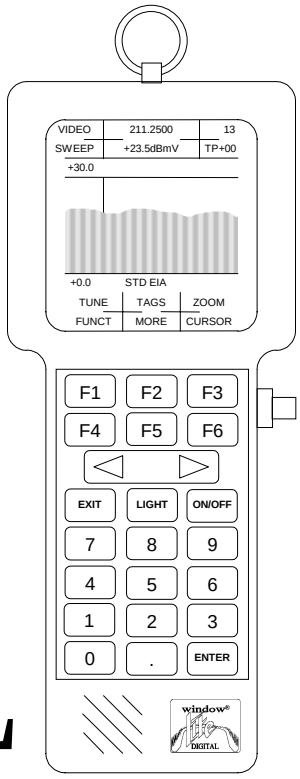
window® Lite DIGITAL



User's Guide

ComSonics, Inc. — An Employee Owned Corporation

1350 Port Republic Road -- Post Office Box 1106
Harrisonburg, VA 22801 USA
USA Toll Free: (800) 336-9681
Phone: (540) 434-5965
Fax: (540) 434-9847
email: marketing@comsonics.com

CSI Doc. 100961-001 Rev A

Warranty

ComSonics, Inc. warrants this product to be free of material and workmanship defects for a period of two years from the original date of shipment.

Remedies provided under Warranty are exclusive and in lieu of all other warranties express or implied. The liability to ComSonics is limited to product repair or replacement at the discretion of ComSonics. ComSonics shall not be held liable for any incidental or consequential damages.

The following are not covered by this warranty:

1) Parts or components not supplied by ComSonics, or parts or components that have been modified.

2) Any product or part failure that results from accident, abuse, misuse, neglect, or unauthorized repairs or modifications by individuals other than ComSonics personnel.

3) Failures caused by use of this product in extreme climates or moisture conditions.

4) WindowLite Digital Battery Pack

Technical Support

ComSonics maintains a Technical Support Service for customer convenience. Should the need arise, a Technical Support Representative can be reached by Phone (1-800-336-9681, 1-540-434-5965), Fax (1-540-432-9794), or Email (tech-support@comsonics.com).

Return Information

Products returned for repair, calibration, etc., must be safely packed. Please enclose information on the reason for return. Ship the material prepaid.

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Harrisonburg, Virginia 22801 USA
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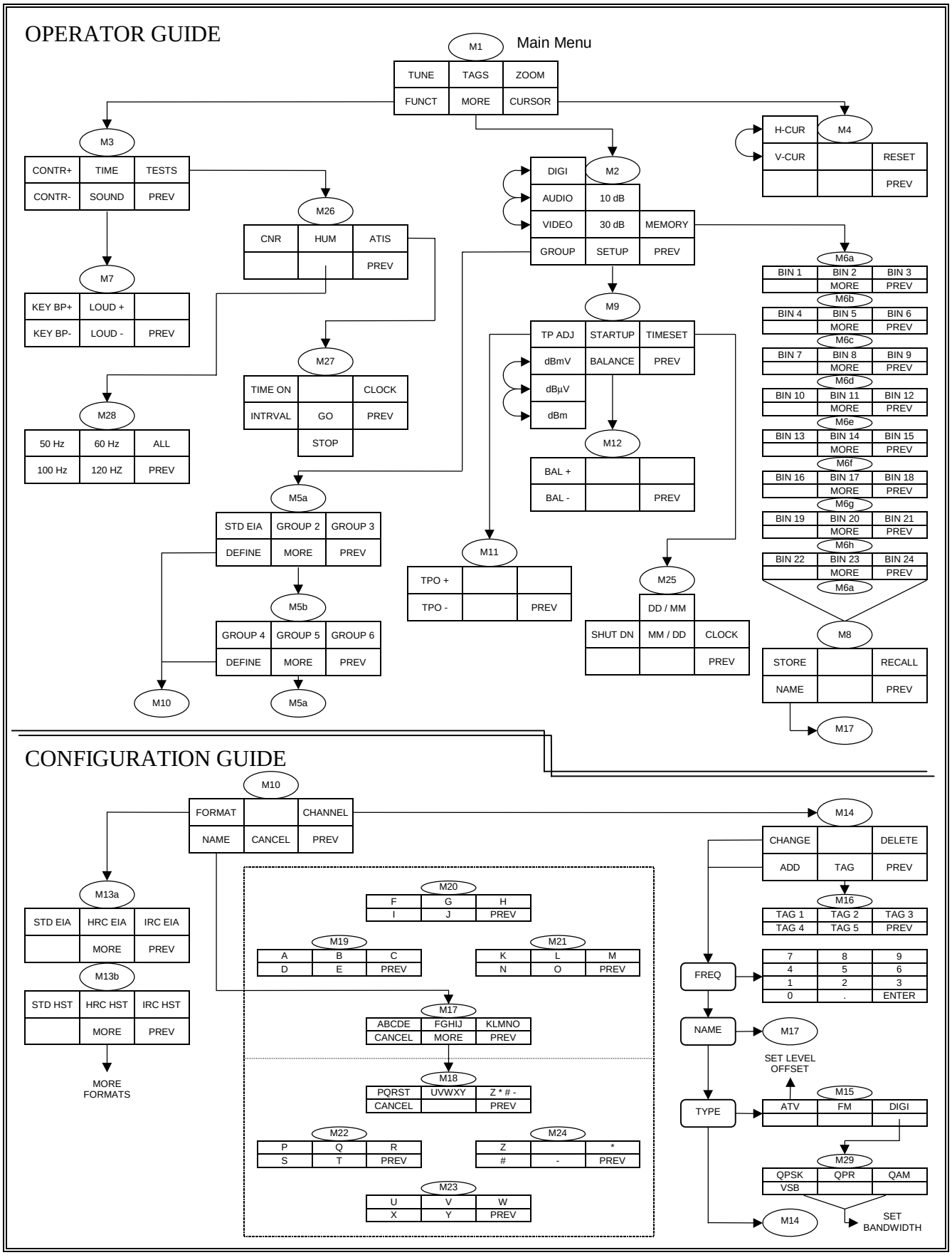
Menu Navigator

WindowLite Digital



Specifications

General

Frequency Range	5 ~ 860 MHz
Input Level Range	-45 dBmV ~ +60 dBmV
Input Impedance	75Ω nominal
IF Passband	180 kHz
Graph Display Range	30 dB or 10 dB, user selectable
Display Units:	
Absolute	dBmV, dBμV, or dBm
Relative	percent, dB
Display Resolution	0.1 dB, 0.1%
Maximum RF Input Power	1.0 Watt
RF Input 50/60 Hz Isolation	250 VAC
Analog Television Types	NTSC / PAL; peak carrier sync, preprogrammed audio offset
Digital Modulation Types	QPSK, QPR, QAM, and VSB; bandwidth up to 20 MHz
Power Requirements	6.0 watts maximum, supplied from a rechargeable 9.6 volt, 1.2 ampere-hour nickel-cadmium (NiCd) battery pack

Signal Level

Accuracy	
68 °F (20 °C)	± 1.0 dB
0 °F ~ 120 °F (-18 °C ~ 49 °C)	± 1.5 dB

Carrier-to-Noise

Accuracy	
68 °F (20 °C)	± 1.5 dB
0 °F ~ 120 °F (-18 °C ~ 49 °C)	± 2.5 dB
Maximum Dynamic Range	50 dB (Input Level = +10 dBmV)

Low Frequency Disturbance (HUM)

Accuracy	
68 °F (20 °C)	± 0.5%
0 °F ~ 120 °F (-18 °C ~ 49 °C)	± 1.0%
Range	0.5% ~ 10%
Passband	50 Hz, 60 Hz, 100 Hz, 120 Hz, or 20 Hz ~ 2 kHz
Input Range	0 dBmV ~ +20 dBmV

Temperature Measurement

Accuracy	± 2°
Range	-40 °F ~ 180 °F (-40 °C ~ 82 °C)

Mechanical

Operating Temperature	0 °F ~ 120 °F (-18 °C ~ 49 °C)
Storage Temperature	-20 °F ~ 150 °F (-29 °C ~ 66 °C)
Operating Humidity	0% ~ 100+% *
Storage Humidity	0% ~ 90% (non-condensing)
Net Weight	2.5 lb. (1.1 kg)
Shipping Weight	5.5 lb. (2.5 kg)
Dimensions (maximum)	10.6 x 4.0 x 3.1 inches (269.2 x 101.6 x 77.7 mm)

* WindowLite Digital designed to operate in light to moderate rainfall without measurement degradation.

Specifications subject to change without notice

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1 Getting Started

The following sub-sections are provided to assist you in initially using your WindowLite Digital.

1.1 Unpacking the Unit

The WindowLite Digital, its charger, and all ordered accessories are included in a single shipping container designed to provide the maximum protection during shipment. Immediately upon receipt, inspect the container and contents for signs of physical damage. Notify the freight forwarder of any damage detected.

It is advisable to keep the original shipping container for use when returning the unit for its annual re-calibration.

1.1.1 Battery Care

The WindowLite Digital is powered by a battery pack of nickel-cadmium cells. In order to receive the maximum benefit from them, care must taken to ensure that the recommended operating practices are followed.

As supplied from ComSonics, the WindowLite Digital battery pack is only partially charged. Before using the unit for a full day's operation, the battery pack must be charged for 4 to 6 hours.

1.1.2 Removing and Installing the Battery Pack

The battery back is accessed from the back of the WindowLite Digital. NOTE: The hand strap needs to be loosened and moved out of the way prior to attempting removal or installation.

To remove a battery pack, squeeze its two recessed slides towards each other (see C in Figure 1). The pack should partially 'pop' out of the housing.

To install a battery pack, squeeze the battery pack into the unit (see B in Figure 1). When fully seated, the locking slides will secure the battery pack into place.

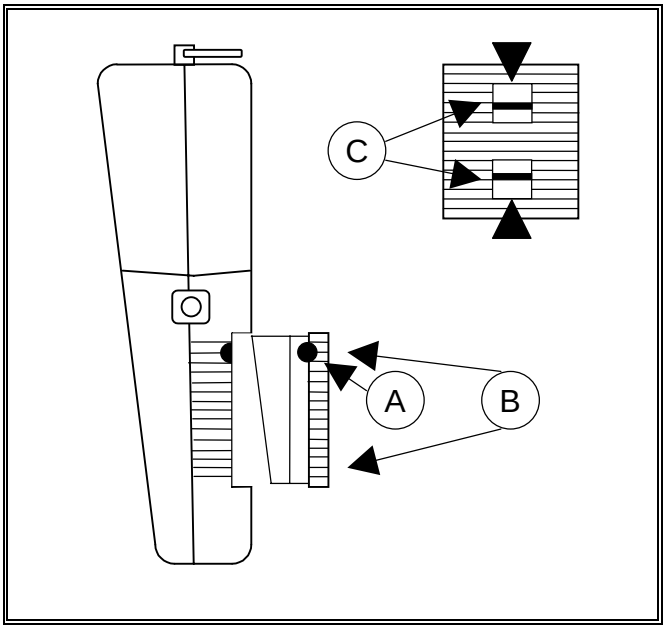

Figure 1 - Battery Pack Removal and Installation

1.1.3 Charging the Battery Pack

Battery packs can be charged either in the unit or out of the unit. The unit should be off during charging.

1) Insert charging plug into battery pack (see A in Figure 1)

2) Plug the charger AC plug into the AC Supply

3) Let charge for 4 to 6 hours.

Maximum recharge life is realized by using the battery pack until the WindowLite Digital automatically shuts down after the Low Battery warning is issued, then recharging for 4 to 6 hours. Fully charged spare battery packs will ensure continued use of the unit.

1.2 Mechanical Features

WindowLite Digital electronics are protected from the outside elements by an ergonomically developed, high impact ABS plastic housing. Surface mount technology (SMT) allows complex high density circuits to reside on multi-layered printed circuit boards. Shock mounting the internal components provides maximum protection during normal field use of the unit.

For the following descriptions, please refer to Figures 2 and 3.

The keyboard and display are engineered to allow use in high moisture areas without adverse effect upon critical measurements. A threaded receptacle is provided to allow user replacement of the standard F-81 input connector or an optional female BNC connector.

A custom battery pack slides quickly and easily into the WindowLite Digital handle. An adjustable strap provides a comfortable and flexible fit to the user's hand. For additional security, an optional utility lanyard can be attached to the ring on the top of the unit.

1 - Safety Ring - Allows the unit to be attached to a strand hook for hands free operation or to a utility lanyard for drop security.

2 - Liquid Crystal Display - a 128 x 128 pixel LCD which displays all information from the unit. A manually operated backlight is included for low ambient lighting use.

3 - Input Signal Connector - a user replaceable F-81 or BNC connector.

4 - LIGHT Key - manually turn the backlight on or off.

5 - ON/OFF Key - manually turn the unit on or off.

6 - ENTER Key - used to indicate the end of numeric input and other sequences.

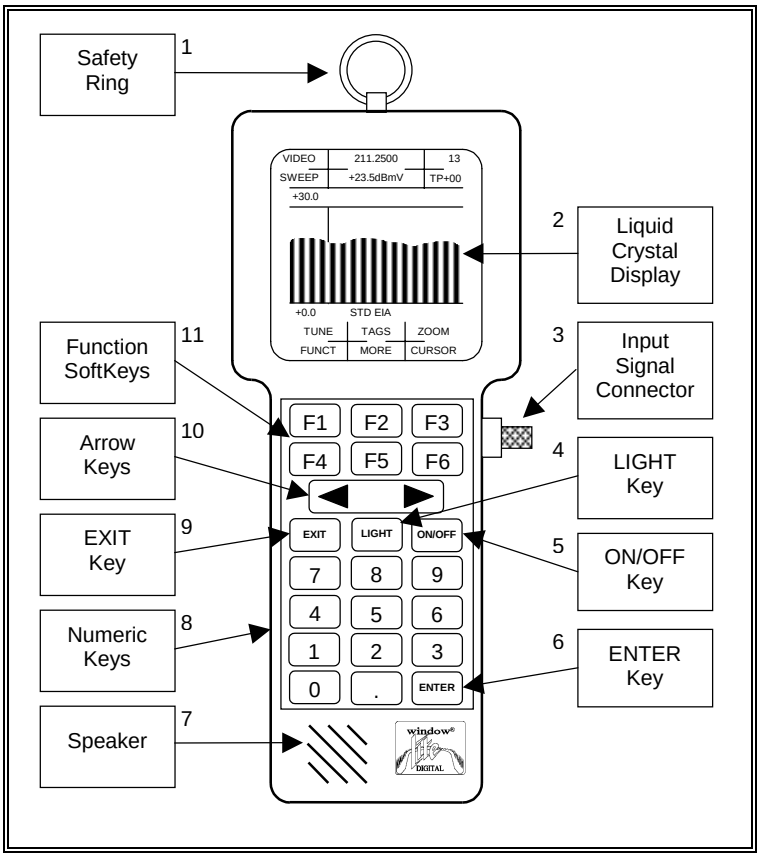

Figure 2 - Mechanical Features, Front View

7 - Speaker - outputs sound when tuning the audio carriers, sounds key beeps and warning beeps.

8 - Numeric Keys - used to input channel names and frequencies.

9 - EXIT Key - force the unit to its startup condition.

10 - ARROW Keys - provide the ability to control the cursors of the unit.

11 - Function SoftKeys - modes and functions are made available to the user through these keys.

12 - Accessory Module Port - used to attach add-on modules and PC communication interface cable.

13 - Adjustable Strap - used to provide a snug, comfortable handhold on the unit.

14 - Charger Input - used to both charge the battery and power the unit.

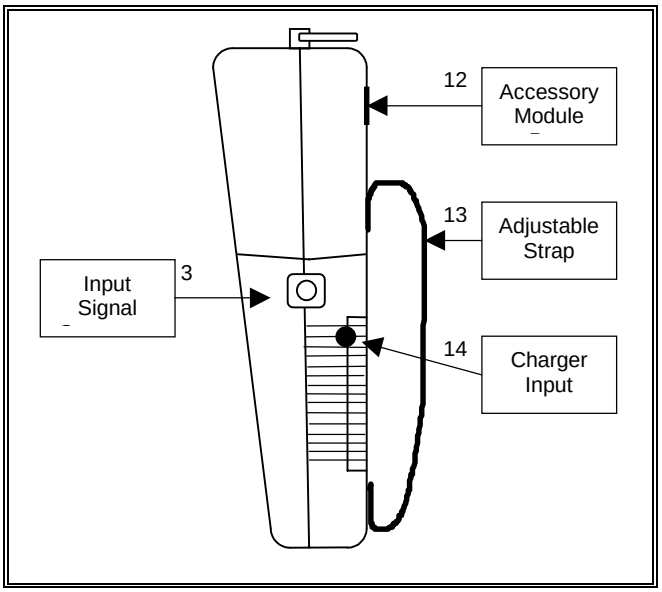

Figure 3 - Mechanical Features, Side View

1.2.1 Accuracy Features / Calibration

To ensure accuracy in the WindowLite Digital, ComSonics, Inc. uses the most modern techniques designed specifically for CATV equipment development and manufacture. Each WindowLite Digital unit is individually calibrated for signal level over frequency and temperature during manufacture in ComSonics' computer controlled calibration facilities.

Each WindowLite Digital is carefully characterized at the factory before shipping. It is possible that internal circuitry aging will cause slight inaccuracies to occur. To confirm original accuracy, it is recommended that each unit be returned to the factory or to a factory authorized calibration facility at time intervals not to exceed one year.

1.3 Accessories

ComSonics provides a number of accessories to enhance the use and operation of the WindowLite Digital.

Description	Part Number
Battery Pack	100329-002
Charger, 120 VAC (domestic use)	BB-522
Charger, 220-240 VAC (international use)	BB-526
Manual - User's Guide	100961-001
Holster (optional)	100326-001
Vehicle Charging Adapter (optional)	100358-001
Utility Lanyard (optional)	100380-001
BNC Connector, Replaceable (optional)	CC-701
F Connector, Replaceable (replacement)	CC-699
Protective Softcase (optional)	100409-001
Docking Station (optional)	100401-001
PC Interface Cable (optional)	100468-001

Table 1 - Accessories

1.4 Personality Features

Cable systems world-wide vary in numerous ways:

Number and frequency of active television channels
Number, frequency, and bandwidth of Digital carriers
Number and frequency of FM frequencies
Offset of Audio frequency to Video frequency

Individual technician's needs and preferences also vary:

Prefer to observe several specific channels on start up.
Must conveniently switch from one cable system to another.
Prefer to hear or not hear an audible tone with each key stroke.
Need to automatically compensate for a test point offset.

The WindowLite Digital addresses all of the above plus many more specific needs of the user and the cable system. This ability to change its personality makes the WindowLite Digital a truly valuable tool.

2 Operational Features

2.1 Introduction

The broad functionality of the WindowLite Digital requires some introduction of terms and functions as follows:

Table 2 - Term / Functions

2.1.1 Screen Display

Information is displayed in specific areas on the screen of the WindowLite Digital. The following is a general reference to the location and use of the screen areas.

1 - Video/Audio/Digital display mode toggle.

2 - Vertical Cursor Amplitude. This is the level of the carrier at the cursor.

3 - Frequency of the channel at the vertical cursor.

4 - Name of the channel at the vertical cursor.

5 - Current Test Point Offset value.

6 - Output Line. This field displays output values depending upon the current function mode of the unit. The title of the field is displayed with the numeric outputs HUM, CNR, ΔdB, etc.

7 - Vertical Cursor. The visual indicator of the channel currently being observed.

8 - Horizontal Cursor Reference. The base value used in ΔdB calculations.

9 - Bar Graph Display Area. The area where graphic displays appear.

10 - Memory Bin Name and data entry area. The area where the name of the current bin is displayed or where keyboard entries are displayed.

11 - SoftKey Labels. The labels that are associated with the function keys F1 through F6.

12 - Group Name. The name of the currently active group.

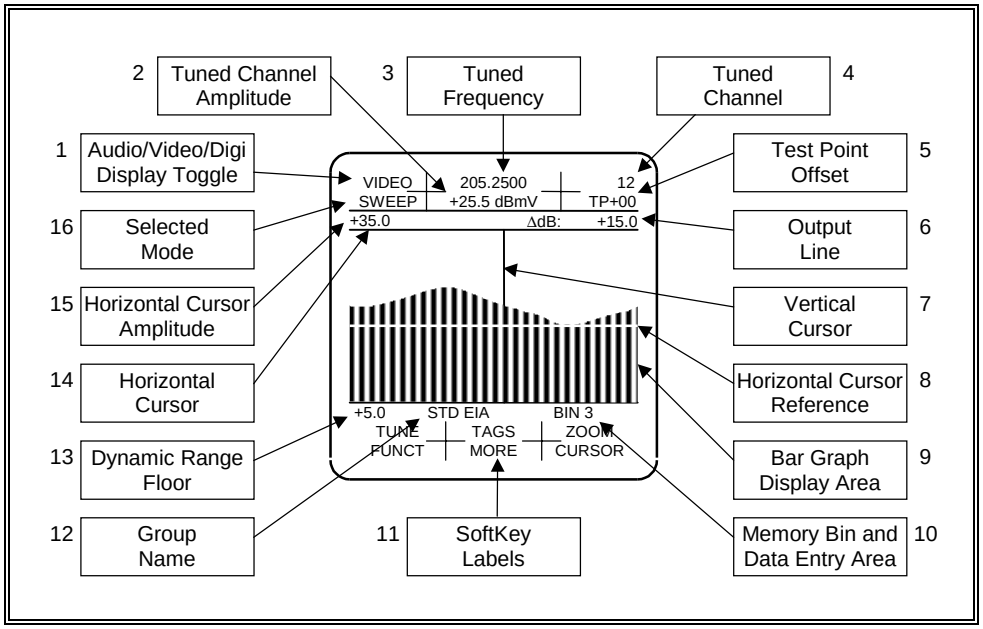

Figure 4 - General Screen Display

13 - Dynamic Range Floor. This is the amplitude of the base line displayed.

14 - Horizontal Cursor. The current position of the horizontal cursor.

15 - Current Horizontal Cursor Amplitude. The amplitude level at the position of the horizontal cursor.

16 - Selected Mode - this is the mode that is currently active. It can be SWEEP, TUNE, ZOOM or TAGS.

2.1.2 SoftKeys

In the WindowLite Digital, the function keys can assume different meanings depending upon the current status of the unit. Consequently, they are termed SoftKeys. This in contrast to the other keys on the unit which always have the same action.

There are 6 function keys labeled F1, F2, F3, F4, F5, and F6. At the bottom of the display screen, there are 6 associated message areas. The message area will always contain a description of the current function of the key. Should the message area be blank, then the SoftKey will have no associated action.

Thus, in this figure, the unit is in SWEEP mode. Pressing the SoftKeys will result in the following:

F1 - go into TUNE mode.

F2 - go into TAGS mode.

F3 - go into ZOOM mode.

F4 - change the SoftKeys to the FUNCTion menu.

F5 - change the SoftKeys to the MORE menu.

F6 - change the SoftKeys to the CURSOR menu.

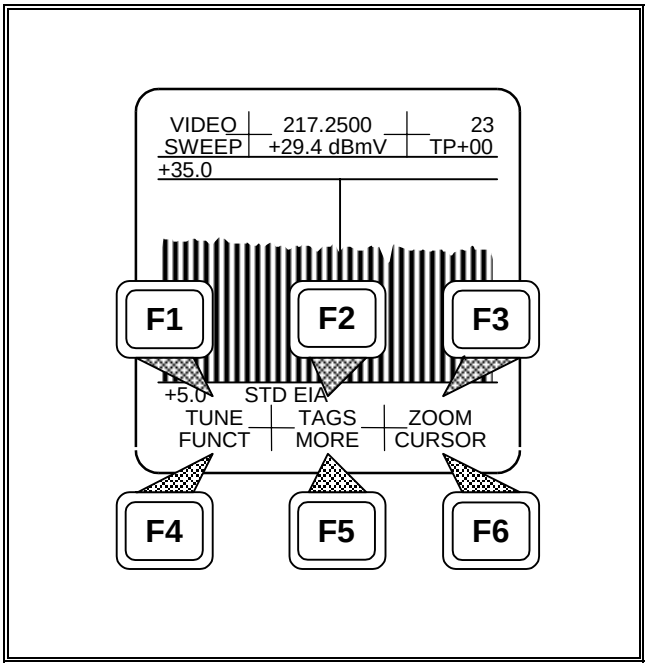

Figure 5 - SoftKeys and their Labels

2.1.3 Battery Usage

The battery pack in the WindowLite Digital, as is true with all batteries, has a finite usage time before it needs to be recharged.

The battery level bar graph indicates when recharging is needed.

When the battery pack's charge is low a warning message BATTERY LOW appears on the screen in the output line.

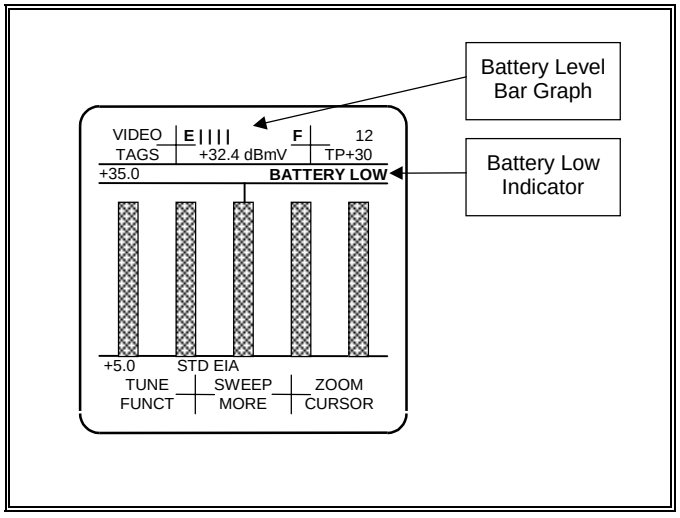

Figure 6 - Battery Low Indicator

Shortly thereafter, if the battery pack is not recharged, a BATTERY DEAD message appears in the middle of the screen. Then the unit shuts itself down.

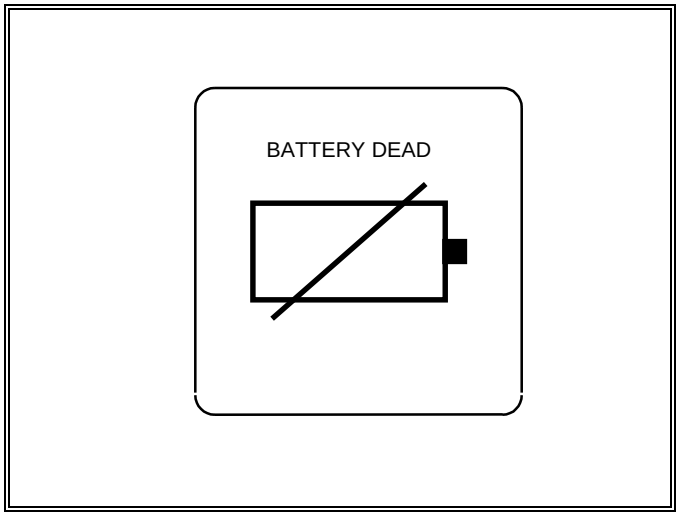

Figure 7 - Battery Dead Indicator

2.1.4 Groups

There are 6 Groups in the WindowLite Digital. Each Group contains specific information on a set of 5 to 128 channels. In this definition, a channel is either an analog TV channel (ATV), a Digital channel (DIGI), or an FM carrier. The information maintained on each channel is its name, its video carrier frequency and its audio carrier frequency. Audio carriers are automatically included with TV channels based on the *audio offset* for the format of the group. For information on formats, see Section 4.1 Format Sets, page 66. Digital channels and FM carriers do not have associated audio carriers.

Digital channels and TV video carriers are displayed in the VIDEO SWEEP mode. Only the Digital channels are displayed in the DIGI SWEEP mode. TV audio and FM carriers are displayed and available for measurement in the AUDIO SWEEP mode.

Initially, each of the 6 Groups is set to the Standard EIA Format which is listed in Section 4.1.24 on page 78. Each group can be changed to any of the factory formats and then be modified by the user to make a customized group.

2.1.5 Tags

Within each Group, 5 channels are designated Tags channels. These 5 channels will be the only ones displayed when the unit is in the Tags sweep mode. Since only 5 channels are being swept, a faster display update is achieved. The channels referenced as Tags can be changed by the user.

Initially, the Tags of each of the 6 Groups are set to those of the default values associated with the Standard EIA Format which is listed in Section 4.1.24 on page 78.

The Tags selection is not available in the DIGI SWEEP mode.

2.1.6 Memory Bins

The WindowLite Digital contains 24 memory bins. These memory bins are used to store a full set of measurements, time, date, carrier-to-noise, hum, temperature and scaling information. At any time, the user can cause the current readings of the Group being observed to be stored in any bin. The readings thus stored can be reviewed at a later time. The memory bins are in the non-volatile memory of the unit and as such their contents are preserved when the unit is turned off.

Detailed information on the use of the memory bins can be found in Section 3.7 which starts on page 63.

2.1.7 Formats

Formats are factory defined channel information sets that can be used to initialize any Group in the unit. ComSonics, Inc. provides many different Format sets to meet the needs of cable systems around the world. No digital or FM carriers are pre-defined in any Format set.

SoftKey Label	Description	Page #
AUSTRAL	Australia	67
BCST US	US Off - Air	67
BELGIUM	Belgium	68
CANADA	Canada	68
CHINA	China	69
DENMARK	Denmark	69
FRANCE	France	70
GERMANY	Germany	70
H.KONG	Hong Kong	71
HRC EIA	US HRC EIA	71
HRC HST	US HRC Historical	72
INDIA	India	72
IRC EIA	US IRC EIA	73
IRC HST	US IRC Historical	73
ISRAEL	Israel	74
ITALY	Italy	74
JAPAN	Japan	75
KOREA	Korea	75
N ZEAL	New Zealand	76
NETH 1	Netherlands 1	76
NETH 2	Netherlands 2	77
POLAND	Poland	77
REVERSE	Reverse Channel	78
STD EIA	US Standard EIA	78
STD HST	US Standard Historical	79
SWEDEN	Sweden	79
SWISS	Switzerland	80
TAIWAN	Taiwan	80
UK 1	United Kingdom 1	81
UK 2	United Kingdom 2	81

TABLE 3 - Country Format

2.2 Personality

2.2.1 Personality Configuration Table

The following is a table of the items that the user can change to affect the personality of the WindowLite Digital. The startup value of these personality items can be reset by the user.

Item	Factory Default	Range	Your Unit	Sub Section	Page #
Shut Down Time out	6 mins	0 to 59 mins step 1 min 0 = no shutdown		2.2.2	13
Display Contrast	medium	Dark to Light		2.2.3	14
Key Beep Loudness	medium	Off to Loud		2.2.4	15
Startup Mode	Sweep	Tags, Tune, Zoom, Sweep		2.2.5	16
Test Point Adjustment	0 dB	0 dB, 10 dB, 20 dB, 30 dB		2.2.6	17
Balance	0 dB	-5.0 dB to +5.0 dB (step 0.1)		2.2.7	18
Units of Measure	dBmV	dBmV, dBµV, or dBm		2.2.8	19
Date/Time Reset	1/1/93	DD = 1-31 MM = 1-12 YY = 00-99 HH = 1-24 MM = 0-59		2.2.9	20
Group 1	STD EIA	See Section 2.1.4 on page 10		3.2	28
Group 2	STD EIA	″		″	″
Group 3	STD EIA	″		″	″
Group 4	STD EIA	″		″	″
Group 5	STD EIA	″		″	″
Group 6	STD EIA	″		″	″

Table 4 - Personality Configuration

2.2.2 Auto Shut-Down Time Set

To conserve the battery, an automatic shut-down timer is incorporated in the WindowLite Digital. When activated, the unit shuts itself off after the designated time expires. Pressing any key, prior to shut down, resets the starting time of the timer.

This scenario shows how to reset the shut-down time interval.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10 dB | MEMORY GROUP | **SETUP** | PREV	F5	
TP ADJ | STARTUP | **TIMESET** dBµV | BALANCE | PREV	F3	
SHUT DN | MM/DD | CLOCK | | PREV	F1	**MINUTES MM** is displayed on the input line. **MM** is the current time to shut-down.
| | | CANCEL | PREV	Numeric Keys	Use the numeric keys and **ENTER** to modify the time. A value of 0 implies that no shutdown will occur.
SHUT DN | MM/DD | CLOCK | | **PREV**	F6	
TP ADJ | **STARTUP** | TIMESET dBµV | BALANCE | PREV	F2	Store the new shut-down time as the default STARTUP value.
TP ADJ | STARTUP | TIMESET dBµV | BALANCE | **PREV**	F6	
AUDIO | 10 dB | MEMORY GROUP | SETUP | **PREV**	F6	
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR		Main Menu is displayed.

Figure 8 - Auto Shut-Down Time Set

2.2.3 Display Contrast

The WindowLite Digital's LCD display contrast can be adjusted to meet the needs of the ambient lighting conditions.

The following scenario shows how to change display contrast.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR+ TIME TESTS CONTR - SOUND PREV	F1	Display darkens.
CONTR + TIME TESTS **CONTR -** SOUND PREV	F4	Display lightens.
CONTR + TIME TESTS CONTR - SOUND **PREV**	F6	Main Menu is displayed.
The Display Contrast is increased and decreased a small portion with each keypress. Once the maximum or minimum level is reached, additional depresses are ignored. Increasing the contrast to the maximum level will result in a totally dark screen. Decreasing the contrast to the minimum level will result in a totally blank screen. Note that the Display Contrast is a STARTUP definable parameter.		

Figure 9 - Display Contrast Steps

2.2.4 Key Beep Loudness

Key beep loudness is a personal preference of the user and is adjustable.

This scenario shows you how to adjust key beep loudness.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR + TIME TESTS CONTR - **SOUND** PREV	F5	Audio for current cursored channel comes on.
KEY BP+ LOUD+ KEY BP - LOUD - PREV	F1	Increase Loudness of Key Beep.
KEY BP+ LOUD+ **KEY BP -** LOUD - PREV	F4	Decrease Loudness of Key Beep.
KEY BP+ LOUD+ KEY BP - LOUD - **PREV**	F6, F6	Press F6 twice to display Main Menu.
Key Beep Loudness is a STARTUP definable parameter.		

Figure 10 - Key Beep Loudness Steps

2.2.5 StartUp Mode Define

Many of the factory default personality parameters can be changed and retained as startup parameters. Those parameters that can be set for startup are listed in Section 2.2.1, on page 12.

To set them for startup, set each parameter to its desired startup value and then follow this scenario. **Be careful, when the startup setup is completed, all of the above mentioned parameters will be set to their current settings.**

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM **FUNCT / MORE / CURSOR**	F1, F2, F3	Put unit into the desired startup configuration.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10 dB / MEMORY GROUP / **SETUP** / PREV	F5	
TP ADJ / **STARTUP** / TIMESET dBµV / BALANCE / PREV	F2	All current start up options (see below) are stored as the defaults.
TP ADJ / STARTUP / TIMESET dBµV / BALANCE / **PREV**	F6	
AUDIO / 10 dB / MEMORY GROUP / SETUP / **PREV**	F6	
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR		Main Menu is displayed.

Note that all definable startup parameters (TUNE, TAGS, ZOOM, SWEEP mode; Group; dBmV/dBµV/dBm; Key Beep; Auto Shut Down Time; Test Point Adjust; Balance; Display Contrast; Audio/Video Carrier Display) are set with this procedure.

Figure 11 - StartUp Mode Define Steps

2.2.6 Test Point Offset Select

The WindowLite Digital allows the user to automatically compensate for test attenuation value. This is accomplished by adding values to the measurement of 5 to 30dB, in 5dB steps (5, 10, 15, 20, 25, or 30 dB). When the operator presses TP ADJ the existing offset is displayed on the output line and changes as the operator makes new selections.

The following scenario shows how to increase or decrease test point offset.

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10 dB / MEMORY GROUP / **SETUP** / PREV	F5	
TP ADJ / STARTUP / TIMESET dBµV / BALANCE / PREV	F1	Current attenuation is displayed.
TPO+ / / TPO- / / PREV	F1	Increase the Test Point Offset.
TPO+ / / **TPO-** / / PREV	F4	Decrease the Test Point Offset.
TPO+ / / TPO- / / **PREV**	F6	
TP ADJ / STARTUP / TIMESET dBµV / BALANCE / **PREV**	F6	
AUDIO / 10 dB / MEMORY GROUP / SETUP / **PREV**	F6	
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR		Main Menu is displayed.
The Test Point Offset is a STARTUP definable parameter.		

Figure 12 - Test Point Offset Select Steps

2.2.7 Balance Adjust

A flat balance adjustment is available in each WindowLite Digital. This is useful when the unit is used with other equipment that is perceived to be reading slightly higher or lower than the WindowLite Digital. This adjustment can be from -5.0 dB through +5.0 dB in 0.1 dB steps.

Please use this function with care! Each WindowLite Digital is carefully calibrated in the factory to provide an instrument that is highly accurate over the operating temperature range. Balance Adjust should only be used to equalize multiple WindowLite Digital reading differences only.

This scenario shows how to increase or decrease balance adjustment.

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F5	
FUNCT	**MORE**	CURSOR		
AUDIO	10 dB	MEMORY	F5	
GROUP	**SETUP**	PREV		
TP ADJ	STARTUP	TIMESET	F5	
dBµV	**BALANCE**	PREV		
BAL+			F1	Balance value is increased.
BAL-		PREV		
BAL+			F4	Balance value is decreased.
BAL-		PREV		
BAL+			F6	
BAL-		**PREV**		
TP ADJ	STARTUP	TIMESET	F6	
dBµV	BALANCE	**PREV**		
AUDIO	10 dB	MEMORY	F6	
GROUP	SETUP	**PREV**		
TUNE	TAGS	ZOOM		Main Menu is displayed.
FUNCT	MORE	CURSOR		
The Unit to Unit Balance is a STARTUP definable parameter.				

Figure 13 - Balance Adjust Steps

2.2.8 Units of Measure Toggle

The WindowLite Digital can be configured to display its absolute measurement values in either dBmV (1.0 millivolt reference), dBμV (1.0 microvolt reference), or dBm (1.0 milliwatt reference) units. All references are at 75Ω.

This scenario illustrates the procedure reset (toggle) display units.

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10 dB / MEMORY GROUP / **SETUP** / PREV	F5	
TP ADJ / STARTUP / TIMESET **dBμV** / BALANCE / PREV	F4	dBmV / dBμV / dBm units are toggled.
Units dBmV / dBμV / dBm is a STARTUP definable parameter.		

Figure 14 - Units of Measure Toggle Steps

2.2.9 Date/Time Reset

The WindowLite Digital maintains a time-of-day clock along with the date. Both time and date are reset using this function. Time is entered and displayed in military style; that is, hours of the day start at 00 and run through 23. PM hours are 13 through 23. Date can be entered and displayed in either MM/DD/YY or DD/MM/YY format. The format is selectable using Date Format Select in Section 2.2.11, on page 22.

This scenario illustrates the procedure for resetting date and time.

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10dB / MEMORY GROUP / **SETUP** / PREV	F5	
TP ADJ / STARTUP / **TIMESET** dBµV / BALANCE / PREV	F3	
SHUT DN / DD/MM / **CLOCK** / / PREV	F3	The current **MONTH MM** displays on the input line. Use the numeric keys and **ENTER** to set the appropriate month (01-12).
/ / / / CANCEL / PREV	NUM Keys and ENTER	The current **DAY DD** displays on the input line. Use the numeric keys and **ENTER** to set the appropriate day (01-31).
/ / / / CANCEL / PREV	NUM Keys and ENTER	The unit displays **YEAR YY** on the input line. **YY** is the current year number. Use the numeric keys and **ENTER** to set the appropriate year.
/ / / / CANCEL / PREV	NUM Keys and ENTER	The unit displays **TIME HHMM** on the input line. **HHMM** is the current time. Use the numeric keys and **ENTER** to set the appropriate time.
SHUT DN / DD/MM / CLOCK / / **PREV**	F6, F6, F6 or EXIT	
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR		Main Menu is displayed.
Note that the Date and Time are resetable in the ATIS menu also.		

Figure 15 - Date/Time Reset Steps

2.2.10 Time Display

The WindowLite Digital maintains a time-of-day clock along with the date. Time is displayed using this function.

This scenario illustrates the procedure for displaying time.

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F4	
FUNCT	MORE	CURSOR		
CONTR+	**TIME**	TESTS	F2	The output line displays **MM/DD/YY HHMM.**
CONTR-	SOUND	PREV		
CONTR+	TIME	TESTS	F6 or EXIT	
CONTR-	SOUND	**PREV**		
TUNE	TAGS	ZOOM		Main Menu is displayed.
FUNCT	MORE	CURSOR		

Figure 16 - Time Display Steps

2.2.11 Date Format Select

The WindowLite Digital maintains the date along with a time-of-day clock. Date can be entered and displayed in either MM/DD/YY or DD/MM/YY format. This function is a toggle used to make the selection.

This scenario illustrates the procedure for selecting date format.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10 dB | MEMORY GROUP | **SETUP** | PREV	F5	
TP ADJ | STARTUP | **TIMESET** dBµV | BALANCE | PREV	F3	
SHUT DN | **MM/DD** | CLOCK | | PREV	F2	Depressing **F2** toggles between domestic (MM/DD) and European (DD/MM) date formats.
SHUT DN | MM/DD | CLOCK | | **PREV**	F6, F6, F6 or EXIT	
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR		Main Menu is displayed.
Date Format is a STARTUP definable parameter.		

Figure 17 - Date Format Select Steps

3 Using the WindowLite Digital

This section is divided into the following subsections. Within each subsection are appropriate scenarios designed to assist you in getting the most out of your WindowLite Digital.

Table 5 - Topics

3.1 Controlling the Unit

The WindowLite Digital has several toggles that are available and useful during regular operation of the unit. Two of these toggles are shown in the table below.

Table 6 - Controlling the Unit

3.1.1 Video/Audio/Digital Carrier Display Toggle

The Video/Audio/Digital carrier Display Select controls the display of carriers in Sweep and Tags mode. Normal startup displays TV video (ATV) and Digital carriers (DIGI). Selecting the AUDIO position causes the Audio and FM carriers to be displayed. Selecting the DIGI mode causes only the Digital carriers to be displayed.

Note that each channel in a Group can set to be **ATV**, **FM**, or **DIGI**. The TAGS function is not available in DIGI SWEEP mode.

Note that the SoftKey displays the next mode that will be activated when the key is pressed.

The scenario to switch between video and audio carrier is as follows:

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10 dB / MEMORY GROUP / SETUP / PREV	F1	Video / Audio / Digital display select is sequenced.
DIGI / 10 dB / MEMORY GROUP / SETUP / PREV	F1	Audio / Digital / Video display select is sequenced.
VIDEO / 10 dB / MEMORY GROUP / SETUP / PREV	F1	Digital / Video / Audio display select is sequenced.
VIDEO / 10 dB / MEMORY GROUP / SETUP / **PREV**	F6	
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR		Main Menu is displayed.
Repeatedly pressing F1 causes AUDIO, DIGI, and VIDEO to sequence in the indicated SoftKey menu location. When Video carriers are tuned, AUDIO is displayed. When AUDIO carriers are tuned, DIGI is displayed. VIDEO / AUDIO / DIGI is a startup definable parameter. Note that PREV was used to return to the Main Menu, EXIT will return to the STARTUP mode setting.		

Figure 18 - Video/Audio/Digital Carrier Display Toggle Steps

IMPORTANT NOTE:

The SoftKey label **DIGI** will not appear unless digital type channels have been added to the group by the user. See Section 3.2.5 on page 33.

3.1.2 Display Range (10dB/30dB) Toggle

Another toggle available in the WindowLite Digital controls the dynamic range of values displayed on the screen. The available ranges are 10dB full scale and 30dB full scale.

The scenario to switch between 10 and 30dB display range is as follows:

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT **MORE** CURSOR	F5	
AUDIO **10 dB** MEMORY GROUP SETUP PREV	F2	30dB / 10dB scale is toggled.
AUDIO **30 dB** MEMORY GROUP SETUP PREV	F2	10dB / 30dB scale is toggled.
When the 10dB mode is active, 30dB is displayed in the SoftKey menu. When the 30dB mode is active, 10dB is displayed in the SoftKey menu.		

Figure 19 - Display Range (10dB/30dB) Toggle Steps

3.1.3 Listening to Channel Audio

The WindowLite Digital allows you to listen to the audio on the channel of interest. In the Sweep mode, audio from the tuned television carrier is heard. If you are in Tune or Zoom modes, demodulated audio at the presently tuned frequency is heard. Thus to hear the actual audio in those modes, you must cursor to the actual audio frequency.

This scenario shows how to listen to channel audio:

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR+ TIME TESTS CONTR- **SOUND** PREV	F5	Audio turns on.
KEY BP+ LOUD+ KEY BP- LOUD- **PREV**	F6	
CONTR+ TIME TESTS CONTR- SOUND **PREV**	F6	
TUNE TAGS ZOOM FUNCT MORE CURSOR		Main Menu is displayed.

Figure 20 - Listening to Channel Audio Steps

Note that while you are listening to the channel audio, you can use any of the three channel tuning methods (see Section 3.4, on page 38) to change to another channel.

3.1.4 Channel Audio Loudness

With the WindowLite Digital, you can listen to the audio of the current channel of interest. For various reasons, you may wish to adjust the speaker volume.

The audio loudness has a range of 0 to 16. When the unit's sound function is selected (see Section 3.1.3, on page 26) the loudness is reset to level 1.

The scenario below shows how to adjust audio level.

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F4	
FUNCT	MORE	CURSOR		
CONTR+	TIME	TESTS	F5	
CONTR-	**SOUND**	PREV		
KEY BP+	**LOUD+**		F2	Loudness Increases.
KEY BP-	LOUD-	PREV		
KEY BP+	LOUD+		F5	Loudness Decreases.
KEY BP-	**LOUD-**	PREV		
KEY BP+	LOUD+		F6	Audio turns off.
KEY BP-	LOUD-	**PREV**		
CONTR+	TIME	TESTS	F6	
CONTR-	SOUND	**PREV**		
TUNE	TAGS	ZOOM		Main Menu is displayed.
FUNCT	MORE	CURSOR		

Tuned channel audio loudness is increased and decreased a small portion with each keypress. Once the maximum or minimum level is reached, additional depresses are ignored. Note that pressing EXIT will reset the loudness to level 1.

Figure 21 - Channel Audio Loudness Steps

3.2 Groups

The WindowLite Digital contains space for 6 Groups. Each Group can be personalized to meet the needs of the user and the cable system.

Table 7 - Groups

A table containing all of the personality items, their range, default values, etc., are located in Section 2.2.1 on page 12.

3.2.1 Selecting the Active Group

The WindowLite Digital activates only a single Group at a time. From the factory, Group 1 is active. This Group selection function enables the user to choose any other Group for use.

The following scenario shows how to select a group.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT **MORE** CURSOR	F5	
AUDIO 10 dB MEMORY **GROUP** SETUP PREV	F4	
STD EIA **GROUP 2** **GROUP 3** DEFINE **MORE** PREV	F1, F2, F3 or F5	Select from groups 1 - 3. **MORE** will display options for groups 4 - 6.
TUNE TAGS ZOOM FUNCT MORE CURSOR	EXIT	Main Menu is displayed.
F5 is used to set up for selection of groups 4 through 6. Group Select is a STARTUP definable parameter.		

Figure 22 - Selecting the Active Group

3.2.2 Initializing a Group with a new Format

In order to personalize the WindowLite Digital to meet your needs, you can change the Format of the channels in any Group. This capability allows you to select any of the Formats listed in Section 2.1.7, on page 11.

Note: Audio frequency offset from the video carrier is automatically assigned by the selected Format. Choosing an incorrect Format may result in inappropriate measurement values.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10 dB | MEMORY **GROUP** | SETUP | PREV	F4	
STD EIA | **GROUP 2** | **GROUP 3** DEFINE | **MORE** | PREV	F1, F2, F3 or F5	Select the appropriate group.
STD EIA | GROUP 2 | GROUP 3 **DEFINE** | MORE | PREV	F4	
FORMAT | | CHANNEL NAME | CANCEL | PREV	F1	
STD EIA | **HRC EIA** | **IRC EIA** | **MORE** | PREV	F1, F2, F3 or F5	Select the appropriate format.
FORMAT | | CHANNEL NAME | CANCEL | **PREV**	F6	Format is stored into the group.
STD EIA | GROUP 2 | GROUP 3 DEFINE | MORE | **PREV**	F6	
AUDIO | 10 dB | MEMORY GROUP | SETUP | **PREV**	F6	
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR		Main Menu is displayed.
Pressing EXIT will load the format into the selected group. On powerup the active group will revert to the startup group.		

Figure 23 - Initializing a Group with a new Format Steps

3.2.3 Naming a Group

The name of each Group can be personalized to meet the user's needs. The maximum length of the name is 7 characters including any blanks or special characters.

The following scenario shows how to name a Group.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10 dB | MEMORY **GROUP** | SETUP | PREV	F4	
STD EIA | **GROUP 2** | **GROUP 3** DEFINE | **MORE** | PREV	F1, F2, F3 or F5	Select group to name.
STD EIA | GROUP 2 | GROUP 3 **DEFINE** | MORE | PREV	F4	
FORMAT | | CHANNEL **NAME** | CANCEL | PREV	F4	
ABCDE | **FGHIJ** | **KLMNO** CANCEL | **MORE** | PREV	F1, F2, F3 or F5	Proceed to select the characters to form the name of the group. Press **ENTER** after the last character.
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	EXIT	Main Menu is displayed.
Pressing the Left Arrow key will delete the last character selected.		

Figure 24 - Naming a Group Steps

3.2.4 Delete a Channel within a Group

In order to further personalize your WindowLite Digital, provision is made to delete one or more channels from a Group.

The following scenario shows how to delete a channel.

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F5	
FUNCT	**MORE**	CURSOR		
AUDIO	10 dB	MEMORY	F4	
GROUP	MORE	PREV		
STD EIA	**GROUP 2**	**GROUP 3**	F1, F2, F3 or F5	Select the appropriate group.
DEFINE	**MORE**	PREV		
STD EIA	GROUP 2	GROUP 3	F4	
DEFINE	MORE	PREV		
FORMAT		**CHANNEL**	F3	
NAME	CANCEL	PREV		
CHANGE		DELETE	NUM Keys	Use the numeric keys or arrow keys to select the appropriate channel to delete.
ADD	TAG	PREV		
CHANGE		**DELETE**	F3	
ADD	TAG	PREV		
TUNE	TAGS	ZOOM	EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		

To delete multiple adjacent channels, locate the highest channel to be removed. Then press DELETE multiple times until all unwanted channels are removed. (Once a channel is deleted, the next lower frequency is displayed. If there is no lower channel, then the next higher will be displayed.)

Figure 25 - Delete a Channel within a Group Steps

The width of the sweep display is optimized for the number of channels in the selected group. Groups containing at or near the following number of channels are displayed at full width: 128, 64, 43, 32, 16, 10, or 8. The minimum group size is 5 channels.

3.2.5 Add a Channel within a Group

During personalization of the WindowLite Digital, it may be necessary to add one or more channels to a Group. Remember that the maximum size of a Group is 128 channels. (ATV, DIGI, and FM all count as channels.) If the Group is currently full and you need to add a channel, you'll have to delete one to make room for the addition. For information on deleting a channel look at Section 3.2.4 on page 32.

The following scenario shows how to add a channel.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10 dB | MEMORY **GROUP** | SETUP | PREV	F4	
STD EIA | **GROUP 2** | **GROUP 3** DEFINE | **MORE** | PREV	F1, F2, F3 or F5	Select appropriate group. First 3 groups are shown. To select from groups 4 - 6, press **MORE**.
STD EIA | GROUP 2 | GROUP 3 **DEFINE** | MORE | PREV	F4	
FORMAT | | **CHANNEL** NAME | CANCEL | PREV	F3	
CHANGE | | DELETE **ADD** | TAG | PREV	F4	**Freq:** _____ Enter primary frequency for new channel. Press **ENTER** to proceed.
ABCDE | **FGHIJ** | **KLMNO** CANCEL | **MORE** | PREV	F1, F2, F3 or F5	**Name:** _____ Use the appropriate keys to select up to **4** characters for the name. Press **ENTER** after the last character.
ATV | **FM** | **DIGI** | |	F1, F2, F3	**Type:** _____ Select the type of channel. Press **ENTER** to proceed. **Continue with Figure 26a, 26b, or 26c for scenario of each type selection.**

Figure 26 - Add a Channel within a Group

If type **ATV** was selected, the following scenario completes Adding a Channel.

SoftKey Menu	Press Key	Results
ATV FM DIGI	F1	**Type:** _____ Select **ATV**. Press **ENTER** to proceed.
OFFSET	F5	Offset for this channel in 0.1 dB increments. Press **OFF +** to increase level offset. Press **OFF –** to decrease level offset. Press **ENTER** to proceed.
OFF + **OFF –**	F1 or F4	
CHANGE DELETE **ADD** TAG PREV	F4	Press **ADD** to add more channels, if desired.
TUNE TAGS ZOOM FUNCT MORE CURSOR	EXIT	Press **EXIT** to store changes and display Main Menu.

Figure 26a - Add an ATV Channel within a Group

Audio carriers are automatically included with ATV channels based on the *audio offset* for the format of the group. For information on formats, see Section 4.1 Format Sets, page 66. FM and DIGI carriers are single frequency channels and do not have associated audio carriers.

If type **FM** was selected, the following scenario completes Adding a Channel.

SoftKey Menu	Press Key	Results
ATV **FM** DIGI	F2	**Type:** _____ Select **FM**. Press **ENTER** to proceed.
CHANGE DELETE **ADD** TAG PREV	F4	Press **ADD** to add more channels, if desired.
TUNE TAGS ZOOM FUNCT MORE CURSOR	EXIT	Press **EXIT** to store changes and display Main Menu.

Figure 26b - Add an FM Channel within a Group

FM channels are displayed and available for measurement only in the audio carrier mode. See Section 3.6.2 Audio Carrier Measurement, page 52.

If type **DIGI** was selected, the following scenario completes Adding a Channel.

SoftKey Menu	***Press Key***	***Results***
ATV | **FM** | **DIGI**	F4	**Type:** _____ Select **DIGI**. Press **ENTER** to proceed.
QPSK | **QPR** | **QAM** / **VSB**	F1, F2, F3 or F4	Select the appropriate digital type. Press **ENTER** to proceed.
SETBW	F1	Press **SETBW** to continue.
	NUM Keys	Enter the bandwidth (max 20 MHz) of the carrier. Note: A bandwidth of less than 1 MHz is read as a single carrier. Press **ENTER** to proceed.
CHANGE | DELETE / **ADD** | TAG | PREV	F4	Press **ADD** to add more channels, if desired.
TUNE | TAGS | ZOOM / FUNCT | MORE | CURSOR	EXIT	Press **EXIT** to store changes and display Main Menu.

Figure 26c - Add a Digital Channel within a Group

3.2.6 Change Channel Frequency, Name, Type

To further personalize your WindowLite Digital, you are given the opportunity to change the frequency, name, or type of any channel in any Group.

The following scenario shows how to change frequency, name, or type:

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F5	
FUNCT	MORE	CURSOR		
AUDIO	10 dB	MEMORY	F4	
GROUP	SETUP	PREV		
STD EIA	**GROUP 2**	**GROUP 3**	F1, F2, F3 or F5	Select appropriate group. First 3 groups are shown. To select from groups 4 - 6, press **MORE**.
DEFINE	**MORE**	PREV		
STD EIA	GROUP 2	GROUP 3	F4	
DEFINE	MORE	PREV		
FORMAT		**CHANNEL**	F3	
NAME	CANCEL	PREV		
CHANGE		DELETE	NUM Keys	Use the numeric keys and **ENTER** or the arrow keys to select the channel to change.
ADD	TAG	PREV		
CHANGE		DELETE	F1	**Freq:** _____ Enter video frequency for new channel. Press **ENTER** to proceed.
ADD	TAG	PREV		
ABCDE	**FGHIJ**	**KLMNO**	F1, F2, F3 or F5	**Name:** _____ Use the appropriate keys to select up to **4** characters for the name. Press **ENTER** after the last character.
CANCEL	**MORE**	**PREV**		
ATV	**FM**	**DIGI**	F1, F2, F3	**Type:** _____ Select the type of channel. Press **ENTER** to proceed.
				Continue with Figure 26a, 26b, or 26c for scenario of each type selection.

Figure 27 - Change Channel Frequency, Name, Type Steps

3.2.7 Changing the Tags within a Group

To meet your needs, channels that are marked as tags in each Group can be changed. There are always 5 tag channels present in each group.

The following scenario takes you through this procedure.

SoftKey Menu			Press Key	Results
TUNE	TAGS	ZOOM	ON or EXIT	Main Menu is displayed.
FUNCT	MORE	CURSOR		
TUNE	TAGS	ZOOM	F5	
FUNCT	**MORE**	CURSOR		
AUDIO	10 dB	MEMORY	F4	
GROUP	SETUP	PREV		
STD EIA	**GROUP 2**	**GROUP 3**	F1, F2, F3 or F5	Select appropriate group. First 3 groups are shown. To select from groups 4 - 6, press **MORE**.
DEFINE	**MORE**	PREV		
STD EIA	GROUP 2	GROUP 3	F4	
DEFINE	MORE	PREV		
FORMAT		**CHANNEL**	F3	
NAME	CANCEL	PREV		
CHANGE		DELETE	F5	
ADD	**TAG**	PREV		
CHANGE		DELETE	NUM Keys or Arrow Keys	Move the cursor to the replacement TAG channel by using either the arrow keys or the numeric keypad.
ADD	TAG	PREV		
TAG 1	**TAG 2**	**TAG 3**	F1, F2, F3, F4, or F5	Select the TAG position to be replaced. Once depressed, the SoftKey reverses to show it is changed.
TAG 4	**TAG 5**	PREV		
TUNE	TAGS	ZOOM	EXIT	Press **EXIT** to store changes and display Main Menu.
FUNCT	MORE	CURSOR		

Note that there are always 5 TAG channels. You cannot increase or decrease this number.

Figure 28 - Changing the Tags within a Group Steps

Only type **ATV** channels can be designated as TAGS.

3.3 Cursor Operations

Table 8 - Cursor Operations

3.3.1 Vertical/Horizontal Cursor Toggle

The WindowLite Digital has 2 cursors available. The Vertical Cursor is active most of the time. It is used primarily to indicate the current channel of interest. The Horizontal cursor is used for amplitude Peak-to-Valley (see Section 3.6.2 on page 52). Only one cursor can be active at a time.

Note that the SoftKey toggles inversely with the currently active cursor. That is, when the Vertical Cursor is active, H-CUR appears in the SoftKey menu. Conversely, when the Horizontal Cursor is active V-CUR is displayed. Thus the SoftKey is always set for the alternate selection.

The following scenario shows how to toggle the cursor.

SoftKey Menu	*Press Key*	*Results*
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE **CURSOR**	F6	
H-CUR PREV	F1	Vertical / Horizontal Cursor is toggled.
V-CUR RESET **PREV**	F6	

Figure 29 - Vertical/Horizontal Cursor Toggle Steps

3.3.2 Horizontal Cursor Position/Reset

When the Horizontal Cursor is active, provision is made to measure the difference of the cursor from a base value. The RESET command gives the user a method for setting the base value to the current cursor position.

This scenario shows how to reset the Horizontal Cursor base value.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE **CURSOR**	F6	
H-CUR PREV	F1	Make the horizontal cursor active.
V-CUR RESET PREV	Arrow Keys	Use the cursor (arrow) keys to raise or lower the Horizontal Cursor to the desired level.
V-CUR **RESET** PREV	F3	Horizontal Cursor base is reset to the current Horizontal Cursor position.
V-CUR RESET **PREV**	F6	
RESET is displayed in the SoftKey menu only when the horizontal cursor is active.		

Figure 30 - Horizontal Cursor Position Base Value Reset Steps

3.4 Tuning to a Channel

In many of the functions of the WindowLite Digital, it is necessary to tune to a specific channel. There are three methods for tuning to an individual channel in the WindowLite Digital.

Tuning Method	Sub Section	Page #
By Channel No.	3.4.1	40
By Frequency	3.4.2	41
By Arrow Keys	3.4.3	41

Table 9 - Tuning to a Channel

3.4.1 Channel Number Tuning

In this method, you are tuning to a channel based on its number or name.

For those channels having names consisting only of numbers, just press the appropriate number keys followed by the enter key. DO NOT PRESS THE DECIMAL POINT KEY. The absence of the decimal point in the process tells the WindowLite Digital to search for the channel name. Should you include the decimal point, the WindowLite Digital looks for a frequency, see Section 3.4.2 on page 41 for further details.

The following scenario is used to tune to a channel number or name.

SoftKey Menu	*Press Key*	*Results*
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys and ENTER	Use the numeric keys and **ENTER** to select the desired channel. Do not put in a decimal point.
Note that the absence of a decimal point implies searching for a channel by its name. Letters in a channel name are ignored during the search. The channels are searched from low to high frequency and the first channel found with the specified number in it is accepted.		

Figure 31 - Channel Number Tuning

3.4.2 Channel Frequency Tuning

In this method, you are tuning to a channel based on its frequency.

Press the appropriate number keys for the frequency, ***including a decimal point***, followed by the enter key. ***YOU MUST INCLUDE THE DECIMAL POINT KEY.*** The presence of the decimal point in the process tells the WindowLite PLUS to search for the specific frequency. If the decimal point is not included, WindowLite PLUS looks for a channel name, see Section 3.4.1 on page 40 for details.

Note that should you enter a frequency not defined within the currently active Group, the WindowLite PLUS tune to an adjacent video or audio carrier.

The following scenario is used to tune to a channel frequency.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys, Decimal Point, and ENTER	Use the numeric keys, decimal point, and **ENTER** to select the desired frequency.
Note that inclusion of a decimal point implies searching for a channel by frequency. Should the entered frequency not be defined within the currently active Group, the video or audio carrier of a channel adjacent to that entered will be chosen.		

Figure 32 - Channel Frequency Tuning Steps

3.4.3 Arrow Key Tuning

In this method, you tune to a channel based on the current cursor position.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	Arrow Keys	Use the arrow keys to move the cursor on channel at a time either left or right.

Figure 33 - Arrow Key Tuning Steps

3.5 Selecting Operational Mode

In order to meet the varying needs of the technician, the WindowLite Digital has several operating modes. The following subsections address the modes shown in the table:

Mode	Sub Section	Page #
Tags Mode Select	3.5.1	43
Tune Mode Select	3.5.2	44
Zoom Mode Select	3.5.3	45
Sweep Mode Select	3.5.4	47
Automatic Time Interval Sampling Mode Select	3.5.5	48

Table 10 - Operational Modes

The examples in this manual illustrate a Standard EIA system.

All other values are at the factory default.

3.5.1 Tags Mode Select

Tags mode enables a rapid sweep of the 5 channels identified as Tags.

To select the Tags mode:

1) Select TAGS at the top level of the SoftKey menus.

The following is a scenario to select Tags mode.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE **TAGS** ZOOM FUNCT MORE CURSOR	F2	Tags mode is entered.
Tags Mode is a STARTUP definable parameter.		

Figure 34 - Tags Mode Select Steps

Figure 35 shows the display when in Tags mode.

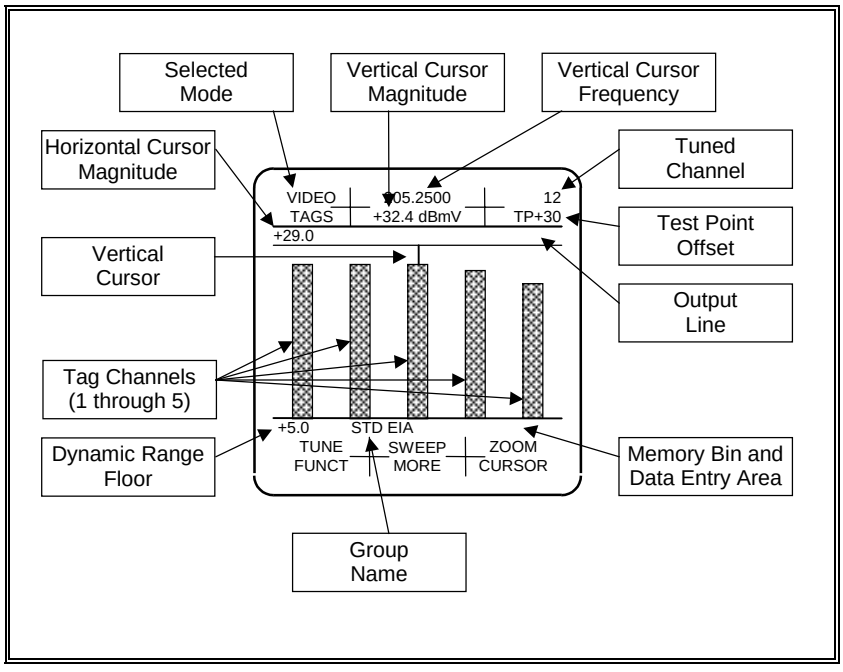

Figure 35 - Tags Mode Display

3.5.2 Tune Mode Select

Tune mode enables a detail sweep of a single channel.

To select the Tune mode:

1) Select the channel of interest.
2) Select TUNE at the top level of the SoftKey menus. mode.

For details on selecting a channel to observe, look at Section 3.4 beginning on page 40.

The following scenario selects tune mode.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys or Arrow Keys	Select the desired channel to be observed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	F1	Tune Mode is entered.
Tune Mode is a STARTUP definable parameter.		

Figure 36 - Tune Mode Select Steps

Note in this display that the current channel plus part of the upper adjacent channel is displayed. Thus, a total display of 7.75 MHz is achieved.

The arrow keys move the vertical cursor to the next 125 kHz band. As you reach the borders of the display, a shift of the display occurs, allowing you to effectively scan into the adjacent channel.

To measure a DIGI channel in TUNE mode, set the vertical cursor within the channel's bandwidth.

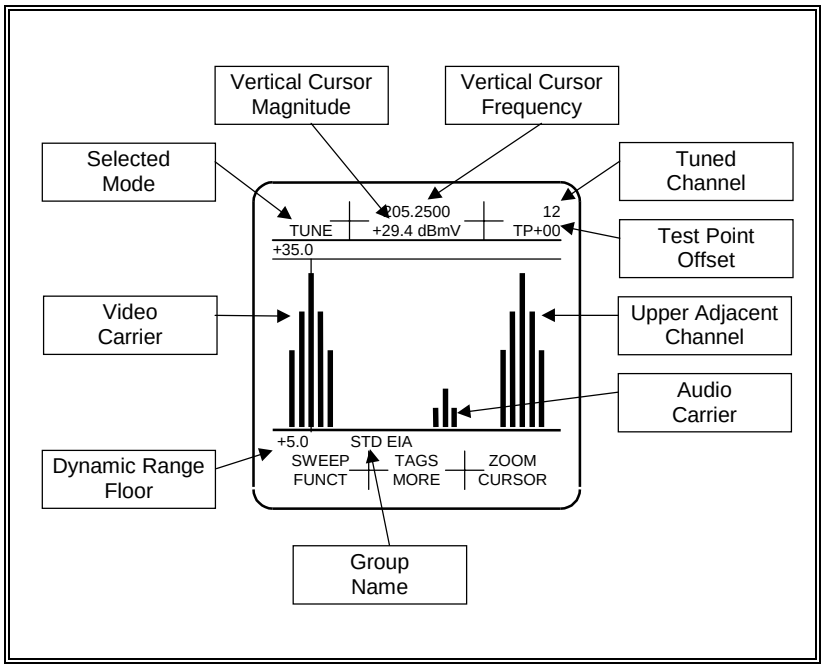

Figure 37 - Tune Mode Display

3.5.3 Zoom Mode Select

Zoom mode measures and displays a single channel's video and audio carriers simultaneously.

To select the Zoom mode:

1) Select the channel of interest.
2) Select ZOOM at the top level of the SoftKey menus. mode.

For details on selecting a channel to observe, look at Section 3.4 beginning on page 40.

The following scenario selects Zoom mode.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys or Arrow Keys	Select the channel to be observed.
TUNE TAGS **ZOOM** FUNCT MORE CURSOR	F3	Zoom Mode is entered.
Zoom Mode is a STARTUP definable parameter.		

Figure 38 - Zoom Mode Select Steps

This example displays the Video and Audio carriers of channel 47. The vertical cursor amplitude (+32.4 dBmV) is that of the Video carrier. The difference between the Video and Audio (V-A) is +15.2.

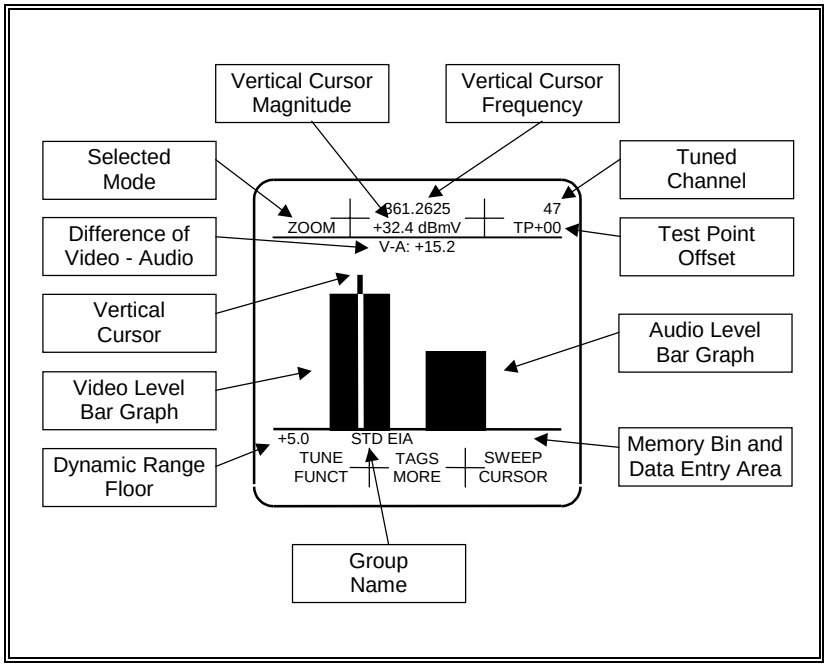

Figure 39 - Zoom Mode Display, Domestic

This example illustrates the display of an International group that includes a Secondary Audio carrier.

Note that an additional difference between Audio 1 and Audio 2 is provided (A-A) adjacent to the normal V-A display.

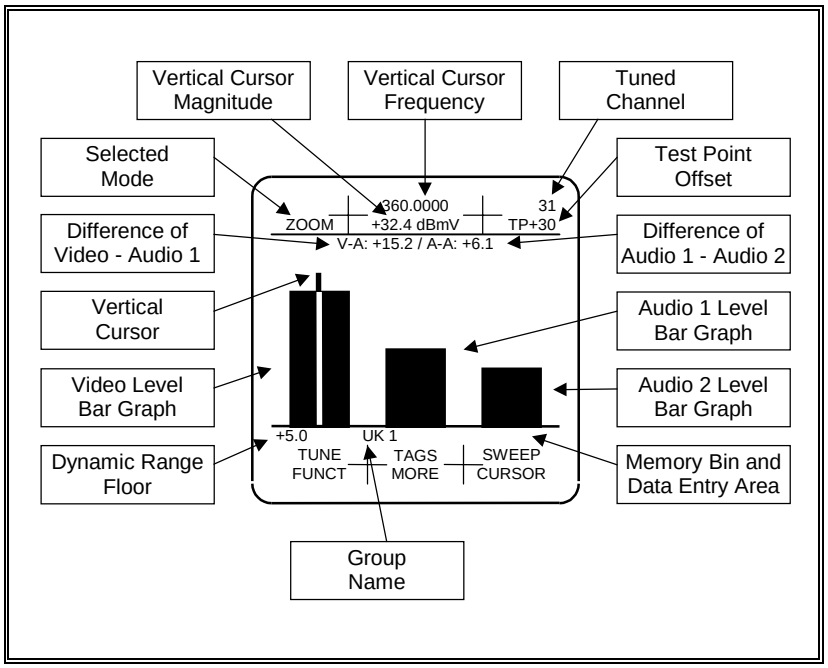

Figure 40 - Zoom Mode Display, International

3.5.4 Sweep Mode Select

Sweep mode measures and simultaneously displays video, digital or audio/FM levels for all frequencies defined within a Group. Video sweep is the normal startup mode for the WindowLite Digital. If you have changed to another mode or have changed the personality of the unit so as to startup in tags mode or some other option, SWEEP appears in the top level SoftKey menu. This enables returning to the sweep mode.

To select the Sweep mode:

1) Select SWEEP at the top level of the SoftKey menus.

The following scenario lets you select Sweep mode.

SoftKey Menu	***Press Key***	***Results***
TUNE | SWEEP | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed. Note that the STARTUP mode is TAGS in this example.
TUNE | **SWEEP** | ZOOM FUNCT | MORE | CURSOR	F2	Select Sweep Mode.
Sweep Mode is a STARTUP definable parameter.		

Figure 41 - Sweep Mode Select Steps

This example shows the Sweep Mode display. The cursor is currently on Channel 23 and its level is +29.4 dBmV.

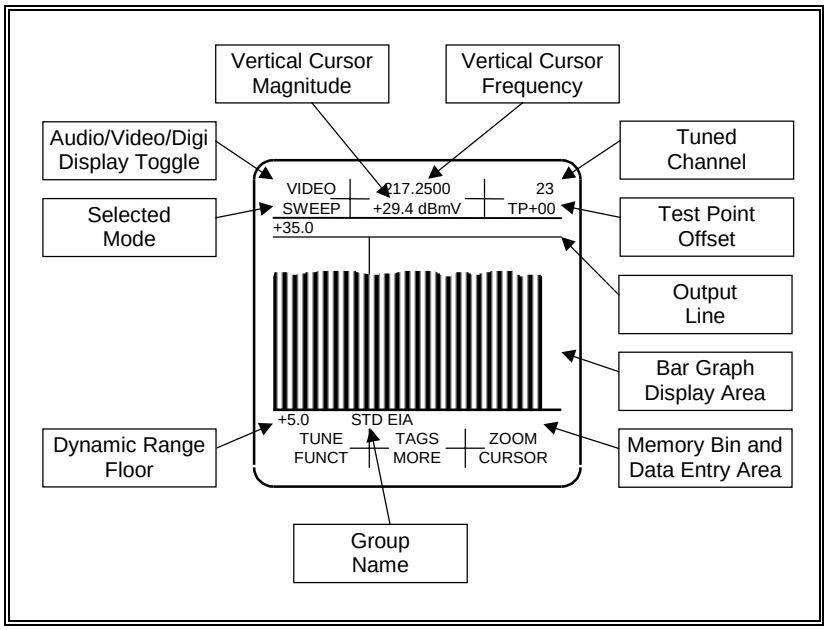

Figure 42 - Sweep Mode Display

3.5.5 Automatic Time Interval Sampling (ATIS) Mode Select

This function is provided to select and deselect ATIS mode. The purpose and use of this sampling function is discussed in Section 3.6.7, on page 62. The following scenario shows how to turn ON and OFF ATIS mode.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR+ TIME **TESTS** CONTR- SOUND PREV	F3	
CNR HUM **ATIS** PREV	F3	
TIME ON CLOCK INTRVAL **GO** PREV	F5	Depress GO to activate the ATIS mode. The unit will turn off, awaiting the first test time.

Figure 43 - Automatic Time Interval Sampling Mode Select Steps

IMPORTANT NOTES:

When the ATIS mode is activated, the WindowLite will power up at the specified start time and store the first measurement. It will repeat the sequence at the specified intervals. The first measurement is stored to internal memory Bin 1, the second interval measurement is stored to Bin 2, and so forth. After the 24th interval is stored to Bin 24, the 25th interval is stored to Bin 1 and overwrites (erases) the data from the first measurement. Be sure to consider the start time, intervals, and when the test is stopped to prevent loosing data from the first measurements.

Each time an ATIS session is started, the first measurement is stored to Bin 1. Any data previously stored to a bin is overwritten (erased) when new data is stored to that bin.

Data stored to memory bins during an ATIS session can be viewed at a later time, see Section 3.7.3 Memory Bin Recall, page 65.

3.6 Making Measurements

Making measurements is what the WindowLite Digital is all about. The following sub-sections address the six most important measurements and methods for taking samples automatically at designated time intervals:

Measurement	Sub Section	Page #
Video Carrier	3.6.1	50
Audio Carrier	3.6.2	52
Digital Carrier	3.6.3	54
Peak-to-Valley	3.6.4	56
Carrier-to-Noise	3.6.5	58
Hum	3.6.6	60
Automatic Time Interval Sampling	3.6.7	62

Table 11 - Making Measurements

The examples in this manual illustrate a Standard EIA system.

All other values are at the factory default.

3.6.1 Video Carrier Measurement

Video carrier measurement is the basic measurement of the unit. Simply turning the unit on and selecting the appropriate channel is all that is required.

For details on selecting a channel to observe, look at Section 3.4 which begins on page 40.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	NUM Keys or Arrow Keys	Use the numeric keys and **ENTER** or the arrow keys to select the channel to observe. The value is displayed on the screen.

Figure 44 - Video Carrier Measurement Steps

IMPORTANT NOTES:

ATV and **DIGI** type channels are displayed in video sweep mode.

The SoftKey label **DIGI** will not appear unless digital type channels have been added to the group by the user. See Section 3.2.5 on page 33.

Carrier-to-Noise and **HUM** SoftKey functions are not available when a digital channel (DIGI) is tuned.

In this example, channel 23 is being observed at Video frequency at 217.25 MHz. The current value of the video carrier is +29.4 dBmV.

Please note that the size of the bars in the Sweep display is dependent upon the number of channels in the group. A group with 35 channels has bars that are much wider than a group of 128 channels.

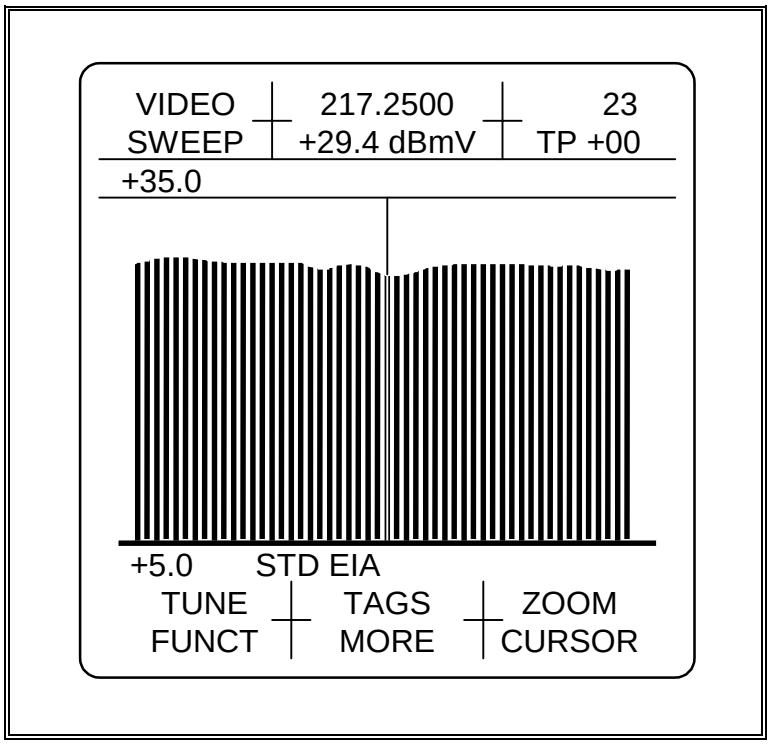

Figure 45 - Video Carrier Measurement Display

3.6.2 Audio Carrier Measurement

There are several ways to observe the level of ATV audio carriers. The method shown displays the audio carriers in a fashion similar to the video sweep display explained in Section 3.6.1 on page 50.

To observe the audio carrier levels:

1) Select an ATV channel of particular interest.
2) Switch to the AUDIO display mode.

For details on selecting a channel to observe, look at Section 3.4 beginning on page 38.

The following is a scenario to measure audio carrier.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys or Arrow Key	Use the numeric keys and **ENTER** or the arrow keys to select the channel to observe.
TUNE TAGS ZOOM FUNCT **MORE** CURSOR	F5	
DIGI 10dB MEMORY GROUP SETUP PREV	F1	Press **DIGI** to cycle SoftKey to audio.
AUDIO 10dB MEMORY GROUP SETUP PREV	F1	Press **AUDIO**.
VIDEO 10dB MEMORY GROUP SETUP PREV		The audio carriers (including FM channels) and their values are displayed.

Figure 46 - Audio Carrier Measurement Steps

IMPORTANT NOTES:

The SoftKey label **DIGI** will not appear unless digital type channels have been added to the group by the user. See Section 3.2.5 on page 33.

FM channels are displayed and available for measurement only in the audio carrier mode.

In this example, channel 23 is being observed at Audio frequency at 221.75 MHz. The current value of the audio carrier is +14.4 dBmV.

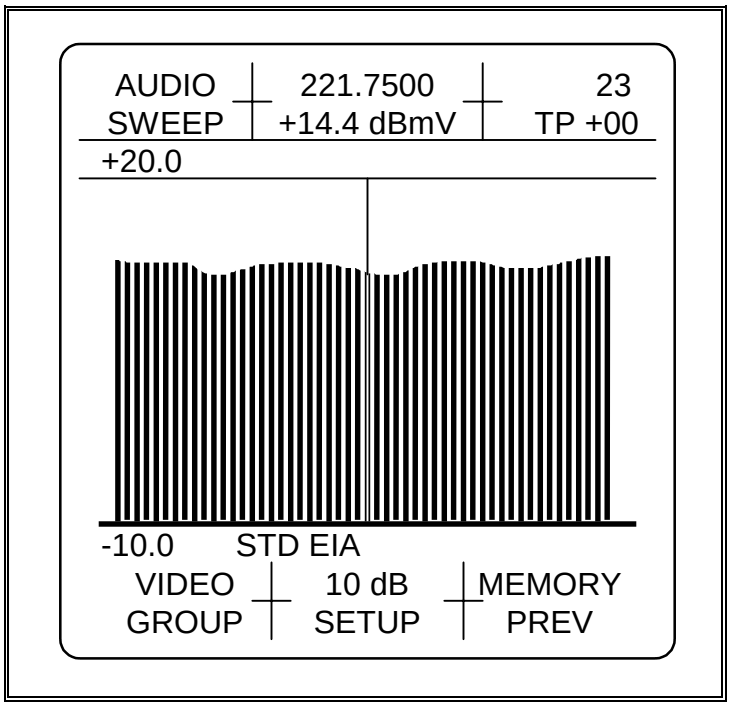

Figure 47 - Audio Carrier Measurement Display

3.6.3 Digital Carrier Measurement

Digital carrier level measurement is a feature of the WindowLite Digital. All digital channels must be set up by the user, see Section 3.2.5 Adding a Channel within a Group. No digital channel information is included in the factory format sets, see Section 4.1.

For details on selecting a channel to observe, look at Section 3.4 which begins on page 38.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys or Arrow Keys	Use the numeric keys and **ENTER** or the arrow keys to select the channel to observe. The value is displayed on the screen.
TUNE TAGS ZOOM FUNCT **MORE** CURSOR	F5	Press **MORE**.
DIGI 10dB MEMORY GROUP SETUP PREV	F1	Press **DIGI** to cycle SoftKey to audio.
AUDIO 10dB MEMORY GROUP SETUP **PREV**	F6	The digital carriers (DIGI) and their values are displayed.
TUNE **ZOOM** FUNCT MORE CURSOR	F3	Press **ZOOM** to display the digital channel under the cursor.

Figure 48 - Digital Carrier Measurement Steps

Only **DIGI** type channels are displayed in digital sweep mode.

IMPORTANT NOTES:

The SoftKey label **DIGI** will not appear unless digital type channels have been added to the group by the user. See Section 3.2.5 on page 33.

Carrier-to-Noise and HUM SoftKey functions are not available when the DIGI Sweep mode is active.

In this example, a digital carrier is being observed with a center frequency at
75.00 MHz. The current value of the carrier is +14.4 dBmV.

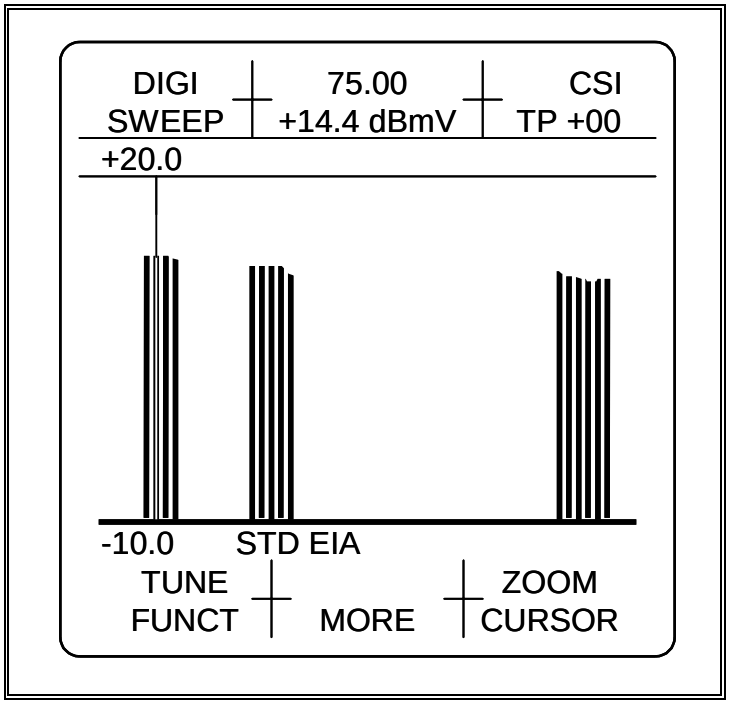

Figure 49 - Digital Carrier Measurement Display

Press the ZOOM SoftKey (F3) to observe the tuned digital carrier.

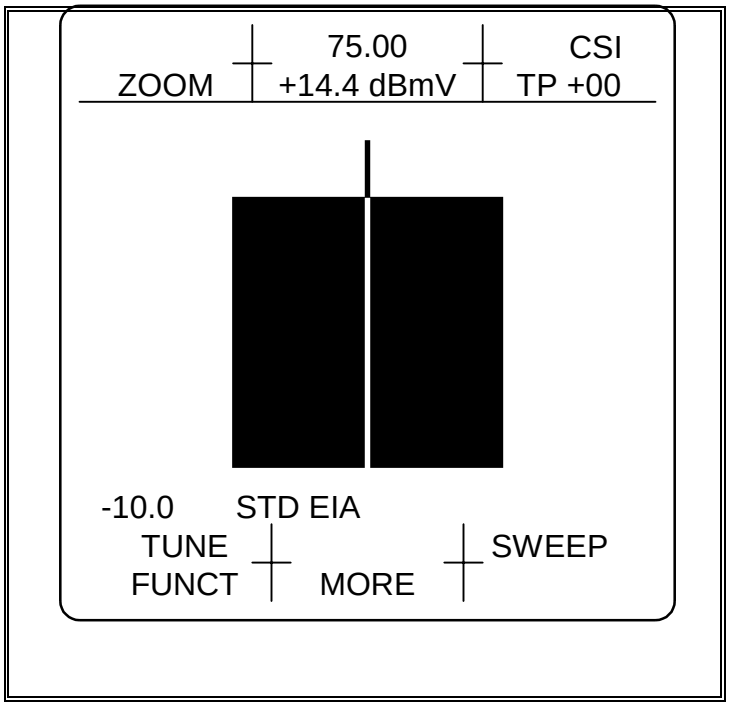

Figure 49a - Digital Carrier Zoom Display

3.6.4 Peak- to-Valley Measurement

By definition, Peak-to-Valley measurement is determining the difference of the highest (the peak) and lowest (the valley) readings of a Group. To make a Peak-to-Valley measurement:

1) Make sure you are in Sweep mode.
2) Activate the Horizontal Cursor and place it on the valley.
3) Reset the Horizontal Cursor to this level.
4) Move the cursor to the peak and read the difference value on the screen.

SoftKey Menu	***Press Key***	***Results***
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed. Be sure you are in the SWEEP mode.
TUNE / TAGS / ZOOM FUNCT / MORE / **CURSOR**	F6	
H-CUR / / / / PREV	F1	Press **F1** as required to activate the horizontal cursor.
V-CUR / / RESET / / PREV	Arrow Key	Use the **RIGHT ARROW** key to move the horizontal cursor down to the valley.
V-CUR / / **RESET** / / PREV	F3	**RESET** the test value of the horizontal cursor to the valley.
V-CUR / / RESET / / PREV	Arrow Key	Use the **LEFT ARROW** key to move the horizontal cursor up to the peak. Read difference on the screen.

Figure 50 - Peak-to-Valley Measurement Steps

(For details on using the Horizontal Cursor, see Section 3.3 which begins on page 38.)

In this example, the Peak-to-Valley measurement has been determined. Note the following:

1) We are in Sweep Mode.

2) The Horizontal Reference has been set at the valley.

3) The current level of the Horizontal Cursor is at the peak.

4) The difference or Peak-to-Valley (ΔdB:) is +4.5 dB.

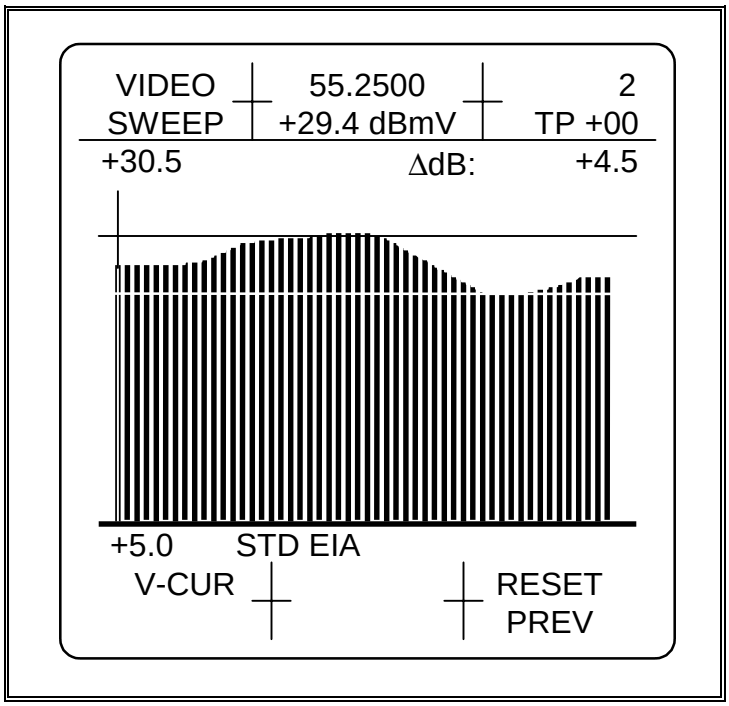

Figure 51 - Peak-to-Valley Measurement Display

3.6.5 Carrier-to-Noise Measurement

To accurately measure the System noise with the WindowLite Digital, you must select a channel which has been processed by a modulator or processor containing a SAW filter. The modulator or processor with a SAW filter will prevent excessive video modulation in the guard band between channels. The maximum input signal level for a Carrier-to-Noise measurement is approximately +15 dBmV (+75 dBµV). The WindowLite Digital displays a 'reduce level' message if you exceed its maximum input level capability for this measurement.

To observe the Carrier-to-Noise Ratio:

1) Select the appropriate channel.
2) Switch to the CNR calculation mode.

For details on selecting a channel to observe, look at Section 3.4 which begins on page 40.

The following is a scenario that will accomplish this for you.

SoftKey Menu	Press Key	Results
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT MORE CURSOR	NUM Keys or Arrow Keys	Use the numeric keys and **ENTER** or the arrow keys to select the channel to observe.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR+ TIME **TESTS** CONTR- SOUND PREV	F3	
CNR HUM ATIS PREV	F1	After a delay for calculations, the Carrier-to-Noise Ratio is displayed. Each depress causes another calculation and display.
CNR HUM ATIS **PREV**	F6	
CNR HUM ATIS **PREV**	F6	
TUNE TAGS ZOOM FUNCT MORE CURSOR		Main Menu is displayed

Figure 52 - Carrier-to-Noise Measurement Steps

NOTE: After a frequency (channel) is selected for the purpose of measuring CNR, it will be used as the CNR frequency when a sweep is stored to a memory bin, either manually or in the ATIS mode. The frequency will remain in effect until another frequency is selected for a CNR measurement.

In this example, CNR has been measured at channel 4.
The resulting value is 47.1 dB.

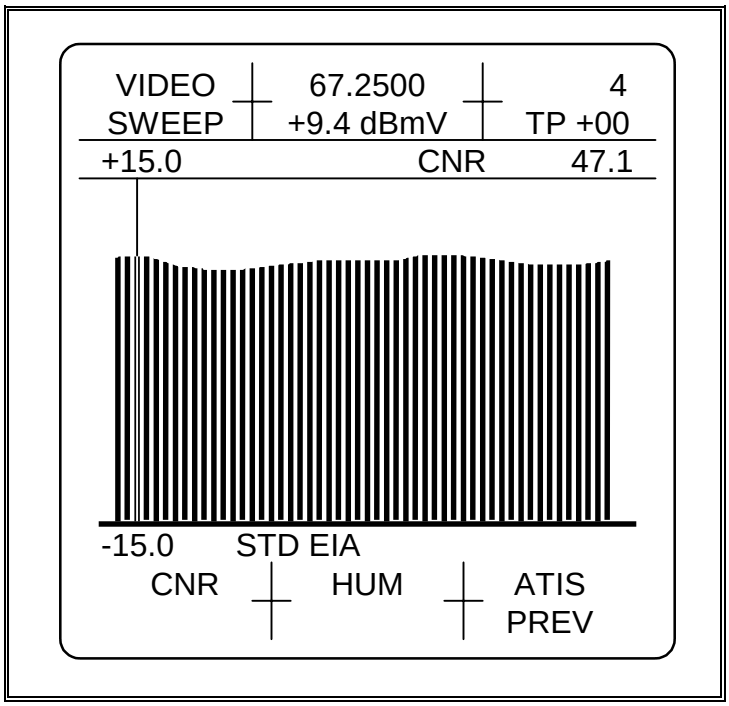

Figure 53 - Carrier-to-Noise Measurement Display

IMPORTANT NOTE:

Carrier-to-Noise and **HUM** SoftKey functions are not available when a digital channel (DIGI) is tuned.

3.6.6 Hum Measurement

Hum must be measured on an active, full amplitude, analog television carrier. Inaccurate measurements will result from scrambled channels. The WindowLite PLUS determines the vertical sync rate of the tuned frequency and displays the appropriate hum component selections. An error message is displayed if no video modulation is found. The minimum input signal level for a hum measurement is 0 dBmV (+60 dBµV).

To observe the Hum percentage:

1) Select the appropriate carrier.
2) Switch to the HUM calculation mode.

For details on selecting a channel to observe, look at Section 3.4 beginning on page 40.

The following is a scenario to measure Hum.

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	NUM Keys or Arrow Keys	Use the numeric keys and **ENTER** or the arrow keys to select the channel to observe.
TUNE / TAGS / ZOOM **FUNCT** / MORE / CURSOR	F4	
CONTR+ / TIME / **TESTS** CONTR- / MORE / CURSOR	F3	
CNR / **HUM** / ATIS / / PREV	F2	
60 Hz vertical frequency detected / 60 HZ / ALL / 120 HZ / PREV	F2, F3, or F5	Choose the HUM frequency to measure. The measurement is displayed. Select again to update the measurement.
50 Hz vertical frequency detected 50 HZ / / ALL 100 HZ / / PREV	F1, F3, or F4	**ALL** is all frequencies from 20 to 2,000 Hz.
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	EXIT	Press **EXIT** and Main Menu is displayed.

Figure 54 - Hum Measurement Steps

NOTE: After a channel is selected for the purpose of measuring hum, it will be used as the hum channel when a sweep is stored to a memory bin, either manually or in the ATIS mode. The channel will remain in effect until another channel is selected for a hum measurement. ATIS and memory bin store operations use the ALL mode for hum measurements.

In this example, the Hum has been measured at channel 37. Its value is 1.5 percent. ALL was selected and the measurement value includes levels from all frequencies between 20 and 2,000 Hz. A vertical frequency of 60 Hz was detected.

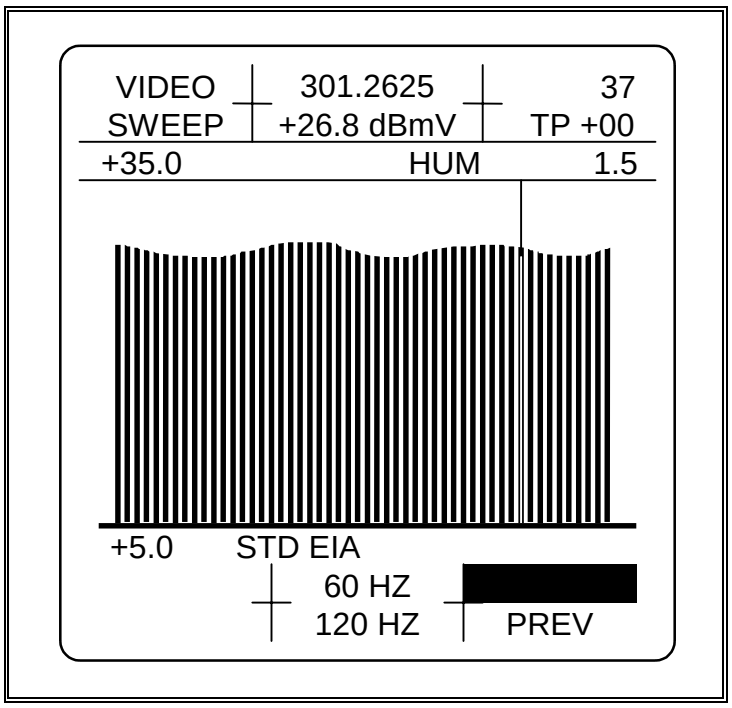

Figure 55 - Hum Measurement Display 60 Hz

In this example, the Hum has been measured at channel 24. Its value is 1.5 percent. ALL was selected and the measurement value includes levels from all frequencies between 20 and 2,000 Hz. A vertical frequency of 50 Hz was detected.

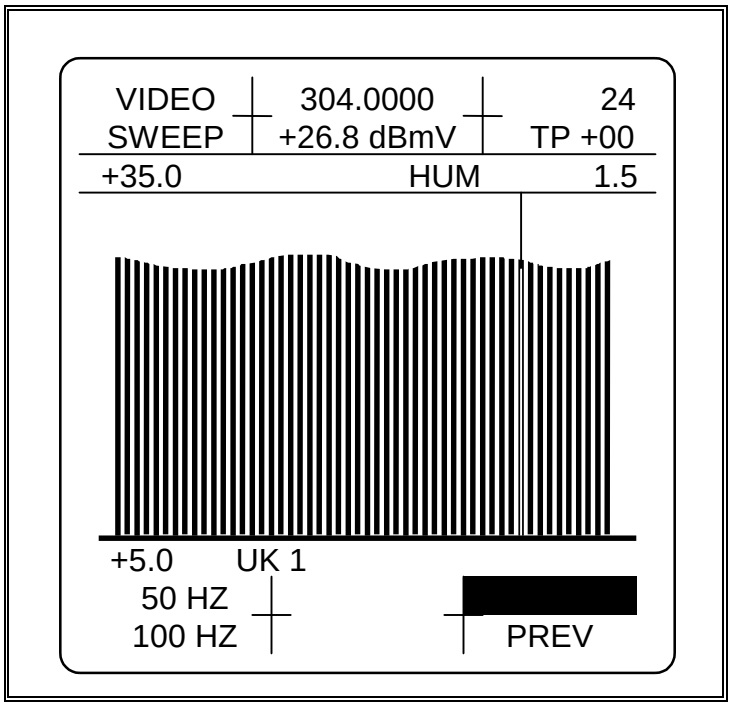

Figure 56 - Hum Measurement Display 50 Hz

IMPORTANT NOTE: Carrier-to-Noise and HUM SoftKey functions are not available when a digital channel (DIGI) is tuned.

3.6.7 Automatic Time Interval Sampling

The WindowLite Digital provides you a method to record several of the important cable test parameters, at intervals selected by the operator, automatically. The following parameters are stored at the specified time intervals in the non-volatile memory (bins) of an unattended WindowLite Digital.

Date/Time (military format)
Single Carrier-to-Noise Ratio (see note Section 3.6.5)
Single Channel Hum ratio (see note Section 3.6.6)
Single external ambient temperature
Scaling information to display data
Additional Control Fields

To set the WindowLite PLUS to automatically store these parameters at specified time intervals, the operator must first enter START TIME, and INTERVAL, and then enter the ATIS mode as shown below and in Section 3.5.5, page 48.

SoftKey Menu	*Press Key*	*Results*
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM **FUNCT** MORE CURSOR	F4	
CONTR+ TIME **TESTS** CONTR- SOUND PREV	F3	
CNR HUM **ATIS** PREV	F3	
TIME ON CLOCK INTRVAL GO PREV	F1	The unit displays **START TIME HHMM** on the input line. **HHMM** is the current start time.
CANCEL PREV	NUM Keys and ENTER	Use the numeric keys and **ENTER** to set the appropriate time.
TIME ON CLOCK **INTRVAL** GO PREV	F4	The unit displays **INTERVAL HHMM** on the input line. **HHMM** is the current interval.
CANCEL PREV	NUM Keys and ENTER	Use the numeric keys and **ENTER** to set the appropriate interval. (*See below)
TIME ON CLOCK INTRVAL **GO** PREV	F5	Depress **GO** to activate the ATIS mode. The unit will then power itself down.

NOTE: HH must be between 00 and 23 inclusive. MM must be between 00 and 59 inclusive.
The signal level of the Carrier-to-Noise and the Hum channels must be in the range of 0 to +20 dBmV (+60 to +80 dBμV) to record measurements made during an ATIS session.

Figure 57 - Start Time and Interval for ATIS Select Steps

3.7 Using the Memory

The WindowLite Digital has 24 memory bins. The memory bins are used to store sweep readings that the user will recall and view at a later time.

Memory Function	Sub Section	Page #
Memory Bin Store	3.7.1	63
Memory Bin Naming	3.7.2	64
Memory Bin Recall	3.7.3	65

Table 12 - Using the Memory

3.7.1 Memory Bin Store

At any time, the user can store all current sweep signal levels to any of the 24 available bins. Note that storing to a bin overwrites any previously stored data. The following parameters are stored:

Date/Time (military format)
Single Carrier-to-Noise Ratio (see note Section 3.6.5)
Single Channel Hum ratio (see note Section 3.6.6)
Single external ambient temperature
Scaling information to display data
Additional Control Fields

The following scenario shows how to store to a bin.

SoftKey Menu	*Press Key*	*Results*
TUNE TAGS ZOOM FUNCT MORE CURSOR	ON or EXIT	Main Menu is displayed.
TUNE TAGS ZOOM FUNCT **MORE** CURSOR	F5	
AUDIO 10dB **MEMORY** GROUP SETUP PREV	F3	
BIN 1 **BIN 2** **BIN 3** **MORE** PREV	F1, F2, F3 or F5	Select Bin to receive data. Use **MORE** to select bin 4 through 24.
STORE RECALL NAME PREV	F1	Store the current data in the selected Bin.
TUNE TAGS ZOOM FUNCT MORE CURSOR	EXIT	Main Menu is displayed.

Figure 58 - Memory Bin Store Steps

3.7.2 Memory Bin Naming

The 24 bins in the WindowLite Digital are initially labeled BIN 1 through BIN 24. You can change these names to be more meaningful to you. As in Group naming, the length of the name is limited to 7 characters, including blanks and special characters.

The following scenario will guide you through changing a bin name:

SoftKey Menu	Press Key	Results
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR	ON or EXIT	Main Menu is displayed.
TUNE / TAGS / ZOOM FUNCT / **MORE** / CURSOR	F5	
AUDIO / 10dB / **MEMORY** GROUP / SETUP / PREV	F3	
BIN 1 / **BIN 2** / **BIN 3** / **MORE** / PREV	F1, F2, F3 or F5	Select Bin to be named. Use **MORE** to select bins 4 through 24.
STORE / / RECALL **NAME** / / PREV	F4	
ABCDE / **FGHIJ** / **KLMNO** CANCEL / **MORE** / **PREV**	F1, F2, F3 F5, F6	Proceed through the steps to select the characters of the name. Press **ENTER** after the last character.
TUNE / TAGS / ZOOM FUNCT / MORE / CURSOR		Main Menu is displayed.

Pressing the Left Arrow key will delete the last character selected.

Figure 59 - Memory Bin Naming Steps

3.7.3 Memory Bin Recall

After data has been stored in a bin (see Section 3.7.1, on page 63), the user can recall the data at a later time. Once recalled, you can use the Sweep, Tags and Zoom modes to look at the recalled data. Note that Tune mode is not available, but CNR, HUM, and TIME measurements recorded when the bin was stored can be displayed after recalling bin data.

This scenario guides you through the procedure of recalling a bin.

SoftKey Menu	Press Key	Results
TUNE | TAGS | ZOOM FUNCT | MORE | CURSOR	ON or EXIT	Main Menu is displayed.
TUNE | TAGS | ZOOM FUNCT | **MORE** | CURSOR	F5	
AUDIO | 10dB | **MEMORY** GROUP | SETUP | PREV	F3	
BIN 1 | **BIN 2** | **BIN 3** | **MORE** | PREV	F1, F2, F3 or F5	Select Bin number for action. Use **MORE** to select bins 4 through 24.
STORE | | **RECALL** NAME | | PREV	F3	Bin is recalled and made active.
STORE | | RECALL NAME | | **PREV**	F6	
BIN 1 | BIN 2 | BIN 3 | MORE | **PREV**	F6	
AUDIO | 10dB | MEMORY GROUP | | **PREV**	F6	
| TAGS | ZOOM FUNCT | MORE | CURSOR		Memory Bin data is displayed with Main Menu. Review stored signal level, CNR, and HUM measurements, including the TIME data was stored. Press **EXIT** to return active display.

Note that RECALL will not be displayed in the SoftKey menu if the selected bin does not have data in it. The Main Menu will not contain TUNE when a memory bin is recalled.

Figure 60 - Memory Bin Recall Steps

4 Miscellaneous

4.1 Format Sets

Formats are factory defined channel information sets that can be used to initialize any Group in the unit. ComSonics, Inc. currently provides 30 different Format sets that meet the needs of cable systems around the world. Others will be added as needed.

SoftKey Label	Description	Page #
AUSTRAL	Australia	67
BCST US	US Off - Air	67
BELGIUM	Belgium	68
CANADA	Canada	68
CHINA	China	69
DENMARK	Denmark	69
FRANCE	France	70
GERMANY	Germany	70
H.KONG	Hong Kong	71
HRC EIA	US HRC EIA	71
HRC HST	US HRC Historical	72
INDIA	India	72
IRC EIA	US IRC EIA	73
IRC HST	US IRC Historical	73
ISRAEL	Israel	74
ITALY	Italy	74
JAPAN	Japan	75
KOREA	Korea	75
N ZEAL	New Zealand	76
NETH 1	Netherlands 1	76
NETH 2	Netherlands 2	77
POLAND	Poland	77
REVERSE	Reverse Channel	78
STD EIA	US Standard EIA	78
STD HST	US Standard Historical	79
SWEDEN	Sweden	79
SWISS	Switzerland	80
TAIWAN	Taiwan	80
UK 1	United Kingdom 1	81
UK 2	United Kingdom 2	81

TABLE 13 - Country Format

4.1.1 AUSTRAL - Australia

```
   audio offset = 5.500

  0  46.2500     E21 471.2500      34 569.2500      47 660.2500      60 751.2500
  1  57.2500     E22 479.2500      35 576.2500      48 667.2500      61 758.2500
  2  64.2500     E23 487.2500      36 583.2500      49 674.2500      62 765.2500
  3  86.2500     E24 495.2500      37 590.2500      50 681.2500      63 772.2500
  4  95.2500     E25 503.2500      38 597.2500      51 688.2500      64 779.2500
  5 102.2500     E26 511.2500      39 604.2500      52 695.2500      65 786.2500
5-A 138.2500     E27 519.2500      40 611.2500      53 702.2500      66 793.2500
  6 175.2500      28 527.2500      41 618.2500      54 709.2500      67 800.2500
  7 182.2500      29 534.2500      42 625.2500      55 716.2500      68 807.2500
  8 189.2500      30 541.2500      43 632.2500      56 723.2500      69 814.2500
  9 196.2500      31 548.2500      44 639.2500      57 730.2500
 10 209.2500      32 555.2500      45 646.2500      58 737.2500
 11 216.2500      33 562.2500      46 653.2500      59 744.2500

                                Tag Channels are:

    1( 57.2500),  5-A(138.2500),   11(216.2500),   35(576.2500),   54(709.2500)
```

4.1.2 BCST US - US Off Air

```
   audio offset = 4.500

 2  55.2500      18 495.2500      34 591.2500      50 687.2500      66 783.2500
 3  61.2500      19 501.2500      35 597.2500      51 693.2500      67 789.2500
 4  67.2500      20 507.2500      36 603.2500      52 699.2500      68 795.2500
 5  77.2500      21 513.2500      37 609.2500      53 705.2500      69 801.2500
 6  83.2500      22 519.2500      38 615.2500      54 711.2500      70 807.2500
 7 175.2500      23 525.2500      39 621.2500      55 717.2500      71 813.2500
 8 181.2500      24 531.2500      40 627.2500      56 723.2500      72 819.2500
 9 187.2500      25 537.2500      41 633.2500      57 729.2500      73 825.2500
10 193.2500      26 543.2500      42 639.2500      58 735.2500      74 831.2500
11 199.2500      27 549.2500      43 645.2500      59 741.2500      75 837.2500
12 205.2500      28 555.2500      44 651.2500      60 747.2500      76 843.2500
13 211.2500      29 561.2500      45 657.2500      61 753.2500      77 849.2500
14 471.2500      30 567.2500      46 663.2500      62 759.2500      78 855.2500
15 477.2500      31 573.2500      47 669.2500      63 765.2500
16 483.2500      32 579.2500      48 675.2500      64 771.2500
17 489.2500      33 585.2500      49 681.2500      65 777.2500

                                Tag Channels are:

    2( 55.2500),   18(495.2500),   34(591.2500),   50(687.2500),   78(855.2500)
```

4.1.3 BELGIUM - Belgium

```
   audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                                Tag Channels are:

    3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.4 CANADA - Canada

```
   audio offset = 4.500

   2  55.2500      23 217.2500      49 373.2500      75 529.2500     106 685.2500
   3  61.2500      24 223.2500      50 379.2500      76 535.2500     107 691.2500
   4  67.2500      25 229.2500      51 385.2500      77 541.2500     108 697.2500
   5  77.2500      26 235.2500      52 391.2500      78 547.2500     109 703.2500
   6  83.2500      27 241.2500      53 397.2500      79 553.2500     110 709.2500
  95  91.2500      28 247.2500      54 403.2500      80 559.2500     111 715.2500
  96  97.2500      29 253.2500      55 409.2500      81 565.2500     112 721.2500
  97 103.2500      30 259.2500      56 415.2500      82 571.2500     113 727.2500
  98 109.2500      31 265.2500      57 421.2500      83 577.2500     114 733.2500
  99 115.2500      32 271.2500      58 427.2500      84 583.2500     115 739.2500
  14 121.2500      33 277.2500      59 433.2500      85 589.2500     116 745.2500
  15 127.2500      34 283.2500      60 439.2500      86 595.2500     117 751.2500
  16 133.2500      35 289.2500      61 445.2500      87 601.2500     118 757.2500
  17 139.2500      36 295.2500      62 451.2500      88 607.2500     119 763.2500
  18 145.2500      37 301.2500      63 457.2500      89 613.2500     120 769.2500
  19 151.2500      38 307.2500      64 463.2500      90 619.2500     121 775.2500
  20 157.2500      39 313.2500      65 469.2500      91 625.2500     122 781.2500
  21 163.2500      40 319.2500      66 475.2500      92 631.2500     123 787.2500
  22 169.2500      41 325.2500      67 481.2500      93 637.2500     124 793.2500
   7 175.2500      42 331.2500      68 487.2500      94 643.2500     125 799.2500
   8 181.2500      43 337.2500      69 493.2500     100 649.2500     126 805.2500
   9 187.2500      44 343.2500      70 499.2500     101 655.2500     127 811.2500
  10 193.2500      45 349.2500      71 505.2500     102 661.2500     128 817.2500
  11 199.2500      46 355.2500      72 511.2500     103 667.2500     129 823.2500
  12 205.2500      47 361.2500      73 517.2500     104 673.2500
  13 211.2500      48 367.2500      74 523.2500     105 679.2500

                                Tag Channels are:

    4( 67.2500),   99(115.2500),   27(241.2500),   40(319.2500),   51(385.2500)
```

4.1.5 CHINA - China

```
   audio offset = 6.500

 DS1  49.7500      Z8 224.2500     Z27 376.2500    DS23 551.2500    DS42 743.2500
 DS2  57.7500      Z9 232.2500     Z28 384.2500    DS24 559.2500    DS43 751.2500
 DS3  65.7500     Z10 240.2500     Z29 392.2500    DS25 607.2500    DS44 759.2500
 DS4  77.2500     Z11 248.2500     Z30 400.2500    DS26 615.2500    DS45 767.2500
 DS5  85.2500     Z12 256.2500     Z31 408.2500    DS27 623.2500    DS46 775.2500
  Z1 112.2500     Z13 264.2500     Z32 416.2500    DS28 631.2500    DS47 783.2500
  Z2 120.2500     Z14 272.2500     Z33 424.2500    DS29 639.2500    DS48 791.2500
  Z3 128.2500     Z15 280.2500     Z34 432.2500    DS30 647.2500    DS49 799.2500
  Z4 136.2500     Z16 288.2500     Z35 440.2500    DS31 655.2500    DS50 807.2500
  Z5 144.2500     Z17 296.2500    DS13 471.2500    DS32 663.2500    DS51 815.2500
  Z6 152.2500     Z18 304.2500    DS14 479.2500    DS33 671.2500    DS52 823.2500
  Z7 160.2500     Z19 312.2500    DS15 487.2500    DS34 679.2500    DS53 831.2500
 DS6 168.2500     Z20 320.2500    DS16 495.2500    DS35 687.2500    DS54 839.2500
 DS7 176.2500     Z21 328.2500    DS17 503.2500    DS36 695.2500    DS55 847.2500
 DS8 184.2500     Z22 336.2500    DS18 511.2500    DS37 703.2500
 DS9 192.2500     Z23 344.2500    DS19 519.2500    DS38 711.2500
DS10 200.2500     Z24 352.2500    DS20 527.2500    DS39 719.2500
DS11 208.2500     Z25 360.2500    DS21 535.2500    DS40 727.2500
DS12 216.2500     Z26 368.2500    DS22 543.2500    DS41 735.2500

                              Tag Channels are:

DS2( 57.7500),  DS7(176.2500),  Z15(280.2500), DS15(487.2500), DS27(623.2500)
```

4.1.6 DENMARK - Denmark

```
   audio offset = 5.500   sec audio offset = 5.850

   2  48.2500    99.0  99.0000       8 196.2500     S38 439.2500      46 671.2500
   3  55.2500    99.5  99.5000       9 203.2500      21 471.2500      47 679.2500
   4  62.2500    100. 100.0000      10 210.2500      22 479.2500      48 687.2500
87.5  87.5000    1005 100.5000      11 217.2500      23 487.2500      49 695.2500
88.0  88.0000    101. 101.0000      12 224.2500      24 495.2500      50 703.2500
88.5  88.5000    1015 101.5000     S11 231.2500      25 503.2500      51 711.2500
89.0  89.0000    102. 102.0000     S13 245.2500      26 511.2500      52 719.2500
89.5  89.5000    1025 102.5000     S14 252.2500      27 519.2500      53 727.2500
90.0  90.0000    103. 103.0000     S15 259.2500      28 527.2500      54 735.2500
90.5  90.5000    1035 103.5000     S16 266.2500      29 535.2500      55 743.2500
91.0  91.0000    104. 104.0000     S17 273.2500      30 543.2500      56 751.2500
91.5  91.5000    1045 104.5000     S18 280.2500      31 551.2500      57 759.2500
92.0  92.0000    105. 105.0000     S19 287.2500      32 559.2500      58 767.2500
92.5  92.5000    1055 105.5000     S20 294.2500      33 567.2500      59 775.2500
93.0  93.0000    106. 106.0000     S21 303.2500      34 575.2500      60 783.2500
93.5  93.5000    1065 106.5000     S22 311.2500      35 583.2500      61 791.2500
94.0  94.0000    107. 107.0000     S23 319.2500      36 591.2500      62 799.2500
94.5  94.5000    1075 107.5000     S26 343.2500      37 599.2500      63 807.2500
95.0  95.0000    108. 108.0000     S27 351.2500      38 607.2500      64 815.2500
95.5  95.5000      S7 147.2500     S28 359.2500      39 615.2500      65 823.2500
96.0  96.0000      S8 154.2500     S29 367.2500      40 623.2500      66 831.2500
96.5  96.5000      S9 161.2500     S30 375.2500      41 631.2500      67 839.2500
97.0  97.0000     S10 168.2500     S31 383.2500      42 639.2500      68 847.2500
97.5  97.5000       5 175.2500     S32 391.2500      43 647.2500      69 855.2500
98.0  98.0000       6 182.2500     S35 415.2500      44 655.2500
98.5  98.5000       7 189.2500     S36 423.2500      45 663.2500

                              Tag Channels are:

    2( 48.2500),   12(224.2500),  S20(294.2500),   21(471.2500),   61(791.2500)
```

4.1.7 FRANCE - France

```
audio offset = 6.500   sec audio offset = 6.742

 5 176.0000      D5 351.2500      30 543.2500      44 655.2500      58 767.2500
 6 184.0000      D6 363.2500      31 551.2500      45 663.2500      59 775.2500
 7 192.0000      D7 375.2500      32 559.2500      46 671.2500      60 783.2500
 8 200.0000      D8 387.2500      33 567.2500      47 679.2500      61 791.2500
 9 208.0000      D9 399.2500      34 575.2500      48 687.2500      62 799.2500
10 216.0000      21 471.2500      35 583.2500      49 695.2500      63 807.2500
11 224.0000      22 479.2500      36 591.2500      50 703.2500      64 815.2500
12 232.0000      23 487.2500      37 599.2500      51 711.2500      65 823.2500
13 240.0000      24 495.2500      38 607.2500      52 719.2500      66 831.2500
14 288.0000      25 503.2500      39 615.2500      53 727.2500      67 839.2500
D1 303.2500      26 511.2500      40 623.2500      54 735.2500      68 847.2500
D2 315.2500      27 519.2500      41 631.2500      55 743.2500
D3 327.2500      28 527.2500      42 639.2500      56 751.2500
D4 339.2500      29 535.2500      43 647.2500      57 759.2500

                              Tag Channels are:

   6(184.0000),   D4(339.2500),   28(527.2500),   51(711.2500),   63(807.2500)
```

4.1.8 GERMANY - Germany

```
  audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                              Tag Channels are:

  3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.9 H.KONG - Hong Kong

```
   audio offset = 6.000   sec audio offset = 6.552

 21 471.2500      30 543.2500      39 615.2500      48 687.2500      57 759.2500
 22 479.2500      31 551.2500      40 623.2500      49 695.2500      58 767.2500
 23 487.2500      32 559.2500      41 631.2500      50 703.2500      59 775.2500
 24 495.2500      33 567.2500      42 639.2500      51 711.2500      60 783.2500
 25 503.2500      34 575.2500      43 647.3500      52 719.2500
 26 511.2500      35 583.2500      44 655.2500      53 727.2500
 27 519.2500      36 591.2500      45 663.2500      54 735.2500
 28 527.2500      37 599.2500      46 671.2500      55 743.2500
 29 535.2500      38 607.2500      47 679.2500      56 751.2500

                          Tag Channels are:

   21(471.2500),   23(487.2500),   25(503.2500),   27(519.2500),   31(551.2500)
```

4.1.10 HRC EIA - US HRC EIA

```
   audio offset = 4.500

  2  54.0027      13 210.0105      48 366.0183      74 522.0261     105 678.0339
  3  60.0030      23 216.0108      49 372.0186      75 528.0264     106 684.0342
  4  66.0033      24 222.0111      50 378.0189      76 534.0267     107 690.0345
  1  72.0036      25 228.0114      51 384.0192      77 540.0270     108 696.0348
  5  78.0039      26 234.0117      52 390.0195      78 546.0273     109 702.0351
  6  84.0042      27 240.0120      53 396.0198      79 552.0276     110 708.0354
 95  90.0045      28 246.0123      54 402.0201      80 558.0279     111 714.0357
 96  96.0048      29 252.0126      55 408.0204      81 564.0282     112 720.0360
 97 102.0051      30 258.0129      56 414.0207      82 570.0285     113 726.0363
 98 108.0054      31 264.0132      57 420.0210      83 576.0288     114 732.0366
 99 114.0057      32 270.0135      58 426.0213      84 582.0291     115 738.0369
 14 120.0060      33 276.0138      59 432.0216      85 588.0294     116 744.0372
 15 126.0063      34 282.0141      60 438.0219      86 594.0297     117 750.0375
 16 132.0066      35 288.0144      61 444.0222      87 600.0030     118 756.0378
 17 138.0069      36 294.0147      62 450.0225      88 606.0303     119 762.0381
 18 144.0072      37 300.0150      63 456.0228      89 612.0306     120 768.0384
 19 150.0075      38 306.0153      64 462.0231      90 618.0309     121 774.0387
 20 156.0078      39 312.0156      65 468.0234      91 624.0312     122 780.0390
 21 162.0081      40 318.0159      66 474.0237      92 630.0315     123 786.0393
 22 168.0084      41 324.0162      67 480.0240      93 636.0318     124 792.0396
  7 174.0087      42 330.0165      68 486.0243      94 642.0321     125 798.0399
  8 180.0090      43 336.0168      69 492.0246     100 648.0324     126 804.0402
  9 186.0093      44 342.0171      70 498.0249     101 654.0327     127 810.0405
 10 192.0096      45 348.0174      71 504.0252     102 660.0330     128 816.0408
 11 198.0099      46 354.0177      72 510.0255     103 666.0333
 12 204.0102      47 360.0180      73 516.0258     104 672.0336

                               Tag Channels are:

  4( 66.0033),   99(114.0057),   27(240.0120),   40(318.0159),   51(384.0192)
```

4.1.11 HRC HST - US HRC HISTORICAL

```
   audio offset = 4.500

  2  54.0027      13 210.0105      LL 366.0183     LLL 522.0261     105 678.0339
  3  60.0030       J 216.0108      MM 372.0186     MMM 528.0264     106 684.0342
  4  66.0033       K 222.0111      NN 378.0189     NNN 534.0267     107 690.0345
A-8  72.0036       L 228.0114      OO 384.0192     OOO 540.0270     108 696.0348
  5  78.0039       M 234.0117      PP 390.0195     PPP 546.0273     109 702.0351
  6  84.0042       N 240.0120      QQ 396.0198     QQQ 552.0276     110 708.0354
A-5  90.0045       O 246.0123      RR 402.0201     RRR 558.0279     111 714.0357
A-4  96.0048       P 252.0126      SS 408.0204     SSS 564.0282     112 720.0360
A-3 102.0051       Q 258.0129      TT 414.0207     TTT 570.0285     113 726.0363
A-2 108.0054       R 264.0132      UU 420.0210     UUU 576.0288     114 732.0366
A-1 114.0057       S 270.0135      VV 426.0213     VVV 582.0291     115 738.0369
  A 120.0060       T 276.0138      WW 432.0216     WWW 588.0294     116 744.0372
  B 126.0063       U 282.0141      XX 438.0219     XXX 594.0297     117 750.0375
  C 132.0066       V 288.0144      YY 444.0222      87 600.0030     118 756.0378
  D 138.0069       W 294.0147      ZZ 450.0225      88 606.0303     119 762.0381
  E 144.0072      AA 300.0150     AAA 456.0228      89 612.0306     120 768.0384
  F 150.0075      BB 306.0153     BBB 462.0231      90 618.0309     121 774.0387
  G 156.0078      CC 312.0156     CCC 468.0234      91 624.0312     122 780.0390
  H 162.0081      DD 318.0159     DDD 474.0237      92 630.0315     123 786.0393
  I 168.0084      EE 324.0162     EEE 480.0240      93 636.0318     124 792.0396
  7 174.0087      FF 330.0165     FFF 486.0243      94 642.0321     125 798.0399
  8 180.0090      GG 336.0168     GGG 492.0246     100 648.0324     126 804.0402
  9 186.0093      HH 342.0171     HHH 498.0249     101 654.0327     127 810.0405
 10 192.0096      II 348.0174     III 504.0252     102 660.0330     128 816.0408
 11 198.0099      JJ 354.0177     JJJ 510.0255     103 666.0333
 12 204.0102      KK 360.0180     KKK 516.0258     104 672.0336

                              Tag Channels are:

    4( 66.0033),  A-1(114.0057),    N(240.0120),   DD(318.0159),   OO(384.0192)
```

4.1.12 INDIA - India

```
   audio offset = 5.500   sec audio offset = 5.742

   2  48.2500       S7 147.2500     S11 231.2500     S23 319.2500     S35 415.2500
   3  55.2500       S8 154.2500     S12 238.2500     S24 327.2500     S36 423.2500
   4  62.2500       S9 161.2500     S13 245.2500     S25 335.2500     S37 431.2500
 S1'  69.2500      S10 168.2500     S14 252.2500     S26 343.2500     S38 439.2500
 S2'  76.2500        5 175.2500     S15 259.2500     S27 351.2500     S39 447.2500
 S3'  83.2500        6 182.2500     S16 266.2500     S28 359.2500     S40 455.2500
  S1 105.2500        7 189.2500     S17 273.2500     S29 367.2500     S41 463.2500
  S2 112.2500        8 196.2500     S18 280.2500     S30 375.2500
  S3 119.2500        9 203.2500     S19 287.2500     S31 383.2500
  S4 126.2500       10 210.2500     S20 294.2500     S32 391.2500
  S5 133.2500       11 217.2500     S21 303.2500     S33 399.2500
  S6 140.2500       12 224.2500     S22 311.2500     S34 407.2500

                              Tag Channels are:

    2( 48.2500),   S6(140.2500),   11(217.2500),  S20(294.2500),  S40(455.2500)
```

4.1.13 IRC EIA - US IRC EIA

```
   audio offset = 4.500

  2  55.2625      13 211.2625      48 367.2625      74 523.2625     105 679.2625
  3  61.2625      23 217.2625      49 373.2625      75 529.2625     106 685.2625
  4  67.2625      24 223.2625      50 379.2625      76 535.2625     107 691.2625
  1  73.2625      25 229.2625      51 385.2625      77 541.2625     108 697.2625
  5  79.2625      26 235.2625      52 391.2625      78 547.2625     109 703.2625
  6  85.2625      27 241.2625      53 397.2625      79 553.2625     110 709.2625
 95  91.2625      28 247.2625      54 403.2625      80 559.2625     111 715.2625
 96  97.2625      29 253.2625      55 409.2625      81 565.2625     112 721.2625
 97 103.2625      30 259.2625      56 415.2625      82 571.2625     113 727.2625
 98 109.2750      31 265.2625      57 421.2625      83 577.2625     114 733.2625
 99 115.2750      32 271.2625      58 427.2625      84 583.2625     115 739.2625
 14 121.2625      33 277.2625      59 433.2625      85 589.2625     116 745.2625
 15 127.2625      34 283.2625      60 439.2625      86 595.2625     117 751.2625
 16 133.2625      35 289.2625      61 445.2625      87 601.2625     118 757.2625
 17 139.2625      36 295.2625      62 451.2625      88 607.2625     119 763.2625
 18 145.2625      37 301.2625      63 457.2625      89 613.2625     120 769.2625
 19 151.2625      38 307.2625      64 463.2625      90 619.2625     121 775.2625
 20 157.2625      39 313.2625      65 469.2625      91 625.2625     122 781.2625
 21 163.2625      40 319.2625      66 475.2625      92 631.2625     123 787.2625
 22 169.2625      41 325.2625      67 481.2625      93 637.2625     124 793.2625
  7 175.2625      42 331.2750      68 487.2625      94 643.2625     125 799.2625
  8 181.2625      43 337.2625      69 493.2625     100 649.2625     126 805.2625
  9 187.2625      44 343.2625      70 499.2625     101 655.2625     127 811.2625
 10 193.2625      45 349.2625      71 505.2625     102 661.2625     128 817.2625
 11 199.2625      46 355.2625      72 511.2625     103 667.2625
 12 205.2625      47 361.2625      73 517.2625     104 673.2625

                                Tag Channels are:

    4( 67.2625),   99(115.2750),   27(241.2625),   40(319.2625),   51(385.2625)
```

4.1.14 IRC HST - US IRC HISTORICAL

```
   audio offset = 4.500

  2  55.2625      13 211.2625       LL 367.2625     LLL 523.2625     105 679.2625
  3  61.2625       J 217.2625       MM 373.2625     MMM 529.2625     106 685.2625
  4  67.2625       K 223.2625       NN 379.2625     NNN 535.2625     107 691.2625
A-8  73.2625       L 229.2625       OO 385.2625     OOO 541.2625     108 697.2625
  5  79.2625       M 235.2625       PP 391.2625     PPP 547.2625     109 703.2625
  6  85.2625       N 241.2625       QQ 397.2625     QQQ 553.2625     110 709.2625
A-5  91.2625       O 247.2625       RR 403.2625     RRR 559.2625     111 715.2625
A-4  97.2625       P 253.2625       SS 409.2625     SSS 565.2625     112 721.2625
A-3 103.2625       Q 259.2625       TT 415.2625     TTT 571.2625     113 727.2625
A-2 109.2750       R 265.2625       UU 421.2625     UUU 577.2625     114 733.2625
A-1 115.2750       S 271.2625       VV 427.2625     VVV 583.2625     115 739.2625
  A 121.2625       T 277.2625       WW 433.2625     WWW 589.2625     116 745.2625
  B 127.2625       U 283.2625       XX 439.2625     XXX 595.2625     117 751.2625
  C 133.2625       V 289.2625       YY 445.2625      87 601.2625     118 757.2625
  D 139.2625       W 295.2625       ZZ 451.2625      88 607.2625     119 763.2625
  E 145.2625      AA 301.2625      AAA 457.2625      89 613.2625     120 769.2625
  F 151.2625      BB 307.2625      BBB 463.2625      90 619.2625     121 775.2625
  G 157.2625      CC 313.2625      CCC 469.2625      91 625.2625     122 781.2625
  H 163.2625      DD 319.2625      DDD 475.2625      92 631.2625     123 787.2625
  I 169.2625      EE 325.2625      EEE 481.2625      93 637.2625     124 793.2625
  7 175.2625      FF 331.2750      FFF 487.2625      94 643.2625     125 799.2625
  8 181.2625      GG 337.2625      GGG 493.2625     100 649.2625     126 805.2625
  9 187.2625      HH 343.2625      HHH 499.2625     101 655.2625     127 811.2625
 10 193.2625      II 349.2625      III 505.2625     102 661.2625     128 817.2625
 11 199.2625      JJ 355.2625      JJJ 511.2625     103 667.2625
 12 205.2625      KK 361.2625      KKK 517.2625     104 673.2625

                                Tag Channels are:

    4( 67.2625),  A-1(115.2750),  N(241.2625),   DD(319.2625),   OO(385.2625)
```

4.1.15 ISRAEL - Israel

```
   audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                              Tag Channels are:

    3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.16 ITALY - Italy

```
   audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                              Tag Channels are:

    3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.17 JAPAN - Japan

```
   audio offset = 4.500

  1  91.2500     C24 231.2500     C47 367.2500      19 507.2500      42 645.2500
  2  97.2500     C25 237.2500     C48 373.2500      20 513.2500      43 651.2500
  3 103.2500     C26 243.2500     C49 379.2500      21 519.2500      44 657.2500
C13 109.2500     C27 249.2500     C50 385.2500      22 525.2500      45 663.2500
C14 115.2500     C28 253.2500     C51 391.2500      23 531.2500      46 669.2500
C15 121.2500     C29 259.2500     C52 397.2500      24 537.2500      47 675.2500
C16 127.2500     C30 265.2500     C53 403.2500      25 543.2500      48 681.2500
C17 133.2500     C31 271.2500     C54 409.2500      26 549.2500      49 687.2500
C18 139.2500     C32 277.2500     C55 415.2500      27 555.2500      50 693.2500
C19 145.2500     C33 283.2500     C56 421.2500      28 561.2500      51 699.2500
C20 151.2500     C34 289.2500     C57 427.2500      29 567.2500      52 705.2500
C21 157.2500     C35 295.2500     C58 433.2500      30 573.2500      53 711.2500
C22 165.2500     C36 301.2500     C59 439.2500      31 579.2500      54 717.2500
  4 171.2500     C37 307.2500     C60 445.2500      32 585.2500      55 723.2500
  5 177.2500     C38 313.2500     C61 451.2500      33 591.2500      56 729.2500
  6 183.2500     C39 319.2500     C62 457.2500      34 597.2500      57 735.2500
  7 189.2500     C40 325.2500     C63 463.2500      35 603.2500      58 741.2500
  8 193.2500     C41 331.2500      13 471.2500      36 609.2500      59 747.2500
  9 199.2500     C42 337.2500      14 477.2500      37 615.2500      60 753.2500
 10 205.2500     C43 343.2500      15 483.2500      38 621.2500      61 759.2500
 11 211.2500     C44 349.2500      16 489.2500      39 627.2500      62 765.2500
 12 217.2500     C45 355.2500      17 495.2500      40 633.2500
C23 223.2500     C46 361.2500      18 501.2500      41 639.2500

                              Tag Channels are:

    2( 97.2500),    4(171.2500),  C27(249.2500),  C50(385.2500),  C62(457.2500)
```

4.1.18 KOREA - Korea

```
   audio offset = 4.500

  2  55.2500      21 163.2500      31 265.2500      48 367.2500      65 469.2500
  3  61.2500      22 169.2500      32 271.2500      49 373.2500      66 475.2500
  4  67.2500       7 175.2500      33 277.2500      50 379.2500      67 481.2500
  5  77.2500       8 181.2500      34 283.2500      51 385.2500      68 487.2500
  6  83.2500       9 187.2500      35 289.2500      52 391.2500      69 493.2500
 95  91.2500      10 193.2500      36 295.2500      53 397.2500      70 499.2500
 96  97.2500      11 199.2500      37 301.2500      54 403.2500      71 505.2500
 97 103.2500      12 205.2500      38 307.2500      55 409.2500      72 511.2500
 98 109.2500      13 211.2500      39 313.2500      56 415.2500      73 517.2500
 99 115.2500      23 217.2500      40 319.2500      57 421.2500      74 523.2500
 14 121.2500      24 223.2500      41 325.2500      58 427.2500      75 529.2500
 15 127.2500      25 229.2500      42 331.2500      59 433.2500      76 535.2500
 16 133.2500      26 235.2500      43 337.2500      60 439.2500      77 541.2500
 17 139.2500      27 241.2500      44 343.2500      61 445.2500      78 547.2500
 18 145.2500      28 247.2500      45 349.2500      62 451.2500
 19 151.2500      29 253.2500      46 355.2500      63 457.2500
 20 157.2500      30 259.2500      47 361.2500      64 463.2500

                              Tag Channels are:

    4( 67.2500),   99(115.2500),   27(241.2500),   40(319.2500),   51(385.2500)
```

4.1.19 N ZEAL - New Zealand

```
   audio offset = 5.500

 1  45.2500      11 224.2500      36 591.2500      46 671.2500      56 751.2500
 2  55.2500      27 519.2500      37 599.2500      47 679.2500      57 759.2500
 3  62.2500      28 527.2500      38 607.2500      48 687.2500      58 767.2500
 4 175.2500      29 535.2500      39 615.2500      49 695.2500      59 775.2500
 5 182.2500      30 543.2500      40 623.2500      50 703.2500      60 783.2500
 6 189.2500      31 551.2500      41 631.2500      51 711.2500      61 791.2500
 7 196.2500      32 559.2500      42 639.2500      52 719.2500      62 799.2500
 8 203.2500      33 567.2500      43 647.2500      53 727.2500
 9 210.2500      34 575.2500      44 655.2500      54 735.2500
10 217.2500      35 582.2500      45 663.2500      55 743.2500

                                Tag Channels are:

    2( 55.2500),    7(196.2500),   28(527.2500),   43(647.2500),   62(799.2500)
```

4.1.20 NETH 1 - Netherlands 1

```
   audio offset = 5.500   sec audio offset = 5.742

K2  48.2500      M6 155.2500      B2 255.2500      B9 314.2500     B16 372.2500
K4  62.2500      M7 163.2500      B3 263.2500     B10 322.2500     B17 380.2500
M1 115.2500      K5 175.2500      B4 271.2500     B11 330.2500     B18 388.2500
M2 123.2500      K7 187.2500      B5 279.2500     B12 338.2500     B19 396.2500
M3 131.2500      K9 203.2500      B6 287.2500     B13 348.2500
M4 139.2500     K11 217.2500      B7 295.2500     B14 356.2500
M5 147.2500      B1 231.2500      B8 306.2500     B15 364.2500

                                Tag Channels are:

   K2( 48.2500),   M6(155.2500),   B2(255.2500),   B9(314.2500),  B19(396.2500)
```

4.1.21 NETH 2 - Netherlands 2

```
   audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                                Tag Channels are:

    3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.22 POLAND - Poland

```
   audio offset = 6.500   sec audio offset = 6.742

   I  49.7500     XII 223.2500      31 551.2500      42 639.2500      53 727.2500
  II  59.2500      21 471.2500      32 559.2500      43 647.3500      54 735.2500
 III  77.2500      22 479.2500      33 567.2500      44 655.2500      55 743.2500
  IV  85.2500      23 487.2500      34 575.2500      45 663.2500      56 751.2500
   V  93.2500      24 495.2500      35 583.2500      46 671.2500      57 759.2500
  VI 175.2500      25 503.2500      36 591.2500      47 679.2500      58 767.2500
 VII 183.2500      26 511.2500      37 599.2500      48 687.2500      59 775.2500
VIII 191.2500      27 519.2500      38 607.2500      49 695.2500      60 783.2500
  IX 199.2500      28 523.2500      39 615.2500      50 703.2500      61 791.2500
   X 207.2500      29 527.2500      40 623.2500      51 711.2500
  XI 215.2500      30 543.2500      41 631.2500      52 719.2500

                                Tag Channels are:

 II( 59.2500),  VII(183.2500),   21(471.2500),   36(591.2500),   55(743.2500)
```

4.1.23 REVERSE - Reverse Channel

```
   audio offset = 4.500

 T7   7.0000      T9  19.0000     T11  31.0000     T13  43.0000
 T8  13.0000     T10  25.0000     T12  37.0000     T14  49.0000

                              Tag Channels are:

   T7(  7.0000),   T8( 13.0000),   T9( 19.0000),  T10( 25.0000),  T11( 31.0000)
```

4.1.24 STD EIA - US STD EIA

```
   audio offset = 4.500

  2  55.2500      23 217.2500      49 373.2625      75 529.2500     106 685.2500
  3  61.2500      24 223.2500      50 379.2625      76 535.2500     107 691.2500
  4  67.2500      25 229.2625      51 385.2625      77 541.2500     108 697.2500
  5  77.2500      26 235.2625      52 391.2625      78 547.2500     109 703.2500
  6  83.2500      27 241.2625      53 397.2625      79 553.2500     110 709.2500
 95  91.2500      28 247.2625      54 403.2500      80 559.2500     111 715.2500
 96  97.2500      29 253.2625      55 409.2500      81 565.2500     112 721.2500
 97 103.2500      30 259.2625      56 415.2500      82 571.2500     113 727.2500
 98 109.2750      31 265.2625      57 421.2500      83 577.2500     114 733.2500
 99 115.2750      32 271.2625      58 427.2500      84 583.2500     115 739.2500
 14 121.2625      33 277.2625      59 433.2500      85 589.2500     116 745.2500
 15 127.2625      34 283.2625      60 439.2500      86 595.2500     117 751.2500
 16 133.2625      35 289.2625      61 445.2500      87 601.2500     118 757.2500
 17 139.2500      36 295.2625      62 451.2500      88 607.2500     119 763.2500
 18 145.2500      37 301.2625      63 457.2500      89 613.2500     120 769.2500
 19 151.2500      38 307.2625      64 463.2500      90 619.2500     121 775.2500
 20 157.2500      39 313.2625      65 469.2500      91 625.2500     122 781.2500
 21 163.2500      40 319.2625      66 475.2500      92 631.2500     123 787.2500
 22 169.2500      41 325.2625      67 481.2500      93 637.2500     124 793.2500
  7 175.2500      42 331.2750      68 487.2500      94 643.2500     125 799.2500
  8 181.2500      43 337.2625      69 493.2500     100 649.2500     126 805.2500
  9 187.2500      44 343.2625      70 499.2500     101 655.2500     127 811.2500
 10 193.2500      45 349.2625      71 505.2500     102 661.2500     128 817.2500
 11 199.2500      46 355.2625      72 511.2500     103 667.2500     129 823.2500
 12 205.2500      47 361.2625      73 517.2500     104 673.2500
 13 211.2500      48 367.2625      74 523.2500     105 679.2500

                              Tag Channels are:

  4( 67.2500),   99(115.2750),   27(241.2625),   40(319.2625),   51(385.2625)
```

4.1.25 STD HST - US STD HISTORICAL

```
   audio offset = 4.500

   2  55.2500       J 217.2500      MM 373.2625     MMM 529.2500     106 685.2500
   3  61.2500       K 223.2500      NN 379.2625     NNN 535.2500     107 691.2500
   4  67.2500       L 229.2625      OO 385.2625     OOO 541.2500     108 697.2500
   5  77.2500       M 235.2625      PP 391.2625     PPP 547.2500     109 703.2500
   6  83.2500       N 241.2625      QQ 397.2625     QQQ 553.2500     110 709.2500
 A-5  91.2500       O 247.2625      RR 403.2500     RRR 559.2500     111 715.2500
 A-4  97.2500       P 253.2625      SS 409.2500     SSS 565.2500     112 721.2500
 A-3 103.2500       Q 259.2625      TT 415.2500     TTT 571.2500     113 727.2500
 A-2 109.2750       R 265.2625      UU 421.2500     UUU 577.2500     114 733.2500
 A-1 115.2750       S 271.2625      VV 427.2500     VVV 583.2500     115 739.2500
   A 121.2625       T 277.2625      WW 433.2500     WWW 589.2500     116 745.2500
   B 127.2625       U 283.2625      XX 439.2500     XXX 595.2500     117 751.2500
   C 133.2625       V 289.2625      YY 445.2500      87 601.2500     118 757.2500
   D 139.2500       W 295.2625      ZZ 451.2500      88 607.2500     119 763.2500
   E 145.2500      AA 301.2625     AAA 457.2500      89 613.2500     120 769.2500
   F 151.2500      BB 307.2625     BBB 463.2500      90 619.2500     121 775.2500
   G 157.2500      CC 313.2625     CCC 469.2500      91 625.2500     122 781.2500
   H 163.2500      DD 319.2625     DDD 475.2500      92 631.2500     123 787.2500
   I 169.2500      EE 325.2625     EEE 481.2500      93 637.2500     124 793.2500
   7 175.2500      FF 331.2750     FFF 487.2500      94 643.2500     125 799.2500
   8 181.2500      GG 337.2625     GGG 493.2500     100 649.2500     126 805.2500
   9 187.2500      HH 343.2625     HHH 499.2500     101 655.2500     127 811.2500
  10 193.2500      II 349.2625     III 505.2500     102 661.2500     128 817.2500
  11 199.2500      JJ 355.2625     JJJ 511.2500     103 667.2500     129 823.2500
  12 205.2500      KK 361.2625     KKK 517.2500     104 673.2500
  13 211.2500      LL 367.2625     LLL 523.2500     105 679.2500

                              Tag Channels are:

    4( 67.2500),  A-1(115.2750),    N(241.2625),   DD(319.2625),   OO(385.2625)
```

4.1.26 SWEDEN - Sweden

```
   audio offset = 5.500   sec audio offset = 5.742

   2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
   3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
   4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
  S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
  S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
  S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
  S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
  S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
  S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
  S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
  S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
  S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
 S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
   5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
   6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
   7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
   8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
   9 203.2500     S28 359.2500      28 527.2500      49 695.2500
  10 210.2500     S29 367.2500      29 535.2500      50 703.2500
  11 217.2500     S30 375.2500      30 543.2500      51 711.2500
  12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                              Tag Channels are:

   3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.27 SWISS - Switzerland

```
   audio offset = 5.500   sec audio offset = 5.742

  2  48.2500     S11 231.2500     S32 391.2500      32 559.2500      53 727.2500
  3  55.2500     S12 238.2500     S33 399.2500      33 567.2500      54 735.2500
  4  62.2500     S13 245.2500     S34 407.2500      34 575.2500      55 743.2500
 S1 105.2500     S14 252.2500     S35 415.2500      35 583.2500      56 751.2500
 S2 112.2500     S15 259.2500     S36 423.2500      36 591.2500      57 759.2500
 S3 119.2500     S16 266.2500     S37 431.2500      37 599.2500      58 767.2500
 S4 126.2500     S17 273.2500     S38 439.2500      38 607.2500      59 775.2500
 S5 133.2500     S18 280.2500     S39 447.2500      39 615.2500      60 783.2500
 S6 140.2500     S19 287.2500     S40 455.2500      40 623.2500      61 791.2500
 S7 147.2500     S20 294.2500     S41 463.2500      41 631.2500      62 799.2500
 S8 154.2500     S21 303.2500      21 471.2500      42 639.2500      63 807.2500
 S9 161.2500     S22 311.2500      22 479.2500      43 647.2500      64 815.2500
S10 168.2500     S23 319.2500      23 487.2500      44 655.2500      65 823.2500
  5 175.2500     S24 327.2500      24 495.2500      45 663.2500      66 831.2500
  6 182.2500     S25 335.2500      25 503.2500      46 671.2500      67 839.2500
  7 189.2500     S26 343.2500      26 511.2500      47 679.2500      68 847.2500
  8 196.2500     S27 351.2500      27 519.2500      48 687.2500      69 855.2500
  9 203.2500     S28 359.2500      28 527.2500      49 695.2500
 10 210.2500     S29 367.2500      29 535.2500      50 703.2500
 11 217.2500     S30 375.2500      30 543.2500      51 711.2500
 12 224.2500     S31 383.2500      31 551.2500      52 719.2500

                                Tag Channels are:

  3( 55.2500),    5(175.2500),  S16(266.2500),  S39(447.2500),   30(543.2500)
```

4.1.28 TAIWAN - Taiwan

```
   audio offset = 4.500

  2  55.2500      23 217.2500      49 373.2625      75 529.2500     106 685.2500
  3  61.2500      24 223.2500      50 379.2625      76 535.2500     107 691.2500
  4  67.2500      25 229.2625      51 385.2625      77 541.2500     108 697.2500
  5  77.2500      26 235.2625      52 391.2625      78 547.2500     109 703.2500
  6  83.2500      27 241.2625      53 397.2625      79 553.2500     110 709.2500
 95  91.2500      28 247.2625      54 403.2500      80 559.2500     111 715.2500
 96  97.2500      29 253.2625      55 409.2500      81 565.2500     112 721.2500
 97 103.2500      30 259.2625      56 415.2500      82 571.2500     113 727.2500
 98 109.2750      31 265.2625      57 421.2500      83 577.2500     114 733.2500
 99 115.2750      32 271.2625      58 427.2500      84 583.2500     115 739.2500
 14 121.2625      33 277.2625      59 433.2500      85 589.2500     116 745.2500
 15 127.2625      34 283.2625      60 439.2500      86 595.2500     117 751.2500
 16 133.2625      35 289.2625      61 445.2500      87 601.2500     118 757.2500
 17 139.2500      36 295.2625      62 451.2500      88 607.2500     119 763.2500
 18 145.2500      37 301.2625      63 457.2500      89 613.2500     120 769.2500
 19 151.2500      38 307.2625      64 463.2500      90 619.2500     121 775.2500
 20 157.2500      39 313.2625      65 469.2500      91 625.2500     122 781.2500
 21 163.2500      40 319.2625      66 475.2500      92 631.2500     123 787.2500
 22 169.2500      41 325.2625      67 481.2500      93 637.2500     124 793.2500
  7 175.2500      42 331.2750      68 487.2500      94 643.2500     125 799.2500
  8 181.2500      43 337.2625      69 493.2500     100 649.2500     126 805.2500
  9 187.2500      44 343.2625      70 499.2500     101 655.2500     127 811.2500
 10 193.2500      45 349.2625      71 505.2500     102 661.2500     128 817.2500
 11 199.2500      46 355.2625      72 511.2500     103 667.2500     129 823.2500
 12 205.2500      47 361.2625      73 517.2500     104 673.2500
 13 211.2500      48 367.2625      74 523.2500     105 679.2500

                                Tag Channels are:

  4( 67.2500),   23(217.2500),   49(373.2625),   75(529.2500),  129(823.2500)
```

4.1.29 UK 1 - United Kingdom 1

```
   audio offset = 6.000   sec audio offset = 6.242

 1 120.0000      12 208.0000      23 296.0000      34 384.0000      45 472.0000
 2 128.0000      13 216.0000      24 304.0000      35 392.0000      46 480.0000
 3 136.0000      14 224.0000      25 312.0000      36 400.0000      47 488.0000
 4 144.0000      15 232.0000      26 320.0000      37 408.0000      48 496.0000
 5 152.0000      16 240.0000      27 328.0000      38 416.0000      49 504.0000
 6 160.0000      17 248.0000      28 336.0000      39 424.0000      50 512.0000
 7 168.0000      18 256.0000      29 344.0000      40 432.0000      51 520.0000
 8 176.0000      19 264.0000      30 352.0000      41 440.0000      52 528.0000
 9 184.0000      20 272.0000      31 360.0000      42 448.0000      53 536.0000
10 192.0000      21 280.0000      32 368.0000      43 456.0000      54 544.0000
11 200.0000      22 288.0000      33 376.0000      44 464.0000

                              Tag Channels are:

1(120.0000),   12(208.0000),   23(296.0000),   34(384.0000),   54(544.0000)
```

4.1.30 UK 2 - United Kingdom 2

```
   audio offset = 6.000   sec audio offset = 6.242

 A  55.2500      10 223.2500      19 319.2500      28 415.2500     U27 519.2500
 2 135.2500      11 231.2500      20 343.2500      29 423.2500     U28 527.2500
 3 159.2500      12 247.2500      21 351.2500      30 431.2500     U29 535.2500
 4 175.2500      13 255.2500      22 359.2500     U21 471.2500     U30 543.2500
 5 183.2500      14 263.2500      23 367.2500     U22 479.2500
 6 191.2500      15 271.2500      24 375.2500     U23 487.2500
 7 199.2500      16 279.2500      25 383.2500     U24 495.2500
 8 207.2500      17 287.2500      26 391.2500     U25 503.2500
 9 215.2500      18 295.2500      27 399.2500     U26 511.2500

                              Tag Channels are:

 A( 55.2500),    2(135.2500),   16(279.2500),   24(375.2500),  U30(543.2500)
```

4.2 Glossary

ATIS Automatic Time Interval Sampling is a method of recording several important cable test parameters, at intervals selected by the operator, automatically.

Balance Adjust A flat balance adjustment used to match the WindowLite Digital to other equipment that is perceived to be reading slightly higher or lower. This adjustment can be from -5.0 dB through +5.0 dB in 0.1 dB steps. Use this function with care! Also, see Offset.

Calibration Updating An internal noise source allows precise, continuous calibration updating. This is a WindowLite Digital exclusive.

Channel One of up to 128 carriers in a Group. A channel is specified for frequency, name, and type (ATV, FM, or DIGI).

Date Format The date format maybe either MM/DD/YY or DD/MM/YY.

DELTA™ An option for the WindowLite Digital that enables the user to visually compare a stored past system response to an active current system response.

Display Contrast Setting the display lighter or darker.

Display Range Toggle The dynamic range displayed on the screen maybe either 10 dB full scale or 30 dB full scale.

FiberLite™ Fiber Optic Powermeter Module for the WindowLite Digital. Offers dual wavelength detection and universal mounting adapter to fit most industry standard connectors.

Formats Formats are factory defined channel information sets that can be used to initialize any Group in the unit.

Groups There are 6 Groups in the WindowLite Digital. Each Group contains specific information on a set of 5 to 128 channels. In this definition, a channel is either an analog TV channel, an FM carrier or a digital carrier. The information maintained on each channel type is as follows: ATV channel name, amplitude offset, video carrier frequency and audio carrier frequency; FM channel name and frequency; DIGI channel name, center frequency, type, and bandwidth. Group information may be customized by the user.

Key Beep Loudness Personal preference of the beep loudness when a key is pressed.

Memory Bins The WindowLite Digital contains 24 memory bins. These memory bins are used to store a full set of measurements, time, date, carrier-to-noise, hum, temperature, and scaling information. At any time, the user can cause the current readings of the Group being observed to be stored in any bin. The readings thus stored maybe reviewed at a later time. The memory bins are in the non-volatile memory of the unit and as such their contents are preserved when the unit is turned off.

Menu Navigator A flowchart of operator and configuration menus

Name A function provided for the user to change group and memory bin names to be more meaningful.

Offset A function provided for ATV type channels to individually compensate level measurements, such as scrambled channels. Also see Balance Adjust.

Personality Configuring the WindowLite Digital to specific startup parameters and user adjustments.

PrintLite™ Printer Module for the WindowLite Digital. Generate on-site reports from data stored in the memory bins.

SnifferLite™ RF Leakage Detection Module for the WindowLite Digital. Allows vehicle mounting with the Docking Station for leakage monitoring. Can be used with the GeoSniffer System for the automatic logging of location and RF leakage data. Hand-held operation is used to measure, detect, or correct leakage sources.

SoftKeys Function Keys that can assume different meanings depending upon the current status of the WindowLite Digital.

StartUp Mode Define Setting the definable startup parameters (TUNE, TAGS, ZOOM, SWEEP mode; Group; dBmV/dBµV/dBm; Key Beep; Auto Shut Down Timer; Test Point Adjust; Balance; Display Contrast; Audio/Video/Digi Carrier Display).

Sweep Mode A bar graph simultaneously measuring and displaying the video or audio/data levels for all frequencies defined with a Group.

Tags Within each Group, 5 channels are designated Tags channels. These will be the only ones displayed when the WindowLite Digital is in the Tags sweep mode. Since only 5 channels are swept, a faster display update is achieved. Only ATV type channels can be TAGS. The channels referenced as Tags can be changed by the user.

TDRLite™ Time Domain Reflectometer Module for the WindowLite Digital. Used as a fault detector in troubleshooting cable runs.

Test Point Offset Pre-programs a value to be added to the current measurement when the operator presses TP ADJ. Selectable values are: 5, 10, 15, 20, 25, or 30 dB.

Time Format The time format is fixed to military style (24 hour).

Tune Mode A bar graph of a detailed sweep of a single channel. The display is stepped in increments of 125 kHz and has a screen bandwidth of 7.75 MHz.

Units of Measure Absolute measurement values maybe in dBmV (1.0 millivolt reference), dBµV (1.0 microvolt reference), or dBm (1.0 milliwatt reference) units. All references are at 75Ω.

WindowLite Digital™ Hand-held signal level meter for the cable television field technician designed with modular capability.

Zoom Mode A bar graph display showing a single channel's video and audio carriers simultaneously.

4.3 European Community Declaration of Compliance

CE

Manufacturer: ComSonics, Inc.
P.O. Box 1106
1350 Port Republic Road
Harrisonburg, VA, 22801 USA
Tel. # 540-434-5965

Product: WindowLite Digital
Models: 100945-001

ComSonics, Inc. of Harrisonburg, Virginia, USA, hereby declares that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

Council Directive 89/336/EEC (May 3, 1989), on Electromagnetic Compatibility, as amended by Council Directive 92/31/EEC (April 28, 1992), and

Council Directive 73/23/EEC (February 19, 1973), on Low Voltage.

The Technical File required by these directives, including the original of this Declaration of Conformity, are maintained at the corporate headquarters of ComSonics, Inc. (as listed above) and within the European Community at ComTec Cable Accessories, Ltd., Over Industrial Park, Over, Cambridge CB4 5QE, United Kingdom.