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July 31, 2003	0.1 Draft
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SIRIUS Satellite Radio

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Dept./Project	**Product Management**	**Home Sirius Satellite Radio Tuner**
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Number-Version	**Version 1.0**	
Owner	**William Brown**	

Audiovox Home Satellite Radio Tuner

October 23, 2003 Version 1.0

Revisions

Revision Level	Revision Date	Author	Change Description and Section(s) affected by Change
0.1	July 31, 2003	W. Brown	Initial draft
0.2	September 30, 2003	W. Brown	Revised for new display, cabinet, and UI based on Shuttle re-skin. Deleted various mobile features including auto-shutdown and auto-dimming. Reconciled channel Up/Down button controls versus Shuttle encoder controls.
1.0	October 23, 2003	W. Brown	Incorporated Audiovox inputs; added definition of tone generation, RS232 control port, mounting bracket accessories, and made changes to remote control button labels.

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1 Overview

This home satellite tuner is a discrete component that receives Sirius programming content via the Sirius antenna system and a single RF input. The tuner provides for analog audio and digital output. Control of the of content streams will be achieved through the use of a remote control or by operation of keys located on the front panel of the tuner. There is also a provision for a RS232 control port.

Data is decoded with the Agere generation 2.0 chipset together with other components required to pass content data and controller commands. These components will be arranged in an Orion module to be installed in the receiver. Kiryung Electronics is the source of the Orion module and the builder of the finished tuner for Audiovox.

Final assembly of the tuner is in Korea.

Power is supplied through a UL approved wall adapter power supply.

A display on the tuner cabinet will provide the means to show PDT data and other information necessary for the set up and operation of the Sirius tuner.

This tuner should operate similarly to the Audiovox SRS (Satellite Radio Shuttle) tuner. Differences in terminology, control operation, and key labels are reconciled in this PDD.

2 Reference Documents

Document Number	Title
RX000023-020000	Supplemental Air Interface and Chipset Interface Applications Note (Version number subject to change without notice)
RX000059.v0.8	SKP User Interface Protocol Applications Note
	SIRIUS Satellite Radio Brandmark Guidelines
RX000036-*xxxxxx*	SIRIUS ID Label Specification
RX00024-02000	Receiver Display/User Interface Requirements
User Interface Document	SRS Satellite Radio Shuttle (SIR-PNP1) , dated 5/12/03

3 Glossary

Glossary

"may"	Permitted but not required for compliance with requirements
"should"	Preferred but not required for compliance with requirements
"shall"	Required for compliance with requirements
navigation	In this document, refers to operation or process
DLP	Down Link Processor (External Receiver)
DCU	Display Control Unit
Subscribed Channel	Broadcast channel that is subscribed to by the user
Unsubscribed Channel	Broadcast channel that is not subscribed to by the user
Invalid Channel	Non-broadcast channel within SIRIUS channel map, or channel outside of SIRIUS channel map
GCI	Global Control Information
PDT	Program Descriptive Text / Program Display Text
PSV	Program Subscription Vector
PSN	Physical Serial Number
SIRIUS ID	SIRIUS-assigned electronic identification number of receiver unit
Cluster	A group of typically 20 (37 maximum) audio and data channels multiplexed into the SIRIUS transmission; there are five clusters in the ~7Mbps data stream, totaling approximately 100 (185 maximum) channels.
Logical Channel Number	A number by which the listener can identify a channel for tuning purposes; the same number is used for control and display, in interaction with the Agere chipset, in SIRIUS advertising of channels, and in all human interactions with channels; this channel number is independent of the TDM slot occupied by the audio content

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

1.1. Reorient or relocate the receiving antenna.
1.2. Increase the separation between the equipment and receiver.
1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
1.4. Consult the dealer or experienced radio/TV technician for help.

FCC Warning

This equipment may generate or use radio frequency energy. Changes or modifications to this equipment may cause harmful interference unless the modifications are expressly approved in this instruction manual. The user could lose the authority to operate this equipment if an unauthorized change or modification is made.

4 Physical Characteristics

The external dimensions of the tuner shall meet acceptable standards for the consumer electronic industry with a minimum width of approximately 11” and a maximum width of approximately 17”. The height of the receiver shall be adequate to accommodate display and controls while not exceeding an acceptable height for a component that may be situated in a rack. The depth shall provide a footprint that allows for a well designed electrical layout and adequate ventilation and heat dissipation.

4.1 Size

375mm (W) x 271mm (D) x 63mm (H)

4.2 Cosmetics

While the shape of the tuner is essentially a rectangular box, the design must convey a pleasing appearance and exhibit characteristics of a product that is leading technology and appealing to consumers seeking high-end products and pride of ownership. Details are critical especially with respect to accessibility of controls, readability of display, and quality of fit and finish.

4.3 Product Characteristics

4.3.1 Front Panel

- Main Display; Negative 132X65 Full dot Graphic, Amber Backlight
- Power On/Off toggle
- Category Up
- Category Down
- Channel/Preset Seek Up
- Channel/Preset Seek Down
- Scan
- Enter/Select

- Display
- Band (toggle; FAV-A, FAV-B, FAV-C)
- Menu
- Memo
- Numeric Keys (0-9)

4.3.2 Rear Inputs/Outputs

- 12VDC Power Input Jack
- Single RF input, female SMB
- Unbalanced Stereo Audio Out: Audio line connectors, 1 pair RCA Left/Right, gold plated
- S/PDIF Digital Audio Output
- RS232 Control Port, Sub D-9

4.3.3 Power Supply

- 120VAC/12VDC Power Adapter
- Maximum Output Rating: 20 Watt
- 60” Power Cord

4.3.4 Orion Module

- Single RF Input, SMB connector, female
- Includes Sirius internal ALC and splitter
- Antenna Operating Voltage: +5.0V to 6.5V max
- Antenna Short Circuit Protection
- Generation 2 base-band chip
- IIS Digital Audio and Unbalanced Audio Out
- SKP User Interface Protocol
- Time, Time Zone, Alarm

4.4 Display

4.4.1 Main Display

Negative 132X65 full dot Graphic, Amber Backlight

4.5 Operating Controls

The tuner may be operated either by direct entry of commands via the front panel controls; or by the use of a hand held infrared remote control unit.

4.5.1 Front Panel

Controls and user operation devices that must be present on the Front Panel include:

- Main Display; Negative 132X65 Full dot Graphic, Amber Backlight
- Power On/Off toggle
- Category Up
- Category Down

- Channel/Preset Seek Up
- Channel/Preset Seek Down
- Scan
- Enter/Select
- Display
- Band (toggle; FAV-A, FAV-B, FAV-C)
- Menu
- Memo
- Numeric Keys (0-9)

4.5.2 Remote Control

The infrared remote control will interface with and IR receiver module located in the front panel of the tuner.

Add Sirius logo

IR Receiver Module: 38KHz, NEC code

Remote Control Unit; 24 Keys

- Power On/Off
- 0-9 Key Matrix
- Channel/Preset Seek Up; glow color
- Channel/Preset Seek Down; glow color
- Category Up; glow color
- Category Down; glow color
- Select/Direct; glow color
- Scan
- Display
- Memo
- Menu
- Mute
- FAV A
- FAV B
- FAV C

5 User Interface

The User Interface navigation for this unit shall fall principally under the provisions of the RX000024 Receiver Display/User Interface document. This document will detail specific operations above and beyond RX000024. Wherever this document and the RX000024 document differ, this document will take precedence. The device shall be defined with simple controls and buttons that are as large as possible for ease of use. The functions are broken down by the controls and modes which have been specified in the following Sections.

5.1 Normal Display Operations

5.1.1 Button Operational Descriptions (Main Device)

- **Power:** Shall toggle between standby (ready to receive an IR command) and operational modes. The work POWER should be printed on the front panel.
- **Channel Up/Down buttons:** Up and Down arrows shall be printed above the buttons (Down, left; Up, right). The word 'CHANNEL' shall be printed on the front panel adjacent to the button.
- **Category up/down buttons:** Up and Down arrows shall be printed below the buttons (Down, left; Up, right). The word 'CATEGORY' shall be printed on the front panel adjacent to the button.
- **0-9 numbered keys (10 Key layout):** Numbers shall be printed above the top row buttons and printed below the bottom row numbers.
- **Scan button:** Allows for scanning up all channels or within categories at 10 second intervals. May also be used in preset mode.
- **Enter/Select button:** Used to confirm various menu and operational commands.
- **IR Sensor:** There shall be no label or text, sensor will be hidden behind front lens.
- **Display:** The word 'DISPLAY' shall be printed on the front panel.
- **Memory:** The word 'MEMO' shall be printed on the front panel.
    - The word 'S-SEEK' shall be printed on the front panel below the 'MEMO' button.
- **Menu:** The word 'MENU' shall be printed on the front panel.
- **Band:** The word 'BAND' shall be printed on the front panel.
    - The word 'P.TUNE' shall be printed on the front panel below the 'BAND' button.

6 User Interface

The User Interface navigation for this unit shall fall principally under the provisions of the RX000024 Receiver Display/User Interface document. This document will detail specific operations above and beyond RX000024. Wherever this document and the RX000024 document differ, this document will take precedence. The device shall be defined with simple controls and buttons that are as large as possible for ease of use. The functions are broken down by the controls and modes which have been specified in the following Sections.

6.1 Normal Display Operations Buttons (Main Device)

Power – Pressing and releasing this button turns the unit on and off. At initial "power on", the display shall show the SIRIUS logo as large as possible for three seconds. The device will then display the

default screen for the stream and tuning mode that was used last prior to power off. (Specifically, the unit shall recall the following state information upon power up: the display format for PDT information (two line / one line) and preset tune mode (on / off)). The display shall show the "AUDIOVOX" logo for two seconds prior to powering off.

Band Button – There are two operation functions with this button; Press and Release as well as Press and Hold. Pressing and releasing this button changes the Preset bank (Favorites) in a circular list from A to B, C. The display in the lower right hand side changes to show the corresponding Preset bank. If not in preset tune mode, the device shall not perform a stream tune when changing preset banks. When in preset tune mode, the device switches to whichever preset was last selected for the selected preset bank. Pressing and holding the Band button for 1000mS puts the tuning of the device in "Preset Tune" mode. The display briefly displays the text "Preset Tune Mode" in a "pop-up" window. If no presets have been set by the user – i.e. they are all empty – then the user shall be blocked from entering Preset Tune mode and a pop-up with "No Presets in Memory" shall be displayed before reverting back to normal tune mode. See Figure 3. The "A" indicator and stream number change from positive display to negative and "A" indicator changes to include both the bank and the preset location. This transition indicates that the unit is now in Preset Tuning mode. In this mode, pressing a channel Up/Down button changes the presets in ascending order (CH Up) or descending order (CH Down) through all presets. Example: A-1 → A-2 → A-3 → A-4 → A-5 → A-6 → A-7 → A-8 → A-9 → B-1 → B-2 → B-3 → B-4, etc. Only those presets that have been set by the user (i.e. not empty) shall be tuned within this sequence. Empty presets are skipped. The display shall show the corresponding stream name and number for each preset and the device shall tune to each stream with each increment or decrement of the rotary encoder. The device shall stay in preset tune mode until the user presses and holds the "Preset" button for 1000mS again. The displays around the "Stream Number" and the "Preset Number" will revert back to their original display states (Stream Number and Preset information highlighted in negative.) See Figure 4.

Figure 3

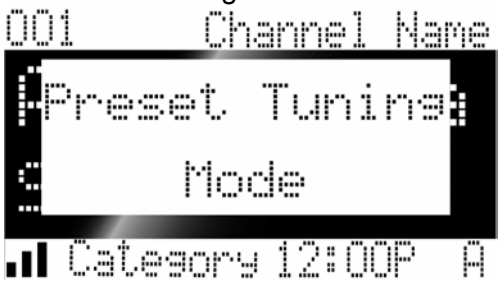
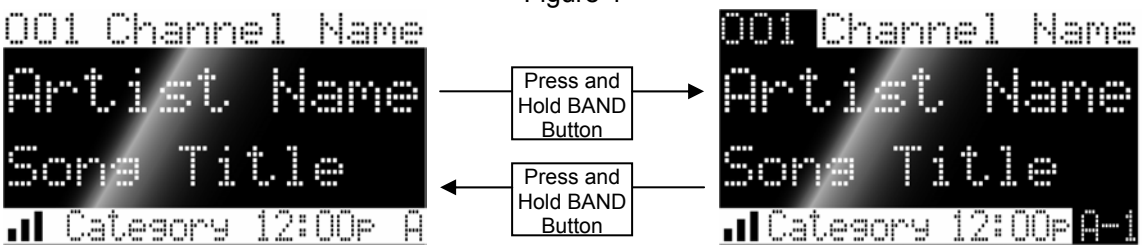


Figure 4



Numbered Preset buttons (0-9) – Pressing and releasing these buttons selects the stream stored within the selected preset bank. Pressing and holding one of these buttons for 1500mS stores the

current selected stream at this location within the selected preset bank. The display begins flashing the corresponding preset number at 1000mS and lights it steady at 1500mS corresponding with the storage of the stream at that preset. An audible beep tone will be heard as confirmation that the preset has been stored.

Channel Up/Down buttons – The channel Up/Down buttons are the primary controls for navigating through streams and the various lists and option menus available on the unit. The function of the Up/Down channel buttons is sequential tuning through the available program streams. Pushing the channel Up button shall tune up one stream and pushing the channel Down button shall tune down one stream. When in a list or menu mode pushing a channel Up/Down button increments or decrements through the various menus and lists, respectively.

Select button -- A press of the Select button in the default display will enter Direct Tuning mode. A press and hold of more than 1500ms will tune to the previously tuned stream.

Category Up & Down buttons – Pressing one of these keys changes the display to the Category List Screen. The current Category and Stream are highlighted. Pressing again increments or decrements the Category highlighted. Pressing the “up” arrow category button increments “up” one Category from the currently selected one, pressing the “down” arrow category button decrements down one Category from the current one.

Memo / S-Seek Button – This feature will allow the user to capture and store the current PDT information (Artist & Song title), with a storage capacity of up to 20 listings. Through this memory function, the receiver will also have the capability to search the current incoming Sirius signal, to cross-reference with any stored Artist/Song title in the receiver memory.

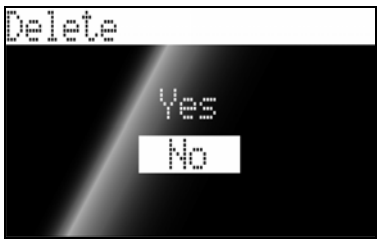
- While the receiver is in either of the 2 standard Display Modes **(i.e. not in list modes)**; pressing & releasing the MEMO button once will enable the current PDT information to be stored within the Shuttle's memory. A Pop-Up screen displaying the word “Stored” followed by “x used / y empty” **(Note: x + y = 20)** will appear for 1 seconds each.

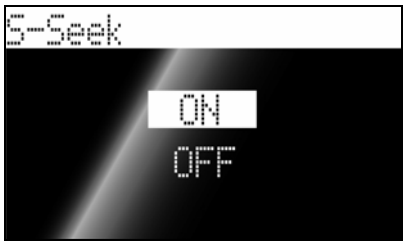
- By holding down the MEMO button for 3 seconds, the stored memory information (1 at a time) will be displayed on the LCD screen in page format, with the ability to scroll through the stored songs (one page per stored song) using the channel Up/Down buttons. This function will allow the user to recall information regarding the Artist/Song Title for the users own personal review. In the figure below, X is the displayed song’s location, Y is the total number of songs stored (maximum value of 20). To ensure that no duplicate entries are stored in memory, the receiver shall check the stored PID to ensure the PID attempted to be stored is not already in memory. If it is a duplicate, shall there be a pop-up window saying something like “Already in Memory”

- A press and release of the Select button while in the memory recall mode will bring up a “pop-up” window with two user selectable options:
    - Delete
    - S-Seek

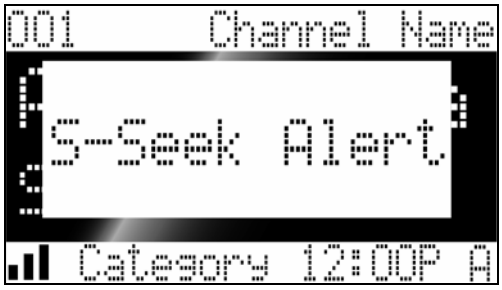
  The highlight bar will default to the Delete option.

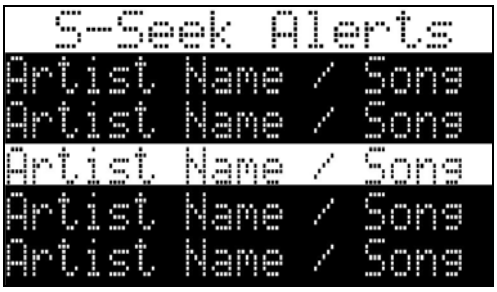
- Pushing a channel Up/Down button highlights the options and pushing the select button selects the option. The Delete options shall be “Yes” or “No”. The highlight bar will default to the “No” position. The S-Seek option shall be “On” or “Off”. The highlight bar will default to the current setting for the stored entry. When a song is initially stored to memory, the default setting is S-Seek On.





- Each time the receiver is turned on, it will automatically begin to search the incoming signal to see if a match is present; cross-referenced with the current saved PDT information in the Shuttle memory whose entry has S-Seek On. If one or multiple matches have been found, the display screen will first show a Pop-Up screen displaying the phrase “S-Seek Alert” for 2 seconds - an audible beep tone will be heard, and then the display will automatically switch to the S-Seek Alert screen as depicted below and will display the current matches. The user can now select the Artist/Song that they wish to listen to. Stored matches shall not be alerted on the currently selected stream.





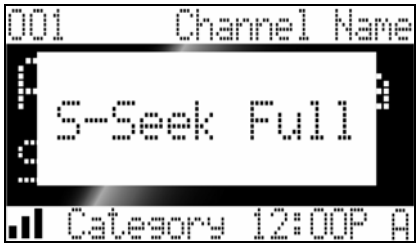
A) If one or multiple matches are found, a listing screen will appear allowing the user to scroll through the list of matched songs. Once a song is found it can be selected by pressing the Select button , and the display will revert back to either of the selected display modes.
The S-Seek Alerts screen displays “S-Seek Alerts” on the top line and up to five lines of songs (on lines two through six). Pressing a channel Up/Down button moves the highlight bar up/down through the matched songs. If there are less than five matched songs, the positions of the songs in the displayed list stay fixed and the highlight bar cycles through them. If there are five or more matched songs, if the highlight bar reaches the bottom line (line 6) and the channel UP button is pushed, the whole list moves upwards by one, displaying a new entry on the bottom line and dropping the entry formerly on line 2; if the highlight bar reaches line 2 and the channel Down button is pushed, the whole list moves downwards by one, displaying a new entry on the line 2 and dropping the entry formerly on the bottom line.

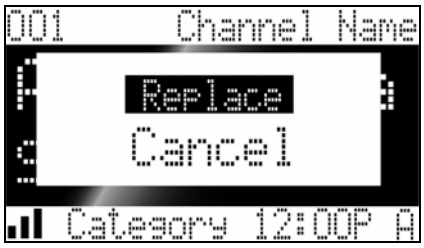
B) If a selection is not chosen within 10 seconds after the last action is made, the screen will revert to the previously selected display and tuning mode.

- Please note that the currently playing selection will remain playing until a new selection has been made.

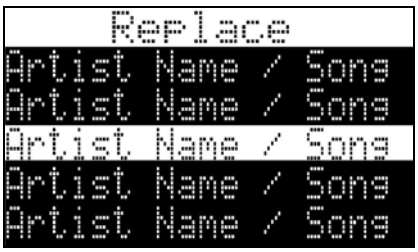
- **Replace/Cancel** If the Memo Button is pressed to save a selection that is currently playing, and all of the Memory spaces are full; in order to prevent a user from accidentally over-writing a Memory space with new information, a prompt screen & audible beep tone will alert the user.

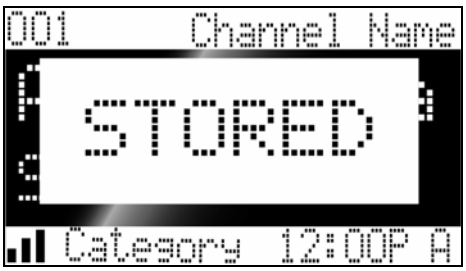
- **S-Seek Full – (see figure below)** will flash on the display for 1 second, followed by a Pop-Up screen providing the options **Replace-Cancel.** The highlight bar will default to the Replace option.

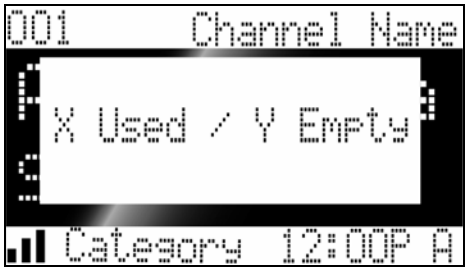




- By selecting **Replace**, the Memory list will appear, and the user would use the channel Up/Down buttons to select the Memory information that he would like to over-write with the new Artist/Song Title. After Scrolling & Highlighting to a selected title, the user would press the Select Button to delete the stored Artist/Song Title, and replace it with the newly selected information.







The Replace screen displays “Replace” on the top line and five lines of songs on lines two through six. The song on line two is initially highlighted. Pressing a channel Up/Down button moves the highlight bar up/down through the matched songs. If the highlight bar reaches the bottom line (line 6) and the channel Up button is pressed, the whole list moves upwards by one, displaying a new entry on the bottom line and dropping the entry formerly on line 2; if the highlight bar reaches line 2 and the channel Down button is pressed, the whole list moves downwards by one, displaying a new entry on the line 2 and dropping the entry formerly on the bottom line.

- By selecting **Cancel**, the prompt screen would disappear, and revert back to the original screen.

Display Button – A press and release of the Display button in the default display changes the display mode/format of the PDT information from the default size (two lines) to a single line of large scrolling text of “Artist Name / Composer / Song Title“. When the composer field is empty then it shall not be displayed. A press and hold of the display button in the default screen in normal tuning mode shall enter the stream list mode. A press and hold of the display button in the default screen in preset tuning mode shall enter the preset list mode. The stream number shall be displayed on the left side of the screen followed by a one character space and then the long stream name. A press of the display button in any list mode (Stream List, Category List, Preset List) will change the long stream name display in a rotation from Stream Name → Artist Name / Composer (if available) → Song Title. A press and hold of the Display button while in any List Mode will return the user to the previously selected tuning / display mode.

Menu Button – A press and release from any tuning/display/list mode other than a setup menu will enter the setup menu. A press and release of the menu button in any setup menu shall move back one level in the menu structure. A press and hold in a setup menu exits to the previously selected tuning / display mode.

6.1.1 Buttons (Remote)

Power – Shall have ISO standard power symbol printed in white on a Red button surface. Operates the same as the Power button on the Main Device.
Category up/down – buttons shall be arrow shaped appropriately to represent up (point right)/ down (point left) direction. The word ‘CAT-‘ shall be printed in white on the down button and the word ‘CAT+’ shall be printed in white on the up button. Operates the same as the Category up/down buttons on the Main Device.
Stream up/down – buttons shall be arrow shaped appropriately to represent up (point up)/ down (point down) direction. The word ‘CH-‘ shall be printed in white on the down button and the word

'CH+' shall be printed in white on the up button. Operates the same as the Stream up/down buttons on the Main Device.
Select button – Shall be center position of the category and stream button cluster. The word 'SEL' shall be printed in white on the button. Operates the same as the Select button on the Main Device.
Mute – The ISO standard mute symbol shall be printed on the button surface in white. Performs a mute of the audio output.
Band – The word 'BAND' shall be printed in white silk screen within reasonable vicinity of the button. The word 'P.TUNE' shall be printed in white silk screen within reasonable vicinity of the 'BAND' button. Operates the same as the Band button on the Main Device.
Display - The word 'DISPLAY' shall be printed in white silk screen within reasonable vicinity of the button. Operates the same as the Display button on the Main Device.
Memo- the word 'MEMO' shall be printed in white silk screen within reasonable vicinity of the button. The word 'S-Seek' shall be printed in white silk screen within reasonable vicinity of the 'MEMO' button. Operates the same as the Memo button on the Main Device.
Menu - The word 'MENU' shall be printed in white silk screen within reasonable vicinity of the button. Operates the same as the Menu button on the Main Device.
Direct – This button will put the remote in direct access mode for stream selection. Once pressed, the display will clear and show dashes where the Stream Number display is. The user will then press the 0-9 keys to select a stream. The user must press the first numbered key within 4 seconds or the receiver reverts back to normal operation and display. Operation can be completed by pressing the "Select" key to confirm. If the user inputs a three digit number, it will not be necessary to press Select. For instance, pressing "0", "2" and "3" will instantly select Stream 23. Pressing "2" and "3" then "Select" will also do the same.

6.2 Menu Display Operations

Setup Menu Mode

Pressing and release the **MENU** button enters the "Menu Options". The Menu Options mode displays the initial setup menu which includes the ESN/SID number along with other settings. The "Menu Options" will be displayed on the top line and the menu items will be listed below. The text to be displayed is shown in quotes for each menu item. The menu list will be a circular list, advanced in either direction by using the channel Up/Down buttons and selecting settings by pressing the select button. At any time in the set up menu, pressing the Menu button moves the user back one level. A press and hold on 1000ms exits the Setup Menu and returns the device to its previous operation mode. Main heading items below indicate top-level menu items:

The user is required to access a menu option within 10 seconds (this only applies on the main level screen) All submenus should automatically exit after 10 seconds, except if explicitly noted below, such as Sirius ID and Antenna Aiming. If no menu option is utilized within 10 seconds, the screen will revert back to the default screen. The following options will appear in order Top > Down, with the top of the LCD screen displaying the text "Menu Options" as a highlighted header on Line 1. Lines 2 through 6 shall list the following options:

- Sirius ID
- Display Settings
- Add or Skip (Add/Skip Streams)

- Lock Options
- Audio Level
- Antenna Aiming
- Memory Options
- Time Features
- Factory Default

The highlight bar defaults to the first (top) in the list on Line 2. Pressing a channel Up/Down button shall move the highlight bar up/down through the choices (in a circular fashion). If the highlight bar reaches the bottom line (line 6) and the channel Up button is pressed, the whole list moves upwards by one, displaying a new entry on the bottom line and dropping the entry formerly on line 2; if the highlight bar reaches line 2 and the channel Down button is pressed, the whole list moves downwards by one, displaying a new entry on the line 2 and dropping the entry formerly on the bottom line. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the default screen.

All information in the setup menu and submenus appear center-justified.

6.2.1 Sirius ID Number

Top line displays the text, **"Sirius ID"**. The second line shows the12 digit Sirius ID number (ESN). No adjustments are allowed in this mode. Pressing either the Select button or the MENU button returns to the top level setup options**.** (There shall be no automatic exit of this menu mode. The user will need to manually exit.)

6.2.2 Display Settings

Top line displays the text, "**Display Settings**". The following adjustments shall be offered:

- Contrast Control
- Dimming Control
- Font Type

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button shall move the highlight bar up/down through the choices. When the highlight bar reaches the last in the list the channel Up button is pressed, the highlight bar shall move to the first in the list. When the highlight bar reaches the first in the list and the channel Down button is pressed, the highlight bar shall move to the last in the list. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the top level setup options.

Contrast Control
Top line displays the text, "Contrast Control". Upon entering Contrast Control, a 10 segment horizontal bag graph will be displayed with a (-) sign to the left and a (+) sign to the right. The current setting shall be indicated on the bar graph by a reverse image segment. Moving the encoder knob will adjust the bar graph indication and function accordingly. Either pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Display Settings menu.

Dimming Control

Top line displays the text, “Dimming Control”. Upon entering Dimming Control, a 10 segment horizontal bag graph will be displayed with a (-) sign to the left and a (+) sign to the right. The current setting shall be indicated on the bar graph by a reverse image segment. Pressing a channel Up/Down button will adjust the bar graph indication and function accordingly. Either pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Display Settings menu.

Font Type

Top line displays the text, “Font Type”. Upon entering the font select menu, a list of the available font types shall be displayed: LIST OF CHOICES. The highlight bar shall default to the current setting. Pressing a channel Up/Down button moves the highlight bar up/down through the choices. When the highlight bar reaches the last in the list and the channel Up button is pressed, the highlight bar shall move to the first in the list. When the highlight bar reaches the first in the list and the channel Down button is pressed, the highlight bar shall move to the last in the list. Either pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Display Settings menu.

6.2.3 Add or Skip (Stream Add/Skip)

Top line displays the text, “**Add or Skip**”. The following adjustments shall be offered:

- **Skip/ Add**

Upon entering this mode, a list of stream numbers and short stream names shall be displayed with the current stream in play highlighted on the top line. A channel Up/Down button shall be used to navigate the list in a circular fashion and move the highlight bar up/down to the stream to be adjusted. Once a stream has been highlighted, pressing the select button shall display the text “Skip” next to the stream and prevent the stream from being accessible during any of the Tuning modes. Skipped streams can be accessed either through direct stream number entry or by returning to this menu and going through the same process to add the stream back to the list. Upon adding a stream, the text “Skip” shall be removed from alongside the stream number / name. Pressing the MENU button shall return to the top level setup options.

6.2.4 Lock Options

Top line displays the text, “**Lock Options**”. The following adjustments shall be offered:

- Lock / Unlock
- Edit Code

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button shall toggle between these two choices. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the top level setup options.

Lock / Unlock

Upon entering this mode for the first time, the user will be prompted to enter a four digit numerical code that shall be used to lock / unlock stream access. All future entries into this mode displays the

text “Lock / Unlock” on the top line and a stream list below it. The unit displays a list of stream numbers and short stream names with the current stream in play highlighted on the top line. A channel Up/Down button shall be used to navigate the list in a circular fashion and move the highlight bar up/down to the stream to be adjusted. Once a stream has been highlighted, pressing the select button shall display the text “Lock” next to the stream and prevent the stream from being accessible during any of the tuning modes. Locked streams can be accessed only by direct stream number entry, upon which the user will be prompted to enter their 4-digit code. Once the correct code has been entered, the audio will begin to play. The stream will return to the locked status if the stream is changed. By returning to this menu and going through the same process, the user can add the stream back to the list. Upon adding a stream, the text “Lock” shall be removed from alongside the stream number / name. Pressing the MENU button shall return to the Lock Options menu.

Edit Code
Upon entering this mode, the user shall be prompted to enter the user’s four digit numerical code being used to lock/ unlock stream access. Once the correct code has been entered, the user shall be prompted to enter the new four-digit code twice – the second entry is requested for confirmation. Once confirmed, the display shall return to the Lock Options menu.

6.2.5 Audio Level

Upon entering this mode, the top line displays the text “Audio Level” on the top line and a 10 segment horizontal bar graph will be displayed with a (-) sign to the left and a (+) sign to the right. The current setting shall be indicated on the bar graph by a reverse image segment. Pressing a channel Up/Down button will adjust the bar graph audio level indication and audio gain, accordingly. The bar graph segments are mapped to –9dB to 0dB in 1 dB steps. Either pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the top level setup options.

6.2.6 Antenna Aiming

Upon entering this mode, the top line displays the text “Antenna Aiming” and two 10-segment horizontal bar graphs will be displayed with a (-) sign to the left and a (+) sign to the right. One will be labeled “SAT” and the other “TER”. The current settings shall be indicated on the bar graphs by a reverse image segment. Moving the antenna location will adjust the bar graph signal strength indication and insure optimum reception. Pressing the either the Select button or the MENU button returns to the top level setup options. (There shall be no automatic exit of this menu mode. The user will need to manually exit.)

6.2.7 Memory Options

Upon entering this mode, the user will have the ability to turn the Memory Search Function (S-Seek) ON or OFF. They will also have the ability to clear all of the 20 Memory Locations.

Top line displays the text, “**Memory Options**” The following adjustments shall be offered:

- Automatic Memory Search
- Clear All Memory

The highlight bar defaults to the first in the list. Pressing a channel Up/Down button will toggle between the two selections. Pressing the select button enters the selected submenu. Pressing the MENU button returns to the top level setup options.

Automatic Memory Search function
(This a global on/off, as opposed to the description in Section 6.1.6)
Upon entering this submenu, the top line displays the text "Automatic Memory Search". The following adjustments shall be offered: ON and OFF. Pressing a channel Up/Down button shall toggle between the two settings. The highlight bar shall default to the current setting. By pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Memory Options submenu.

Clear All Memory
By pressing the select button the user may clear all memory locations for PDT memory.

The top line displays the text "Clear All Memory". The following adjustments shall be offered:

- Yes
- No

The highlight bar shall default to the "No" option. Pressing a channel Up/Down button shall toggle between the two settings. Pressing the Select button shall make the choice and return to the Memory Options submenu.

6.2.8 Time Based Features

Top line displays the text, "Time Features". The following features shall be offered:

- Clock
- Alarm Clock
- Program Alert
- Auto Shutdown
- Sleep Mode

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button shall move the highlight bar up/down through the choices. When the highlight bar reaches the last in the list and the channel Up button is pressed, the highlight bar shall move to the first in the list. When the highlight bar reaches the first in the list and the channel Down button is pressed, the highlight bar shall move to the last in the list. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the top level setup options.

6.2.8.1 Clock Functionality

The time reference for the clock function shall be obtained from the time information broadcast in the satellite data stream whenever the Shuttle is powered on and receiving satellite data. When setting up the clock for local time, the Shuttle will store the local time zone (and daylight savings time observance) in non-volatile memory for initialization of the module upon each power-up initialization. The Sirius transmission provides time information in universal GMT format, which is converted to local time in the module software prior to transmitting the updated time message to the Shuttle's

front controller. When displaying time information, the Shuttle simply uses the local time information provided by the latest time update message.

An internal real-time clock shall be used to provide a time reference when the unit is not receiving satellite data, or when the unit is connected to power but not turned on. This internal real-time clock function shall be generated in software in the front board micro-controller using a 32.768khz tuning fork crystal typically used for clock applications for a time reference. This internal real-time clock shall be automatically synchronized with the correct local time when time information is available from the satellite data stream. When displaying time information and the satellite data stream is not available, the Shuttle uses the local time maintained by the internal real-time clock.

When the Shuttle unit is not powered, time information in the local real-time clock may be lost. If time information is lost, the clock should not display time information and programmed alarms should not be triggered until the local real-time clock has been re-synchronized with time information from the satellite.

6.2.8.2 Clock

When entering this menu option, the user will be able to setup the clock that is shown on the default display based upon the format desired, and the time zone for which they reside. The clock data is provided via the Sirius stream, and will update based upon the signal received, and is dependent on the unit being powered up. When the unit is off, but still connected to power, the clock data will be internally generated from a software implemented real-time clock.

Top line displays the text, “Clock”. The following adjustments shall be offered:

- Format
- Time Zone
- Daylight Savings Time

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button shall move the highlight bar up/down through the choices. When the highlight bar reaches the last in the list and the channel Up button is pressed, the highlight bar shall move to the first in the list. When the highlight bar reaches the first in the list and the channel down button is pressed, the highlight bar shall move to the last in the list. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the Time Features submenu.

Format - Upon entering this mode, moving the encoder knob will toggle between the following formats:

- **12 Hour (Factory Default)**
- **24 Hour**

The highlight bar shall default to the current setting. By pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Clock submenu.

Time Zone - Upon entering this mode, pressing a channel Up/Down button will toggle between the following time zones

- **(GMT -9:00) Alaska**
- **(GMT -8:00) Pacific**
- **(GMT -7:00) Mountain**

- **(GMT -6:00) Central**
- **(GMT -5:00) Eastern (Factory Default)**
- **(GMT -4:00) Atlantic**
- **(GMT -3:30) Newfoundland** (Abbreviate as **(GMT -3:30) NewfndInd)**

The highlight bar shall default to the current setting. By pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Clock submenu.

Daylight Savings Time Observance – This sets whether or not the user's current location observes daylight savings time (not whether DST is in effect – this is transmitted in the Sirius bit-stream.) Upon entering this mode, pressing a channel Up/Down button will toggle between the following choices:

- **DST Observed (Factory Default)**
- **DST Not Observed**

The highlight bar shall default to the current setting. By pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Clock submenu.

6.2.8.3 Alarm Clock

When entering this menu option, the user will be able to set the unit to turn on at a selected time. The last selected stream prior to shutdown will be present when the Alarm feature is activated.

Top line displays the text, "Alarm". The following adjustments shall be offered:

- Set Alarm
- Alarm Time

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button will toggle between the choices. Pressing the select button enters the selected submenu. Pressing the MENU button returns to the Time Features submenu.

Set Alarm - Upon entering this mode, pressing a channel Up/Down button will toggle between the following:

- Alarm Off (Factory Default)
- Alarm On

The highlight bar shall default to the current setting. By pressing the select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Alarm Clock submenu.

- When the alarm function is enabled, the clock on the default screen will be inversed, ex. Negative to positive mode only on the clock section of the default screen.

Alarm Time - Upon entering this mode, the screen shall display the current (last programmed) setting for the alarm (factory default is 12:00pm). By pressing a channel Up/Down button, the minutes shall increase (channel Up), or decrease (channel Down) in a circular motion in 1 minute increments. By pressing the category buttons, the hour shall increase (Up Arrow) or decrease (Down Arrow) in a circular motion in 1 hour increments. AM or PM will switch automatically when the AM or PM threshold has been exceeded. By pressing the select button (to modify the setting) or pressing the MENU button (to cancel) shall return to the Alarm Clock submenu.

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6.2.8.4 Program Alert

When entering this menu option, the user will be able to have the unit switch to a selected stream at a selected time.

Top line displays the text, “Set Program Alert”. The following adjustments shall be offered:

- Program Time/Day
- Stream Number
- Program Alert On/Off

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button shall move the highlight bar up/down through the choices. When the highlight bar reaches the last in the list and the channel Up button is pressed, the highlight bar shall move to the first in the list. When the highlight bar reaches the first in the list and the channel Down button is pressed, the highlight bar shall move to the last in the list. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the Time Features submenu.

Program Time/ - Upon entering this mode, pressing a channel Up/Down button will toggle between the following choices:

- Time
- Day

The highlight bar defaults to the first (top) in the list. Pressing a channel Up/Down button toggles between the two choices. Pressing the Select button enters the selected submenu. Pressing the MENU button returns to the Set Program Alert submenu.

By selecting “Time”, the screen shall display the current (last programmed) setting for the program time (factory default is 12:00pm). By pressing a channel Up/Down button, the minutes shall increase (channel Up), or decrease (channel Down) in a circular motion in 1 minute increments. By pressing the category buttons, the hour shall increase (Up Arrow) or decrease (Down Arrow) in a circular motion in 1 hour increments. AM or PM will switch automatically when the AM or PM threshold has been exceeded. By pressing the Select button (to modify the setting) or pressing the MENU button (to cancel) shall return to the Program Time/Day submenu.

By selecting “Day”, the screen shall display the current (last programmed) setting for the program day (factory default is of “Monday”), with selectable choices of “Monday”, “Tuesday”, “Wednesday”, “Thursday”, “Friday”, “Saturday, or “Sunday”. By pressing a channel Up/Down button, the day shall increase (channel Up), or decrease (channel Down) in a circular motion. By pressing the Select button (to modify the setting) or pressing the MENU button (to cancel) shall return to the Program Time/Day submenu.

Stream Number - Upon entering this mode, a list of available streams shall be displayed. The highlight bar shall default to the current setting for the stream number (factory default is the currently playing stream) on the top line. Pressing a channel Up/Down button will move the highlight bar in a circular motion through a listing of all the Sirius streams. The listing should encompass all 6 available lines. By pressing the Select button (to modify the setting) or pressing the MENU button (to cancel) shall return to the Set Program Alert submenu.

Program Alert On/Off - Upon entering this mode, the channel Up/Down buttons will toggle between 'Program Alert On" or "Program Alert Off" (factory default). The highlight bar shall default to the current setting. By pressing the Select button (to modify the setting) or pressing the MENU button (to cancel) shall return to the Set Program Alert submenu.

6.2.8.5 Sleep Mode

When entering this mode, the user will have the ability to have the unit shutdown after a selected period of time.

Top line displays the text, "Sleep Mode". The following adjustments shall be offered:

- **Off (Factory Default)**
- **15 min**
- **30 min**
- **45 min**
- **60 min**

Upon entering this mode, moving the encoder knob will toggle between the selections from top line to bottom line: "Off", "15 min", "30 min", "45 min", or "60 Min". The highlight bar shall default to the current setting. By pressing the Select button (to modify the setting) or pressing the MENU button (no change in setting) shall return to the Time Features submenu.

6.2.9 Factory Default

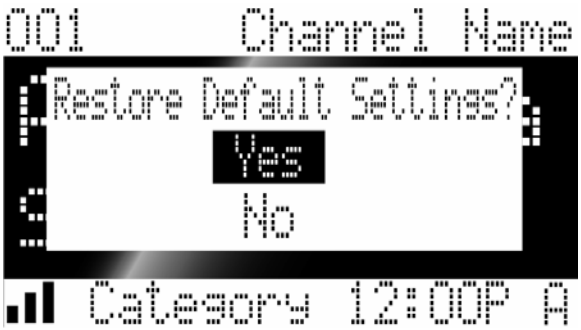
Top line displays the text, "**Restore Default Settings?**" The following adjustments shall be offered:

- Yes
- No

Upon entering this mode, the encoder knob will toggle between the "Yes" and "No" function/ display selection. The highlight bar shall default to No. By pressing the Select button shall return to the top level setup options. If "Yes" is chosen the unit shall revert to the original factory settings for the following parameters:

All Presets revert to empty
Normal Tuning Mode
Display Mode for PDT Format = 2 line
Display Contrast to 50%
Font Type Verdana
Access to all skipped streams. (Locked streams will remain locked.)
Audio Output Level to 50%
Memory Search On
Memory locations will be erased
12 Hour Clock Format
Eastern time zone
Daylight savings time observed
Alarm Off
Alarm Time 12:00pm
Program Alert Time 12:00pm

Program Alert Day Monday
Program Alert Stream Number (current channel)
Auto Shutdown Off
Sleep Mode Off



6.3 Special Display Messages

6.3.1 Acquiring Signal

Whenever signal (i.e. audio) is lost, a pop-up window with the message “Acquiring Signal” shall be displayed until signal is recovered. While the “Acquiring Signal” pop-up is active, no PDT information shall be displayed in the list modes, nor should any time information be displayed (as this may be outdated information).

6.3.2 Antenna Not Detected

Whenever BOTH the antenna sense detects no antenna AND signal (i.e. audio) is lost, a pop-up window with the message “Antenna Not Detected” shall be displayed until either the antenna sense detects an antenna (reverts to “Acquiring Signal” pop-up) or signal is recovered (removes all pop-ups). While the “Antenna Not Detected” pop-up is active, no PDT information shall be displayed in the list modes, nor should any time information be displayed (as this may be outdated information). NOTE – The indication from the antenna sense detection circuit alone is not sufficient enough to display this message since it is not desirable to display any fault message at retail locations that may not provide the proper antenna sense to the Shuttle.

6.3.3 Updating Streams

Whenever a GCI **(stream lineup)** update from the Sirius broadcast is detected, a pop-up window with the message “Updating Streams” on the top line and “X% Completed” (0%→20%→40%→60%→80%→100%) on the bottom line shall be displayed by the Shuttle until the GCI update completes. Additionally, audio shall be muted and no channel tunes shall be permitted during the display of this message and until the re-tune of the previous stream is completed.

6.3.4 Subscription Updated

Whenever a subscription (PSV) update from the Sirius broadcast is detected, a pop-up window with the message “Subscription Updated” on the top line and “Press Any Key to Continue” on the bottom

line shall be displayed by the Shuttle until the user presses a button on the front panel or the remote control.

6.4 Default Display

Upon power up the unit shall display the default display (recalling the display format for PDT and the preset tuning mode on/off) of the last stream tuned prior to shutdown. The display shall provide for a three digit stream number in the top left corner of the display. The long stream name shall be right justified on the top line with a minimum one character space between the stream number location and stream name. The top line shall be a positive display area. There shall be a one pixel border to all edges. The artist name and song title PDT shall be displayed in the center of the display. In two-line mode, PDT is displayed with the Artist name on the top line and song title on the lower line. When displaying the PDT information (Artist Name / Composer and Song Title) in the two-line display mode, the unit shall automatically select the character size (medium or small) for each line such that the full information fits on the line without truncation. If the full information cannot fit on the line in any character size without truncation, the unit shall use the small character size and scroll according to the scheme detailed in Section 6.4.1. In on-line mode, PDT is displayed in large font as Artist / Composer / Song Title, scrolling according to the scheme detailed in Section 6.4.1. The bottom line shall contain the following information in a positive display area: signal meter / mute indicator, short category name, clock, and preset bank information. The signal meter shall display up to 3 bars; when there is no signal an X shall be displayed. If the audio is muted via the remote control, the ISO standard mute symbol shall be displayed in place of the signal meter. The short category name shall be left justified on the bottom line with a minimum one character space to the clock display and a one character space to the preset bank letter.

Time information from the clock function should only be displayed when a valid time reference is available from the satellite data stream or from the internal real-time clock. If a time reference is not available, then time information on the default display should be left blank.

6.4.1 Scrolling

In two-line PDT default display mode and Memory Recall screens, the Artist name and/or song title lines shall scroll if the PDT information can not be scaled to fit on the display. The information shall begin scrolling to the left, move off-screen, and scroll back on-screen until again left-justified on the screen. It shall then pause for 5 seconds before repeating the scroll sequence. When scrolling both the Artist Name and song title, they shall begin to scroll at the same time and rate. Upon left-justification after scrolling, the shorter line shall wait until the longer line finishes its scroll and is left-justified on the display. They both then shall pause for 5 seconds before repeating the scroll sequence. Upon a PDT or channel change, the two lines shall first pause for 5 seconds prior to scrolling if necessary.

In one-line PDT default display mode, the Artist / Composer / Song Title shall scroll if the PDT information can not fit on the display. The information shall begin scrolling to the left, move off-screen, and scroll back on-screen until again left-justified on the screen. It shall then pause for 5 seconds before repeating the scroll sequence. Upon a PDT or channel change, the new PDT information shall first pause for 5 seconds prior to scrolling if necessary.

The scrolling of PDT in default display modes shall be as smooth/continuous as possible (fewest pixels per update, highest display update rate) – minimizing any apparent "jumping" motion across the screen.

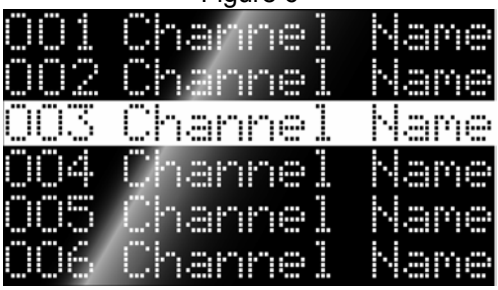
In list modes, S-Seek Alert display, and Memory Replace screens, the PDT information on the highlighted line only shall scroll to the left, move off-screen, and scroll back on-screen until again left-justified on the screen. It shall then pause for 5 seconds before repeating the scroll sequence.

6.5 Stream List Mode

Stream list mode is entered into from the Normal mode by a press and hold of the "Display" button. Once entered, the display will revert to the list display mode (stream, artist, song) that was last accessed from previous list mode access.

- EXAMPLE - The user last was in Category List mode and selected a stream when in the Artist list display. When the user re-enters the Stream List mode by pressing/holding DISP, the user shall re-enter the Artist list display rather than the stream list display.

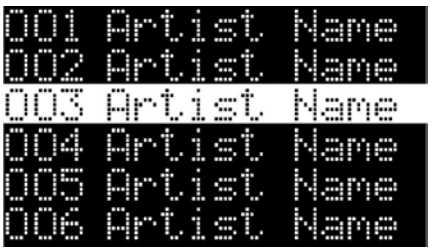
Figure 6



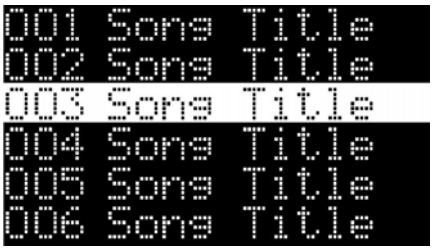
The Stream List Mode contains six lines of data. The Stream Name data are listed along with stream number from top to bottom in order of ascending logical stream number.

- Upon entry to Stream List Mode from default display, if there are 6 or more streams available for listing, the currently selected stream is highlighted and positioned on Line 3. Pressing the Up/Down buttons shall move the highlight bar up/down through the streams (in a circular fashion). If the highlight bar reaches Line 5 (second from bottom) and the channel UP button is pushed, the highlight bar stays on Line 5 and the whole list moves upwards by one line, displaying a new entry on the bottom line (Line 6) and dropping the entry formerly on the top line (Line 1). If the highlight bar reaches Line 2 (second from top) and the channel Down button is pushed, the highlight bar stays on Line 2 and the whole list moves downward by one line, displaying a new entry on the top line (Line 1) and dropping the entry formerly on the bottom line (Line 6).

- Upon entry to Stream List Mode from default display, if there are fewer than 6 streams available for listing, then the streams are listed in ascending logical channel number order with the currently selected stream highlighted (could be on any line). The positions of the streams displayed in the list remain fixed. Pressing the Up/Down buttons shall move the highlight bar up/down through the streams (in a circular fashion). When the highlight bar reaches the last stream at the bottom of the list and the channel Up button is pressed, the highlight bar shall move to the first stream at the top of the list. When the highlight bar reaches the first stream at the top of the list and the channel Down button is pressed, the highlight bar shall move to the last stream at the bottom of the list.
- Pressing Select button at any time will select the highlighted stream and switch to the Main Screen normal mode for the selected stream.
- While in the “Stream List” menu, pressing the Display button will change from “Stream List” to “Artist List”. The display shall simply replace the stream name data with the artist name data, while maintaining the list of stream numbers and highlight bar position. Artist Names that are too long to be fully seen in the display area available will automatically scroll (scroll/pause for five seconds/scroll) on the highlighted line only, other lines will be truncated. On streams that broadcast “Composer”, the Composer Name should be listed with the Artist Name data separated by a slash “/”.



- Pressing Display again changes to the “Song List” screen. The display shall simply replace the artist name data with the song title data, while maintaining the list of stream numbers and highlight bar position. Song Titles that are too long to be fully seen in the display area available will automatically scroll (scroll/pause for five seconds/scroll) on the highlighted line only, other lines will be truncated.



- Navigation of both the Artist Name and Song Title List screen works the same as the Stream List screens as indicated above. PDT will automatically update as it becomes available in the Sirius signal.
- Any stream that is selected to be skipped or locked in the Setup Menu will not be displayed in the Stream List screen.

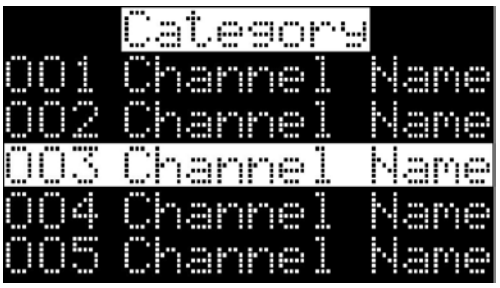
- A press and hold of the Display button when in a list mode will cancel out and revert back to the default display of the currently selected stream and mode (Normal or Preset tuning modes).
- Audio from the selected stream shall continue to play while in the list modes until the user selects a new stream by pushing the encoder knob.
- Pressing CAT UP or CAT DOWN buttons from within the stream list mode —shall enter the category list mode, maintaining the highlighted stream displayed under its category according to the display rules of category mode entry outlined in the next section.

6.6 Category List Mode

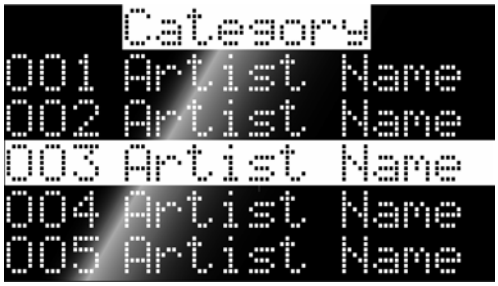
The Category List mode is entered into from normal mode, stream list mode, preset mode, or preset list mode by pressing either the Up or Down arrow buttons (Category) buttons. Once entered, the display will revert to the list display mode (stream, artist, song) that was last accessed from previous list mode access.

The Category List Mode contains six lines. The top line always displays the long category name. The bottom five lines (Lines 2-6) are for data. Stream Name data for streams within the category are listed along with stream number from top to bottom in order of ascending logical stream number.

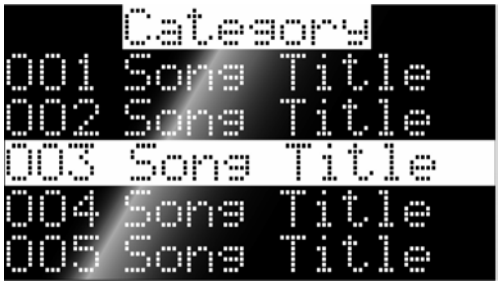
- Upon entry to Category List Mode, if there are 5 or more streams available in the category of the current stream selection, the currently selected stream is highlighted and positioned on Line 4. Pressing the Up/Down buttons shall move the highlight bar up/down through the streams (in a circular fashion). If the highlight bar reaches Line 5 (second from bottom) and the channel Up button is pressed, the highlight bar stays on Line 5 and the whole list moves upwards by one line, displaying a new entry on the bottom line (Line 6) and dropping the entry formerly on the top line of data (Line 2). If the highlight bar reaches Line 3 (second data line from top) and the channel Down button is pressed, the highlight bar stays on Line 3 and the whole list moves downward by one line, displaying a new entry on the top data line (Line 2) and dropping the entry formerly on the bottom line (Line 6).
- Upon entry to Category List Mode, if there are fewer than 5 streams available in the category of the current stream selection, then the streams are listed in ascending logical channel number order with the currently selected stream highlighted (could be on any line). The positions of the streams displayed in the list remain fixed. Pressing the Up/Down buttons shall move the highlight bar up/down through the streams (in a circular fashion). When the highlight bar reaches the last stream at the bottom of the list and the channel Up button is pressed, the highlight bar shall move to the first stream at the top of the list. When the highlight bar reaches the first stream at the top of the list and the channel Down button is pressed, the highlight bar shall move to the last stream at the bottom of the list.



- Pressing the category Up or Down buttons increments or decrements categories. Upon entry of a new category, the streams are arranged with the lowest logical stream number on Line 2. If there are 3 or more streams available in the new category, the stream on Line 4 is highlighted. If there are only 2 streams available, the stream on Line 3 is highlighted. If there is only 1 stream available, the stream on Line 2 is highlighted. If there are no streams available (all unsubscribed and/or locked and/or skipped), the text “No Streams Available” shall be displayed on Line 3. Navigation of streams works the same as indicated above.
- Pressing Select button at any time will select the highlighted stream and switch to the Main Screen normal or preset mode for the selected stream.
- While in the “Category List” menu, pressing the Display button will change from “Stream List” to “Artist List”. The display shall simply replace the stream name data with the artist name data, while maintaining the list of stream numbers and highlight bar position. Artist Names that are too long to be fully seen in the display area available will automatically scroll (scroll/pause for five seconds/scroll) on the highlighted line only, other lines will be truncated. On streams that broadcast “Composer”, the Composer Name should be listed with the Artist Name data separated by a slash “/”.



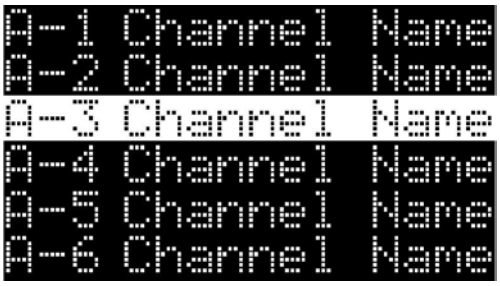
- Pressing Display again changes to the “Song List” screen. The display shall simply replace the artist name data with the song title data, while maintaining the list of stream numbers and highlight bar position. Song Titles that are too long to be fully seen in the display area available will automatically scroll (scroll/pause for five seconds/scroll) on the highlighted line only, other lines will be truncated.



- Navigation of both the Artist Name and Song Title List screen works the same as the Category List screens as indicated above. PDT will automatically update as it becomes available in the Sirius signal.
- Any stream that is selected to be skipped or locked in the Setup Menu will not be displayed in the Category List screen
- A press and hold of the Display button when in a list mode will cancel out and revert back to the default display of the currently selected stream and mode (Normal or Preset tuning modes).
- Audio from the selected stream shall continue to play while in the list modes until the user selects a new stream by pushing the encoder knob.

6.7 Preset List Mode

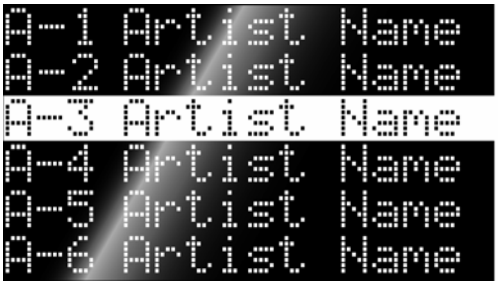
(Shall disallow entry into Preset Tune mode if no presets are set – i.e. all empty)
When in “Preset Tune” mode, a press and hold of 1000ms of the Display button, changes from normal tuning of presets via the rotary encoder and puts the unit in a six-line menu mode similar to the Stream List Mode. However, instead of displaying the Stream Number and Stream Name, it will display the Preset number “A-1” (Preset location indicator), a single space and the 20 character Stream Name. All other functions described in the preceding Stream List Menu will apply to the Presets.



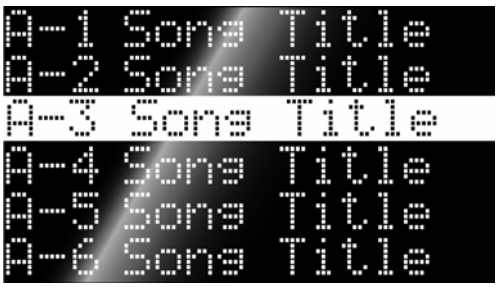
- Upon entry to Preset List Mode from default display, if there are 6 or more non-empty presets, the currently selected stream is and positioned on Line 3. Pressing the Up/Down buttons shall move the highlight bar up/down through the presets (in a circular fashion). If the highlight bar reaches Line 5 (second from bottom) and the channel Up button is pressed, the highlight bar stays on Line 5 and the whole list moves upwards by one line, displaying a new entry on the bottom line (Line 6) and dropping the entry formerly on the top line (Line 1). If the highlight bar reaches Line 2 (second from top) and the channel Down button is pressed,

the highlight bar stays on Line 2 and the whole list moves downward by one line, displaying a new entry on the top line (Line 1) and dropping the entry formerly on the bottom line (Line 6).

- Upon entry to Preset List Mode from default display, if there are fewer than 6 non-empty presets, then the presets are listed in ascending preset number order with the currently selected stream highlighted (could be on any line). The positions of the presets displayed in the list remain fixed. Pressing the Up/Down buttons shall move the highlight bar up/down through the presets (in a circular fashion). When the highlight bar reaches the last preset at the bottom of the list and the channel Up button is pressed, the highlight bar shall move to the first preset at the top of the list. When the highlight bar reaches the first preset at the top of the list and the channel Down button is pressed, the highlight bar shall move to the last preset at the bottom of the list.
- Pressing Select button at any time will select the highlighted preset and switch to the Main Screen preset mode for the selected stream.
- While in the “Preset List” menu, pressing the Display button will change from “Preset List” to “Artist List”. The display shall simply replace the stream name data with the artist name data, while maintaining the list of preset numbers and highlight bar position. Artist Names that are too long to be fully seen in the display area available will automatically scroll (scroll / pause for five second /scroll) on the highlighted line only, other lines will be truncated. On streams that broadcast “Composer”, the Composer Name should be listed with the Artist Name data separated by a slash “/”.



- Pressing Display again changes to the “Song List” screen. The display shall simply replace the artist name data with the song title data, while maintaining the list of preset numbers and highlight bar position. Song Titles that are too long to be fully seen in the display area available will automatically scroll (scroll/pause for five seconds/scroll) on the highlighted line only, other lines will be truncated.



- Navigation of both the Artist Name and Song Title List screen works the same as the Preset List screens as indicated above. PDT will automatically update as it becomes available in the Sirius signal.

- Any stream that is selected to be skipped or locked in the Setup Menu can not be a preset. If after presetting a stream, a user goes into the Setup Menu and instructs it to be skipped or locked, it will be dropped from the preset location it was originally in. Additionally, if a preset becomes unsubscribed or invalid, it shall also be deleted/dropped. ONLY list presets which have been set by the user (i.e. are not empty). (That is do not display "<Empty>" for each empty entry.)
- A press and hold of the Display button when in a list mode will cancel out and revert back to the default display of the currently selected stream and mode (Normal or Preset tuning modes).
- Audio from the selected stream shall continue to play while in the list modes until the user selects a new stream by pushing the encoder knob.
- Pressing CAT UP or CAT DOWN buttons from within the preset list mode shall enter the category list mode, maintaining the highlighted stream displayed under its category according to the display rules of category mode entry outlined in the previous section.

7 Packaging

The product will be packaged in a full color box suitable for retail sales.

The package art shall include:

- Audiovox brand mark
- Audiovox address
- Country of origin
- Sirius brand mark
- A color photo of the product
- Diagram showing inputs and outputs
- Feature list
- Specifications
- ESN label
- UPC

Each packaged component shall be sealed in a poly bag

Inner packing shall protect the product from drops and vibration according to industry standards

7.1 Main Product System

The standalone system is developed to be an over-the-counter sale that can be easily setup by the consumer. Additional installation items in the packaging can allow for enhanced mounting and installation options. Items included in this package shall be:

- SIRIUS Receiver
- Remote Control
- Batteries

- RCA Audio Cables
- Power Cord
- Owner's Manual
- All necessary packaging with color photo of product along with printed specifications and feature list.
- SIRIUS ID (ESN) labeling on the outside of the box per the parameters listed in the "SIRIUS ID Label" (RX000036) document.

8 Accessory Items

8.1 Mounting Brackets

Mounting brackets for installing the tuner in a 19 inch racks will be provided by Audiovox as an after market accessory.

8.2 Antenna (not included)

The antenna system will be supplied by Terk Technologies to retailers and distributors to support Audiovox home receiver business. The antenna shall consist of a Sirius approved module in a weather resistant cabinet (radome) with a 50 ohm cable and SMB push-on connector to connect to the home tuner.

8.2.1 Antenna Cables (not included)

8.2.1.1 Standard Cable (not included)

The cable standard is 30 feet, RG58U, 50 ohms, terminated with male a SMB connector to attach to the antenna module and a male SMB connector to attach to the RF input on the tuner. This length of cable will be included in the home antenna kit.

8.2.1.2 Extension Cable (not included)

Extension cables will be available to accommodate longer installation requirements.