



23351 Madero,  
Mission Viejo, CA  
92691. USA.  
Tel: + 1 949 859 8800  
Fax: + 1 949 859 9643  
Email: sales@holtic.com  
Web: www.holtic.com

# HI-8470/HI-8476 ARINC 429 Repeater Evaluation Board

---

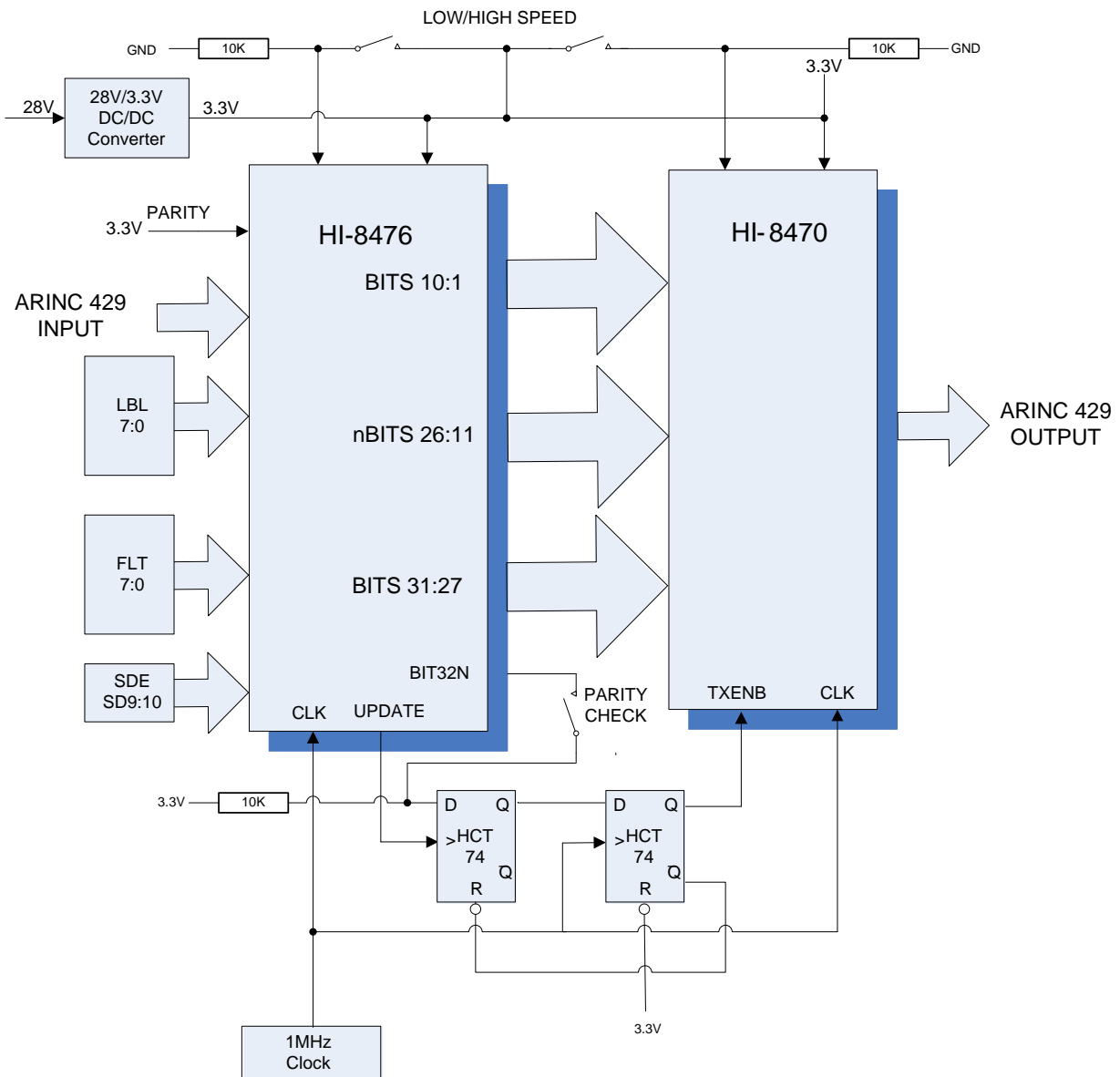
## Quick Start Guide Oct 25, 2018

---

## INTRODUCTION

The Holt ARINC Repeater Board contains the Holt HI-8470 and HI-8476 devices, these are ARINC 429 receiver and transmitter devices respectively. In this project they are combined together to produce an ARINC 429 repeater or regenerator. The board runs from a single 3.3V  $\pm$  5% supply voltage. The Repeater Evaluation Module requires no software for control; all functions are set by hardware DIP switches.

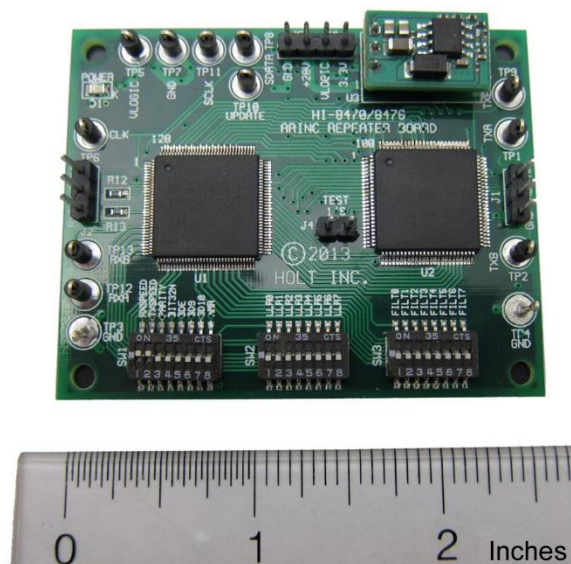
The HI-8476 receiver has parallel outputs that are connected to the HI-8470 parallel inputs, see block diagram below:



The picture below shows the ARINC repeater board. At the top right is a 28V to 3.3V DC-DC converter that gives the option of running from an aircraft type 28VDC instead of a 3.3VDC supply.

More details about the design of the repeater are available in the Holt ARINC repeater white paper.

This guide summarizes how to get set up and running quickly.



## KIT CONTENTS

- This User Guide
- ARINC Repeater Evaluation Board

### Switch Functions

SWITCH	NAME	DEFAULT	DESCRIPTION
SW1	RXSPEED	ON	Receive ARINC 429 speed ON = High, OFF = Low
	TXSPEED	ON	Transmit ARINC 429 speed ON = High, OFF = Low
	PARITY	OFF	HI-8476 Parity Checking ON = Enable, OFF = Disable
	BIT32N	OFF	Use HI-8476 Parity bit to disable HI-8470 transmission
	SDE	OFF	SD bit filtering enable ON = Enabled
	SD9	OFF	SD9 filtering enable ON = Enabled
	SD10	OFF	SD10 filtering enable ON = Enabled
	nMR	OFF	Master Reset ON = Reset
SW2	LABEL 0:7	All OFF	ARINC 429 label bits 0:7.  ON = '1' , OFF = '0'
SW3	FILT 0:7	All OFF	Sets ARINC 429 message filter bits.  ON = '1' , OFF = '0'

### Connector Functions

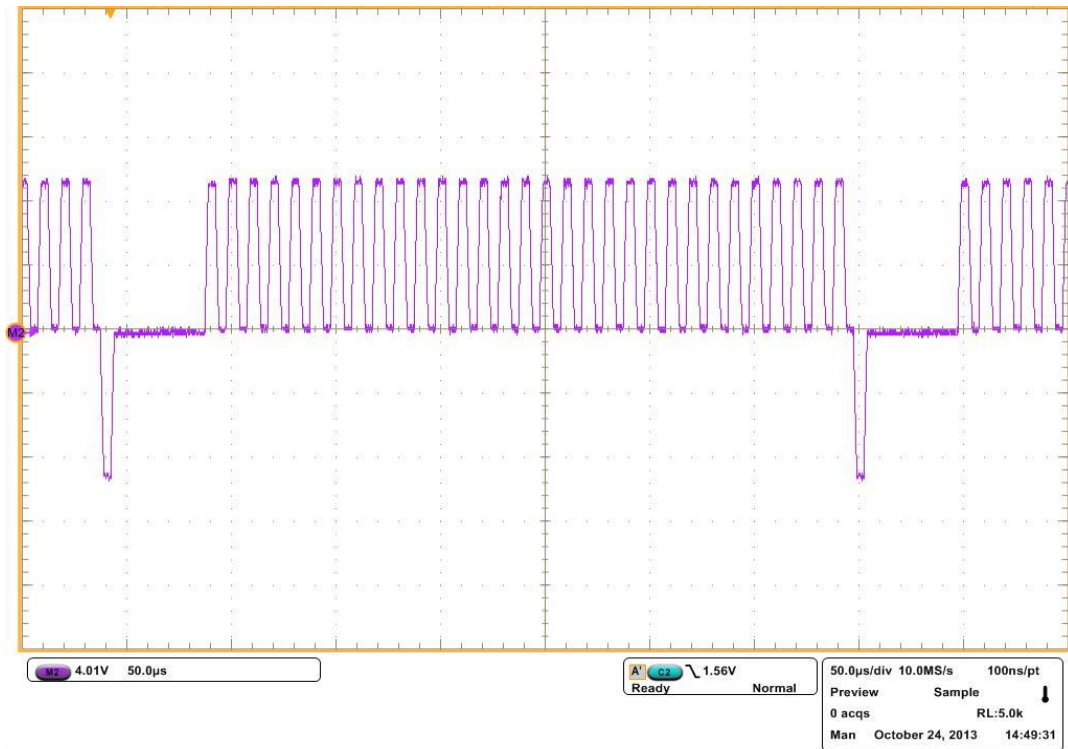
CONNECTOR	NAME	PIN	DESCRIPTION
J1	GND	1	GND
	TXB	2	TXB ARINC negative output
	TXA	3	TXA ARINC positive output
J2	GND	1	GND
	RXA	2	RXA ARINC negative input
	RXB	3	RXB ARINC positive input
J5	GND	1	GND
	+28V	2	+28V, 28VDC converter supply (link J6)

## Jumper Functions

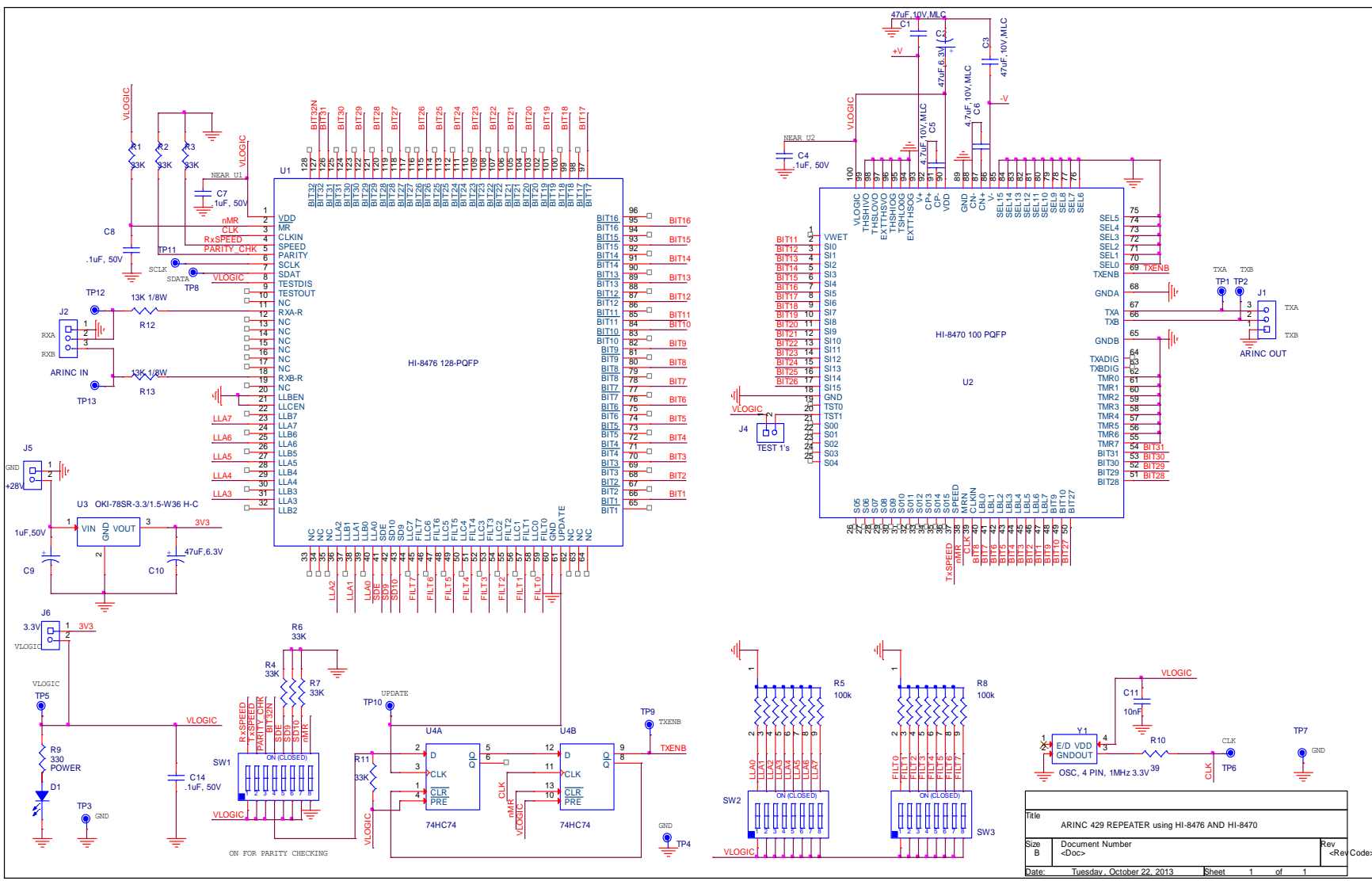
JUMPER	DEFAULT	NAME	DESCRIPTION
J4	OFF	TEST 1'S	When linked all 1's data pattern is transmitted on J1
J6	OFF	VLOGIC/3.3V	When using 28V supply install J6, this links converter 3.3V output to VLOGIC.

## Board Set Up

1. Make sure the link and switch positions are in the default state as listed in the tables above. Ensure that link J6 is off; connect a 3.3V supply between the VLOGIC and GND test points, the current should be ~50mA, the 'POWER' LED should be lit. If preferred, the board can be powered from a nominal +28V supply. To configure for this; install J6 and connect a 28V supply between the GND and +28V terminals of J6.
2. Using an ARINC 429 source, connect the positive side of the signal to the RXA terminal and the negative to the RXB terminal. Place TEST 1's link in position, connect an oscilloscope to the ARINC 429 outputs, TXA and TXB for best results; use the scope in differential mode. Observe the ARINC 429 output waveform, it should be the test pattern, all 1's and should look similar to the waveform shown below:



3. Remove the TEST 1's link. The ARINC output should now be the same as the ARINC input; the board is repeating the input signal. Change SW1 TXSPEED to OFF. The output data rate should be low speed, the data content should be the same as before. Now change SW1 RXSPEED to OFF and input a Low speed ARINC signal, the output data should be the same as the low speed data input.
4. If desired, the repeater can selectively repeat ARINC words according to the LABEL content. The LABEL switch selects the LABEL to be retransmitted and FILT switch selects the LABEL bits that are evaluated during the filtering process. For example; if only messages with LABEL = 0000001 were required to be repeated, then the LABEL switch SW2 is set to 0000001 and FILT switch SW3 set to 11111111. Note that on the board the switch bits are in the order of LSB to the left, MSB to the right. If all words with LABEL bits[1:0] = 11 should be repeated, then the LABEL switch is set to 00000011 and FILT switch is set to 00000011. In a similar manner the SD9 and SD10 bits can be used to select word for transmission. See HI-8476 datasheet for more details.
5. With the SW1 PARITY switch in default mode, the repeater will re-transmit all valid ARINC words whether the parity is odd or even. When set to ON, parity checking is enabled, so only odd parity words are retransmitted.



QSG-8476-Repeater\_A

HOLT INTEGRATED CIRCUITS

10/25/18

Title			ARINC 429 REPEATER using HI-8476 AND HI-8470
Size	Document Number	Rev	
B	<Doc>	<Rev Code>	
Date:	Tuesday, October 22, 2013	Sheet	1 of 1

		<b>HI-8470 &amp; 76 Arinc Repeater Board</b>		<b>11-Dec-13</b>
<b>Qty</b>	<b>Description</b>	<b>Reference</b>	<b>DigiKey</b>	<b>Mfr P/N</b>
4	Capacitor, Ceramic 100nF 10% 50V X7R 0603	C4,C7,C8,C14	399-5089-1-ND	Kemet C0603C104K5RACTU
1	Capacitor, Ceramic 10nF 10% 50V X7R 0603	C11	399-1091-1-ND	Kemet C0603C103K5RACTU
2	Capacitor Ceramic 4.7uF 10V 10% X5R 0603	C5,C6	445-7482-1-ND	TDK CGB3B1X5R1A475K055AC
1	Capacitor Ceramic 1uF 50V 10% X7R 1210	C9	490-1863-1-ND	Murata GRM32RR71H105KA01L
2	Capacitor Tantalum 47uF 6.3V 20% 1210	C2,C10	493-4094-1-ND	Nichicon F920J476MBA Nichicon F920J476MBA
2	Capacitor Ceramic 47uF 10V 20% JB 0805	C1,C3	445-11420-1-ND	TDK C2012JB1A476M125AC
5	Conn Shunt 2 Position, 0.1" Pitch	N/A	A31697-ND	TE 2-382811-1
2	Header, Male 1x2, .1" Pitch	J5,J6	S1012E-02-ND	Sullins S1012E-02-ND
3	Header, Male 1x3, .1" Pitch	J1,J2,J4	S1012E-03-ND	Sullins S1012E-09-ND
2	Res 39 Ohm 1/10W 5% 0603 SMD	R10,R11	P39GCT-ND	Panasonic ERJ-3GEYJ390V
2	Res 1K Ohm 1/10W 5% 0603 SMD	R2,R8	P1.0KGCT-ND	Panasonic ERJ-3GEYJ102V
1	Res 330 Ohm 1/10W 5% 0603 SMD	R9	P330GCT-ND	Panasonic ERJ-3GEYJ331V
2	Res 13K Ohm 1/10W 5% 0603 SMD	R12,R13	P13KGCT-ND	Panasonic ERJ-3GEYJ13KV
7	Res 33K Ohm 1/10W 5% 0603 SMD	R1,R2,R3,R4,R6,R7,R11	P33KGCT-ND	Panasonic ERJ-3GEYJ333V
5	Res 100K Ohm 1/10W 5% 0603 SMD	R14,R15,R16,R18,R19	P100KGCT-ND	Panasonic ERJ-3GEYJ104V
2	Res Array 100K Ohm 8 RES 9SRT	R5,R8	752-091-100KPCT-ND	CTS 752091104GPTR7
1	LED Green Clear 0805 SMD	D1	160-1179-1-ND	LiteOn LTST-C170GKT
3	Switch DIP Half Pitch 8 Pos	SW1,SW2,SW3	CT2188LPST-ND	CTS 218-8LPST
1	Osc 1.0 Mhz 3.3V HCMOS, 5x7 mm SMD	Y1	631-1122-1-ND	FOX FXO-HC735-1
13	Test Point PC Mini .040"D Black	TP1-TP13	5001K-ND	Keystone 5011
1	HI-8476 128 PQFP Arinc Receiver	U1	HOLT IC	Holt IC
1	HI-8470 100 PQFP Arinc Transmitter	U2	HOLT IC	Holt IC
1	IC Single Gate SOT-23-5	U4	296-1240-1-ND	TI SN74LVC74ADR
1	Converter DC/DC 4.95W 36VIn 3.3VOut	U3	OKI-78SR-3.3/1.5-W36 H-C	OKI-78SR-3.3/1.5-W36 H-C
4	Bumpon Cylindrical .312X.200 Black	N/A	SJ5746-0-ND	3M SJ61A1



## REVISION HISTORY

<b>Revision</b>	<b>Date</b>	<b>Description of Change</b>
QSG-8476, Rev. New	12/11/13	Initial Release
QSG-8476-Repeater, Rev. New	01/20/14	Change document name from QSG-8476_New to QSG-8476-Repeater_New
QSG-8476-Repeater, Rev. New	10/25/18	Correct typo in Connector Functions table on p. 4. J2, RXA and RXB pins reversed.