

# **Eclipse Series**

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## **Receiver Data Interface Operation, Maintenance and Installation**

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## **Contents**

<b>1.</b>	<b>Operating Instructions</b>	<b>3</b>
1.1	Squelch	3
1.2	Carrier Detect	3
1.3	Low Signal Alarm	3
1.4	Support Software	3
<b>2.</b>	<b>I/O Connctions</b>	<b>4</b>
<b>3.</b>	<b>Circuit Description</b>	<b>4</b>
3.1	Differential Amplifier	4
3.2	Data Filter and Comparator	4
3.3	Data and CD Outputs	5
3.4	Voltage Regulator	5
<b>4.</b>	<b>Alignment Procedure</b>	<b>5</b>
<b>5</b>	<b>Installation</b>	<b>6</b>
<b>6.</b>	<b>Connection Diagram</b>	
<b>7.</b>	<b>Schematic Diagram</b>	
<b>8.</b>	<b>Board Layout</b>	

## **WARNING**

Changes or modifications not expressly approved by RF Technology could void your authority to operate this equipment. Specifications may vary from those given in this document in accordance with requirements of local authorities. RF Technology equipment is subject to continual improvement and RF Technology reserves the right to change performance and specification without further notice.

# **1 Operating Instructions**

No special operating procedures are required when the data interface is installed. All of the normal receiver functions operate in exactly the same way as described in the receiver manual. However, it is worth noting that when the receiver is used to receive FSK data, it is usually better to use carrier squelch instead of noise squelch.

## **1.1 Squelch**

Noise squelch can be used, but in data applications the required set point is usually higher than can be obtained with the noise squelch. The carrier squelch is usually set to 1 microvolt or higher. For point to point links for example, the carrier squelch would typically be set 20 dB below the normal signal level. Assuming, of course, that the link has at least a 20dB fade margin.

## **1.2 Carrier Detect**

The squelch logic signal drives the data carrier detect TTL and RS-422 outputs on the rear connector. Since the radio frequency is in effect the data carrier, the SQ LED on the receiver indicates data carrier detect (CD) indicator.

## **1.3 Low Signal Alarm**

The receiver low signal alarm is a useful feature for data link applications. The alarm threshold is usually set a few dB above the squelch (CD) threshold.

## **1.4 Support Software**

The squelch and low signal alarms are most easily set using RF Technology TechHelp or Service Monitor Software which can be obtained through your dealer or distributor.

## 2 I/O Connections

### DB9 Pin Connector

Function/Signal	Pins	Specification
Ground	1	
+CD Output*	2	RS-422
-Data Output	3	RS-422
TTL Data Output	4	0<0.8V, 1>2.2V
Ground	5	
-CD Output*	6	RS-422
TTL CD Output*	7	0<0.8V, 1>2.2V
+Data Output	8	RS-422
Ground	9	

\*Inverse logic, 0=CD, 1= Not CD

### Data Polarity Selection

Jumper Positions (-)	JP1_
Normal Polarity	2 4-6 1-3 5
Reverse Polarity	2-4 6 1 3-5

## 3 Circuit Description

The following descriptions should be read as an aid to understanding the schematic diagram at the rear of this manual.

### 3.1 Differential Amplifier

The data interface module connects to the receiver FM discriminator IC U3b. U3b provides a balanced differential output at pins 6 and 7. Normally only the output from pin 6 is used. But, by connecting pin 6 and pin 7 to a differential amplifier (U1a,b,c) a dc voltage proportional to the frequency is obtained. The differential amplifier is biased so that when the input difference is zero the output is +5Vdc. The dc voltage from pin 8 of U1c is then passed through a three pole flat delay (Bessel) filter U1d. The filter attenuates the high frequency noise.

### 3.2 Data Filter and Comparator

The output from the data filter (U1d pin 14) connects to the inverting input of a differential voltage comparator U2a. The non-inverting input is connected to +5Vdc. Since +5Vdc output corresponds to the centre frequency, the logic level at the

comparator output (U2a pin 1) is high or low depending on whether the received frequency is above or below the channel centre frequency.

### **3.3 Data and CD Outputs**

The TTL level from U2a is connected to the data interface connector. It is also connected to the input of a differential line driver U3a. U3a provides the RS-422 data output.

The squelch logic signal from the receiver is connected to the inverting input of comparator U2b. U2b provides the TTL level CD output and drives U3b which provides the RS-422 CD output.

### **3.4 Voltage Regulator**

U4 is a three terminal IC regulator. It provides +5Vdc for U3 and also is used as a stable source for biasing the differential amplifier and the comparators.

## **4 Alignment Procedure**

The data interface module does not have any adjustments and should provide near optimum data reception when the receiver is aligned in accordance with the procedure in the receiver's manual.

In cases where the data equipment connected to the receiver does not regenerate the data, it may be necessary to adjust the receiver's discriminator coil to minimize distortion. The following procedure should be used.

### Test Equipment Required

- FM Signal Generator      RF Output level, -100dBm  
- Frequency accuracy, +/- 100Hz  
- Modulation, 600Hz square wave  
- FM deviation, +/- 4.5KHz
- Oscilloscope              - DC coupled, 0-5Vdc, 200 uSec/div

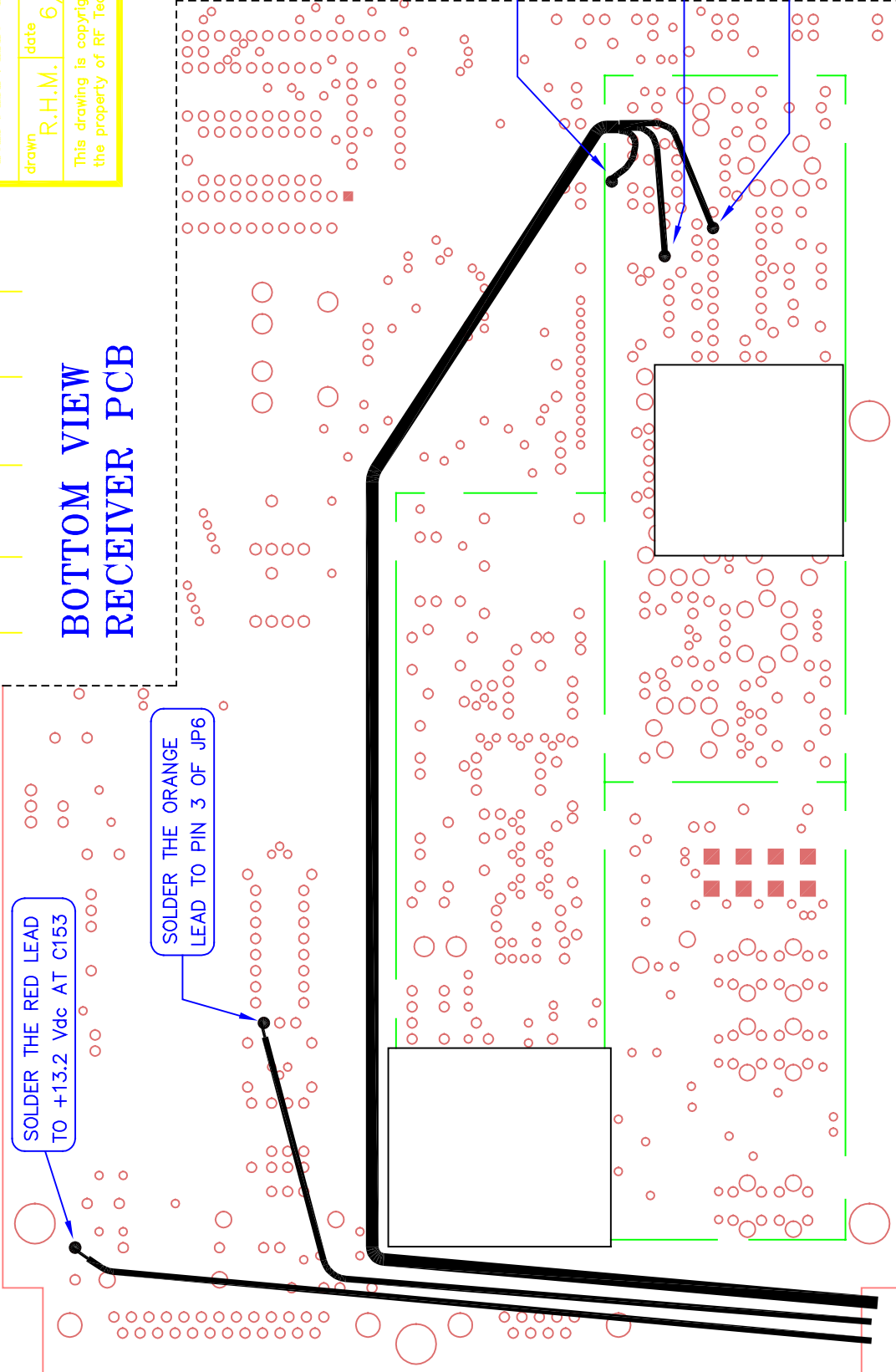
Step	Input	Measure	Adjust
1			Ensure that the receiver is aligned according to the procedure in the manual.
2	FM generator set as above on the channel centre frequency	Connect the oscilloscope to the TTL data output (pin 4)	Adjust the receiver discriminator coil (L10) for equal mark/space times

## 5 Installation

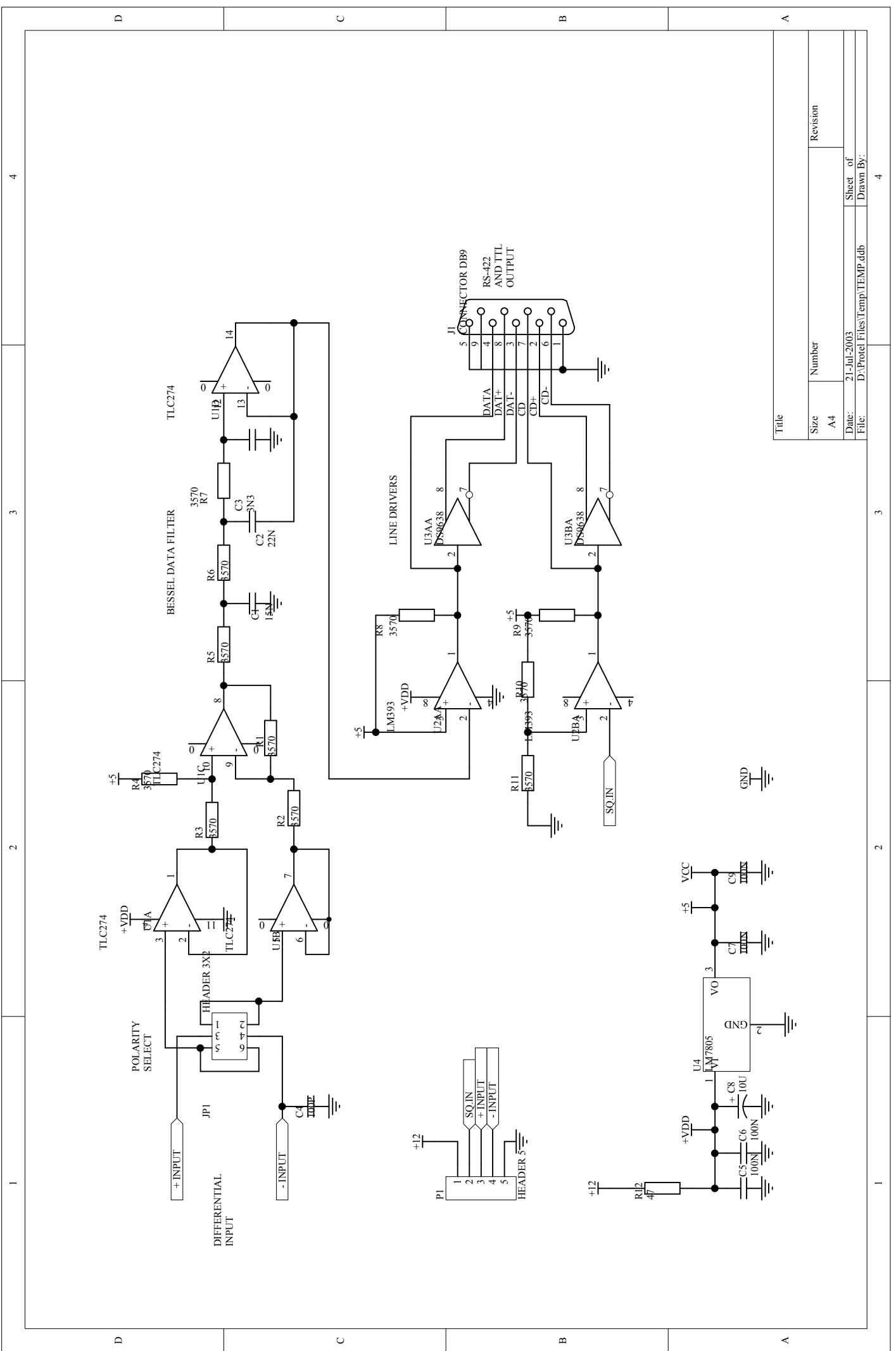
- 1 Remove the receivers two side covers
- 2 Locate the “D” connector cut-out on the rear panel and remove any labels which may be covering the holes.
- 3 From the top side of the receiver board, pass the three leads connected to the interface module through the gap next to the “N” connector to the bottom side of the receiver.
- 4 Carefully slip the interface module into position on the rear panel so that the “D” connector fits into the rear panel cut-out. Pull the leads through the bottom of the receiver.
- 5 Secure the interface module in place with two M3 x 6mm screws.
- 6 Referring to the connection diagram at the back of this manual solder the leads to the PCB as indicated. Route the leads so that they do not rest on the ends of component leads. Use tape to hold them in place
- 7 Replace the receiver side covers.

ISSUE NO.	DATE	DRAWN	APP'D	E.C.O. NO.
1	6/7/93	R.H.M.		

**BOTTOM VIEW  
 RECEIVER PCB**



**RECEIVER DATA INTERFACE CONNECTIONS**



Title		Revision	
Size	Number		
A4			
Date:	21-Jul-2003		Sheet of
File:	D:\Protel Files\Temp\TEMP.ddb		Drawn By:

4

3

2

1

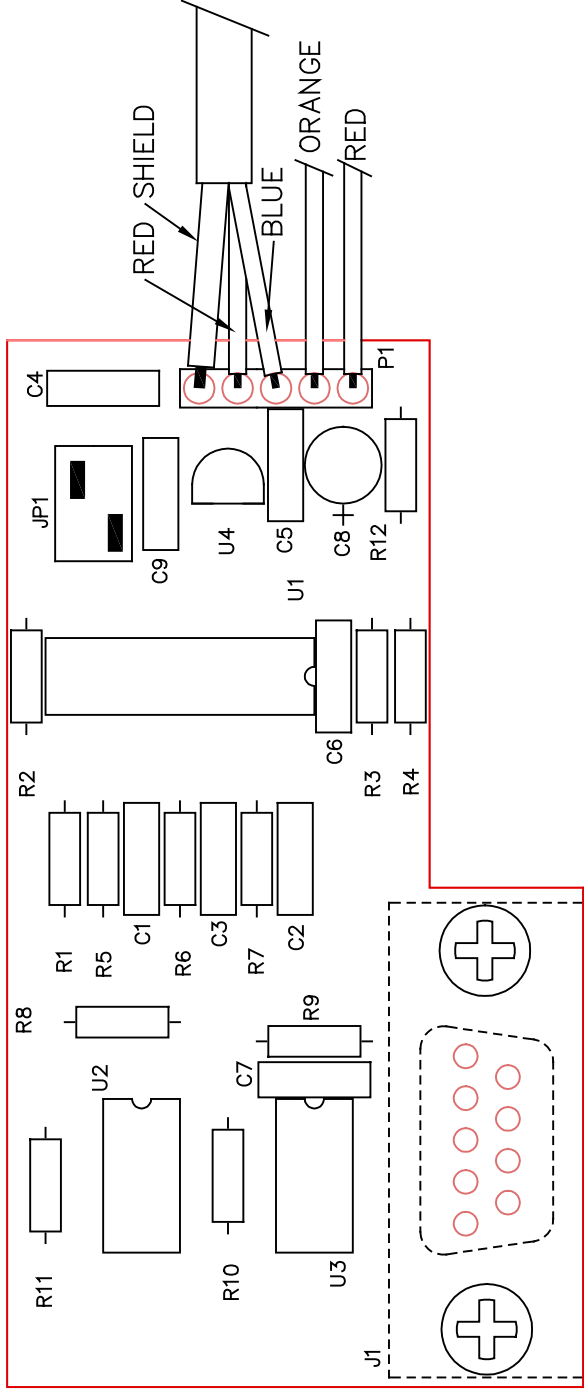
4

3

2

1





RECEIVER DATA INTERFACE COMPONENT LAYOUT