

# TIME DIFFERENCE OF ARRIVAL DIRECTION FINDER

## UPDATES&CHANGES

FROM 102-73170-20:  
ADD SYNCHRONOUS DETECTION  
AND LED METER

CIRCUIT BOARD SIZE CHANGED  
TO FIT HAMMOND 1599E ENCLOSURE

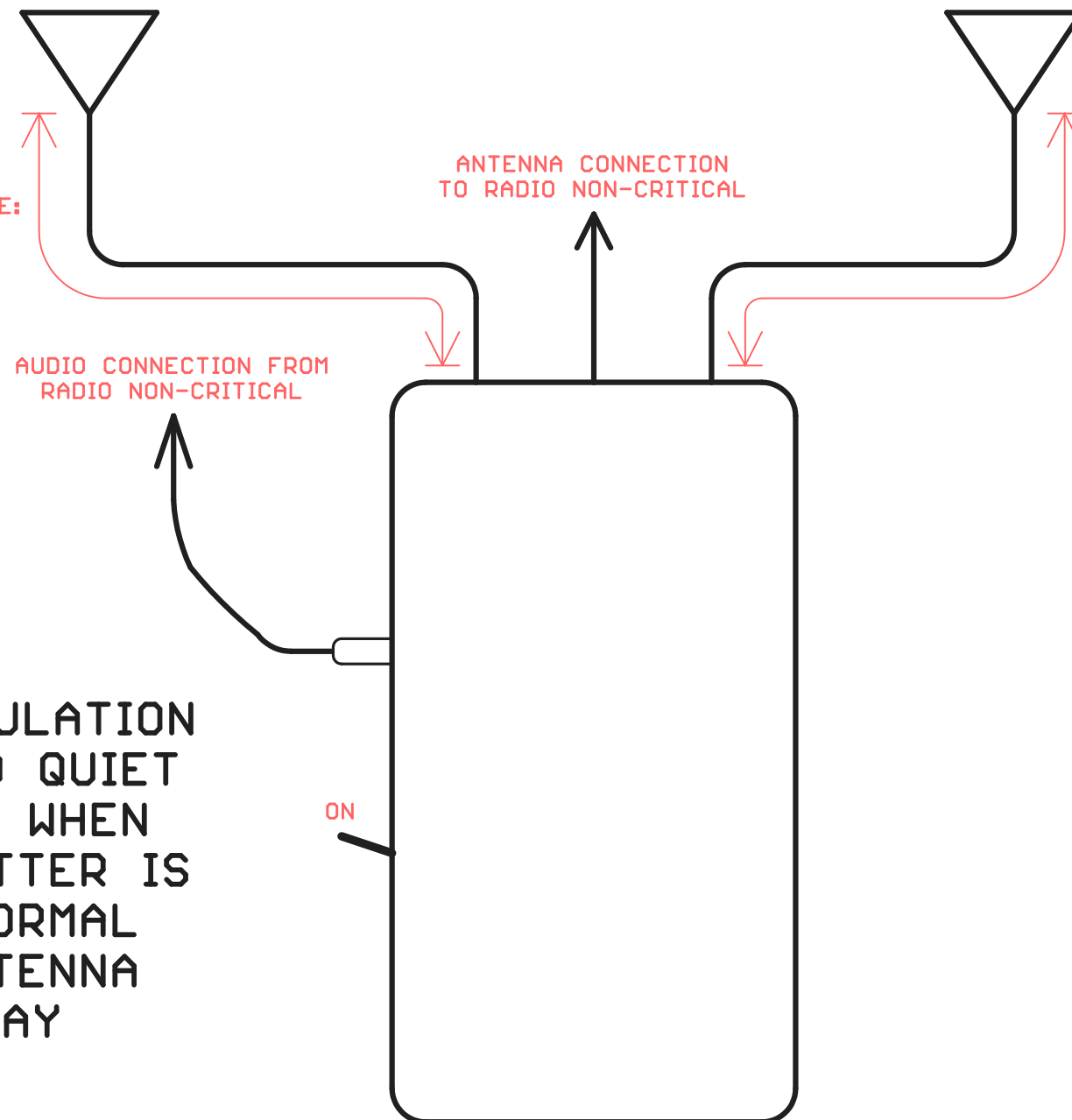
INTERNAL SPEAKER ADDED

SYNCHRONOUS DETECTOR ADDED

ANALOG METER EMULATION  
(USING LEDs)

HAYWIRE/HACK  
1M Ohm ACROSS X1 CRYSTAL

ANTENNA TYPE:  
1/4 TO 1/2 WAVE  
SEPERATION  
SAME ELEMENT  
SAME IMPEDANCE  
SAME LENGTH



## PROTO

Z8F1680 SOFTWARE PROTOTYPING BUILD

## PROD

PRODUCTION BUILD: (METER EMULATION)  
OP-AMPS CIRCUITRY FOR METER  
SUPPORT OMITTED

## METER

PRODUCTION BUILD: (ANALOG METER)  
Z8F1680 CIRCUITRY OMITTED

MARK ZERO POINT FOR  
PICK & PLACE FILE ON  
PRINTED CIRCUIT BOARD

# KCØJFQ

TOP_FULL	
DRAWING FRAME SHOWN ON CIRCUIT BOARD	
BOARD ASSY	
DRAWING FRAME SHOWN ON CIRCUIT BOARD	
BOT_COMPACT	
DRAWING FRAME SHOWN ON CIRCUIT BOARD	
BOARD-ID	
DRAWING FRAME SHOWN ON CIRCUIT BOARD	

PWB RELEASED AS 2D354 102-73170-62

PWA RELEASED AS 2D354 102-73170-62

Drawn	Date
W. ROBISON	8/2019
Designed	Date
W. ROBISON	8/2019

TITLE: ICARC TDOA, SYNCHRONOUS  
A102\_73170\_62

CAGE	Series	Number	2 Layers	Rev
2D354	102 ICARC FOX HUNT	B 73170		62

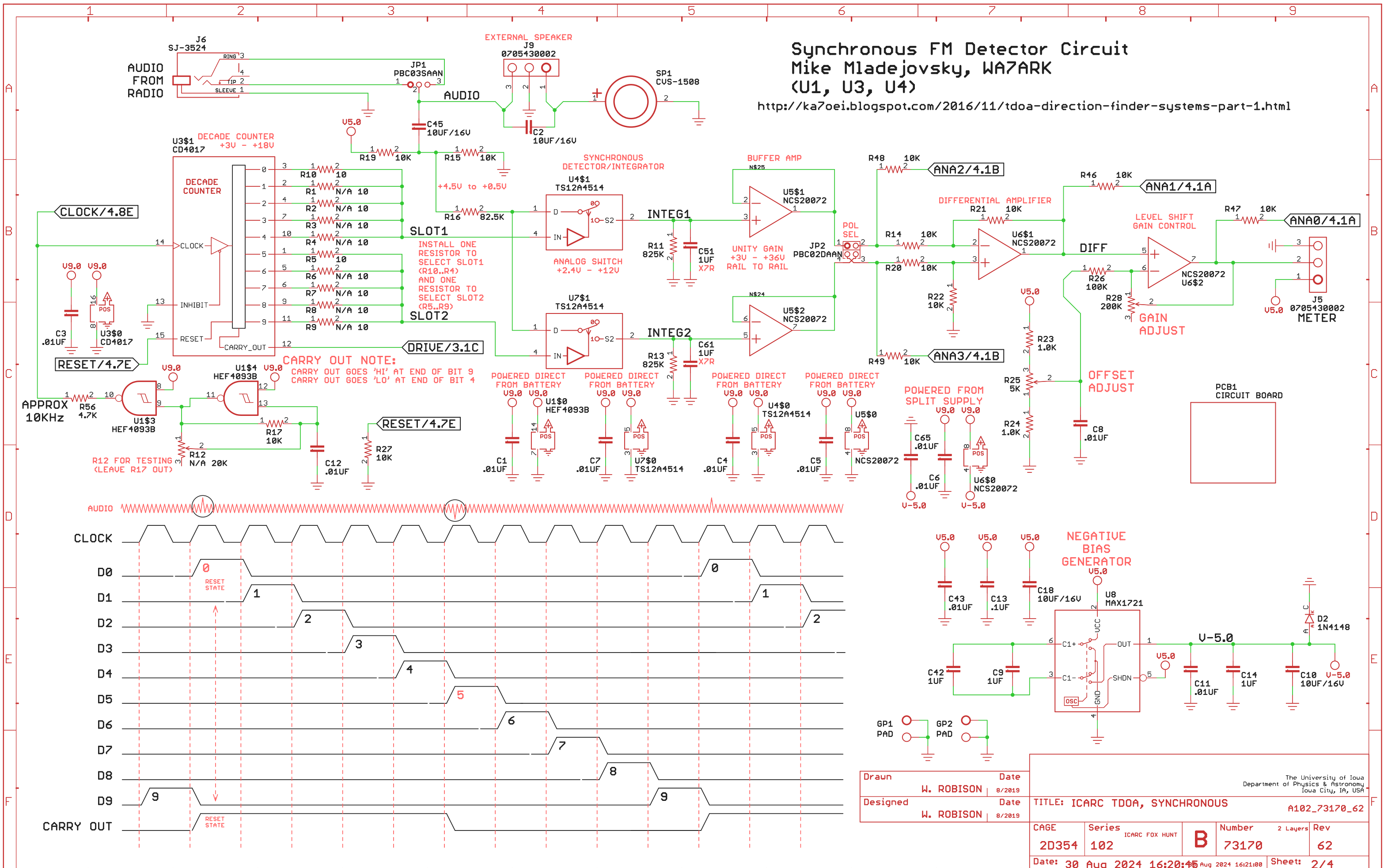
Date: 30 Aug 2024 16:20:45 Aug 2024 16:21:00 Sheet: 1/4

The University of Iowa  
Department of Physics & Astronomy  
Iowa City, IA, USA

# Synchronous FM Detector Circuit

Mike Mladejovsky, WA7ARK  
(U1, U3, U4)

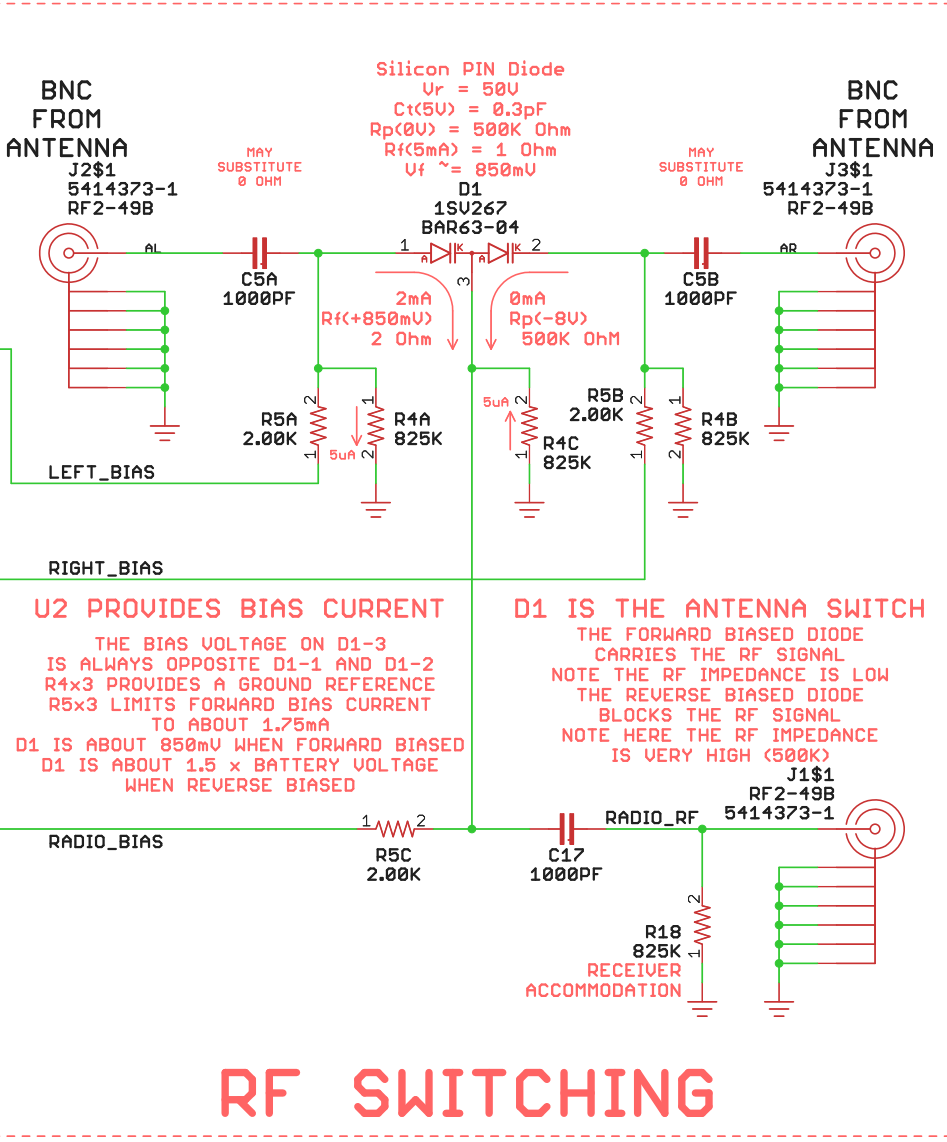
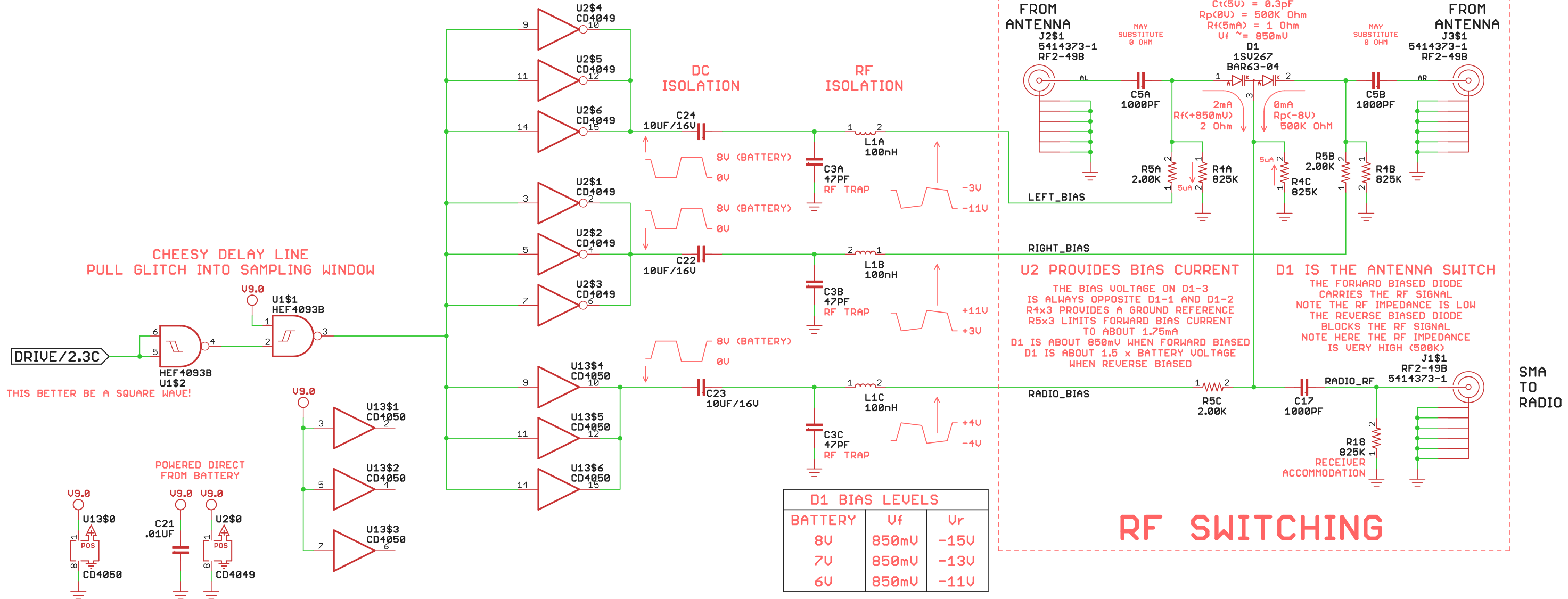
<http://ka7oei.blogspot.com/2016/11/tdoa-direction-finder-systems-part-1.html>



Drawn: W. ROBISON  
Designed: W. ROBISON  
Date: 8/2019

The University of Iowa Department of Physics & Astronomy Iowa City, IA, USA	
TITLE: ICARC TDOA, SYNCHRONOUS	
A102_73170_62	
CAGE: 2D354	Series: 102 ICARC FOX HUNT
Number: B 73170	2 Layers Rev: 62
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# ANTENNA SWITCHING DRIVE FROM 102-73170-20



**D1 BIAS LEVELS**

BATTERY	$U_f$	$U_r$
8V	850mV	-15V
7V	850mV	-13V
6V	850mV	-11V

ENCLOSURE  
ENCL1  
1599EBKBAT

THIS BOARD CONTAINS STATIC SENSITIVE DEVICES. HANDLE ONLY IN STATIC SAFE ENVIRONMENT

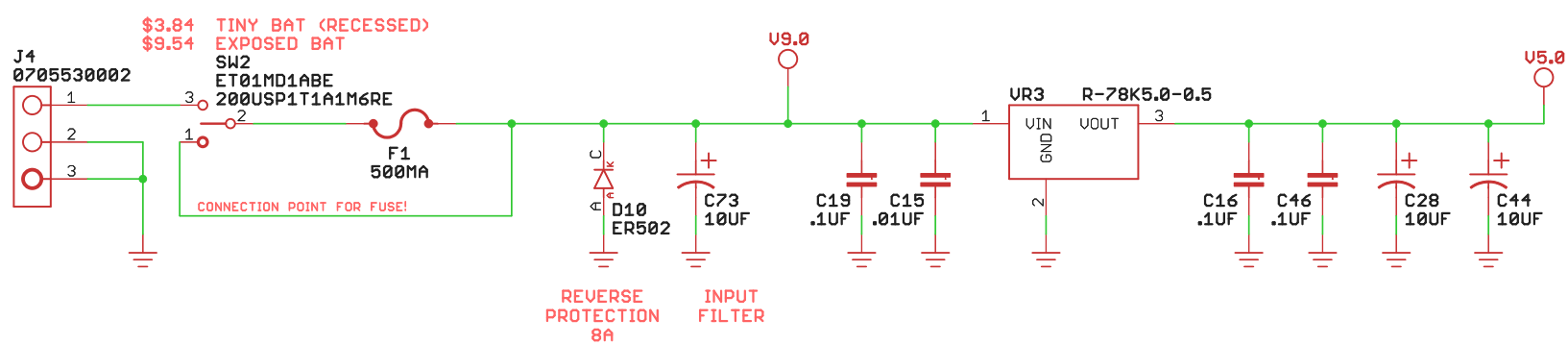
Drawn: W. ROBISON, Date: 8/2019  
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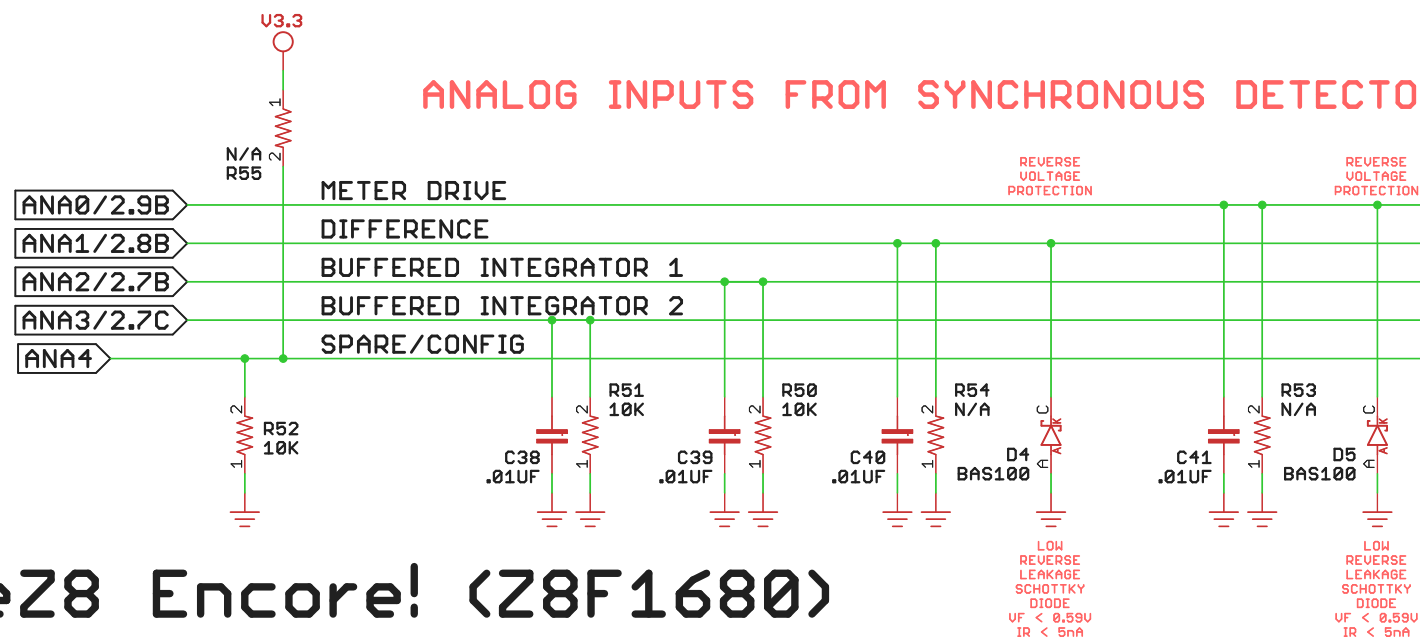
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2D354	102 ICARC FOX HUNT	B 73170		62

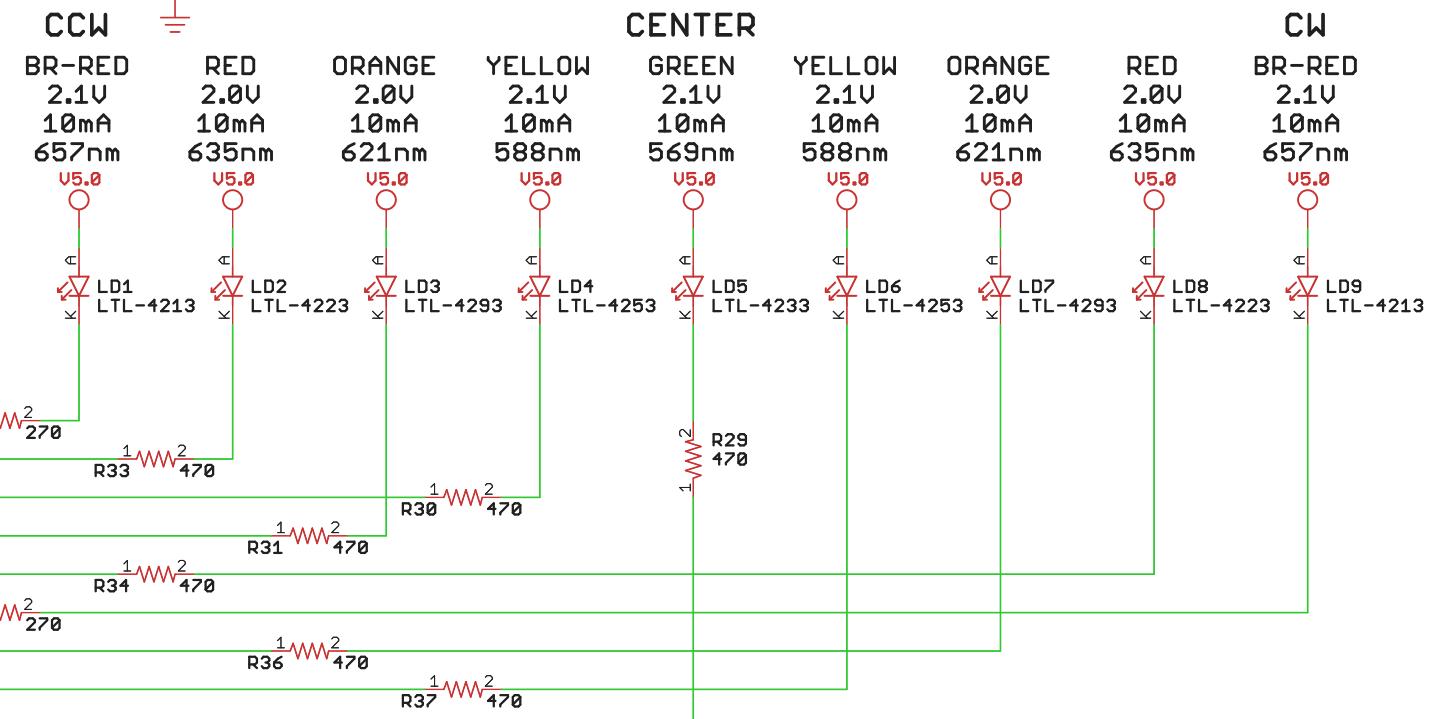
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## ANALOG INPUTS FROM SYNCHRONOUS DETECTOR



## ANALOG METER EMULATION



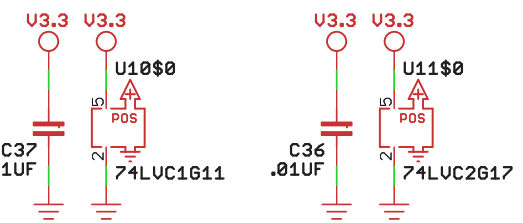
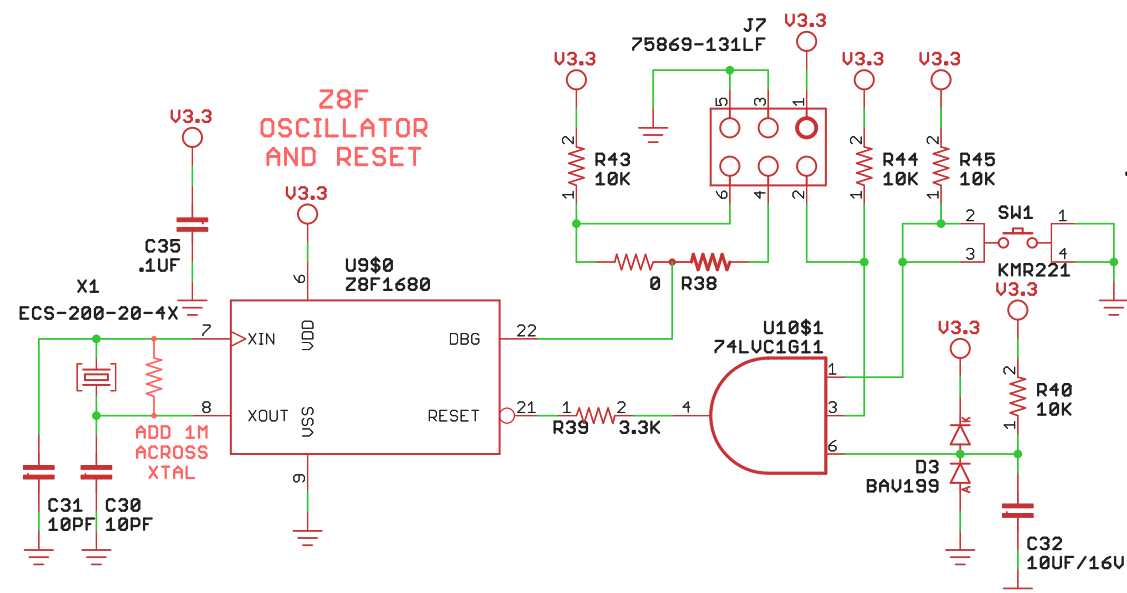
# eZ8 Encore! (Z8F1680)

THE Z8 IS USED TO IMPLEMENT A LOW RESOLUTION METER (i.e. ANALOG METER SIMULATION) ANALOG METERS ARE DIFFICULT TO FIND, SO THIS PROVIDES A METER REPLACEMENT.

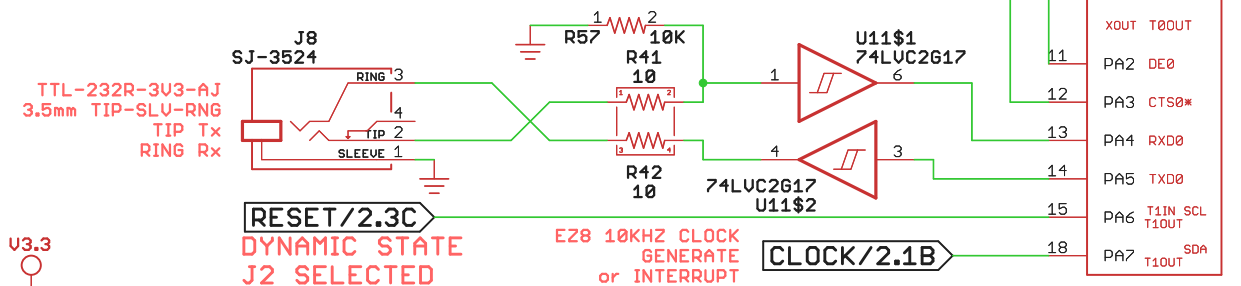
THE CIRCUIT BOARD MAY BE CUT OUT AROUND THE EZ8 TO MAKE ROOM FOR AN ANALOG METER, THE RING OF LEDs RUN ALONG A CUTTING GUIDE TO ALLOW THE REMOVAL OF EVERYTHING ON THIS SHEET OF THE SCHEMATIC.

THE Z8F1680 DEVICE HAS 16KB OF PROGRAM FLASH AND 2KB OF DATA RAM. THE SOFTWARE SIMPLY IMITATES AN ANALOG METER MOVEMENT. THE 'LD5' LED IS THE MID-RANGE POINT.

### Z8F 3.3V FLASH PROGRAMMER



### Z8F 3.3V DEBUG PORT



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Designed	W. ROBISON	Date	8/2019

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