Example 2: Rx frequency = 425.9375.
The receiver has a 21.4MHz IF and low side injection.
$f_{VCO} = f_{Rx} - 21.4 = 404.5375$

VCO frequency:	404.5375	
subtract	204.8	pad N8 unconnected
	199.7375	
subtract	102.4	pad N7 unconnected
	97.3375	
subtract	51.2	pad N6 unconnected
	46.1375	
subtract	25.6	pad N5 unconnected
	20.5375	
subtract	12.8	pad N4 unconnected
	7.7375	
subtract	6.4	pad N3 unconnected
	1.3375	
subtract	0.8	pad N0 unconnected
	0.5375	
subtract	0.4	pad A5 unconnected
	0.1375	
subtract	0.1	pad A3 unconnected
	0.0375	
subtract	0.025	pad A1 unconnected
	0.0125	
subtract	0.0125	pad A0 unconnected
	0.0	

In each case subtract the largest value from Table 1 which yields a positive result. Continue the process until zero is reached.

Check:
204.8 + 102.4 + 51.2 + 25.6 + 12.8 + 6.4 + 0.8 + 0.4 + 0.1 + 0.025 + 0.0125 = 404.5375

404.5375 + 21.4 = 425.9375

Note: All the above N values have pads left open. The remainder, i.e. N9, N2, N1, A4 & A2, are solder shorted.

Once the correct diode programme has been calculated, remove the diode matrix board from the T555 and solder the pads as required.

Figure 10 shows where to solder the diode programming pads and Table 1 shows the matrix board with one channel. The other channel is identical and is on the other side of the board.

When programming is complete, replace the diode matrix board in the T555.

5.5 VCO ALIGNMENT

5.5.1 GENERAL

Connect the T555 to a dummy RF load.

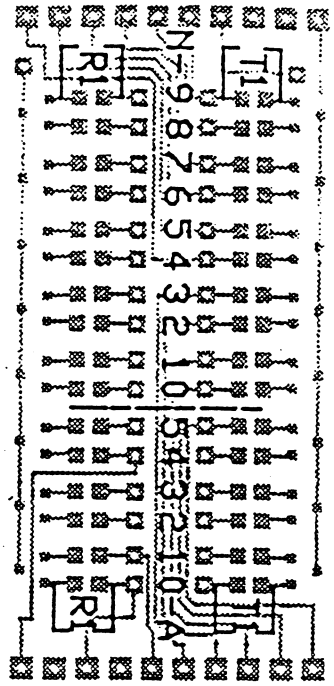
Remove the RF shield cover to gain access to TP3.

Plug a UHF frequency counter onto the test plug (TP3):

Connect: centre pin to ground
left pin to Rx VCO
right pin to TX VCO

Table 1

Frequency Increment	Code
409.6MHz	N9
204.8MHz	N8
102.4MHz	N7
51.2MHz	N6
25.6MHz	N5
12.8MHz	N4
6.4MHz	N3
3.2MHz	N2
1.6MHz	N1
800kHz	N0
400kHz	A5
200kHz	A4
100kHz	A3
50kHz	A2
25kHz	A1
12.5kHz	A0



When a pad is solder bridged, its corresponding N or A value is subtracted from the maximum frequency count.

When a pad is left open, the corresponding value is incremented from zero.

The following examples show a simple method of calculating the correct diode programme.

Example 1: Tx frequency = 458.5MHz

VCO frequency:	458.5	
subtract	409.6	pad N9 unconnected
	48.9	
subtract	25.6	pad N5 unconnected
	23.3	
subtract	12.8	pad N4 unconnected
	10.5	
subtract	6.4	pad N3 unconnected
	4.1	
subtract	3.2	pad N2 unconnected
	0.9	
subtract	0.8	pad N0 unconnected
	0.1	
subtract	0.1	pad A3 unconnected
	0.0	

In each case subtract the largest value from Table 1 which yields a positive result. Continue the process until zero is reached.

To check: The sum of the extracted values should equal the required VCO frequency.

N9 + N5 + N4 + N3 + N2 + N0 + A3 = VCO

409.6 + 25.6 + 12.8 + 6.4 + 3.2 + 0.8 + 0.1 = 458.5

Note: All these N values have pads left open. The remainder, i.e. N8, N7, N1, A5, A4, A2, A1 & A0, are all solder shorted.

check: The sum of the extracted values should equal the required VCO frequency.

N9 + N6 + N5 + N2 = VCO
128 + 16 + 8 + 1 = 153

Example 2

Rx frequency = 147.865, 5kHz reference frequency. The receiver has a 21.4MHz IF and low side injection. NB! LB VHF is high side injection

$f_{VCO} = f_{Rx} - 21.4 = 126.465$

	VCO frequency:	126.465		
	subtract	102.4	cut diode N9	
		24.065		
	subtract	12.8	cut diode N6	
In each case subtract		11.265		
the largest value from	subtract	6.4	cut diode N5	
Table 1 which yields a		4.865		
positive result.	subtract	3.2	cut diode N4	
		1.665		
	subtract	1.6	cut diode N3	
		0.065		
Continue the process				
until zero is reached.	subtract	0.040	cut diode A3	
		0.025		
	subtract	0.020	cut diode A2	
		0.005		
	subtract	0.005	cut diode A0	
		0.000		

FRX = 74.21

74.21
1
N 8 51.2
1
7 25.6
18.81
6 12.8
6.01
4 3.2
2.81
3 1.6
1.210
2 .800
410
1 400
10
A 1 10
0

Check:
N9 + N6 + N5 + N4 + N3 + A3 + A2 + A0 = VCO
102.4 + 12.8 + 6.4 + 3.2 + 1.6 + 0.040 + 0.020 + 0.005 = 126.465
126.465 + 21.4 = 147.865

Once the correct diode programme has been calculated, remove the diode matrix board from the T530 and clip diodes as required. Figure 11 shows where to cut the diode leads, and Table 1 shows the diode position on the matrix board.

Replace the diode matrix board in the T530.

5.5 VCO ALIGNMENT

5.5.1 GENERAL

Connect the T530 to the RF power meter.

Ensure that a correctly programmed diode matrix PCB is fitted.

Connect 13.8 volts of the correct polarity.

Monitor the loop voltage (centre pin of TP2) with a high impedance voltmeter (0-10 volt range).

Note: It is always necessary to set transmit (CV210) before setting the receive offset (CV208).

Table 1 which yields a

PROGRAMMING OF VHF HB & LB

NB LB VHF is high side injection & IF is 10.7MHz

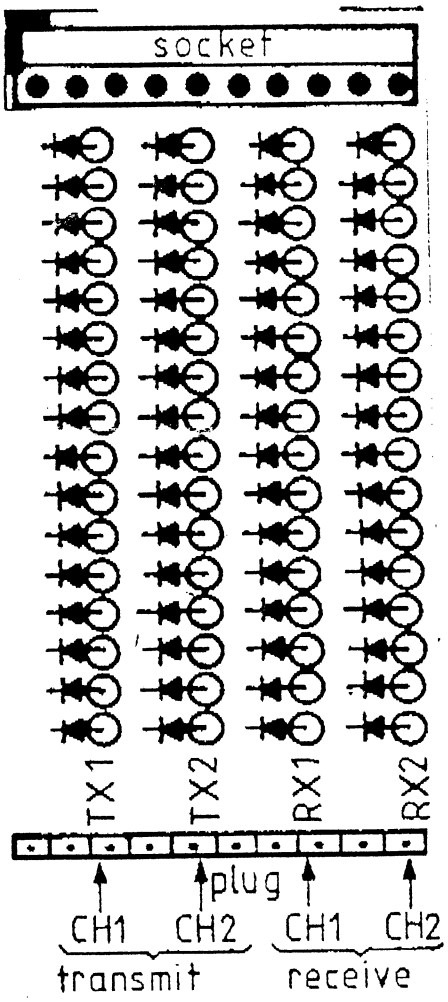
T530 Servicing

Table 1 shows how, when starting with A0, each successive diode influences the synthesizer frequency by a multiple of 6.25kHz or 5kHz in an ascending binary sequence. (Note that it is sometimes possible to have two correct solutions for one particular frequency).

Table 1

Frequency Increment 6.25kHz Ref.	5kHz Ref.	Code
128MHz	102.4MHz	N9
64MHz	51.2MHz	N8
32MHz	25.6MHz	N7
16MHz	12.8MHz	N6
8MHz	6.4MHz	N5
4MHz	3.2MHz	N4
2MHz	1.6MHz	N3
1MHz	800kHz	N2
500kHz	400kHz	N1
250kHz	200kHz	N0
200kHz	160kHz	A5
100kHz	80kHz	A4
50kHz	40kHz	A3
25kHz	20kHz	A2
12.5kHz	10kHz	A1
6.25kHz	5kHz	A0

When a diode is clipped, its corresponding frequency is added to the VCO frequency.



(Viewed from component side of diode board.)

The following examples show a simple method of calculating the correct diode programme.

Example 1

Tx frequency = 153.0MHz, 6.25kHz reference frequency.

VCO frequency:	153	
Subtract	128	cut diode N9
	25	
subtract	16	cut diode N6
	9	
subtract	8	cut diode N5
	1	
subtract	1	cut diode N2
	0	

In each case subtract the largest value from Table 1 which yields a