

FC 802 - Programming.Contents.

1. FC 802.
2. Information required for programming.
3. Recommended x-tal lists.
4. "N" number calculation formulas.
5. PROM - programming list.
6. Example.

1. FC 802.

The frequency control unit FC 802 is intended for programming the programmable divider in PL 801. 11 channels can be selected (it is expanded to 12 in CH 8019)
The FC 802 consists of a decimal to binary decoder, a plug-in PROM (32 x 8) and a PROM controller.

2. Programming informations.

Given :

- channel spacing.
- lowest and highest RX-frequency.
- lowest and highest TX-frequency.
- frequency of other wanted RX/TX channels.

3. Recommended x-tal lists.

Read introduction to standard-x-tals.
no. 19J706720.

"List of standard crystals".

no. 19J707408

"List of standard crystals" for "4m" 68-88MHz.

L 30

Rev. 1 Added "4m" 82.05.03

REVISIONS

THIRD ANGLE PROJECTION



FIRST ANGLE PROJECTION



SI-METRIC

PRINTS TO

APPV	DATE	TITLE	FIRST MADE FOR
KAH	22/12 -80	PROGRAMMING. FC 802	FC 802.
MADE BY		F.C.F.O.	
ISSUED		19J706721	
KAH 80 DEC. 9		2	
1980 DEC 29		SH NO. 1	
GENERAL ELECTRIC		CONT ON SHEET	
Storno		2	

4. "N" Number calculation.

401 CQP 81x - 2m.

After selecting the down-conversion crystals, "N" can be calculated.

$$RX: N = \frac{f_{RX} - 21.4 - f_{XO 811}}{f_{ref.}} \quad (f \text{ in MHz}) \quad (1)$$

$$TX: N = \frac{f_{TX} - f_{crystal XO 817 \times 3}}{f_{ref.}} \quad (2)$$

The reference frequency can be found on no. 19J706583.

402 CQP 83x - 4m.

After selecting the down-conversion crystal, "N" can be calculated.

$$RX: N = \frac{f_{RX} + 21.4 - f_{XO 831}}{f_{ref.}} \quad (f \text{ in MHz}) \quad (3)$$

$$TX: N = \frac{f_{TX} - f_{crystal XO 833 \times 4}}{f_{ref.}} \quad (4)$$

The reference frequency can be found on no. 19J706583.

5. PROM - programming list.

Prepare a list for wanted frequency versus calculated "N" numbers (see page 5).
Translate "N" numbers to hexadecimal code using conversion table included at page 7.

Fill the hex code to the list. This list should be the basis for the PROM burning.
Additional hwx code to binary conversion table at page 8 can be used to check the burned PROM.

Added "4m" 02.05.03 Rev. 1		REVISIONS		L 30	
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KAH	23/12-80	PROGRAMMING. FC 802.		F.C.F.O.	
MADE BY KAH 80 DEC. 9		GENERAL ELECTRIC		19J706721	
ISSUED 1980 DEC 29		Storno		CONT ON SHEET 3 SH NO 2	

6. Example.

An example is given to clarify the procedure for CQP 813Us using the sample list at page 5.

Given:

Channel spacing	25 kHz
Lowest RX frequency	151.3 MHz
Highest RX frequency	152.9 MHz
Lowest TX frequency	151.5 MHz
Highest TX frequency	152.95 MHz

Frequency of other wanted RX channels.

151.450	151.750
151.575	151.800
151.600	151.900
151.625	152.500

Frequency of other wanted TX channels.

151.550	151.750
151.575	151.800
151.600	151.900
151.625	152.500

From 19J706583, select the reference frequency = 0.00625 for 25kHz channel spacing.

Find the relevant section of the recommended x-tal list.

From sheet 5 right frequency column, recommended RX-x-tal: 128.5 MHz covering 150.7 - 153.075 MHz. This is done because the preferred frequency range does not cover the wanted range and it means that a special VCO-adjustment procedure is required. (Read 39.110).

L 30

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	-80	MADE BY KAH 80 DEC. 9		GENERAL ELECTRIC		19J706721		
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From sheet 3 left column, recommended TX x-tal : 49.96667
covering 151.500 - 153.075 MHz.

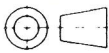

This means that the TX-VCO can be adjusted according to the normal adjustment procedure.

Calculate RX and TX "N" numbers according to eq. (1) and (2) respectively. Start filling these information to the list given at page 5. Place the wanted RX and TX frequencies and the corresponding "N" numbers on the same lines as the wanted knob-positions.

Convert the "N" numbers to hex code, by using the conversion list shown on page 7, and write these to the appropriate column.

Now all information needed to burn the PROM is listed.

PROM specification: 32 x 8, open collector with J package No. 19J706247P1.

				L 30	
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		MADE BY		FIRST MADE FOR FC 802	
		KAH 80 DEC. 9.		F.C.F.O.	
		ISSUED		19J706721	
		1980 DEC 29		CONT ON SHEET 5 SH NO. 4	
		GENERAL ELECTRIC			
		Storno			

Sample list.

Knob pas.	Wanted RX Frequency	PROM Address	Calculated "N"	Hex code.
1	151.300	10	224	70
2	151.450	11	248	7C
3	151.575	12	268	86
4	151.600	13	272	88
5	151.625	14	276	8A
6	151.750	15	296	94
7	151.800	16	304	98
8	151.900	17	320	A0
9	152.500	18	416	D0
10	152.900	19	480	F0
11		1A		
12		1B		

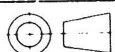
Knob pas.	Wanted TX Frequency	PROM Address	Calculated "N"	Hex code.
1	151.500	00	256	80
2	151.550	01	264	84
3	151.575	02	268	86
4	151.600	03	272	88
5	151.625	04	276	8A
6	151.750	05	296	94
7	151.800	06	304	98
8	151.900	07	320	A0
9	152.500	08	416	D0
10	152.950	09	488	F4
11		0A		
12		0B		

Recommended RX x-tal: 128.5 MHz.
 Recommended TX x-tal: 49.96667 MHz.
 Reference x-tal: 6.4 MHz.

L 30

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		MADE BY KAH 80 DEC. 9		F.C.F.O.	
		ISSUED 1980 DEC 29		19J706721	
		GENERAL ELECTRIC Storno		CONT ON SHEET 6 SH NO. 5	

List for programming the PROM in FC 802.

19J706721

CONT ON SHEET

7

SH NO.

6

Knob pos.	Wanted RX Frequency	PROM Address	Calculated "N"	Hex code
1		10		
2		11		
3		12		
4		13		
5		14		
6		15		
7		16		
8		17		
9		18		
10		19		
11		1A		
12		1B		

Knob pos.	Wanted TX Frequency	PROM Address	Calculated "N"	Hex code
1		00		
2		01		
3		02		
4		03		
5		04		
6		05		
7		06		
8		07		
9		08		
10		09		
11		0A		
12		0B		

Recommended RX x-tal: _____
 Recommended TX x-tal: _____
 Reference x-tal: _____

L 30

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APPV	DATE	TITLE		FIRST MADE FOR	
KAH	11/12	PROGRAMMING. FC 802		FC 802	
	-80	MADE BY		F.C.F.O.	
		KAH 80 DEC. 9		19J706721	
		ISSUED		1980 DEC 29	
			GENERAL ELECTRIC		
			Storno		
			CONT ON SHEET		7 SH NO. 6

LSD of hex code.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
4	128	130	132	134	136	138	140	142	144	146	148	150	152	154	156	158
5	160	162	164	166	168	170	172	174	176	178	180	182	184	186	188	190
6	192	194	196	198	200	202	204	206	208	210	212	214	216	218	220	222
7	224	226	228	230	232	234	236	238	240	242	244	246	248	250	252	254
8	256	258	260	262	264	266	268	270	272	274	276	278	280	282	284	286
9	288	290	292	294	296	298	300	302	304	306	308	310	312	314	316	318
A	320	322	324	326	328	330	332	334	336	338	340	342	344	346	348	350
B	352	354	356	358	360	362	364	366	368	370	372	374	376	378	380	382
C	384	386	388	390	392	394	396	398	400	402	404	406	408	410	412	414
D	416	418	420	422	424	426	428	430	432	434	436	438	440	442	444	446
E	448	450	452	454	456	458	460	462	464	466	468	470	472	474	476	478
F	480	482	484	486	488	490	492	494	496	498	500	502	504	506	508	510

MSD of hex code.

"N" numbers.

"N" number to hex code conversion table.

Example: "N" = 426 equals to hex code D5.

"N" = 292 equals to hex code 92.

This is not a "normal"
decimal-to-hex con-
version table. It is
modified for this use
only.

L 30

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PRINTS TO

APPV

DATE

TITLE

PROGRAMMING. FC 802

FIRST MADE FOR FC 802

F.C.F.O.

KAH

21/12
-80

MADE BY

KAH 80 DEC. 9

ISSUED

1980 DEC 29

GENERAL ELECTRIC
Storno

CONT ON SHEET

8




19J706721

SH NO. 7

PIN	7	6	5
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1
8	0	0	0
9	0	0	1
A	0	1	0
B	0	1	1
C	1	0	0
D	1	0	1
E	1	1	0
F	1	1	1

Hex code to binary conversion table.
Example: 3B equals to binary code 0011 1011

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KAH	21/12	PROGRAMMING. FC 802					F.C.F.O.						
	-80	MADE BY		KAH 80 DEC. 9		 GENERAL ELECTRIC Storno		19J706721					
		ISSUED		1980 DEC 29				CONT ON SHEET F SH NO. 8					