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# MODEL NC104 PROGRAMMABLE CTCSS ENCODER INSTRUCTION MANUAL

## INTRODUCTION

The Model NC104 is a sub-miniature programmable CTCSS encoder. The NC104 has been designed with solder bridging pads for ease of programming, allowing the user to field select on the P.C. Board or by remote switching any one of the standard 37 E.I.A. CTCSS tones without the need of tone measuring equipment. The NC104 is ideal for applications where tone selection is provided by use of radio's frequency switch or by other remote methods.

## GENERAL

The Model NC104 has been engineered for maximum reliability. However should you require technical assistance or additional information, please contact our Customer Service Department at (530) 477-8400.

## SPECIFICATIONS

- FREQUENCY RANGE** . . . . . Programming of all 37 EIA tones (Plus 69.37, 97.4 and 206.5 Hz)
- FREQUENCY STABILITY** . . . . . Exceed E.I.A. specifications (±0.1% Nominal)
- ENCODE OUTPUT** . . . . . Adjustable 0 to 750mVRMS (no load)
- ENCODE DISTORTION** . . . . . Less than 2.0% (THD)
- PROGRAMMING** . . . . . Solder bridging of numbered pads
- OPERATING VOLTAGE** . . . . . 7.5VDC to 24VDC
- OPERATING CURRENT** . . . . . 3mADC @ 10VDC (Nominal)
- OPERATING TEMPERATURE** . . . -30°C to +80°C
- SIZE** . . . . . 0.625" W x 0.80" L x 0.170" H
- MOUNTING** . . . . . Double sided adhesive tape
- INTERFACING** . . . . . 12" flying colored leads

--SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE--

# INTERFACING

The Model NC104 is supplied with a piece of double sided adhesive tape to eliminate the need for mounting hardware. When programming is completed remove the protective covering from one side of the tape and apply to bottom side of P.C. Board. After making sure that mounting surface is clean and dry to insure positive mounting, remove protective cover from remaining side of tape and adhere unit to desired location. For maximum operational reliability the decoder should be located away from intensive R.F. or magnetic fields and all leads should be kept to minimum lengths.

RED [+] ..... Connect to 7.5VDC to 25VDC

BLACK [-] ..... Connect to system ground

YELLOW [Encoder Output] ..... Connect to transmitter CTCSS input at a point following all pre-emphasis, clipping or limiting circuitry. A series resistor may be necessary to eliminate input circuit loading due to the low output impedance of the encoder. Adjust R1 for  $\pm 750\text{Hz}$  transmitter deviation as viewed on monitor scope or deviation meter.

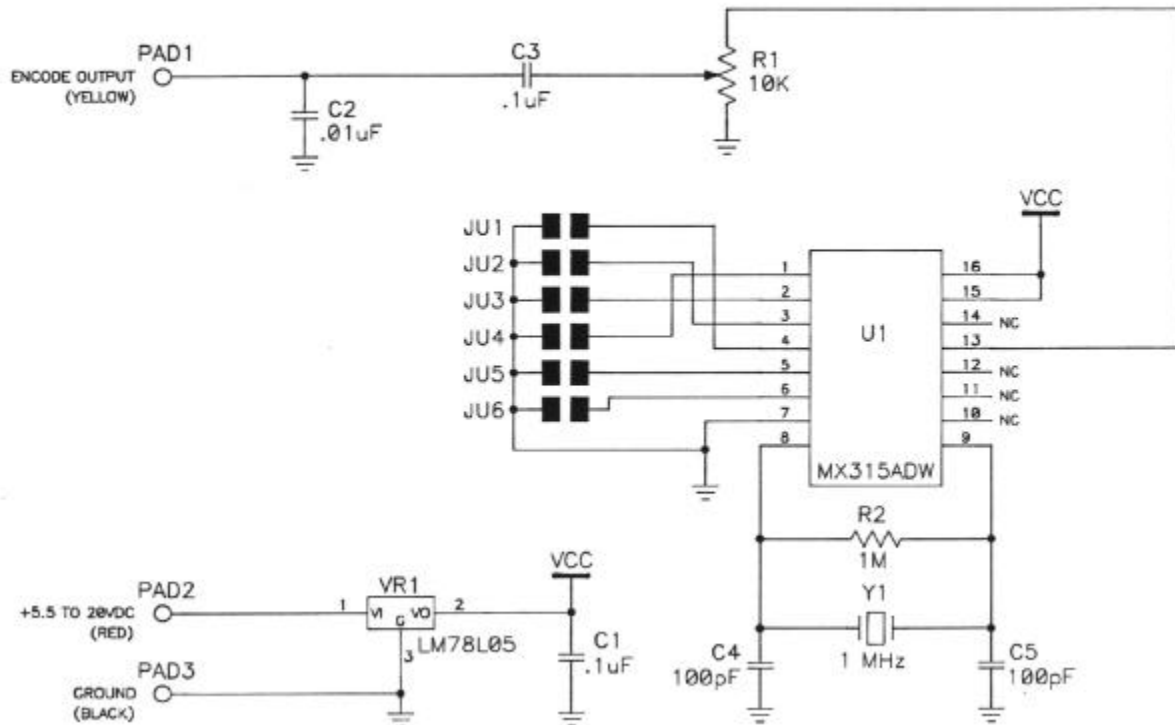
# PROGRAMMING

To select a desired tone frequency refer to the PROGRAMMING CHART on page 3 and take note of the program line numbers (1 through 6) and solder bridge the associated programming pads on bottom of P.C. boards where there is a "0". Refer to page 4 for the programming pad layout.

Example: To program the NC104 to a frequency of 103.5 Hz:

- [A] Look up 103.5Hz in the FREQUENCY column of the PROGRAMMING CHART
- [B] Find which (if any) pads are "0" in the 103.5 Hz row
- [C] Solder bridge pads 1, 2, and 6.
- [D] End

# SCHEMATIC LAYOUT



## PROGRAMMING CHART

#	CODE	FREQUENCY (Hz)	PROGRAM LINES					
			1	2	3	4	5	6
1	XZ	67.0	1	1	1	1	1	1
2		69.3	1	0	0	1	1	1
3	XA	71.9	1	1	1	1	1	0
4	WA	74.4	0	1	1	1	1	1
5	XB	77.0	1	1	1	1	0	0
6	SP	79.7	1	0	1	1	1	1
7	YZ	82.5	0	1	1	1	1	0
8	YA	85.4	0	0	1	1	1	1
9	YB	88.5	0	1	1	1	0	0
10	ZZ	91.5	1	1	0	1	1	1
11	ZA	94.8	1	0	1	1	1	0
12		97.4	0	1	0	1	1	1
13	1Z	100.0	1	0	1	1	0	0
14	1A	103.5	0	0	1	1	1	0
15	1B	107.2	0	0	1	1	0	0
16	2X	110.9	1	1	0	1	1	0
17	2A	114.8	1	1	0	1	0	0
18	2B	118.8	0	1	0	1	1	0
19	3Z	123.0	0	1	0	1	0	0
20	3A	127.3	1	0	0	1	1	0
21	3B	131.8	1	0	0	1	0	0
22	4Z	136.5	0	0	0	1	1	0
23	4A	141.3	0	0	0	1	0	0
24	4B	146.2	1	1	1	0	1	0
25	5Z	151.4	1	1	1	0	0	0
26	5A	156.7	0	1	1	0	1	0
27	5B	162.2	0	1	1	0	0	0
28	6Z	167.9	1	0	1	0	1	0
29	6A	173.8	1	0	1	0	0	0
30	6B	179.9	0	0	1	0	1	0
31	7Z	186.2	0	0	1	0	0	0
32	7A	192.8	1	1	0	0	1	0
33	M1	203.5	1	1	0	0	0	0
34		206.5	0	0	0	1	1	1
35	M2	210.7	0	1	0	0	1	0
36	M3	218.1	0	1	0	0	0	0
37	M4	225.7	1	0	0	0	1	0
38		233.6	1	0	0	0	0	0
39		241.8	0	0	0	0	1	0
40		250.3	0	0	0	0	0	0
41	TEST	4032	1	1	0	0	1	1

- SOLDER JUMPER -    0=SOLDER BRIDGED (ON)                    1=UNBRIDGED (OFF)

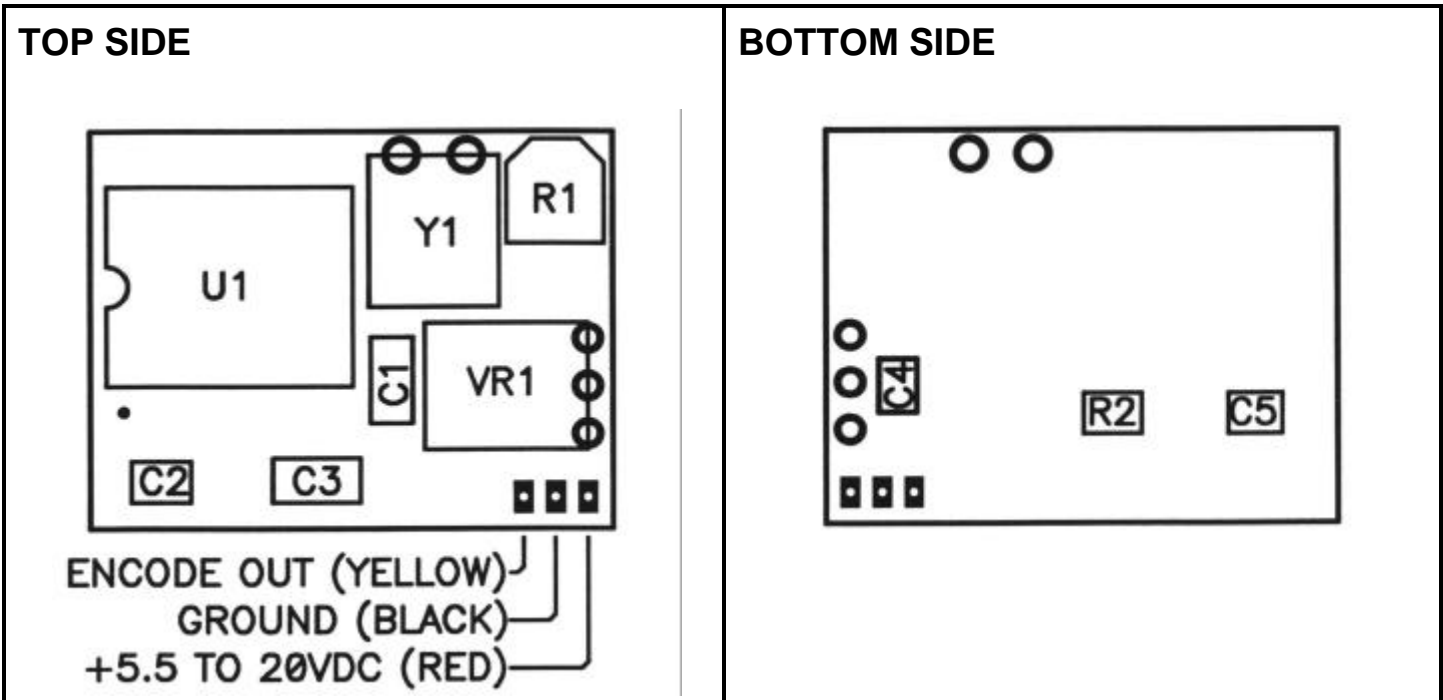
## WARRANTY POLICY

NorComm products are unconditionally guaranteed for two (2) years on materials and labor from date of purchase.

All Warranty repairs must be performed at NorComm's Customer Service Department in Grass Valley, CA. Units under warranty can be returned for repair or replacement without prior authorization, however, a letter explaining the defect should be enclosed with the unit. Out of warranty units returned constitute Purchaser's authorization for NorComm to repair or replace equipment and to invoice Purchaser for any and all reasonable costs of repair labor, parts and freight.

NorComm shall not be obligated to repair or replace equipment rendered defective, in whole or in part, by causes external to the equipment, such as, but not limited to, catastrophe, power failure, or transients, environmental extremes, improper use, and maintenance or interfacing applications. NorComm further assumes no liability for any incidental or consequential damages which may result from the applications of its products by the Purchaser or any other party.

# COMPONENT LAYOUT



# PROGRAMMING "PAD" LAYOUT

