

Specifications

Input Voltage	5.15- 30 VDC
Current Drain	4.7mA @ 12V Typ No Load
RX Input Impedance	500 K Ohm
Frequency Range	67.00 to 254.1 Hz
Encode Frequency Accuracy	0.3%
Encode Time	<45mS Typical
Tone Distortion	< 2% THD
Output Tone Voltage Level	4..7 V P-P No Load
Encode Output Impedance	20 K Ohms
Decode Response Time	<150mS Typ.
Decode Bandwidth	fo +/- 1.5% Typ.
Decode Input Level	-3-dB to 3.5dB
Decode Drop Out Time	<200mS Typ.
TX Filter Cutoff Frequency	300Hz
TX Filter Attenuation @ 250Hz	36dB Typ.

Limited Warranty

CES Wireless Technologies (CES) warrants its products to be free of defects in material and workmanship and extends this warranty under intended use and normal service conditions to the original owner for a period of two (2) years from the date of purchase.

This warranty does not apply to any product that has been subjected to repairs or alteration not authorized by CES, or for any product that has been damaged due to accident, abuse, neglect, vandalism, loss, unreasonable use, improper installations, lightning, fire, or water damage, or any acts of God.

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Installation Instructions

(Ref: Man82)

ARi-52 CTCSS ENCODER-DECODER

GENERAL DESCRIPTION

The ARi-52 is an exceptional sub-miniature CTCSS encoder - decoder device, providing 47 CTCSS tones + no tone. Selection is achieved through solder bridges.

INSTALLATION

Installation and programming of this CES product must be completed by a qualified two-way radio technician or engineer. CES is not responsible for any operational problems caused by system design, outside interference, or improper installation. Observe static prevention practices.

Before Installing

The ARi-52 may be installed in almost any mobile or portable radio. The encoder should be programmed prior to performing the actual installation into the radio.

Output Level Adjustment

The output tone level can be adjusted by turning R1 to increase or decrease the output level. See Figure 1 for component layout diagram. The setting may vary from radio to radio. Adjust the output level to achieve 500hz deviation on a 25khz system, 250Khz on a 12.5Khz system. Verify that the modulation does not go into limiting when the CTCSS tone is transmitted.

Tone Selection

Following Table 1 place solder bridges on the specified coding pads. X means solder bridge required, blank means leave bridge open. The location of the solder bridges on the PCB are shown in Figure 1.

Wiring Interface

This sub miniature module will easily fit in almost all popular mobile and portable radio's. Most radio manufacturers provide recommended hook up points in their radio's for CTCSS. Where possible follow the manufacturers instructions. See Table 2 for wiring details.

Mounting Details

Place the provided heatshrink tubing around the ARi-52 module and shrink the tubing with a heat gun (preferred). Mount the encoder to a suitable location in the radio, preferably away from high RF and sensitive receiving stages, with the provided double-sided tape. **Note: Do not overheat the encoder while using a heat gun. You will melt the solder and the SMD components on the circuit board will become dislodged, causing failure of the encoder, and voiding of the warranty.**

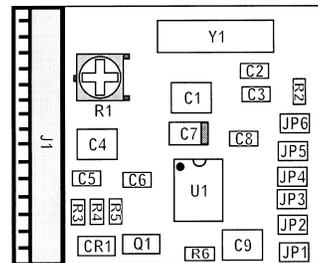
Table 1. Program Jumpers

Tone	Number	JP6	JP5	JP4	JP3	JP2	JP1
67.0	0						
69.3	1				X	X	
71.9	2	X					
74.4	3						X
77.0	4	X	X				
79.7	5					X	
82.5	6	X					X
85.4	7					X	X
88.5	8	X	X				X
91.5	9				X		
94.8	10	X				X	
97.4	11				X		X
100.0	12	X	X			X	
103.5	13	X				X	X
107.2	14	X	X			X	X
110.9	15	X			X		
114.8	16	X	X		X		
118.8	17	X			X		X
123.0	18	X	X		X		X
127.3	19	X			X	X	
131.8	20	X	X		X	X	
136.5	21	X			X	X	X
141.3	22	X	X		X	X	X
146.2	23	X		X			
151.4	24	X	X	X			
156.7	25	X		X			X
159.8	26			X	X	X	
162.2	27	X	X	X			X
167.9	29	X		X			X
173.8	31	X	X	X			X
179.9	33	X		X		X	X
183.5	34			X	X		X
186.2	35	X	X	X		X	X
189.9	36			X	X		

Factory Default Setting is 67Hz

Tone	Number	JP6	JP5	JP4	JP3	JP2	JP1
192.8	37	X		X	X		
196.6	38			X		X	X
199.5	39			X		X	
203.5	40	X	X	X	X		
206.5	41			X			X
210.7	42	X		X	X		X
218.1	43	X	X	X	X		X
225.7	44	X		X	X	X	
229.1	45			X			
233.6	46	X	X	X	X	X	
241.8	47	X		X	X	X	X
250.3	48	X	X	X	X	X	X
254.1	49				X	X	X
No Tone	50			X	X	X	X

Figure 1. PCB Layout



ARI-52
COMPONENT LAYOUT

Table 2. Wiring Diagram

J1 Pin #	Color	Description
Pin 1	Red	12 V: Connect to the radio's +ve supply. The supply must be present during both transmit and receive cycles.
Pin 2	Black	Ground: Connect to 0V (Ground).
Pin 3	Orange	Sub Audio In: Connect to the discriminator output. This audio input is used as the audio source to decode the correct CTCSS tone.
Pin 4	Yellow	# Audio Out: OPTIONAL: Audio is only present here if the monitor input is active, or a correct tone is being received, and Pin 6 is connected.
Pin 5	Light Green	PTT In: Connect directly to the microphone PTT switch, active low only.
Pin 6	Blue	# Audio In: OPTIONAL: Connect to the discriminator output (see below).
Pin 7	Violet	Tone Out: Connect to the (transmit) audio stage, after the microphone clipper/limited stages, and before the modulator circuit.
Pin 12	Gray	Tone Valid Output: This output can be used to control the receive squelch gate, or the radio's mute circuit. When a correct tone is received, or the monitor input is active, this output will go low.
Pin 13	White	Tone Valid Output: This output can be used to control the receive squelch gate, or the radio's mute circuit. This output will be low when a correct tone is not being received, or the monitor input is inactive.
Pin 14	Brown	Monitor Input: This input is used to control the channel monitor function. When low, (e.g. microphone hook switch enabled) Pin 12 & 13 will be active only on correct decode of CTCSS tone. Similarly if Pin 6 is connected, audio will be only be present on Pin 4.
		# - If switched speaker audio is required (audio will be heard when the correct CTCSS tone is decoded, or the Monitor input is active) break the receive audio line at a convenient point. Connect Pin 6 to the discriminator output side of the break and connect Pin 4 to the output (Audio Amplifier or Speaker Side) of the break. Audio Input has a high pass filter to filter CTCSS tones.

Figure 2. Circuit Diagram ARI-52

