PHASE-LOCKED LOOP

The phase-locked loop (PLL) frequency synthesizer consists of four major circuits. They are the voltage controlled oscillator (VCO); PLL local oscillator and mixer; reference oscillator and phase detector; and programmable divider and diode matrix.

The VCO section (QV02) receives a correction voltage from the phase detector (QP02) via a low pass filter. As the transceiver changes frequency, so will the correction voltage and the VCO operating frequency. The output signal of the VCO will be buffered and amplified (QV03, QP40, QP6U) before proceeding to the mixer (QP61).

The PLL local oscillator (QP20) output frequency is tripled for the F3 to F6 ranges and doubled for the F1 to F2 ranges, by LP22 and LP23 before being applied to the mixer (QP61). The mixer heterodynes the doubled or tripled frequency with the output frequency of the VCO. The output of the mixer is amplified by QP62 and QP63, then applied to the programmable driver (QP03).

The programmable divider is provided with a Binary Coded Decimal (BCD) divide by "N" number by the diode matrix board. This number counts down the amplified signal received from the mixer. The product of this divide by "N" number should be 6.25 kHz, applied to the phase detector.

The phase detector compares the signal from the programmable divider to the signal from the reference oscillator (QP01). The reference frequency is 6.40 MHz, divided by 1024. The resulting signal output from QP01, applied to the phase detector, is 6.25 kHz. Should the two signals be in phase (at QP02) the correction voltage to the VCO will remain stable. Should the signals be out of phase the phase detector will send a corresponding correction voltage to the VCO. If the frequency synthesizer is unable to lock onto a proper correction voltage and frequency, the unlock output from QP02 will automatically inhibit the transmitter from transmitting any illegal transmissions.

PROGRAMMING FREQUENCIES

Model C866L incorporates a diode matrix board for determination of its phase-locked loop frequencies. Eight different frequencies can be programmed into the board, two for each of the four channels (receive and transmit). Each of these eight frequencies is determined by connection or non-connection of a row of thirteen diodes.

DIODE MATRIX BOARD

1. Simplex:
   Do not cut the jumper wire. Program the frequency using the RX section diode matrix. (The frequencies of RX and TX are equal.)

   Duplex:
   Cut the jumper wire. Program the RX and TX frequencies using their respective diode matrixes. When the jumper wire is cut, different RX and TX frequency programming becomes possible.

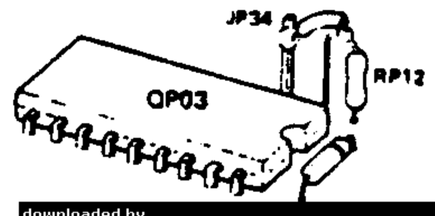
2. In model C866, the following channels are programmable.

   A. Example

F5		"N" number
162.000 MHz	) 12.5 kHz	1968
162.0125 MHz	) 12.5 kHz	1970
162.025 MHz		1972
⋮		
168.9875 MHz	) 12.5 kHz	3086
169.000 MHz		3088

   NOTE:
   "N" number input to the programmable divider (QP03) should be even. (Mass product)

   B. When the mass product unit is modified, odd "N" number are programmable. Connect pin 1 of the programmable divider QP03 and JP34 with a jumper wire.



   NOTE:
   When "N" number contains both odd and even numbers, it is not programmable.

3. To obtain "N" number from the desired frequency, use the following formula.

   F_D = Desired frequency (MHz)

   F1 band (138 ~ 144 MHz)
   $N = 160 \times (F_D - 126.7)$

   F2 band (144 ~ 150 MHz)
   $N = 160 \times (F_D - 133.5)$

   F3 band (150 ~ 157 MHz)
   $N = 160 \times (F_D - 139.2)$

   F4 band (156 ~ 163 MHz)
   $N = 160 \times (F_D - 143.7)$

   F5 band (162 ~ 169 MHz)
   $N = 160 \times (F_D - 149.7)$

   F6 band (168 ~ 174 MHz)
   $N = 160 \times (F_D - 155.7)$

DETERMINING "N" NUMBER

Before we decide binary code Numbers of Specified freq, we must calculate "N" Number with the flwng formula.

(F5 Band)

$N=160 \times (f_D-149.7)$, f_D=Freq Desired

For example RX Freq is 162.650, "N" Number becomes 2072.

Then pls refer to page 5 of Owners Operation Manual for American version. There are Numbers from 13 to 1 as below, (13) (12) (11) (10) (9) (8) (7) (6) (5) (4) (3) (2) (1)

1. **First digit of "N" Number decides code Number for above (13) and (1) as flws.**

	(13)	(1)
1 =	1	0
2 =	0	1
3 =	1	1

So if first digit is 2 out of above 2070.
(13) Means 0
(1) Means 1

2. **Second digit of "N" Number decides for (12) (11) (10) (9)**

	(12)	(11)	(10)	(9)
0 =	0	0	0	0
1 =	1	0	0	0
2 =	0	1	0	0
3 =	1	1	0	0
4 =	0	0	1	0
5 =	1	0	1	0
6 =	0	1	1	0
7 =	1	1	1	0
8 =	0	0	0	1
9 =	1	0	0	1

3. **3rd digit of "N" Number decides codes of (8) (7) (6) (5) as flws,**

	(8)	(7)	(6)	(5)
0 =	0	0	0	0
1 =	0	0	0	1
2 =	0	0	1	0
3 =	0	0	1	1
4 =	0	1	0	0
5 =	0	1	1	0
6 =	0	1	1	0
7 =	0	1	1	1
8 =	1	0	0	0
9 =	1	0	0	1

4. **4th digit of "N" Number decides codes of (4) (3) (2) as flws,**

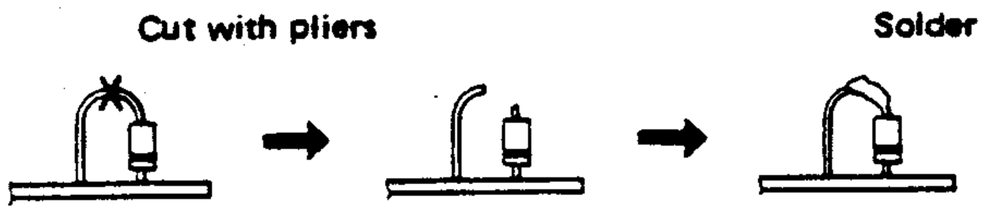
	(4)	(3)	(2)
0 =	0	0	0
2 =	0	0	1
4 =	0	1	0
6 =	0	1	1
8 =	1	0	0

For example 162.650 MHz RX of Type B equal 2072 as "N" Number then according to above codes for 4 digits 2072 becomes to:

(13)	(12)	(11)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
0	0	0	0	0	0	1	1	1	0	0	1	1

0=Diode Cutting
1=Indicates Diode in Place.

Cutting diodes



To reconnect the cut diode, solder the lead.

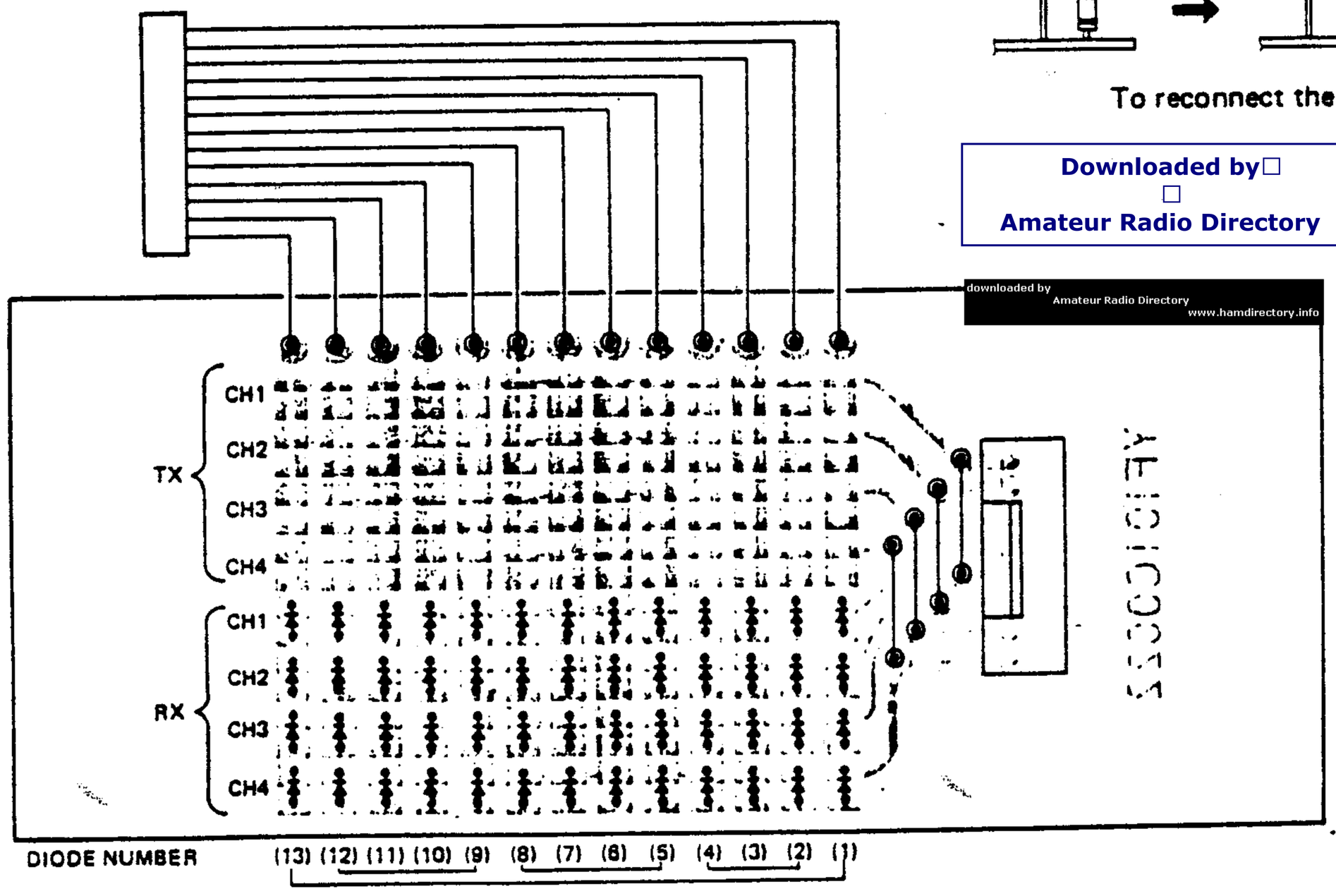


Fig. 1.

DIODE(FREQUENCY STEP MODEL)

DESIRED FREQUENCY						"N"	DIODE MATRIX NUMBER												
F_1	F_2	F_3	F_4	F_5	F_6		(13)	(12)	(11)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
	144.000					1680	1	0	1	1	0	1	0	0	0	0	0	0	0
	144.0125					1682	1	0	1	1	0	1	0	0	0	0	0	1	0
	144.025					1684	1	0	1	1	0	1	0	0	0	0	1	0	0
	144.0375					1686	1	0	1	1	0	1	0	0	0	0	1	1	0
	144.050					1688	1	0	1	1	0	1	0	0	0	1	0	0	0
	144.0625					1690	1	0	1	1	0	1	0	0	1	0	0	0	0
	144.075					1692	1	0	1	1	0	1	0	0	1	0	0	1	0
	144.0875					1694	1	0	1	1	0	1	0	0	1	0	1	0	0
	144.100					1696	1	0	1	1	0	1	0	0	1	0	1	1	0
	144.1125					1698	1	0	1	1	0	1	0	0	1	1	0	0	0
	144.125					1700	1	0	1	1	1	0	0	0	0	0	0	0	0
	144.1375					1702	1	0	1	1	1	0	0	0	0	0	0	1	0
	144.150					1704	1	0	1	1	1	0	0	0	0	0	1	0	0
	144.1625					1706	1	0	1	1	1	0	0	0	0	0	1	1	0
	144.175					1708	1	0	1	1	1	0	0	0	0	1	0	0	0
	144.1875					1710	1	0	1	1	1	0	0	0	1	0	0	0	0
	144.200					1712	1	0	1	1	1	0	0	0	1	0	0	1	0
	144.2125					1714	1	0	1	1	1	0	0	0	1	0	1	0	0
	144.225					1716	1	0	1	1	1	0	0	0	1	0	1	1	0
	144.2375					1718	1	0	1	1	1	0	0	0	1	1	0	0	0
	144.250					1720	1	0	1	1	1	0	0	1	0	0	0	0	0
	144.2625					1722	1	0	1	1	1	0	0	1	0	0	0	1	0
	144.275					1724	1	0	1	1	1	0	0	1	0	0	1	0	0
	144.2875					1726	1	0	1	1	1	0	0	1	0	0	1	1	0
	144.300	150.000				1728	1	0	1	1	1	0	0	1	0	1	0	0	0
	144.3125	150.0125				1730	1	0	1	1	1	0	0	1	1	0	0	0	0
	144.325	150.025				1732	1	0	1	1	1	0	0	1	1	0	0	1	0
	144.3375	150.0375				1734	1	0	1	1	1	0	0	1	1	0	1	0	0
	144.350	150.050				1736	1	0	1	1	1	0	0	1	1	0	1	1	0
	144.3625	150.0625				1738	1	0	1	1	1	0	0	1	1	1	0	0	0
	144.375	150.075				1740	1	0	1	1	1	0	1	0	0	0	0	0	0
	144.3875	150.0875				1742	1	0	1	1	1	0	1	0	0	0	0	1	0
	144.400	150.100				1744	1	0	1	1	1	0	1	0	0	0	1	0	0
	144.4125	150.1125				1746	1	0	1	1	1	0	1	0	0	0	1	1	0
	144.425	150.125				1748	1	0	1	1	1	0	1	0	0	1	0	0	0
	144.4375	150.1375				1750	1	0	1	1	1	0	1	0	1	0	0	0	0
	144.450	150.150				1752	1	0	1	1	1	0	1	0	1	0	0	1	0
	144.4625	150.1625				1754	1	0	1	1	1	0	1	0	1	0	1	0	0
	144.475	150.175				1756	1	0	1	1	1	0	1	0	1	0	1	1	0
	144.4875	150.1875				1758	1	0	1	1	1	0	1	0	1	1	0	0	0
	144.500	150.200				1760	1	0	1	1	1	0	1	1	0	0	0	0	0
	144.5125	150.2125				1762	1	0	1	1	1	0	1	1	0	0	0	1	0
	144.525	150.225				1764	1	0	1	1	1	0	1	1	0	0	1	0	0
	144.5375	150.2375				1766	1	0	1	1	1	0	1	1	0	0	1	1	0
	144.550	150.250				1768	1	0	1	1	1	0	1	1	0	1	0	0	0
	144.5625	150.2625				1770	1	0	1	1	1	0	1	1	1	0	0	0	0
	144.575	150.275				1772	1	0	1	1	1	0	1	1	1	0	0	1	0
	144.5875	150.2875				1774	1	0	1	1	1	0	1	1	1	0	1	0	0
	144.600	150.300				1776	1	0	1	1	1	0	1	1	1	0	1	1	0
	144.6125	150.3125				1778	1	0	1	1	1	0	1	1	1	1	0	0	0

DESIRED FREQUENCY						"N"	DIODE MATRIX NUMBER												
F_1	F_2	F_3	F_4	F_5	F_6		(13)	(12)	(11)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
	144.625	150.325				1780	1	0	1	1	1	1	0	0	0	0	0	0	0
	144.6375	150.3375				1782	1	0	1	1	1	1	0	0	0	0	0	1	0
	144.650	150.350				1784	1	0	1	1	1	1	0	0	0	0	1	0	0
	144.6625	150.3625				1786	1	0	1	1	1	1	0	0	0	0	1	1	0
	144.675	150.375				1788	1	0	1	1	1	1	0	0	0	1	0	0	0
	144.6875	150.3875				1790	1	0	1	1	1	1	0	0	1	0	0	0	0
	144.700	150.400				1792	1	0	1	1	1	1	0	0	1	0	0	1	0
	144.7125	150.4125				1794	1	0	1	1	1	1	0	0	1	0	1	0	0
	144.725	150.425				1796	1	0	1	1	1	1	0	0	1	0	1	1	0
	144.7375	150.4375				1798	1	0	1	1	1	1	0	0	1	1	0	0	0
	144.750	150.450				1800	1	1	0	0	0	0	0	0	0	0	0	0	0
	144.7625	150.4625				1802	1	1	0	0	0	0	0	0	0	0	0	1	0
	144.775	150.475				1804	1	1	0	0	0	0	0	0	0	0	1	0	0
	144.7875	150.4875				1806	1	1	0	0	0	0	0	0	0	0	1	1	0
138.000	144.800	150.500				1808	1	1	0	0	0	0	0	0	0	1	0	0	0
138.0125	144.8125	150.5125				1810	1	1	0	0	0	0	0	0	1	0	0	0	0
138.025	144.825	150.525				1812	1	1	0	0	0	0	0	0	1	0	0	1	0
138.0375	144.8375	150.5375				1814	1	1	0	0	0	0	0	0	1	0	1	0	0
138.050	144.850	150.550				1816	1	1	0	0	0	0	0	0	1	0	1	1	0
138.0625	144.8625	150.5625				1818	1	1	0	0	0	0	0	0	1	1	0	0	0
138.075	144.875	150.575				1820	1	1	0	0	0	0	0	1	0	0	0	0	0
138.0875	144.8875	150.5875				1822	1	1	0	0	0	0	0	1	0	0	0	1	0
138.100	144.900	150.600				1824	1	1	0	0	0	0	0	1	0	0	1	0	0
138.1125	144.9125	150.6125				1826	1	1	0	0	0	0	0	1	0	0	1	1	0
138.125	144.925	150.625				1828	1	1	0	0	0	0	0	1	0	1	0	0	0
138.1375	144.9375	150.6375				1830	1	1	0	0	0	0	0	1	1	0	0	0	0
138.150	144.950	150.650				1832	1	1	0	0	0	0	0	1	1	0	0	1	0
138.1625	144.9625	150.6625				1834	1	1	0	0	0	0	0	1	1	0	1	0	0
138.175	144.975	150.675				1836	1	1	0	0	0	0	0	1	1	0	1	1	0
138.1875	144.9875	150.6875				1838	1	1	0	0	0	0	0	1	1	1	0	0	0
138.200	145.000	150.700				1840	1	1	0	0	0	0	1	0	0	0	0	0	0
138.2125	145.0125	150.7125				1842	1	1	0	0	0	0	1	0	0	0	0	1	0
138.225	145.025	150.725				1844	1	1	0	0	0	0	1	0	0	0	1	0	0
138.2375	145.0375	150.7375				1846	1	1	0	0	0	0	1	0	0	0	1	1	0
138.250	145.050	150.750				1848	1	1	0	0	0	0	1	0	0	1	0	0	0
138.2625	145.0625	150.7625				1850	1	1	0	0	0	0	1	0	1	0	0	0	0
138.275	145.075	150.775				1852	1	1	0	0	0	0	1	0	1	0	0	1	0
138.2875	145.0875	150.7875				1854	1	1	0	0	0	0	1	0	1	0	1	0	0
138.300	145.100	150.800				1856	1	1	0	0	0	0	1	0	1	0	1	1	0
138.3125	145.1125	150.8125				1858	1	1	0	0	0	0	1	0	1	1	0	0	0
138.325	145.125	150.825				1860	1	1	0	0	0	0	1	1	0	0	0	0	0
138.3375	145.1375	150.8375				1862	1	1	0	0	0	0	1	1	0	0	0	1	0
138.350	145.150	150.850				1864	1	1	0	0	0	0	1	1	0	0	1	0	0
138.3625	145.1625	150.8625				1866	1	1	0	0	0	0	1	1	0	0	1	1	0
138.375	145.175	150.875				1868	1	1	0	0	0	0	1	1	0	1	0	0	0
138.3875	145.1875	150.8875				1870	1	1	0	0	0	0	1	1	1	0	0	0	0
138.400	145.200	150.900				1872	1	1	0	0	0	0	1	1	1	0	0	1	0
138.4125	145.2125	150.9125				1874	1	1	0	0	0	0	1	1	1	0	1	0	0
138.425	145.225	150.925				1876	1	1	0	0	0	0	1	1	1	0	1	1	0
138.4375	145.2375	150.9375				1878	1	1	0	0	0	0	1	1	1	1	0	0	0

C866L(12.5/25kHz STEP MODEL)

DESIRED FREQUENCY						"N"	DIODE MATRIX NUMBER													
F1	F2	F3	F4	F5	F6		(13)	(12)	(11)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
138.450	145.250	150.950				1880	1	1	0	0	0	1	0	0	0	0	0	0	0
138.4625	145.2625	150.9625				1882	1	1	0	0	0	1	0	0	0	0	0	1	0
138.475	145.275	150.975				1884	1	1	0	0	0	1	0	0	0	0	1	0	0
138.4875	145.2875	150.9875				1886	1	1	0	0	0	1	0	0	0	0	1	1	0
138.500	145.300	151.000				1888	1	1	0	0	0	1	0	0	0	1	0	0	0
138.5125	145.3125	151.0125				1890	1	1	0	0	0	1	0	0	1	0	0	0	0
138.525	145.325	151.025				1892	1	1	0	0	0	1	0	0	1	0	0	1	0
138.5375	145.3375	151.0375				1894	1	1	0	0	0	1	0	0	1	0	1	0	0
138.550	145.350	151.050				1896	1	1	0	0	0	1	0	0	1	0	1	1	0
138.5625	145.3625	151.0625				1898	1	1	0	0	0	1	0	0	1	1	0	0	0
138.575	145.375	151.075				1900	1	1	0	0	1	0	0	0	0	0	0	0	0
138.5875	145.3875	151.0875				1902	1	1	0	0	1	0	0	0	0	0	0	1	0
138.600	145.400	151.100				1904	1	1	0	0	1	0	0	0	0	0	1	0	0
138.6125	145.4125	151.1125				1906	1	1	0	0	1	0	0	0	0	0	1	1	0
138.625	145.425	151.125				1908	1	1	0	0	1	0	0	0	0	1	0	0	0
138.6375	145.4375	151.1375				1910	1	1	0	0	1	0	0	0	1	0	0	0	0
138.650	145.450	151.150				1912	1	1	0	0	1	0	0	0	1	0	0	1	0
138.6625	145.4625	151.1625				1914	1	1	0	0	1	0	0	0	1	0	1	0	0
138.675	145.475	151.175				1916	1	1	0	0	1	0	0	0	1	0	1	1	0
138.6875	145.4875	151.1875				1918	1	1	0	0	1	0	0	0	1	1	0	0	0
138.700	145.500	151.200				1920	1	1	0	0	1	0	0	1	0	0	0	0	0
138.7125	145.5125	151.2125				1922	1	1	0	0	1	0	0	1	0	0	0	1	0
138.725	145.525	151.225				1924	1	1	0	0	1	0	0	1	0	0	1	0	0
138.7375	145.5375	151.2375				1926	1	1	0	0	1	0	0	1	0	0	1	1	0
138.750	145.550	151.250				1928	1	1	0	0	1	0	0	1	0	1	0	0	0
138.7625	145.5625	151.2625				1930	1	1	0	0	1	0	0	1	1	0	0	0	0
138.775	145.575	151.275				1932	1	1	0	0	1	0	0	1	1	0	0	1	0
138.7875	145.5875	151.2875				1934	1	1	0	0	1	0	0	1	1	0	1	0	0
138.800	145.600	151.300				1936	1	1	0	0	1	0	0	1	1	0	1	1	0
138.8125	145.6125	151.3125				1938	1	1	0	0	1	0	0	1	1	1	0	0	0
138.825	145.625	151.325				1940	1	1	0	0	1	0	1	0	0	0	0	0	0
138.8375	145.6375	151.3375				1942	1	1	0	0	1	0	1	0	0	0	0	1	0
138.850	145.650	151.350				1944	1	1	0	0	1	0	1	0	0	0	1	0	0
138.8625	145.6625	151.3625				1946	1	1	0	0	1	0	1	0	0	0	1	1	0
138.875	145.675	151.375				1948	1	1	0	0	1	0	1	0	0	1	0	0	0
138.8875	145.6875	151.3875				1950	1	1	0	0	1	0	1	0	1	0	0	0	0
138.900	145.700	151.400				1952	1	1	0	0	1	0	1	0	1	0	0	1	0
138.9125	145.7125	151.4125				1954	1	1	0	0	1	0	1	0	1	0	1	0	0
138.925	145.725	151.425				1956	1	1	0	0	1	0	1	0	1	0	1	1	0
138.9375	145.7375	151.4375				1958	1	1	0	0	1	0	1	0	1	1	0	0	0
138.950	145.750	151.450				1960	1	1	0	0	1	0	1	1	0	0	0	0	0
138.9625	145.7625	151.4625				1962	1	1	0	0	1	0	1	1	0	0	0	1	0
138.975	145.775	151.475				1964	1	1	0	0	1	0	1	1	0	0	1	0	0
138.9875	145.7875	151.4875				1966	1	1	0	0	1	0	1	1	0	0	1	1	0
139.000	145.800	151.500	156.000	162.000	168.000	1968	1	1	0	0	1	0	1	1	0	1	0	0	0
139.0125	145.8125	151.5125	156.0125	162.0125	168.0125	1970	1	1	0	0	1	0	1	1	1	0	0	0	0
139.025	145.825	151.525	156.025	162.025	168.025	1972	1	1	0	0	1	0	1	1	1	0	0	1	0
139.0375	145.8375	151.5375	156.0375	162.0375	168.0375	1974	1	1	0	0	1	0	1	1	1	0	1	0	0
139.050	145.850	151.550	156.050	162.050	168.050	1976	1	1	0	0	1	0	1	1	1	0	1	1	0
139.0625	145.8625	151.5625	156.0625	162.0625	168.0625	1978	1	1	0	0	1	0	1	1	1	1	0	0	0

DESIRED FREQUENCY						"N"	DIODE MATRIX NUMBER													
F1	F2	F3	F4	F5	F6		(13)	(12)	(11)	(10)	(9)	(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)
139.075	145.875	151.575	156.075	162.075	168.075	1980	1	1	0	0	1	1	0	0	0	0	0	0	0
139.0875	145.8875	151.5875	156.0875	162.0875	168.0875	1982	1	1	0	0	1	1	0	0	0	0	0	1	0
139.100	145.900	151.600	156.100	162.100	168.100	1984	1	1	0	0	1	1	0	0	0	0	1	0	0
139.1125	145.9125	151.6125	156.1125	162.1125	168.1125	1986	1	1	0	0	1	1	0	0	0	0	1	1	0
139.125	145.925	151.625	156.125	162.125	168.125	1988	1	1	0	0	1	1	0	0	0	1	0	0	0
139.1375	145.9375	151.6375	156.1375	162.1375	168.1375	1990	1	1	0	0	1	1	0	0	1	0	0	0	0
139.150	145.950	151.650	156.150	162.150	168.150	1992	1	1	0	0	1	1	0	0	1	0	0	1	0
139.1625	145.9625	151.6625	156.1625	162.1625	168.1625	1994	1	1	0	0	1	1	0	0	1	0	1	0	0
139.175	145.975	151.675	156.175	162.175	168.175	1996	1	1	0	0	1	1	0	0	1	0	1	1	0
139.1875	145.9875	151.6875	156.1875	162.1875	168.1875	1998	1	1	0	0	1	1	0	0	1	1	0	0	0
139.200	146.000	151.700	156.200	162.200	168.200	2000	0	0	0	0	0	0	0	0	0	0	0	0	1
139.2125	146.0125	151.7125	156.2125	162.2125	168.2125	2002	0	0	0	0	0	0	0	0	0	0	0	1	1
139.225	146.025	151.725	156.225	162.225	168.225	2004	0	0	0	0	0	0	0	0	0	0	1	0	1
139.2375	146.0375	151.7375	156.2375	162.2375	168.2375	2006	0	0	0	0	0	0	0	0	0	0	1	1	1
139.250	146.050	151.750	156.250	162.250	168.250	2008	0	0	0	0	0	0	0	0	0	1	0	0	1
139.2625	146.0625	151.7625	156.2625	162.2625	168.2625	2010	0	0	0	0	0	0	0	0	1	0	0	0	1
139.275	146.075	151.775	156.275	162.275	168.275	2012	0	0	0	0	0	0	0	0	1	0	0	1	1
139.2875	146.0875	151.7875	156.2875	162.2875	168.2875	2014	0	0	0	0	0	0	0	0	1	0	1	0	1
139.300	146.100	151.800	156.300	162.300	168.300	2016	0	0	0	0	0	0	0	0	1	0	1	1	1
139.3125	146.1125	151.8125	156.3125	162.3125	168.3125	2018	0	0	0	0	0	0	0	0	1	1	0	0	1
139.325	146.125	151.825	156.325	162.325	168.325	2020	0	0	0	0	0	0	0	1	0	0	0	0	1
139.3375	146.1375	151.8375	156.3375	162.3375	168.3375	2022	0	0	0	0	0	0	0	1	0	0	0	1	1
139.350	146.150	151.850	156.350	162.350	168.350	2024	0	0	0	0	0	0	0	1	0	0	1	0	1
139.3625	146.1625	151.8625	156.3625	162.3625	168.3625	2026	0	0	0	0	0	0	0	1	0	0	1	1	1
139.375	146.175	151.875	156.375	162.375	168.375	2028	0	0	0	0	0	0	0	1	0	1	0	0	1
139.3875	146.1875	151.8875	156.3875	162.3875	168.3875	2030	0	0	0	0	0	0	0	1	1	0	0	0	1
139.400	146.200	151.900	156.400	162.400	168.400	2032	0	0	0	0	0	0	0	1	1	0	0	1	1
139.4125	146.2125	151.9125	156.4125	162.4125	168.4125	2034	0	0	0	0	0	0	0	1	1	0	1	0	1
139.425	146.225	151.925	156.425	162.425	168.425	2036	0	0	0	0	0	0	0	1	1	0	1	1	1
139.4375	146.2375	151.9375	156.4375	162.4375	168.4375	2038	0	0	0	0	0	0	0	1	1	1	0	0	1
139.450	146.250	151.950	156.450	162.450	168.450	2040	0	0	0	0	0	0	1	0	0	0	0	0	1
139.4625	146.2625	151.9625	156.4625	162.4625	168.4625	2042	0	0	0	0	0	0	1	0	0	0	0	1	1
139.475	146.275	151.975	156.475	162.475	168.475	2044	0	0	0	0	0	0	1	0	0	0	1	0	1
139.4875	146.2875	151.9875	156.4875	162.4875	168.4875	2046	0	0	0	0	0	0	1	0	0	0	1	1	1
139.500	146.300	152.000	156.500	162.500	168.500	2048	0	0	0	0	0	0	1	0	0	1	0	0	1
139.5125	146.3125	152.0125	156.5125	162.5125	168.5125	2050	0	0	0	0	0	0	1	0	1	0	0	0	1
139.525	146.325	152.025	156.525	162.525	168.525	2052	0	0	0	0	0	0	1	0	1	0	0	1	1
139.5375	146.3375	152.0375	156.5375	162.5375	168.5375	2054	0	0	0	0	0	0	1	0	1	0	1	0	1
139.550	146.350	152.050	156.550	162.550	168.550	2056	0	0	0	0	0	0	1	0	1	0	1	1	1
139.5625	146.3625	152.0625	156.5625	162.5625	168.5625	2058	0	0	0	0	0	0	1	0	1	1	0	0	1
139.575	146.375	152.075	156.575	162.575	168.575	2060	0	0	0	0	0	0	1	1	0	0	0	0	1
139.5875	146.3875	152.0875	156.5875	162.5875	168.5875	2062	0	0	0	0	0	0	1	1	0	0	0	1	1
139.600	146.400	152.100	156.600	162.600	168.600	2064	0	0	0	0	0	0	1	1	0	0	1	0	1
139.6125	146.4125	152.1125	156.6125	162.6125	168.6125	2066	0	0	0	0	0	0	1	1	0	0	1	1	1
139.625	146.425	152.125	156.625	162.625	168.625	2068	0	0	0	0	0	0	1	1	0	1	0	0	1
139.6375	146.4375	152.1375	156.6375	162.6375	168.6375	2070	0	0	0	0	0	0	1	1	1	0	0	0	1
139.650	146.450	152.150	156.650	162.650	168.650	2072	0	0	0	0	0	0	1	1	1	0	0	1	1
139.6625	146.4625	152.1625	156.6525	162.6625	168.6625	2074	0	0	0	0	0	0	1	1	1	0	1	0	1
139.675	146.475	152.175	156.675	162.675	168.675	2076	0	0	0	0	0	0	1	1	1	0	1	1	1
139.6875	146.4875	152.1875	156.6875	162.6875	168.6875	2078	0	0	0	0	0	0	1	1	1	1	0	0	1