

Specifications

Input Voltage	5.15- 30 VDC
Current Drain	3.5mA Typ No Load
Frequency Range	67.00 to 254.1 Hz
Encode Frequency Accuracy	0.05%
Encode Time	<12mS Typical
Tone Distortion	< 1.5% THD
Output Tone Voltage Level	3.1 V P-P No Load
Encode Output Impedance	20 K Ohms

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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For technical support call CES at the numbers below:

CES Wireless Technologies
925-122 S. Semoran Blvd.
Winter Park, FL 32792 USA
Phone: Int. + 407-679-9440
Fax: Int. + 407-679-8110
E-Mail: sales@cesusa.com
Web Site: <http://www.ceswireless.com>

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Installation Instructions

(Ref Man81)

ARi-51 CTCSS ENCODER

GENERAL DESCRIPTION

The ARi-51 is an exceptional sub-miniature CTCSS encoder device, providing 50 CTCSS tones plus 14 factory configurable tones. 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-51 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 R7 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 being transmitted.

TX Tone Phase Reversal

Tone Phase Reversal can be enabled or disabled on the ARi-51 using JP2. See Figure 1 for location diagram. Tone Phase Reversal is enabled when JP2 is open. The unit is shipped with JP2 open. To disable, short JP2. If JP2 is short (disabled), Tone Phase Reversal can be enabled/disabled externally by using pin 5 of the input/output wiring harness, see Table 2.

Programmable Input Polarity

The active phase of the PTT Input can be programmed with JP1. Solder the jumper for active high, leave open for active low.

Tone Selection

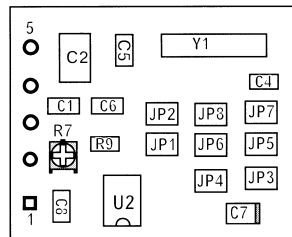
Following Table 1 place solder bridges on the specified coding pads. X means solder bridge required, blank means leave bridge open. The location of the solder bridges on the PCB are shown in Figure 1.

Table 1. Program Jumpers

Tone	Number	JP8	JP7	JP6	JP5	JP4	JP3
67.0	0						
69.3	1						X
71.9	2					X	
74.4	3					X	X
77.0	4				X		
79.7	5				X		X
82.5	6				X	X	
85.4	7				X	X	X
88.5	8			X			
91.5	9			X			X
94.8	10			X		X	
97.4	11			X		X	X
100.0	12			X	X		
103.5	13			X	X		X
107.2	14			X	X	X	
110.9	15			X	X	X	X
114.8	16		X				
118.8	17		X				X
123.0	18		X			X	
127.3	19		X			X	X
131.8	20		X		X		
136.5	21		X		X		X
141.3	22		X		X	X	
146.2	23		X		X	X	X
151.4	24		X	X			
156.7	25		X	X			X
159.8	26		X	X		X	
162.2	27		X	X		X	X
165.5	28		X	X	X		
167.9	29		X	X	X		X
171.3	30		X	X	X	X	
173.8	31		X	X	X	X	X
177.3	32	X					
179.9	33	X					X
183.5	34	X					X
186.2	35	X					X
189.9	36	X					X

Tone	Number	JP8	JP7	JP6	JP5	JP4	JP3
192.8	37	X			X		X
196.6	38	X			X	X	
199.5	39	X			X	X	X
203.5	40	X		X			
206.5	41	X		X			X
210.7	42	X		X		X	
218.1	43	X		X		X	X
225.7	44	X		X	X		
229.1	45	X		X	X		X
233.6	46	X		X	X	X	
241.8	47	X		X	X	X	X
250.3	48	X	X				
254.1	49	X	X				X
	50	X	X			X	
	51	X	X			X	X
	52	X	X		X		
	53	X	X		X		X
	54	X	X		X	X	
	55	X	X		X	X	X
	56	X	X	X			
	57	X	X	X			X
	58	X	X	X		X	
	59	X	X	X		X	X
	60	X	X	X	X		
	61	X	X	X	X		X
	62	X	X	X	X	X	
	63	X	X	X	X	X	X

Figure 1. PCB Layout



Ari-51
COMPONENT LAYOUT

Wiring Interface

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

Table 2. Wiring Diagram

Pin #	Color	Description
Pin 1	Red	12 V: Connect to the radio's switched transmit voltage source.
Pin 2	Black	Ground: Connect to the radio 0 volt point (ground).
Pin 3	Orange	Tone Out: Connect to a (transmit) audio point after the limiter/clipper stage but before the radio's modulator. Do not connect to the radio's microphone input as distortion will occur.
Pin 4	Light Green	PTT In: Connect to microphone PTT switch.
Pin 5	Blue/White	Phase Reversal Input: This input can be used to activate Phase Reversal (JP1 must be shorted).

Mounting Details

Place the provided heatshrink tubing around the Ari-51 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.**

Figure 2. Circuit Diagram Ari-51

