1 frame out in 6 hours)
Timecode Type	SMPTE
Timecode Frame-rates	23.98, 24, 25, 29.97NDF, 29.97DF, 30NDF, 30DF

Recording

Media	MiniSD card (Flash memory)
File Format	.ZAX
Recording Time	96 hours (16 GB card)

Physical

Weight	14.0 oz (397 grams) without a battery
Dimensions (L x Dia)	6.12" x 1.5" (155mm x 38mm) without windscreen and mic capsule
External Power	N/A
Internal Power (Battery)	up to 10 hours (one CR123)
Display	Graphic LCD panel

IFB100 Specifications

Transmitter

RF Power Output	100 mW
RF Modulation	Digital Spread Spectrum
RF Frequency Range	2.403 to 2.475 GHz
RF Frequency Step	0.001 GHz (1 MHz)
RF Bandwidth	1 MHz
Channel Separation	2 MHz
Antenna Connector	50-ohm SMA female
Emission Designator	180 KV2E
FCC Part	CFR Title 47, Part 18

Transmitter Audio

Dynamic range	103 dB
Distortion	0.01%
Frequency Response	20 Hz to 12 kHz
Highpass Filter	'OFF' or 30 to 220 Hz, step: 10 (6 dB per octave)
System Group Delay	10 ms

Audio Input

Connector	TA-5M
Type	Balanced
Level	-10 to +8 dBu
Impedance	10 k ohms
ADC Bit-depth	24 bits
ADC Sampling-rate	48 kHz

Timecode Input

Connector	1/8" Stereo (3.5 mm)
Level Range	1 to 5V, P-P
Impedance	10 k ohms

Timecode Reader/Generator

Clock Accuracy	1.54 PPM (1 frame out in 6 hours)
Timecode Type	SMPTE
Timecode Frame-rates	23.98, 24, 25, 29.97NDF, 29.97DF, 30NDF, 30DF

Physical

Weight	6 oz. (170 grams)
Dimensions (H x W x D)	3.44" x 3.88" x .9" (87 mm x 98 mm x 23 mm)
External Power	8 to 18 VDC @ 125 mA
Internal Power	N/A
Display	Graphic LCD panel

Chapter 8 – Wiring Diagrams

NOTE: All of the diagrams in this chapter show the solder side of each connector.

ZFR100 cables

NOTE: The following 3-pin micro-LEMO connectors mate with the microphone connector:

- FGB.00.303.CLAD.22 – has a latch with a pull release. (HIGHLY recommended for RFI prevention)
- FVB.00.303.NLA – has a latch with a twist release.

CAUTION: When wiring a microphone for the TRX900 (/AA), the microphone shield/ground must be connected to the LEMO shell as well as the correct pin on the microphone connector itself.
This connection stops RF energy from entering the body pack through the shield of the microphone cable. If this happens, the user can experience RF dropouts at any distance from the receiver. Routing the microphone cable away from the TRX900 antenna is a temporary fix if this effect is noticed.
Use of the push-in type LEMO connector, rather than the screw in type, is advised as it is easier to make the ground connection to the connector shell.

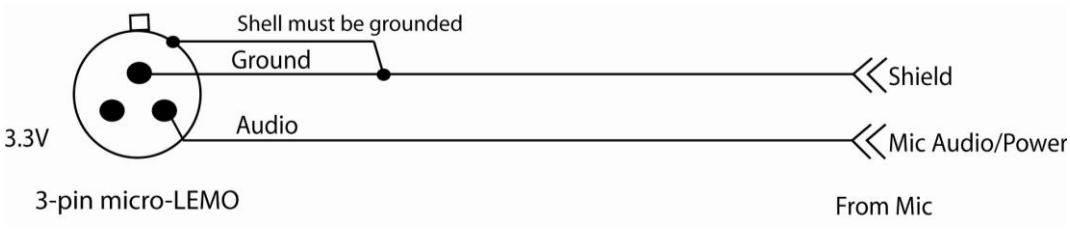


Figure 8-1 Two-wire microphone configuration (with internal bias)

Contact your Mic's Manufacturer.

Figure 8-2 Three-wire microphone configuration (with internal bias)

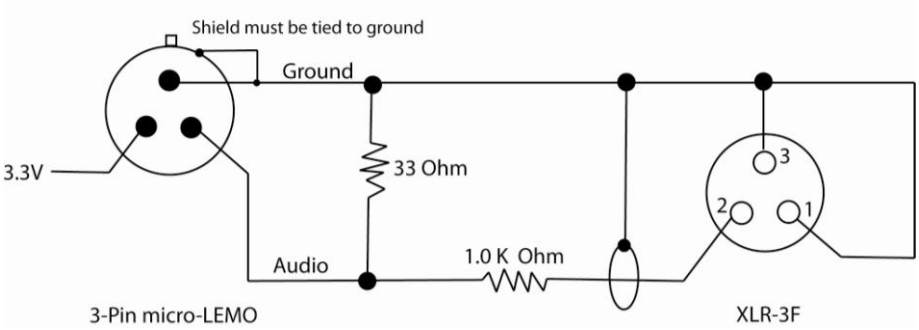


Figure 8-3 Balanced Line to ZFRxxx

STAxxx and IFB100 Cables

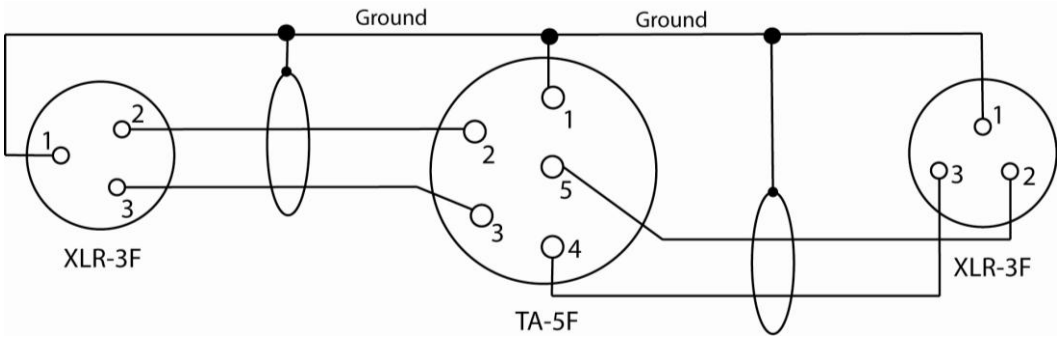


Figure 8-4 Standard XLR-3F to TA-5F Line-level input cable

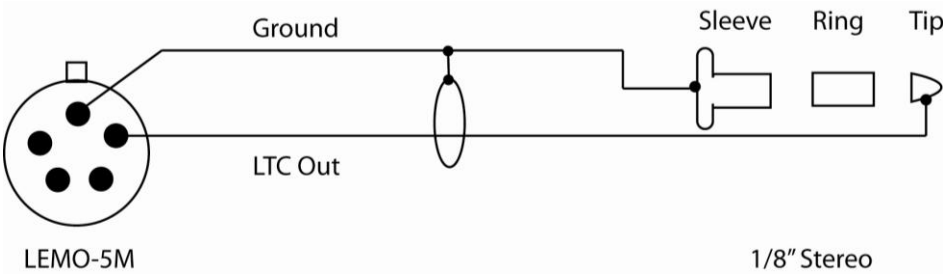


Figure 8-5 LEMO-5M to 1/8" male timecode input cable

IMPORTANT: A stereo plug is required for external timecode sync. Do **NOT** connect to the ring on the plug. **You cannot use a mono plug.** A mono plug will not destroy any components but it will short out the signal.

Chapter 9 – Firmware Information

Firmware

Each unit is shipped with the latest firmware version installed. As newer firmware becomes available, it can be downloaded from the Zaxcom website (http://zaxcom.com/software_up dates.htm).

Each time a unit is powered up, the firmware version number is displayed briefly on the LCD screen.

Advantages to Upgrading the Firmware

By upgrading the software, the range and feature set have and will continue to dramatically increase over time. Zaxcom has a reputation for constantly adding additional features and user suggestions during the product's lifetime. This ensures that your wireless system will perform better and better, the longer you own it.

Upgrading the Firmware in Each Unit

Perform the following:

1) Download the firmware from the Zaxcom website and load it onto a MiniSD memory card.
2) Insert the card (with the downloaded firmware) into the unit.
3) Simultaneously hold down the **INC** and **DEC** keys while powering up the unit.
4) The screen will display the sequence below. From power up to "**DONE**" takes about 30 seconds.
5) Upon completion, cycle the power to run on the new version.

```
LCD
SYNTH AB
```

```
PCB REV B     0150
VER #-###     {03}
```

(**#-###** – indicates the currently installed version.)

```
FOUND SD CARD
PCB REV B     0150
```

```
BURN ROM
TRX-###.bin
```

(**TRX-###.BIN** – indicates the firmware package being loaded.)

```
ERASE0...
TRX-###.bin
```

```
ERASE1 . . .
TRX-###.bin
```

```
BURNING ROM . . .
TRX-###.bin
```

```
READ BACK TEST
```

(At this point, the firmware has been installed and the system is verifying the install.)

```
DONE
```

(The install process has completed successfully.)

CAUTION: Do not power down the unit during the upgrade process.
Before installing the upgrade, be sure to insert a fresh set of batteries. If the unit should lose power during the upgrade, it will need to be sent back to Zaxcom for repair.

Significant Change Reminders

Using High Capacity SD Cards (2009-03-03) — TX Version 5.98+

A problem with using 4GB, 8GB and 16GB cards has been fixed. This change could possibly cause some older cards to stop working. If you upgrade to this version and find that your brand of SD card no longer works, you may need to use another brand of SD card to downgrade to an older version.
Note: large cards take longer to start up.

New IFB High Quality Mode (2009-01-29) — TX Version 5.92T+ IFB Version 5.92+

The user may select between high quality audio mode and normal mode.
Note: while in high quality mode, the wireless timecode and remote control features are not available.

New Recorder LCD module (2008-12-04) — RX x80+

A new LCD module has been incorporated into all of the receiver configurations.
NOTE: effective with serial # 1517.

New IFB Audio Codec (2008-05-21) — TX & IFB Version 5.50a+

The IFB audio transmission format has changed. To maintain IFB audio compatibility, both the IFB transmitter(s) and the audio transmitter(s) must be loaded with this version or higher.

Know Firmware Problems

Recorders

- **PROBLEM:** Naming your recorder "ZAXCOMSD" in the ***Track Name page*** {p.29}, will cause the Format function in the ***Media Erase & Format page*** {p.20} to fail.
  WORKAROUND: Don't do that.
- **PROBLEM:** The first audio segment is always timecode stamped with 00:00:00.
  WORKAROUND: Go into record mode for a few seconds, after the card has been initialized. Any recording after this point will have the correct timecode recorded in the file.

IFB

NONE

TRX / ZFR / IFB Firmware History

==========

Version 6.00: 2009-04-08
- Added STA-150 setting to ADC external mode page
- Changed Forced ADCexternal==1 when product is IFB

==========

Version 5.99: 2009-03-13
- Changed rounding of MBytes and GBytes display (round up using 999.9)

==========

Version 5.98: 2009-03-03
- Fixed formatting cards larger than 4GB

==========

Version 5.97: 2009-02-19
- Changed Transmitter stops transmitting for 1 second while changing frequency to prevent stomping on intermediate frequencies
- Changed PACIFIER Page – display of remaining recording time

==========

Version 5.96: 2009-02-12
- Added "FORMAT CANCELED" text when just writing wrapper files to card using 9 **DEC** key presses

==========

Version 5.95: 2009-02-12
- Fixed Remaining Recording Time display area in the PACIFIER screen

==========

Version 5.94: 2009-02-11
- Removed GROUP ID and UNIT ID screens if IFBMODE = not installed
- Removed TRX800 – MUTE SWITCH ENABLE screen
- Removed All four of the AUDIO TRANSMITTER POWER CALIBRATION screens
- Added Tx power display value to Tx Power Calibration screens
- Changed Display of Remaining Recording time while IFBMODE = not installed
- Fixed Card Size Display during bootup
- Removed IFB100 & ZFRxxx – LR SWITCH MODE screen
- Removed IFB100 – NAME display during bootup

==========

Version 5.93T: 2009-02-05
- Fixed loud clicking sound when IFB signal started to get weak

==========

Version 5.93: 2009-02-04
- Added CRC error check in IFB RX interrupt
- Changed IFBmode_screen to include the new CRC error counters

==========

Version 5.92: 2009-01-29
- Added Card reformat to the MEDIA ERASE & FORMAT screen (9 DEC key presses)
- Changed SD card's volume label from ZAXCOM to ZAXCOMSD

==========

Version 5.90: 2009-01-27
- Added re-start if recording was forced into STOP mode due to an SD card problem

==========

Version 5.89: 2009-01-27
- Changed IFB100 – hardcoded the previously updatable record status, preventing the display of "LREC", to prevent confusion.
- Changed Disallow record-mode screen if the record option is not installed.
- Added IFB100 - TVCH MAX & TVCH MIN screens to Extended menu to support the REMOTE FREQUENCY CHANGE screen
- Changed IFB100 –TVCH MAX & TVCH MIN screens display the frequency as well as the existing TV channel
- Changed Increased size of RECFIFO buffer
- Removed TRX700 – IFB EARPIECE SOURCE screen
- Removed IFB100 – IFB INPUT MIX screen

==========

Version 5.88: 2009-01-26
- Added TRX992 – VPX battery formula
- Changed TRX992 – swapped IFB mixer knob rotation to match the silk screen

==========

Version 5.87: 2009-01-25
- Deleted remnants of BlownPA detector
- Deleted ICAL, QCAL and DIAMOND screens from factory menu

==========

Version 5.86T: UNKNOWN
Changed HeadPhone Beep tones are now SUMMED into HP
Changed location of channel changer in RX-INT handler (gIFBSlotTimer==1)

==========

Version 5.85T: 2009-01-22
Added 500Hz headphone beep to LRSWitch mode
Added tone64[]

==========

Version 5.84T: 2009-01-22
Changed TRX900 text to TRX992

==========

Version 5.83: 2009-01-21
Added TRX900 & TRX800 – LRSWitch option

==========

Version 5.82: UNKNOWN
Changed problem with IFB format and TXformat overlap

==========

Version 5.81: UNKNOWN
Changed IFB channel changing scheme

==========

Version 5.80T: UNKNOWN
Added new format scheme that separates TX and RX formats for IFB and Txer
Added IFB_RX_FORMAT_screen
Added high quality IFB format mode (no timecode or remote control in this mode)
Deleted QCAL screen from IFB

==========

Version 5.75T: UNKNOWN
Changed PROBLEM WITH STUFFED DECODE CONDITION

==========

Version 5.74T: 2009-01-12
Disabled IFB MIX screen if IFBoptioncode == 0
Changed LCD opts back 'ON'

==========

Version 5.73: 2009-01-11
Added TRX800 - MENU key to enter Extended Menus (REC key already does this)
Changed "UNIT CODE" to "UNIT ID"
Changed "GROUP CODE" to "GROUP ID"
Removed IFB100 - ADC SELECT screen, BATTERY TYPE screen, ICAL screens, QCAL screens
Removed IFB100 – battery graphic from the PACIFIER screen
Deleted IFB FREQUENCY BAND screen since it's always set to the 2GHz band
Changed sub channel keys to use Pre-Lock key status (added gXkeyStatesPreLOCK)
Added sub channel support for bXKEYS_8PUNCH key press (and RECORD key)

==========

Version 5.72: 2008-12-11
Added Support for wireless remote channel changing via IFB100
Fixed OLD LCD lines were swapped due to wrong page numbers

==========

Version 5.71: 2008-12-03
Added Support for new LCD module (serial 1988 & above)

==========

Version 5.7LL: 2008-12-03
Changed ** SPECIAL VERSION ** hold UP key to force a LCD mode change

==========

Version 5.70T: 2008-11-29
Added TRX992 – mute chunk in IFB audio codec when no packets are arriving

==========

Version 5.70R: 2009-01-29
Changed parm==0 problem and some more tweaks to terminal and Trx900.c

==========

Version 5.69R: 2008-11-28
Added special IQ cal mode in Terminal.c

==========

Version 5.68R: 2008-11-24
Changed working on RXpacket / power up / down feature for RCR

==========

Version 5.67R: 2008-11-22

Changed command line seems to work

==========

Version 5.66R: 2008-11-21

Changed RAW RS232 in and out work at 300 baud

==========

Version 5.65R: 2008-11-17

Changed forced unit = 1 in RCR software

==========

Version 5.64R: 2008-11-15

Changed turn 'ON' PTT pin for RCR (remove this for normal units!)

Changed forced settings for RCR uint (IFB = 'ON') Group=42 etc

==========

Version 5.62g: 2008-10-23

Added MUTE switch option

Changed a RED LED also means MUTE

Changed lock screen now locks out the transport buttons as well as the INC, DEC, MENU buttons

Added DYNAMICS screen

Added theatrical mod support

Fixed FORMAT_CARD to fix last wrapper file size corruption

Fixed removed several useless menus from IFB products

Changed renamed menu item LED Reverse to Hardware Options

Changed extended GAIN range from 0 – 38 dB to 0 – 52 dB

Changed allow US_MONO_R format with a hand held mic (for new audio board mod)

==========

Version 5.53: 2008-07-15

Added support for high capacity SD cards (4GB and higher) and more support for other smaller cards.

==========

Version 5.51: 2008-05-21

Fixed recent IFB jam bug (could cause timecode to stop)

==========

Version 5.50a: UNKNOWN

Changed re-wrote IFB audio codec (sounds less crunchy)

==========

Version 5.36a: 2008-05-13

Changed Reversed cursor direction in the OPT and IDCODES screens

Fixed bug in OPT screen

==========

Version 5.34a: 2008-04-23

Added IFB100 - always allow IFB POWER SELECTION screen in the Extended Menu

Disabled IFB100 – EXPANDER and IDCODES screens

==========

Version 5.33c: 2008-04-21

Added TIMECODE OUTPUT ENABLE screen

Added New user power level settings for high power RF boards

Moved EXPANDER screen to bottom of extended menu

Added TRX990 - separate Left and Right gain setting

Fixed TRX990 - a new gain problem in Mono mode

Changed TRX990 - GAIN-L to GAIN-1

Changed TRX990 - GAIN-R to GAIN-2

Fixed IFB100 - IFB power setting to work above power level 3

==========

Version 5.33b: UNKNOWN

Fixed TC Reader no longer jams on seconds boundary

==========

Version 5.33a: UNKNOWN

Changed Loosened jam requirements

==========

Version 5.20: 2008-03-07

Added Higher resolution transmit waveform to increase TX range

==========

Version 5.19: 2008-02-29

Added	Timecode display in LOCK screen
Added	Timecode debug codes to DBG screen
Fixed	23/24/25 fps TC reader problems
Fixed	Transmitter's name initialization (was always NLD by default now it's SN######)

==========

Version 5.17: 2008-02-18

Fixed	Timecode problem with 23.98, 24 and 25fps timecode. This was causing autoload to trigger several times in a take. This version should be used in an IFB transmitter if using the wireless autoload feature

==========

Version 5.13: 2007-12-18

Added	Low battery warning text on PACIFIER screen
Added	EXPANDER screen (experimental version)
Added	BATTERY TYPE screen (LITHIUM, ALKALINE and NIMH) NIMH needs some tweaking
Added	Voltage display in PACIFIER screen (press **INC** key)
Added	500ms delay in AUDIO GAIN screen to prevent accidental gain change when leaving the LOCK screen
Added	Support for Non-Loop Record mode
Added	"FULL" message to PACIFIER screen for Non-Loop Record mode
Changed	LOCK screen to prevent unintended GAIN changes
Fixed	Left/right audio channel swap problem (effected only some units)
Modified	IFB100 - TXPWR screen to Extended Menu to adjust transmitter output power

==========

Version 5.04: 2007-11-12

Fixed	Stereo TONE transmit problem (*since 5.02)

==========

Version 5.03: 2007-11-09

Added — Accurate voltage display on the PACIFIER screen and AUDIO GAIN screen (press DOWN or UP key)

Modified — Low Power mode triggers a new experimental Low Power mode.

This mode is triggered if:
LED mode = "LOW POWER MODE"
TX Format = US (MONO)
IFBMODE = "OFF"

Timecode, IFB and Recording features are turned 'OFF' in this mode

To change to Low Power mode:

1. Go to Extended Menu (hold **MENU** while powering up the unit)
2. Change IFBMODE to 'OFF' (if you have that option)
3. Go to the LEDREVERSE screen (one of the last menu pages). The LEDREVERSE setting allows you to change the default color of the LED. The LED should usually be green.
4. Change the setting to LED LOW PWR MODE while keeping the LEDREVERSE setting the same digit as it was previously.
5. If the conditions have been met, the unit will display LOW POWER MODE, IFB IS OFF when the unit boots up again and the LED turns 'OFF' when not in use. This setting should increase the battery life by over 15% depending on the chemistry of the batteries you are using.

Added — IFB100 - TXPWR SCREEN (range = 0 to 7)

==========

Version 5.00d: UNKNOWN

Added — Timecode wrap at 24 hours for non-jammed timecode setting using last recorded segment as TCjam

Fixed — a serious record bug that prevented the unit from going into record if the timecode had wrapped around the 24-hour mark.

==========

Version 5.00b: UNKNOWN

Added — Special super Low Power operating mode: It is triggered if:
LED mode = LOW POWER MODE
TX Format = US (MONO)
(**NOTE:** no timecode, IFB or recording is available in this mode)

Changed — battery meter table

==========

Version 5.00a: 2007-11-03

Added — LED OFF mode in the LEDREVERSE screen

==========

Version 5.00: 2007-10-29

Fixed — TRX900 - swapped LOW1 / LOW2 display in the PACIFIER screen's remote power display

==========

Version 4.99a: UNKNOWN

Fixed — IFB side autoload (would not go into STOP because it never really went into RECORD)

==========

Version 4.99: 2007-10-04

Added	support for RCR dual mic side adapter
Changed	stereo to always be ISO
Changed	FORMAT_EUNB to FORMAT_MONO_R

==========

Version 4.98: 2007-09-25

Fixed	IFB Autoload function (remote transport commands TXifb.NS_RemoteTPmode not being set)

==========

Version 4.97a: 2007-09-25

Changed	sector size from 32k to 16k (or less) for Digital Foci PhotoSafe (FAT16 vs. FAT32 problem)

==========

Version 4.97: 2007-08-31

Fixed	a serious bug regarding the RecoverOpenSegment feature. If the unit is powered down while in record, the next recorded segment could begin at the start of the card, which would overwrite previous audio and make only that last recorded segment available.

The new ZaxConvert software (v5-97) fixes a minor problem with the RecoverOpenSegment feature and now appends the segment number (in decimal) to the end of each generated WAV or MP3 file.

==========

Version 4.95: 2007-08-10

Added	IFB VOTING screen. Turn 'ON' voting only if you have two IFB transmitters transmitting 2MHz apart from each other. If a receiver has voting turned 'ON' and it loses its IFB signal it will try to acquire an IFB signal on a channel that is 2MHz higher than its current RX frequency. For example: set the IFB to receive on 2.403GHz and set up two IFB transmitters (far apart from each other) one at 2.403GHz and one at 2.405 GHz. The IFB receiver(s) will switch from one channel to the other if the IFB signal degrades. This feature dramatically increases the IFB range when using two or more IFB transmitters.
Added	Safe Boot Mode feature. If the unit crashes after boot (and the battery is OK), hold the **MENU** and **DEC** keys while powering up. This will turn 'OFF' the IFB. An older unit may crash if IFB and STEREO are both enabled. There is a modification to the power supply board that will fix this.

==========

Chapter 10 – Menu Sheets

Menu Sheet for ZFR100

MENU SETTINGS

Standard Menu

i. (Transport Control page)
While in RECORD mode, press **DEC** to STOP recording. While in STOP, press **DEC** to move the playback pointer backward. To PLAY, press **INC**. While in PLAY, press **INC** to move the playback pointer forward.

ii. **GAIN**: _____ (Audio Gain page)
(0 to 52 dB, step 2)

iii. **HIGH PASS:** _____ (Highpass Filter page)
([OFF] / [value range: 30 to 220Hz, step: 10])

iv. **LIMITER:** _____ (Limiter page)
([OFF] \ [ON])

v. **TIMECODE:** _____ (Timecode Frame-rate page)
([23.98] / [24] / [25] / [29.97NDF] / [29.97DF] / [30NDF] / [30DF])

vi. **TC JAM MODE**: _____ (Timecode Jam Mode page)
([MANUAL (OFF)] / [AUTO-JAM] / [AUTO-LOAD])

vii. **TC SOURCE**: _____ (Timecode Source page)
([AUDIO INPUT] / [IFB (RF)] / [SIDE CONNECTOR])

viii. **PRESS UP KEY 5X** (Media Erase & Format page)

ix. **LOCK** (Lock page)
(5 sec countdown once entered)
(To unlock, simultaneously press **MENU** & **UP** keys)

Extended Menu – to reach these, turn 'OFF' the TX and hold the **MENU** key down while powering up.
(Displays EXTENDED MENU PRESS UP TO EXIT)

i. **HIGH PASS:** _____ (Highpass Filter page)
([OFF] / [value range: 30 to 220Hz, step: 10])

ii. **LIMITER:** _____ (Limiter page)
([OFF] \ [ON])

iii. **RECORD FORMAT:** _____ (Record Format page)
([US MONO] \ [EUROPEAN] \ [STEREO] \ [US MONO-R])

iv. **IFB FORMAT:** _____ (IFB Format page)

([LOW Q] / [HIGH Q])

v. **RXMODE**: _____ (IFB Enable page)
([OFF] / [RX])

vi. **IFB VOTING**: _____ (IFB Voting Enable page)
([NORMAL (OFF)] / [2 TXERS (ON)])

vii. **IFB FREQ**: _____ (IFB Frequency page)
(value range: 2.403 to 2.475 GHz, step: .001)

viii. **POWER UP MODE**: _____ (Power-up Mode page)
([UNLOCKED] / [LOCKED])

ix. **PRESS UP KEY 5X** (Media Erase & Format page)

x. **TC JAM MODE**: _____ (Timecode Jam Mode page)
([MANUAL (OFF)] / [AUTO-JAM] / [AUTO-LOAD])

xi. **TC SOURCE**: _____ (Timecode Source page)
([AUDIO INPUT] / [IFB (RF)] / [SIDE CONNECTOR])

xii. **TIMECODE OUTPUT:** _____ (Timecode Output Enable page)
([OFF] / [ON: OUTLEFT] / [ON: OUTRIGHT])

xiii. **REMOTE CONTROL GROUP ID**: _____ (Remote Control Group ID page)
(value range: 0 to 99, step: 1)

xiv. **REMOTE CONTROL UNIT ID**: _____ (Remote Control Unit ID page)
([ALL] / [value range: 1 to 200, step: 1])

xv. **EXPANDER** (Expander page)

	Factory Setting
PARMS: ([OFF] / [ON])	**OFF**
RATIO: _____ (value range: 1:1.01 to 1:4.00, step: .01)	**1:1.30**
THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-40 dB**
REDUCE: _____ (value range: 0 to -36 dB, step: 1)	**-6 dB**
SPEED: ([SLOW] / [NORMAL] / [FAST])	**SLOW**

xvi. **DYNAMICS** (Dynamics page)

	Factory Setting
PARMS: ([OFF] / [ON])	**OFF**
SIDECHAIN: ([IN] / [LP1] / [LP2] / [HFB])	**IN**
SPEED: ([SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST])	**SLOW**
ATTACK: ([SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST])	**SLOW**
CMP RATIO: _____ (value range: 1.0:1 to 5.0:1, step: .1)	**3.0:1**
CMP THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-20dB**
CMP KNEE: _____ (value range: 0 to 20 dB, step: 1)	**0dB**
EXP RATIO: _____ (value range: 1:1.00 to 1:4.00, step: .01)	**1:1.10**
EXP THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-40dB**
REDUCE: _____ (value range: 0 to -36 dB, step: 1)	**-12dB**
GAIN: _____ (value range: 0 to 30 dB, step: 1)	**0dB**

xvii. **ADC**: _____ (ADC Location page)
([INTERNAL] / [STA-100] / [STA-150])

xviii. **BATTERY TYPE:** _____ (Battery Type page)
([LITHIUM] / [ALKALINE] / [NIMH])

xix. **RECORD MODE:** _____ (Recording Mode page)
([LOOP RECORD] / [NON-LOOP RECORD])

xx. **NAME**: _____ (Track Name page)
(max: 8 chars, char = 0 to 9, space, A to Z)

RECORDING TO THE MINISD CARD

i. **Format the card:**

1) With the power 'OFF', insert the card into the slot
2) Hold the **MENU** key while powering up
3) Once up, release the **MENU** key
4) Press the **MENU** key repeatedly until **PRESS UP KEY 5X** appears
5) Press the **UP** key 5 times to erase and format the card
6) The display indicates it progress
7) Wait for successful completion before using. If it fails, do not use it to record in the TRX900

ii. **Record to the card:**

1) Turn 'OFF' the transmitter
2) Insert the MiniSD card
3) Turn 'ON' the transmitter
   (The unit will go into Record mode after the initialization process has completed)

INSTALLING A NEW OPERATING SYSTEM

i. Copy the program to a MiniSD card.
ii. Insert the card into the media slot.
iii. Simultaneously press the **UP** & **DOWN** keys while powering up the unit.
iv. Unit displays "BurningROM". Process takes 20 seconds.
v. Once "Done"is displayed, cycle the power to run on the new version.

SAFE BOOT MODE

Simultaneously press the **MENU** and **DOWN** keys while powering up.

Menu Sheet for ZFR800

MENU SETTINGS

Standard Menu

i. (Pacifier page)
(Displays: transmit frequency, remaining battery capacity, available recording time, recording mode, audio input level and recording buffer overrun.)

ii. **GAIN**: _____ (Audio Gain page)
(0 to 52 dB, step 2)

iii. **TXFREQ: _____** (Audio Transmitter Frequency page)
(518 to 872 MHz, 30 MHz block, step: 100 KHz) **Minimum channel separation: 500KHz**

iv. (Transport Control page)
While in RECORD mode, press **DEC** to STOP recording. While in STOP, press **DEC** to move the playback pointer backward. To PLAY, press **INC**. While in PLAY, press **INC** to move the playback pointer forward.

v. **TIMECODE: _____** (Timecode Frame-rate page)
([23.98] / [24] / [25] / [29.97NDF] / [29.97DF] / [30NDF] / [30DF])

vi. **LOCK** (Lock page)
(5 sec countdown once entered)
(To unlock, simultaneously press **MENU** & **UP** keys)

Extended Menu – to reach these, turn 'OFF' the TX and hold the **MENU** key down while powering up.
(Displays EXTENDED MENU PRESS UP TO EXIT)

i. **HIGH PASS: _____** (Highpass Filter page)
([OFF] / [value range: 30 to 220Hz, step: 10])

ii. **LIMITER: _____** (Limiter page)
([OFF] \ [ON])

iii. **TX FORMAT: _____** (Audio Transmission Format page)
([US MONO] \ [EUROPEAN] \ [STEREO] \ [US MONO-R])

iv. **POWER UP MODE**: _____ (Power-up Mode page)
([UNLOCKED] / [LOCKED])

v. **PRESS UP KEY 5X** (Media Erase & Format page)

vi. **EXPANDER** (Expander page)

	Factory Setting
PARMS: ([OFF] / [ON])	**OFF**
RATIO: _____ (value range: 1:1.01 to 1:4.00, step: .01)	**1:1.30**
THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-40 dB**
REDUCE: _____ (value range: 0 to -36 dB, step: 1)	**-6 dB**
SPEED: ([SLOW] / [NORMAL] / [FAST])	**SLOW**

vii. **DYNAMICS** (Dynamics page)

	Factory Setting
PARMS: ([OFF] / [ON])	**OFF**
SIDECHAIN: ([IN] / [LP1] / [LP2] / [HFB])	**IN**
SPEED: ([SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST])	**SLOW**
ATTACK: ([SLOWEST] / [SLOW] / [NORMAL] / [FAST] / [FASTEST])	**SLOW**
CMP RATIO: _____ (value range: 1.0:1 to 5.0:1, step: .1)	**3.0:1**
CMP THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-20dB**
CMP KNEE: _____ (value range: 0 to 20 dB, step: 1)	**0dB**
EXP RATIO: _____ (value range: 1:1.00 to 1:4.00, step: .01)	**1:1.10**
EXP THRESH: _____ (value range: 0 to -96 dB, step: 1)	**-40dB**
REDUCE: _____ (value range: 0 to -36 dB, step: 1)	**-12dB**
GAIN: _____ (value range: 0 to 30 dB, step: 1)	**0dB**

viii. **BATTERY TYPE: _____** (Battery Type page)
([LITHIUM] / [ALKALINE] / [NIMH])

ix. **RECORD MODE: _____** (Recording Mode page)
([LOOP RECORD] / [NON-LOOP RECORD])

x. **TX POWER: _____** (Audio Transmitter Power page)
([10MW] / [25MW] / [50MW] / [100MW])

xi. **BOOT UP IN**: _____ (Boot Up Mode page)
([NORMAL] / [STANDBY])

xii. **MUTE SWITCH: _____** (Mute Switch Enable page)
([0 - DISABLED] / [1 – ENABLED POSITIVE] / [0 – ENABLED NEGATIVE])

xxi. **LR SWITCH MODE: _____** (Left/Right Key Assignment page)
([OFF] / [ON: UP KEY] / [ON: MENU KEY]/ [ON: DOWN KEY]/ [(ALL KEYS])

xiii. **NAME**: _____ (Track Name page)
(max: 8 chars, char = 0 to 9, space, A to Z)

xiv. **ID1: _____ ID0**: _____ (Security Code page)
(each value range: 000 to FFF, step: 1, unless necessary, use 000)

RECORDING TO THE MINISD CARD

i. **Format the card:**

1) With the power 'OFF', insert the card into the slot
2) Hold the **MENU** key while powering up
3) Once up, release the **MENU** key
4) Press the **MENU** key repeatedly until **PRESS UP KEY 5X** appears
5) Press the **UP** key 5 times to erase and format the card
6) The display indicates it progress
7) Wait for successful completion before using. If it fails, do not use it to record in the TRX900

ii. **Record to the card:**

1) Turn 'OFF' the transmitter
2) Insert the MiniSD card
3) Turn 'ON' the transmitter
(The unit will go into Record mode after the initialization process has completed)

INSTALLING A NEW OPERATING SYSTEM

i. Copy the program to a MiniSD card.
ii. Insert the card into the media slot.
iii. Simultaneously press the **UP** & **DOWN** keys keys while powering up the unit.
iv. Unit displays "BurningROM". Process takes 20 seconds.
v. Once "Done"is displayed, cycle the power to run on the new version.

Menu Sheet for IFB100

MENU SETTINGS

Standard Menu

i. (Pacifier page)
(Displays: transmitter frequency, DC power level, audio level meter and remote transport control status.)

ii. **REMOTE GAIN**: _____ (Remote Audio Gain Change page)
(**UP** increases gain, **DOWN** decreases gain)

iii. **REMOTE CONTROL UNIT ID**: _____ (Remote Unit ID page)
([ALL] / [value range: 0 to 200, step: 1])

iv. **REMOTE CH**: _____ (Remote Audio Frequency Change page)
(value range: 512.0 to 752.0 MHz, step: .1)

v. **REMOTE POWERMODE**: _____ (Remote Power Setting Change page)
([0: POWER=ON] / [1: POWER=ON] / [2: POWER=ON] / [3: POWER=ON] / [4: POWER=ON] / [5: POWER=LOW1] / [6: POWER=LOW2])

vi. **TIMECODE**: _____ (Timecode Frame-rate page)
([23.98] / [24] / [25] / [29.97 NDF] / [29.97 DF] / [30 NDF] / [30 DF])

vii. **IFB FREQ**: _____ (IFB Frequency page)
(value range: 2.403 to 2.475 GHz, step: .001)

viii. **IFB INPUT MIX**: _____ (IFB Input Mix page)
([LR MONO MIX] / [LEFT ONLY] / [RIGHT ONLY])

ix. **LOCK** (Lock page)
(5 sec countdown once entered)
(To unlock, simultaneously press **MENU** & **UP** keys)

Extended Menu – to reach these, turn 'OFF' the RX and hold the **MENU** key down while powering up
(Displays EXTENDED MENU PRESS UP TO EXIT)

i. **HIGH PASS:** _____ (High Pass Filter page)
([Off] / [value: 30 to 220 Hz, step: 10])

ii. **LIMITER:** _____ (Limiter page)
([OFF] / [ON])

iii. **IFB FORMAT**: _____ (IFB Format page)
([LOW Q] / [HIGH Q])

iv. **IFB FREQ**: _____ (IFB Frequency page)
(value range: 2.403 to 2.475 GHz, step: .001)

v. **POWER UP MODE:** _____ (Power-up Mode page)
([Unlocked] / [Locked])
(Unlock by simultaneously pressing the **MENU** and **UP** keys)

vi. **TC JAM MODE:** _____ (Timecode Jam Mode page)
([MANUAL (OFF)] / [AUTO-JAM] / [AUTO-LOAD])

vii. **TC SOURCE:** _____ (Timecode Source page)
([AUDIO INPUT] / [IFB (RF)] / [SIDE CONNECTOR])

viii. **TIMECODE OUTPUT:** _____ (Timecode Output Enable page)
([OFF] / [ON: OUTLEFT] / [ON: OUTRIGHT])

ix. **REMOTE CONTROL GROUP ID:** _____ (Remote Control Group ID page)
(value range: 0 to 99, step: 1)

x. **REMOTE CONTROL UNIT ID**: _____ (Remote Control Unit ID page)
([ALL] / [value range: 001 to 200, step: 1])

xi. **IFB TX POWER:** _____ (IFB Transmitter Power page)
(value range: 0 to 7, step: 1)

xii. **TVCHAN MIN**: _____ (TV Channel Minimum page)
(value range: 16 to 99, step: 1)

xiii. **TVCHAN MAX**: _____ (TV Channel Maximum page)
(value range: 16 to 99, step: 1)

INSTALLING A NEW OPERATING SYSTEM

i. Copy the program to a MiniSD card.
ii. Insert the card into the media slot.
iii. Simultaneously press the **UP** & **DOWN** keys.
iv. Unit displays "BurningROM". Process takes 20 seconds.
v. Power down and back up to run new version.

Chapter 11 – Zaxcom Warranty Policy and Limitations

Zaxcom Inc. values your business and always attempts to provide you with the very best service.

No limited warranty is provided by Zaxcom unless your Zaxcom ZFRxxx ("Product") was purchased from an authorized distributer or authorized reseller. Distributers may sell Product to resellers who then sell Product to end users. Please see below for warranty information or obtaining service. No warranty service is provided unless the Product is returned to Zaxcom Inc. or a Zaxcom dealer in the region where the Product was first shipped by Zaxcom.

Warranty Policy

Zaxcom Product carries a Standard Warranty Period of one (1) year.

NOTE: The warranty period commences from the date of delivery from the Zaxcom dealer or reseller to the end user.

There are no warranties which extend beyond the face of the Zaxcom limited warranty. Zaxcom disclaims all other warranties, express or implied, regarding the Product, including any implied warranties of merchantability, fitness for a particular purpose or non-infringement. In the United States, some laws do not allow the exclusion of the implied warranties.

Return Material Authorization (RMA)

No Product may be returned directly to Zaxcom without first contacting Zaxcom for a Return Material Authorization ("RMA") number. If it is determined that the Product may be defective, you will be given an RMA number and instructions for Product return. An unauthorized return, i.e. one for which an RMA number has not been issued, will be returned to you at your expense. Authorized returns are to be shipped prepaid and insured to the address on the RMA in an approved shipping container. Your original box and packaging materials should be kept for storing or shipping your Product. To request an RMA, please contact Zaxcom by telephone. There is an RMA form on the Zaxcom website. Please fill out the form and return it with the Product for repair. Zaxcom will return the warranty repair via 2nd day UPS or FedEx at their discretion. If overnight service is required, a FedEx or UPS account number must be provided to Zaxcom to cover the shipping expenses.

Warranty Limitations

Zaxcom's limited warranty provides that, subject to the following limitations, each Product will be free from defects in material and workmanship and will conform to Zaxcom's specification for the particular Product.

Limitation of Remedies

Your exclusive remedy for any defective Product is limited to the repair or replacement of the defective Product.

Zaxcom may elect which remedy or combination of remedies to provide in its sole discretion. Zaxcom shall have a reasonable time after determining that a defective Product exists to repair or replace a defective Product. Zaxcom's replacement Product under its limited warranty will be manufactured from new and serviceable used parts. Zaxcom's warranty applies to repaired or replaced Product for the balance of the applicable period of the original warranty or thirty days from the date of shipment of a repaired or replaced Product, whichever is longer.

Limitation of Damages

Zaxcom's entire liability for any defective Product shall, in no event, exceed the purchase price for the defective Product. This limitation applies even if Zaxcom cannot or does not repair or replace any defective Product and your exclusive remedy fails of its essential purpose.

No Consequential or Other Damages

Zaxcom has no liability for general, consequential, incidental or special damages. These include loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any Product, the installation of replacement Product, and any inspection, testing or redesign caused by any defect or by the repair or replacement of Product arising from a defect in any Product.

In the United States, some states do not allow exclusion or limitation of incidental or consequential damages, so the limitations above may not apply to you. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state.

Your Use of the Product

Zaxcom will have no liability for any Product returned if Zaxcom determines that:

- The Product was stolen.
- The asserted defect:
  1. Is not present,
  2. Cannot reasonably be fixed because of damage occurring when the Product is in the possession of someone other than Zaxcom, or
  3. Is attributable to misuse, improper installation, alteration, including removing or obliterating labels and opening or removing external covers (unless authorized to do so by Zaxcom or an authorized Service Center), accident or mishandling while in the possession of someone other than Zaxcom.
- The Product was not sold to you as new.

Additional Limitations on Warranty

Zaxcom's warranty does not cover Product, which has been received improperly packaged, altered or physically abused.