

A10-RX Digital Wireless Receiver

— User Guide —



Models: A10-RX-SL and A10-RX-XLR

Copyright / Doc Rev History Info

Part Number: 9279.000

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Overview

The A10-RX two-channel Advanced Dual Diversity receiver is a portable, all-digital wireless receiver for the A10 system. It is designed to work with one or two A10-TX transmitters. It offers 224 MHz switching bandwidth and precision RF tracking filters in a lightweight, robust package. Two models are available, the A10-RX-SL for slot-in connection and the A10-RX-XLR for stand-alone operation with hardwired power and audio connections.

The A10 systems ultra-low 2 mS end-to-end delay and superb digital audio assures performance that is indistinguishable from a hard-wired cable. The A10 system allows the user to operate up to 20 channels in an 8 MHz TV channel, maximising spectrum efficiency.

Key Features

Some key features of the A10-RX are:

- Two-channel, wideband receiver usable over the whole A10 system range
- Advanced Digital Diversity topology uses two complete RF receivers for each of the two channels, four RF receivers total
- Easy and fast menu control
- Available in both slot (Uni-/SuperSlot) with the A10-RX-SL or stand-alone cabled version with the A10-RX-XLR
- Analogue line-level or AES3 digital audio output

System Quickstart

The A10 Digital Wireless System is easy to use. Follow the steps below for basic setup and operation.

At the Receiver

- 1. Fit the included straight and right-angled antennae to the A10-RX receiver.
- 2. Connect the receiver to a power source. It will immediately power on.
- 3. Using the scanning tool in the Selection menu find an available open frequency. If multiple wireless systems are in use, make certain to keep frequencies least 400 kHz apart.
- 4. Connect the audio output from channel 1, channel 2, or both to an audio input on a mixer, recorder, camera, or PA system.
- 5. Ensure that the receiver audio output type and level are set based on the input type.

At the Transmitter

- 1. Attach the straight antenna to the A10-TX.
- 2. Attach an audio source to the 3-pin LEMO input connector.
- 3. Insert AA batteries into the A10-TX battery compartment and power on the unit with the red On/Off button.
- 4. Set the audio input type to set to match the connected input.
- 5. Set the transmitting frequency on the A10-TX match the frequency set on the A10-RX receiver channel.
- 6. Adjust the audio gain according to your environment and source, taking care not to overload the signal. This is indicated by a red LED.

At the Receiver

- 1. Confirm that the Channel Power LED is solid blue.
- 2. Confirm that the RF Status LEDs and display indicate good RF strength.
- 3. Confirm that the audio level at the receiver corresponds to the audio connected to the A10-TX input.
- 4. The system is now ready for use.

Connectors, Controls Description



Figure 1: A10-RX

1 -Antenna Socket

SMA connector, 50 ohm, connects to included 1/4-wave whip antenna.

2 -Channel Power LED

Illuminates blue when the channel's receiver circuitry is powered and operational.

Blue LED flashes when paired transmitter's battery is critically low or depleted.

3 - Green/Red RF Status LEDs

Indicates signal strength of received RF. Green LED illuminates solid green with good RF reception.

Red LED flashes red when RF signal strength is poor. Illuminates red continuously when RF level is no longer suitable or when RF transmitter has been turned off.

4 -Left Button

Moves the selection in menu to the left, or decrements values.

5 -Menu/Select Button

Enters the menu selection. Also used to select options in the menu.

6 -Right Button

Moves the selection in the menu to the right, or increments values.

7 -Antenna Socket

SMA connector, 50 ohm, connects to included 1/4-wave whip antenna.

8 -Display

OLED screen. The screen can be set to turn off after a period of inactivity from the Selection menu (*Main* > *Settings* > *Screensaver*).

Powering

The A10-RX-SL receives power over its D-sub connector. The A10-RX-XLR receives power from its 4-pin Hirose female connector. The male Hirose connector is a power loop through.

When DC power is present, either at the D-sub connector or the Hirose 4-pin, the A10-RX is powered. There are no additional power switches.

Channel Powering

Each of the two channels of the A10-RX can be powered on or off individually. When a channel is powered down that portion of the A10-RX no longer draws power. If the A10-RX is going to be used for a single wireless channel, best practice is to power down the unused channel. Channel powering is controlled in the Selection Menu (Main > System > Power).



Channel Power LEDs

The A10-RX has blue Channel Power LEDs for each of its two channels. When first powering the A10-RX without transmitters present, the LEDs illuminate indicating the receiver channel is powered.

The receiver channel will connect, or pair, to an A10-TX transmitter that is powered on and set to the receiver frequency. The Channel Power LED then shows the battery status of its associated transmitter.

- Solid Blue a solid blue LED indicates that the transmitter battery is in good condition.
- **Flashing Blue** a flashing blue LED indicates when the transmitter battery level is low or depleted.

When a paired transmitter is powered down, the blue LED continues to show the last condition of the transmitter battery. If the transmitter is powered back on, or a new transmitter is activated on the channel, that transmitter pairs with the receiver and its transmitter battery condition is shown with the blue LED.

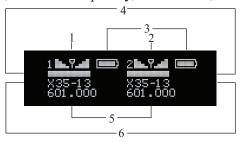
The LEDs change assignment based on the orientation of the display. Channel 1 is always shown left of the display and channel 2 is always on the right.

Main Display

When the receiver is first powered on, the main display is in two-channel view.

Two-Channel View

The display shows channel 1 and channel 2 simultaneously. Parameters displayed include the RF signal strength at each antenna, receiver frequency, audio level, and transmitter battery level.



1 -Channel 1 Settings

Bars indicates RF signal strength at each antenna.

2 -Channel 2 Settings

Bars indicates RF signal strength at each antenna.

3 -TX Battery Status

Battery icons indicate status of transmitters' batteries.

4 - Audio Level

Each channel shows a horizontal meter for audio levels.

5 - Frequency

Receiver frequency for each channel.

6 -Channel/Sub-channel Assignment

Displays region, channel, and sub-channel frequency assignment for each transmitter.

X, Y, and Z regions are selected by the TV Channel Map setting.

Single-Channel View

Pressing the Left or Right buttons when in two-channel view changes the display to a single-channel view of channel 1 or 2, respectively.

In addition to the parameters shown in single channel view, the transmitter gain level is indicated in single channel view. Pressing the Right button again shows the A10-TX metadata for the transmitter associated with the channel.





An asterisk next to the sub channel indicates that the set frequency is not directly on a preassigned sub channel.

RF Signal Indicator LEDs

The RF Signal LEDs offer an at-a-glance indication of RF performance. The LEDs to the left of the display indicate channel 1 activity, whilst the LEDs to the right indicate channel 2 activity. Each channel has one green LED and one red LED.

- Solid Green indicates good RF reception.
- **Flashing Red** warns that the RF level is low and that the receiving error rate is high, possibly resulting in audio dropouts.
- Solid Red when RF level no longer is suitable or when RF transmitter has been turned off.
- The LEDs change assignment based on the orientation of the display. Channel 1 is always shown left of the display and channel 2 is always on the right.

Display Orientation

The A10-RX Menu screen operates with its Menu buttons either below or above the display. This is controlled in the Selection Menu (*Main* > *Settings* > *Orientation*).

Selection Menu

The A10-RX receiver is controlled through its main Selection menu. Enter the menu by first selecting either the channel 1 receiver (Left button) or channel 2 receiver (Right button), then press the centre Menu button. Once in the menu, the Left and Right buttons toggle among options, and the Menu button makes the selection.

Main Menu

Selections	Icon	Description	Channel or Global	Options
Exit		Returns to the main display screen.		
Frequency	M	Sets the transmitter's frequency. Frequency selection and channel increments change based on the region of operation to which the unit is set.	Channel	• TV Channel Increments • Sub Channel Increments • Tune: Frequency Increments in 25 kHz steps
Outputs	-	Enters the Outputs sub menu.		Maximum Level Audio Polarity Mode Test Tone
Scan	(C)	Enters the scan function. Scanner indicates the RF activity. Scans can either be in 25 MHz increments or across the full range of the receiver.	Global	• 1-10 - scans subsections of the tuning range • Full - scans entire tuning range of system
Privacy		When active the transmitter sends its signal encoded with a four-digit privacy key set at the transmitter. The same four digit key needs to be set on a receiver to receiver to receive the signal.	Channel	• On - enter key • Off - encryption cleared, set to 0000 to deactivate
Settings	\bigcirc	Enters additional settings sub menu.		Screen Brightness Screensaver Orientation LEDs TV Channel Map
System		Enters additional settings sub menu		Power Restore Info

Outputs Sub-Menu

Selections	Icon	Description	Channel or Global	Options		
Exit		Returns to the main menu				
Max Level		Selects the maximum analogue output level. Output level based on a 0 dBFS signal sent from an A10-TX transmitter.	Channel	• +14 dBu • +2 dBu • -10 dBu • -22 dBu		
Audio Polarity	Φ	Selects the polarity of the balanced output signal.	Channel	• Normal • Inverted		
Mode		Chooses the audio output type of the A10-RX. When the A10-RX is set to AES the channel 2 XLR connection is not used.	Global	• Analogue • AES		
Test Tone	Z)	Activates a 1 kHz tone oscillator sent directly to the outputs. This disrupts the output from a linked A10-TX transmitter.	Global	• -18 dB • -12 dB • -6 dB • 0 dB		

Settings Sub-Menu

∜ *All setting are Global.*

Selections	Icon	Description	Options
Exit		Returns to the main menu	
Screen Brightness	*	Sets the brightness of the OLED screen.	Five increments, 1–5, 5 is brightest
Screensaver		Sets the duration, in seconds, how long the screen remains on after a button press. Off keeps the screen on continuously with no screensaver.	• Off - display remains on when unit is powered • 5 sec • 30 sec • 120 sec
Orientation	(<u>*</u>	Sets the operating orientation of the menu screen and LEDs. The A10-RX can be used in an orientation with the buttons below the screen (normal), or with the buttons to the top (flipped).	Normal Flipped
LEDs		When set to On the LEDs remain illuminated. Off deactivates the LEDs.	• On • Off
TV Ch Map	(0)	Selects the TV channel spacing in MHz to ensure channel selection corresponds to a specific geographic region. See frequency chart.	• X – 6 MHz • Y – 7 MHz • Z – 8 MHz

System Sub-Menu

All settings are Global.

Selections	Icon	Description	Options
Exit		Returns the main menu	
Power	(0)	Turns power to the RF receiver for each of the two channels on and off.	• 1 - channel 1 only • 1 and 2 - both channel 1 and 2 • 2 - channel 2 only • Off - receiver circuits off
Restore		The restore function allows the user to reset the A10-RX to the factory default settings. **Restore sets the TV Channel Map to region Z. Select the current region in your locality before proceeding.	
Info	(i)	Shows numerous attributes of the transmitter.	Serial Number Firmware Revision Frequency Band

Basic Operation

Frequency Selection

The A10 Digital Wireless System operates in the UHF frequency band from 470 to 694 MHz. The A10-RX can tune across the entire range of the system.

Because the A10 digital RF transmission is inherently immune to intermodulation multiple A10 Digital Wireless systems can be used simultaneously on nearby adjacent frequencies without worry of intermodulation interference. Systems can be used together when separated by at least 400 kHz.

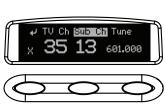
Manually Setting Channel, Sub Channel, Frequency

To simplify frequency selection, frequencies are divided into channels and sub channels. The specific frequencies corresponding to channels and sub channels depends on the setting of the TV Channel Mapping (*Main* > *Settings* > *TV Ch Map*). Three options are available, 6, 7, and 8 MHz spacing, X, Y, and Z respectively. These three settings generally correspond to three main geographic regions, the Americas, Australia/New Zealand, and Europe, respectively. For more information, see Channel Assignments by Region.

- **Channel** corresponds to broadcast television channels used in a geographic region. Depending on the selected channel mapping, channels cover 6, 7, or 8 MHz.
- **Sub Channel** channels are divided in 400 kHz increments called sub channels to speed up frequency selection. The number of sub channels depends on the channel mapping selected.
- **Frequency** specific frequencies within the receivers tuning range can be selected in 25 kHz increments. When a selected frequency does not correspond with a channel/sub channel mapping, an asterisk character (*) is shown in the display adjacent to channel/sub channel assignment below the frequency shown.

To change TV channels:

- 1. Use the Left button to highlight the TV Channel.
- 2. Press the centre menu to select the TV channel.
- 3. Select the sub channel until the desired sub-channel is selected.



Remember, for a given channel / sub channel, the actual frequency will change depending on the TV Channel Mapping setting.

See the Frequency Tables in this guide for a complete list of frequencies corresponding to the channel and sub channel selections.

Frequency Scanning

The frequency scanning tool uses the radios in the A10-RX to measure and display RF activity within the system's tuning range. This allows a user to find frequencies with low RF activity suitable for system operation. The scan tool operates over the full 224 MHz bandwidth of the receiver. Enter the scanner from the Selection Menu *Main* > *Scan*.

Audio from channel 1 and channel 2 is muted when the scan tool is active.

To initiate a scan press the >> button. The scan will start, working from lower frequencies to higher frequencies. The cursor can be seen to move along the screen denoting the current position of the scan. The scan can be stopped by pressing the Left button.

Selecting the > button allows the user to manually step through in 400 kHz steps at a time. Selecting the << button allows the user to automatically scan backwards, and similarly selecting the < button allows the user to manually step lower in frequency in 400 kHz steps.

Partial Scanning, 25 MHz Increments

In partial scanning mode the receiver scans a 25 MHz range. This partial scan improves the resolution of the scan over a full scan. The ten partial scans cover the following ranges:



1 - 470-495 MHz	6 - 581-606 MHz
2 - 492-517 MHz	7 - 603-628 MHz
3 - 515-540 MHz	8 - 626-651 MHz
4 - 537-562 MHz	9 - 648-673 MHz
5 - 559-584 MHz	10 - 669-694 MHz

Full Scan, 224 MHz

The full receiver bandwidth of 224 MHz can also be scanned.



Audio Output and Control

The A10-RX outputs either analogue line level or AES3 digital audio. This global setting applies to both channel outputs.

Analogue Output

When set to analogue in the Selection Menu the A10-RX outputs low-impedance, balanced line level audio. It is designed to connect to balanced or unbalanced line level inputs. To unbalance the output, float pin-3.

AES Digital Output

When set to AES output in the Selection Menu the A10-RX outputs two-channel AES3 at 24-bit, 48 kHz. Channel 1 output appears at AES left, channel 2 appears at AES right.

With the A10-RX-XLR the channel 1 XLR connector is used for AES3 output. The channel 2 XLR connector is not active when set to AES output.

Antennae

The SMA antenna connector is used to mount the included 1/4-wave whip antenna. For specialty applications external, high-gain receiving antennae can be attached to the SMA connector.

For best operation and reception power with the included 1/4-wave antenna, keep it in the free field, away from direct contact with the wearer's body. When multiple wireless systems are in use keep transmitters separated by at least 1/2-wave distance of the transmitted frequency.

Firmware Updates

From time to time Audio Ltd. issues new firmware for the A10-RX receiver. Make certain to register your Audio Ltd. product at the Audio Ltd. website to receive firmware update notifications.

A10-RX-XLR

The Audio Ltd. software utility Mic2Wav, which is available as a free download from the Audio Ltd. website, includes a receiver firmware update tool.

To update firmware:

- 1. Download new firmware update file from the Audio Ltd. website.
- 2. Launch the Mic2Wav application on a Windows-based computer.
- 3. Power on the A10-RX-XLR.
- 4. Connect the receiver (microUSB) to the computer's USB port.
- 5. From within the application, select File > Update RX and then select the firmware update file (.PRG) to install.
- 6. Follow the on-screen prompts.

A10-RX-SL

At present, updating the firmware on the A10-RX-SL requires converting from SL to XLR.

Converting Between XLR and SL Mounts

The A10-RX receiver is modular in design. With the correct accessories—either the A-SL or the A-XLR adapters—the A10-RX-SL slot receiver and A10-RX-XLR cabled receiver can be converted between each type.

- The A-SL accessory is a 25-Pin D-Type Uni/Superslot adapter, and comes with the A-PLATE spacer.
- The A-XLR accessory is an XLR and power cable adapter.

To convert from an A10-RX-SL to an A10-RX-XLR:

1. Remove the four perimeter screws. Do not remove the two screws on either side of the 25-pin D-Type connector.



2. Remove the A-SL accessory.



3. Position the A-XLR accordingly, and replace screws.

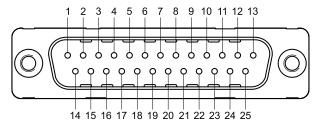


Specifications

	T										
Frequency Range	World Models:	U.S. Only Models:									
	A10-RX-SL (470–694 MHz)	A10-RX-SL-US (470-608 MHz)									
	A10-RX-XLR (470–694 MHz)	A10-RX-XLR-US (470–608 MHz)									
	Transmitters are tunable in 25 kHz steps.										
Modulation Mode	Audio Ltd. proprietary digital RF modulation										
Digital Audio Codec	Audio Ltd. proprietary, high-performance digital encoding algorithm										
Audio Frequency Response	Audio Frequency Response 20 Hz–20 kHz										
Maximum Output Level	+14 dBu, +2 dBu, -10 dBu, or -22 dBu, me input, 130 ohms impedance	nu-selectable, with a 0 dBFS signal at the transmitter									
Digital Audio Output	AES3 balanced connection, 110 ohms, left-	=channel 1, right=channel 2									
Menu and Controls	OLED menu display, 3 button navigation										
Privacy	User settable 4-digit PIN, Audio Ltd. propr	ietary									
Powering	6–16 VDC, approx. 3 W with one receiver	active, approx. 4.4 W with two receivers active									
Operating Temperature	-10 °C to +55 °C										
Range											
Weight and Dimensions	108 g, 83 x 64 x 18 mm										

A10-RX-SL DB-25 Connector Pin Assignments

The illustration below shows the pin assignments of the A10-RX-SL when viewing the bottom connector.



DB-25 Pin	Name	Description						
1	Ground	Ground connection						
2	Ch 1+ analogue / Ch 1,2 AES +	Ch 1 + analogue audio out, +2 dBu level (+/- 0.5 dB), balanced. Alternately, Ch1 and Ch 2 AES3+ (balanced, 110 ohm, transformerless).						
3	Ch 1 - analogue / Ch 1,2 AES -	Ch 1 - analogue audio out, +2 dBu level (+/- 0.5 dB), balanced. Alternately, Ch 1 and Ch 2 AES3- (balanced, 110 ohm, transformerless).						
4	Ground	Ground for power						
5	6-18 VDC	Power supply, 6.0-18.0 V, 6 W max.						
6	no connection							
7	no connection							
8	no connection							
9	no connection							
10	no connection							
11	no connection							
12	no connection							
13	Ground	Ground connection						
14	Ground	Ground connection						
15	Ch 2+ analogue	Ch 2 + analogue audio out, +2 dBu level (+/- 0.5 dB), balanced.						
16	Ch 2- analogue	Ch 2 - analogue audio out, +2 dBu level (+/- 0.5 dB), balanced.						
17	no connection							
18	no connection							
19	no connection							
20	no connection							
21	no connection							
22	UART transmit (0/3.3V)	UART from A10-RX. 0/3.3V signaling.						
23	UART receive (0/3.3V)	UART to A10-RX. 0/3.3 V signaling.						
24	no connection							
25	Ground	Ground connection						

Certifications

Industry Canada Conformity

EN: This device complies with Industry Canada RSS-210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FR :Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio RSS-210. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC Conformity

The A10-TX transmitter complies with the following requirements:

FCC (Federal Communications Commission) Part 74

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operations.

Changes or modification not expressly approved.

A10-TX frequency ranges supplied for use in USA

A10-TX transmitters available for sale in the U. S. can tune over a switching bandwidth of up to 100 MHz. The frequency ranges are listed below:

- 470.1-547.9 MHz
- 518.1-607.9 MHz
- \$\footnote{\text{Frequency range 608-614 MHz}}\$ Is forbidden for use in US.
- Warning! Any modifications or changes made to this device, unless explicitly approved by Audio Ltd. may invalidate the authorisation of this device. Operation of an unauthorised device is prohibited under Section 302 of the Communications act of 1934, as amended, and Subpart 1 of Part 2 of Chapter 47 of the Code of Federal Regulations.

Minimize RF Exposure

To avoid the possibility of exceeding the FCC RF exposure limits, it is recommended that the transmitter or attached microphone is kept at a minimum distance of 13 mm (0.5 inch) away from the head or body during normal operation.

Frequency Tables

The A10-TX offers preselected frequencies based on channels and sub channels. Three sets of frequencies are available based on either 6, 7, or 8 MHz channel bandwidth. Select the channel bandwidth based on the geographic region where the unit is operating.

X Frequencies (6 MHz Per TV Channel)

The chart below shows all frequencies available for the A10 wireless system. Not all channels are available on all transmitters.

								Sub	Char	nel						
		1 2 3 4 5 6 7 8 9 10 11 12 13 14														15
	14	470.2	470.6	471	471.4	471.8	472.2	472.6	473	473.4	473.8	474.2	474.6	475	475.4	475.8
	15	476.2	476.6	477	477.4	477.8	478.2	478.6	479	479.4	479.8	480.2	480.6	481	481.4	481.8
	16	482.2	482.6	483	483.4	483.8	484.2	484.6	485	485.4	485.8	486.2	486.6	487	487.4	487.8
	17	488.2	488.6	489	489.4	489.8	490.2	490.6	491	491.4	491.8	492.2	492.6	493	493.4	493.8
	18	494.2	494.6	495	495.4	495.8	496.2	496.6	497	497.4	497.8	498.2	498.6	499	499.4	499.8
	19	500.2	500.6	501	501.4	501.8	502.2	502.6	503	503.4	503.8	504.2	504.6	505	505.4	505.8
	20	506.2	506.6	507	507.4	507.8	508.2	508.6	509	509.4	509.8	510.2	510.6	511	511.4	511.8
	21	512.2	512.6	513	513.4	513.8	514.2	514.6	515	515.4	515.8	516.2	516.6	517	517.4	517.8
	22	518.2	518.6	519	519.4	519.8	520.2	520.6	521	521.4	521.8	522.2	522.6	523	523.4	523.8
	23	524.2	524.6	525	525.4	525.8	526.2	526.6	527	527.4	527.8	528.2	528.6	529	529.4	529.8
	24	530.2	530.6	531	531.4	531.8	532.2	532.6	533	533.4	533.8	534.2	534.6	535	535.4	535.8
	25	536.2	536.6	537	537.4	537.8	538.2	538.6	539	539.4	539.8	540.2	540.6	541	541.4	541.8
	26	542.2	542.6	543	543.4	543.8	544.2	544.6	545	545.4	545.8	546.2	546.6	547	547.4	547.8
	27	548.2	548.6	549	549.4	549.8	550.2	550.6	551	551.4	551.8	552.2	552.6	553	553.4	553.8
	28	554.2	554.6	555	555.4	555.8	556.2	556.6	557	557.4	557.8	558.2	558.6	559	559.4	559.8
	29	560.2	560.6	561	561.4	561.8	562.2	562.6	563	563.4	563.8	564.2	564.6	565	565.4	565.8
	30	566.2	566.6	567	567.4	567.8	568.2	568.6	569	569.4	569.8	570.2	570.6	571	571.4	571.8
e	31	572.2	572.6	573	573.4	573.8	574.2	574.6	575	575.4	575.8	576.2	576.6	577	577.4	577.8
Channel	32	578.2	578.6	579	579.4	579.8	580.2	580.6	581	581.4	581.8	582.2	582.6	583	583.4	583.8
ha	33	584.2	584.6	585	585.4	585.8	586.2	586.6	587	587.4	587.8	588.2	588.6	589	589.4	589.8
	34	590.2	590.6	591	591.4	591.8	592.2	592.6	593	593.4	593.8	594.2	594.6	595	595.4	595.8
	35	596.2	596.6	597	597.4	597.8	598.2	598.6	599	599.4	599.8	600.2	600.6	601	601.4	601.8
	36	602.2	602.6	603	603.4	603.8	604.2	604.6	605	605.4	605.8	606.2	606.6	607	607.4	607.8
	37	608.2	608.6	609	609.4	609.8	610.2	610.6	611	611.4	611.8	612.2	612.6	613	613.4	613.8
	38	614.2	614.6	615	615.4	615.8	616.2	616.6	617	617.4	617.8	618.2	618.6	619	619.4	619.8
	39	620.2	620.6	621	621.4	621.8	622.2	622.6	623	623.4	623.8	624.2	624.6	625	625.4	625.8
	40	626.2	626.6	627	627.4	627.8	628.2	628.6	629	629.4	629.8	630.2	630.6	631	631.4	631.8
	41	632.2	632.6	633	633.4	633.8	634.2	634.6	635	635.4	635.8	636.2	636.6	637	637.4	637.8
	42	638.2	638.6	639	639.4	639.8	640.2	640.6	641	641.4	641.8	642.2	642.6	643	643.4	643.8
	43	644.2	644.6	645	645.4	645.8	646.2	646.6	647	647.4		648.2	648.6	649	649.4	649.8
	44	650.2	650.6	651	651.4	651.8	652.2	652.6	653	653.4	653.8	654.2	654.6	655	655.4	655.8
	45	656.2	656.6	657	657.4	657.8	658.2	658.6	659	659.4	659.8	660.2	660.6	661	661.4	661.8
	46	662.2	662.6	663	663.4	663.8	664.2	664.6	665	665.4	665.8	666.2	666.6	667	667.4	667.8
	47	668.2	668.6	669	669.4	669.8	670.2	670.6	671	671.4	671.8	672.2	672.6	673	673.4	673.8
	48	674.2	674.6	675	675.4	675.8	676.2	676.6	677	677.4	677.8	678.2	678.6	679	679.4	679.8
	49	680.2	680.6	681	681.4	681.8	682.2	682.6	683	683.4	683.8	684.2	684.6	685	685.4	685.8
	50	686.2	686.6	687	687.4	687.8	688.2	688.6	689	689.4	689.8	690.2	690.6	691	691.4	691.8
	51	692.2	692.6	693	693.4	693.8	694.2	694.6	695	695.4	695.8	696.2	696.6	697	697.4	697.8

Y Frequencies (7 MHz Per TV Channel)

									Sub	Char	nels							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	22	485.3	485.7	486.1	486.3	486.7	487.1	487.3	487.7	488.1	488.3	488.7	489.1	489.3	489.7	490.1	490.3	490.7
	23	492.3	492.7	493.1	493.3	493.7	494.1	494.3	494.7	495.1	495.3	495.7	496.1	496.3	496.7	497.1	497.3	497.7
	24	499.3	499.7	500.1	500.5	500.7	501.1	501.3	501.7	502.1	502.5	502.7	503.1	503.3	503.7	504.1	504.5	504.7
	25	506.3	506.7	507.1	507.5	507.9	508.3	508.3	508.7	509.1	509.5	509.9	510.3	510.3	510.7	511.1	511.5	511.9
	26	513.3	513.7	514.1	514.5	514.9	515.3	515.3	515.7	516.1	516.5	516.9	517.3	517.3	517.7	518.1	518.5	518.9
	27	520.3	520.7	521.1	521.5	521.9	522.3	522.3	522.7	523.1	523.5	523.9	524.3	524.3	524.7	525.1	525.5	525.9
	28	527.3	527.7	528.1	528.5	528.9	529.3	529.3	529.7	530.1	530.5	530.9	531.3	531.3	531.7	532.1	532.5	532.9
	29	534.3	534.7	535.1	535.5	535.9	536.3	536.3	536.7	537.1	537.5	537.9	538.3	538.3	538.7	539.1	539.5	539.9
	30	541.3	541.7	542.1	542.5	542.9	543.3	543.3	543.7	544.1	544.5	544.9	545.3	545.3	545.7	546.1	546.5	546.9
	31	548.3	548.7	549.1	549.5	549.9	550.3	550.3	550.7	551.1	551.5	551.9	552.3	552.3	552.7	553.1	553.5	553.9
	32	555.3	555.7	556.1	556.5	556.9	557.3	557.3	557.7	558.1	558.5	558.9	559.3	559.3	559.7	560.1	560.5	560.9
	33	562.3	562.7	563.1	563.5	563.9	564.3	564.3	564.7	565.1	565.5	565.9	566.3	566.3	566.7	567.1	567.5	567.9
	34	569.3	569.7	570.1	570.5	570.9	571.3	571.3	571.7	572.1	572.5	572.9	573.3	573.3	573.7	574.1	574.5	574.9
SIS	35	576.3	576.7	577.1	577.5	577.9	578.3	578.3	578.7	579.1	579.5	579.9	580.3	580.3	580.7	581.1	581.5	581.9
Channels	36	583.3	583.7	584.1	584.5	584.9	585.3	585.3	585.7	586.1	586.5	586.9	587.3	587.3	587.7	588.1	588.5	588.9
hai	37	590.3	590.7	591.1	591.5	591.9	592.3	592.3	592.7	593.1	593.5	593.9	594.3	594.3	594.7	595.1	595.5	595.9
C	38	597.3	597.7	598.1	598.5	598.9	599.3	599.3	599.7	600.1	600.5	600.9	601.3	601.3	601.7	602.1	602.5	602.9
	39	604.3	604.7	605.1	605.5	605.9	606.3	606.3	606.7	607.1	607.5	607.9	608.3	608.3	608.7	609.1	609.5	609.9
	40	611.3	611.7	612.1	612.5	612.9	613.3	613.3	613.7	614.1	614.5	614.9	615.3	615.3	615.7	616.1	616.5	616.9
	41	618.3	618.7	619.1	619.5	619.9	620.3	620.3	620.7	621.1	621.5	621.9	622.3	622.3	622.7	623.1	623.5	623.9
	42	625.3	625.7	626.1	626.5	626.9	627.3	627.3	627.7	628.1	628.5	628.9	629.3	629.3	629.7	630.1	630.5	630.9
	43	632.3	632.7	633.1	633.5	633.9	634.3	634.3	634.7	635.1	635.5	635.9	636.3	636.3	636.7	637.1	637.5	637.9
	44	639.3	639.7	640.1	640.5	640.9	641.3	641.3	641.7	642.1	642.5	642.9	643.3	643.3	643.7	644.1	644.5	644.9
	45	646.3	646.7	647.1	647.5	647.9	648.3	648.3	648.7	649.1	649.5	649.9	650.3	650.3	650.7	651.1	651.5	651.9
	46	653.3	653.7	654.1	654.5	654.9	655.3	655.3	655.7	656.1	656.5	656.9	657.3	657.3	657.7	658.1	658.5	658.9
	47	660.3	660.7	661.1	661.5	661.9	662.3	662.3	662.7	663.1	663.5	663.9	664.3	664.3	664.7	665.1	665.5	665.9
	48	667.3	667.7	668.1	668.5	668.9	669.3	669.3	669.7	670.1	670.5	670.9	671.3	671.3	671.7	672.1	672.5	672.9
	49	674.3	674.7	675.1	675.5	675.9	676.3	676.3	676.7	677.1	677.5	677.9	678.3	678.3	678.7	679.1	679.5	679.9
	50	681.3	681.7	682.1	682.5	682.9	683.3	683.3	683.7	684.1	684.5	684.9	685.3	685.3	685.7	686.1	686.5	686.9
	51	688.3	688.7	689.1	689.5	689.9	690.3	690.3	690.7	691.1	691.5	691.9	692.3	692.3	692.7	693.1	693.5	693.9

Z Frequencies (8 MHz Per TV Channel)

										S	ub Cl	nannel	s								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	21	470.2	470.6	471.0	471.4	471.8	472.2	472.6	473.0	473.4	473.8	474.2	474.6	475.0	475.4	475.8	476.2	476.6	477.0	477.4	477.8
	22	478.2	478.6	479.0	479.4	479.8	480.2	480.6	481.0	481.4	481.8	482.2	482.6	483.0	483.4	483.8	484.2	484.6	485.0	485.4	485.8
	23	486.2	486.6	487.0	487.4	487.8	488.2	488.6	489.0	489.4	489.8	490.2	490.6	491.0	491.4	491.8	492.2	492.6	493.0	493.4	493.8
	24	494.2	494.6	495.0	495.4	495.8	496.2	496.6	497.0	497.4	497.8	498.2	498.6	499.0	499.4	499.8	500.2	500.6	501.0	501.4	501.8
	25	502.2	502.6	503.0	503.4	503.8	504.2	504.6	505.0	505.4	505.8	506.2	506.6	507.0	507.4	507.8	508.2	508.6	509.0	509.4	509.8
	26	510.2	510.6	511.0	511.4	511.8	512.2	512.6	513.0	513.4	513.8	514.2	514.6	515.0	515.4	515.8	516.2	516.6	517.0	517.4	517.8
	27	518.2	518.6	519.0	519.4	519.8	520.2	520.6	521.0	521.4	521.8	522.2	522.6	523.0	523.4	523.8	524.2	524.6	525.0	525.4	525.8
	28	526.2	526.6	527.0	527.4	527.8	528.2	528.6	529.0	529.4	529.8	530.2	530.6	531.0	531.4	531.8	532.2	532.6	533.0	533.4	533.8
	29	534.2	534.6	535.0	535.4	535.8	536.2	536.6	537.0	537.4	537.8	538.2	538.6	539.0	539.4	539.8	540.2	540.6	541.0	541.4	541.8
	30	542.2	542.6	543.0	543.4	543.8	544.2	544.6	545.0	545.4	545.8	546.2	546.6	547.0	547.4	547.8	548.2	548.6	549.0	549.4	549.8
	31	550.2	550.6	551.0	551.4	551.8	552.2	552.6	553.0	553.4	553.8	554.2	554.6	555.0	555.4	555.8	556.2	556.6	557.0	557.4	557.8
	32	558.2	558.6	559.0	559.4	559.8	560.2	560.6	561.0	561.4	561.8	562.2	562.6	563.0	563.4	563.8	564.2	564.6	565.0	565.4	565.8
<u>~</u>	33	566.2	566.6	567.0	567.4	567.8	568.2	568.6	569.0	569.4	569.8	570.2	570.6	571.0	571.4	571.8	572.2	572.6	573.0	573.4	573.8
Channels	34	574.2	574.6	575.0	575.4	575.8	576.2	576.6	577.0	577.4	577.8	578.2	578.6	579.0	579.4	579.8	580.2	580.6	581.0	581.4	581.8
Cha	35	582.2	582.6	583.0	583.4	583.8	584.2	584.6	585.0	585.4	585.8	586.2	586.6	587.0	587.4	587.8	588.2	588.6	589.0	589.4	589.8
	36	590.2	590.6	591.0	591.4	591.8	592.2	592.6	593.0	593.4	593.8	594.2	594.6	595.0	595.4	595.8	596.2	596.6	597.0	597.4	597.8
	37	598.2	598.6	599.0	599.4	599.8	600.2	600.6	601.0	601.4	601.8	602.2	602.6	603.0	603.4	603.8	604.2	604.6	605.0	605.4	605.8
	38	606.2	606.6	607.0	607.4	607.8	608.2	608.6	609.0	609.4	609.8	610.2	610.6	611.0	611.4	611.8	612.2	612.6	613.0	613.4	613.8
	39	614.2	614.6	615.0	615.4	615.8	616.2	616.6	617.0	617.4	617.8	618.2	618.6	619.0	619.4	619.8	620.2	620.6	621.0	621.4	621.8
	40	622.2	622.6	623.0	623.4	623.8	624.2	624.6	625.0	625.4	625.8	626.2	626.6	627.0	627.4	627.8	628.2	628.6	629.0	629.4	629.8
	41	630.2	630.6	631.0	631.4	631.8	632.2	632.6	633.0	633.4	633.8	634.2	634.6	635.0	635.4	635.8	636.2	636.6	637.0	637.4	637.8
	42	638.2	638.6	639.0	639.4	639.8	640.2	640.6	641.0	641.4	641.8	642.2	642.6	643.0	643.4	643.8	644.2	644.6	645.0	645.4	645.8
	43	646.2	646.6	647.0	647.4	647.8	648.2	648.6	649.0	649.4	649.8	650.2	650.6	651.0	651.4	651.8	652.2	652.6	653.0	653.4	653.8
	44	654.2	654.6	655.0	655.4	655.8	656.2	656.6	657.0	657.4	657.8	658.2	658.6	659.0	659.4	659.8	660.2	660.6	661.0	661.4	661.8
	45	662.2	662.6	663.0	663.4	663.8	664.2	664.6	665.0	665.4	665.8	666.2	666.6	667.0	667.4	667.8	668.2	668.6	669.0	669.4	669.8
	46	670.2	670.6	671.0	671.4	671.8	672.2	672.6	673.0	673.4	673.8	674.2	674.6	675.0	675.4	675.8	676.2	676.6	677.0	677.4	677.8
	47	678.2	678.6	679.0	679.4	679.8	680.2	680.6	681.0	681.4	681.8	682.2	682.6	683.0	683.4	683.8	684.2	684.6	685.0	685.4	685.8
	48	686.2	686.6	687.0	687.4	687.8	688.2	688.6	689.0	689.4	689.8	690.2	690.6	691.0	691.4	691.8	692.2	692.6	693.0	693.4	693.8

Channel Assignments by Region

Region	AL Frequency Region
North America, South Korea, Taiwan, Philippines	X
UK and Western Europe, Greenland, Asia, Africa	Z
Australia and New Zealand	Y
Japan	X
Taiwan	X
China	X

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