

FYG-4

FREQUENCY PROGRAMMER

OPERATING

MANUAL

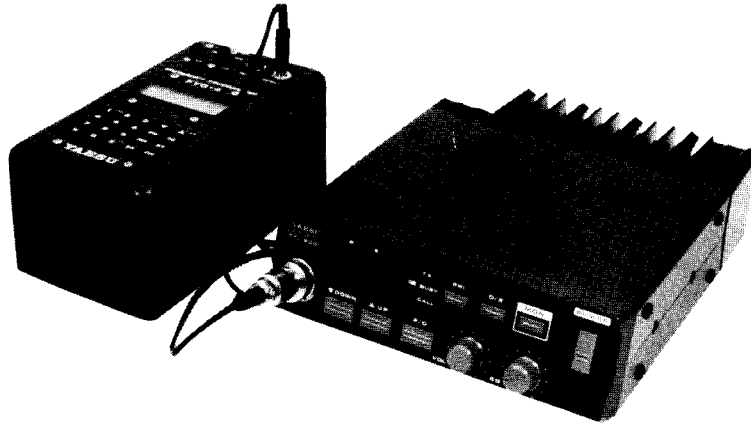


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FYG-4 CHANNEL FREQUENCY PROGRAMMER
FOR YAESU FTL-2001/-7002 MOBILE TRANSCEIVERS



The FYG-4 is a microprocessor-controlled channel data programmer for the Yaesu FTL-2001 VHF and FTL-7002 UHF land mobile transceivers. Simplex and semi-duplex channel frequencies can be programmed, along with EIA standard RS-220-A subaudible CTCSS tones when the FTS-14 Tone Squelch Unit is installed in the transceiver.

The FYG-4 can be either manually programmed, or automatically programmed by transfer of data from a preprogrammed transceiver. In either case, data in the FYG-4 can be freely modified, and then transferred back to any number of transceivers to change or initially program them with new data. Once programmed, data is retained by an EEPROM in the FYG-4 indefinitely.

The FYG-4 can be operated portably by installing six UM-3 dry batteries, or from the AC mains by using the Yaesu NC-9 battery charger as a source of 9V DC. A shielded cable is provided for data transfer to and from transceivers.

CONTROLS AND CONNECTORS

(1) IN/OUT Jack

This 3-contact jack accepts data input from a transceiver to program the FYG-4, and provides output of FYG-4 data to a transceiver. The supplied programming cable connects between this jack and the microphone jack of the transceiver.

(2) DC IN Jack

This 2-contact jack accepts 9V DC for operation from the NC-9 Charger, when used as a power supply. When this jack is used the internal dry cell batteries are disconnected (the NC-9 does NOT function as a charger for the batteries in the FYG-4).

(3) POWER ON/OFF Switch

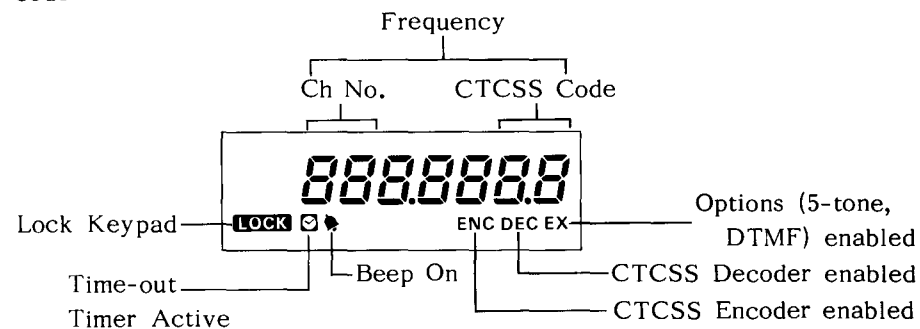
This switch turns the FYG-4 on and off. When operating from the internal batteries, make sure to switch the FYG-4 off when not in use.

(4) TX/RX Switch

On semi-duplex channels, this switch allows confirmation of the transmit frequency on the display.

(5) Display

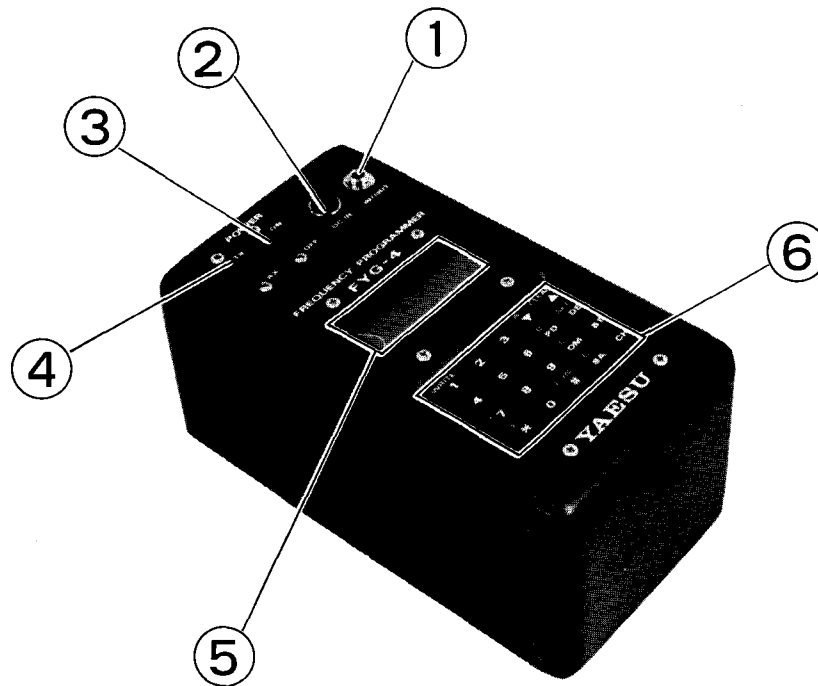
This 7-digit LCD shows frequency, channel number and CTCSS tone code:



(6) Keypad

These 20 keys are used to enter and check programming data in the FYG-4. Most keys have two functions, depending upon the mode of operation of the FYG-4 (Writing Data, or Simulating Operation). Normally, if the FYG-4 POWER switch is simply turned on, the keypad and display simulate transceiver operation. However, if the ^{WRITE} **1** key is held down while the POWER switch is turned on, and "AAAA" is then keyed in, the keypad is activated for writing data.

KEY	Simulate mode	Write mode	Display
^{WRITE} 1	Number 1	Number 1	<i>1</i>
2 ~ 0	Numbers 2,3,4,...0	Number 2,3,4,...0	<i>2~0</i>
^A ▼	Step Channel Down	Hex Number A	<i>A</i>
^{CLEAR} ▲	Step Channel Up	Erase or Skip Data	
^B PD	(no function)	Hex Number B	<i>b</i>
^{SET} DE	(no function)	Gen'l Parameter Prog.	
^C DM	Change Channel Parameter	Hex Number C	<i>C</i>
BT	Keypad Beeper On/Off	(no function)	•
^D SA	(no function)	Hex Number D	<i>d</i>
CH	Select Ch (after entering Ch No.)	(no function)	
^E *	Keypad Lock (hold >1 sec.)	Hex Number E	LOCK , <i>E</i>
^{F/IN} #	Transfer Data	Hex Number F	<i>F</i>



Battery Installation, Power Connections

Before operating the FYG-4 for the first time, remove the four screws affixing the rear cover and install six UM-3 dry cell batteries according to the polarity marked in the battery holder. To operate the FYG-4 from the AC mains, connect the appropriate NC-9 battery charger to the DC IN jack (NC-9B for 110-120VAC, or NC-9C for 220-240VAC), and to the AC outlet.

PROGRAMMING PROCEDURES

OVERVIEW (see Flowchart 1)

Installing or changing the data in a transceiver will generally involve the following procedures:

- I. Upload* data from one transceiver to the FYG-4.
- II. Alter the data in the FYG-4 as required.
- III. Download the altered data from the FYG-4 to transceiver(s).

Skipping Procedure I.: If the FYG-4 is already loaded

If the FYG-4 has been previously uploaded with data from a transceiver having some parameters (such as PLL parameters or lowest channel frequencies) the same as the target transceiver(s), uploading may be skipped, and only the parameters (such as channel frequencies) that are different need to be altered in Procedure II. Uploading allows much time to be saved in programming, since it will only be necessary to alter the data that is different between the source and target transceivers. New transceivers from the factory, if ordered without channel programming, still come with the General Parameters pre-programmed, so these will not normally need to be altered (unless timers need to be changed or certain options are added).

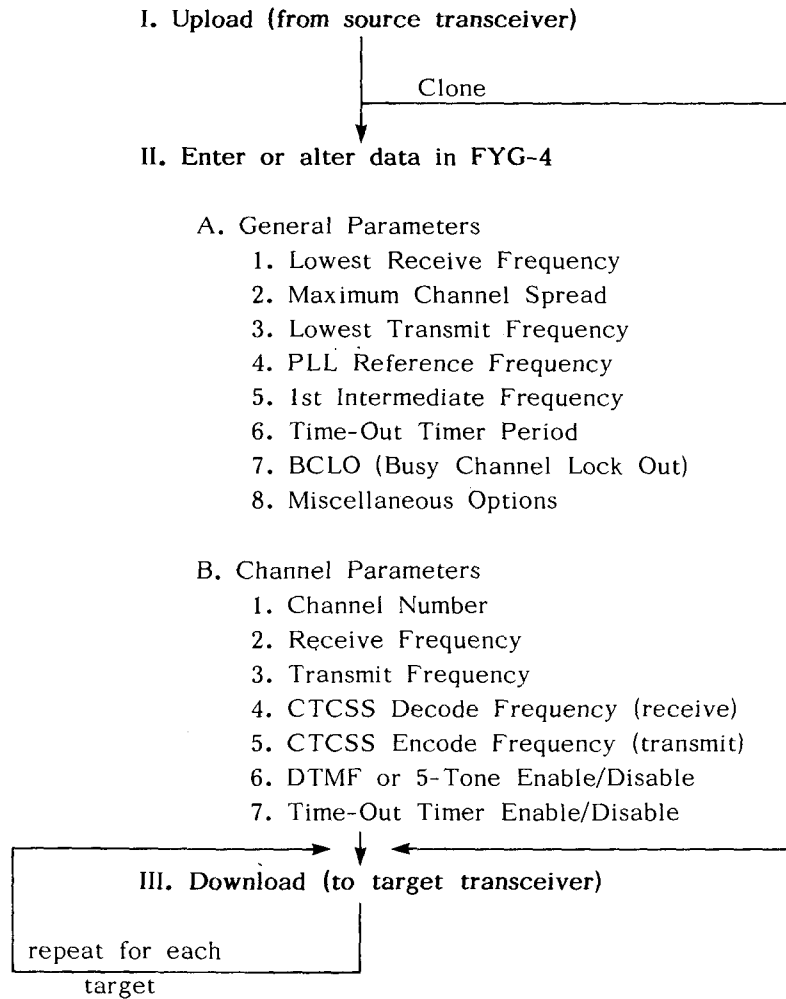
Skipping Procedure II.: Cloning

After the FYG-4 has been programmed once (either manually, or by uploading from a transceiver), it is generally only necessary to modify the data in the FYG-4 for different transceiver requirements before downloading. The EEPROM (memory) in the FYG-4 will hold its contents indefinitely. However, if adding transceivers to widely different networks, it may be more practical to upload from an existing (source)

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- * "Upload" = moving data from a source transceiver to the FYG-4. "Download" = moving data from the FYG-4 to a target transceiver.

transceiver in the network and then download it without alteration to the new (target) transceiver(s) in the same network (in other words, clone the data). Of course when adding more than one transceiver with the same programming data, uploading and data alteration may only need to be done once, with the downloading procedure repeated for each target transceiver.

Flowchart I. OVERVIEW OF PROGRAMMING PROCEDURES



UPLOADING AND DOWNLOADING THE FYG-4

When ready to upload or download, switch both the FYG-4 and transceiver off, and connect the IN/OUT jack on the FYG-4 to the MIC jack on the transceiver using the supplied programming cable.

To upload data from a source transceiver (either new, or previously programmed with some or all of the required data),

- (1) Press and hold the F/IN
button on the FYG-4 while turning the FYG-4 POWER switch on.
- (2) Press the power switch on the transceiver (the transceiver display should show two zeros).
- (3) After 21 seconds both displays should show the lowest programmed channel number (if a continuous beep was heard, the data transfer failed).
- (4) Switch off both the transceiver and FYG-4, and remove the programming cable.

To download data from the FYG-4 to a target transceiver,

- (1) Press and hold the PRI button on the transceiver while turning the transceiver POWER switch on (the transceiver display should show two zeros).
- (2) Turn on the POWER switch on the FYG-4.
- (3) After 21 seconds the FYG-4 will beep briefly, and both displays should show the lowest programmed channel number (if a continuous beep was heard, the data transfer failed).
- (4) Switch off both the transceiver and FYG-4, and remove the programming cable.


DISPLAYING AND ALTERING DATA


Each transceiver requires two types of data: General Parameters and Channel Parameters. See Parts II.A and II.B in Flowchart I. This data will have been uploaded from a source transceiver into the FYG-4, where it can be displayed and modified before downloading to the target transceiver(s). Procedures for viewing and altering the General and Channel parameters are quite different, and so are described separately. Also, complete key-by-key examples of each procedure are provided starting on page 18. If any steps in the descriptions are unclear, please take the time to step through the example of that procedure.


The General Parameters are specific to the circuitry (and installed options) of the transceiver, and are common to all channels. These parameters are initially programmed in all transceivers after alignment at the factory, so normally you will only need to upload them from a source or target transceiver. The only cases where you may need to alter the General Parameters would be when you need to program a different frequency spread, time-out timer period or option. However, you will want to check the General Parameters that have been uploaded to the FYG-4, either to determine how a transceiver is set up, or to confirm the desired settings before downloading.

The Channel Data Parameters are different for each channel, and unless you are cloning the source transceiver channels to the target transceiver(s), these must be altered for each new or changed operating channel, as described starting on page 12.

Displaying General Parameter Codes

Press and hold  while turning on the POWER switch (this brings up the Write Mode)

Press  four times (to enter hexadecimal AAAA).

Press  to select General Parameter display.

A four-digit hexadecimal code is now displayed. The left-most two digits are the EEPROM address (02 to 12), and the right-most two digits are the 4-bit (nybble) codes at that address. Parameters are represented by one to three of these code digits, as described in Table I.

Press to step forward sequentially through each of the General Parameter addresses, for display or alteration.

Altering General Parameters

- (1) To change a General Parameter, refer to Tables I - V to determine the code* that corresponds with the parameter you want to change. Then refer to Table I to determine the address(es) in which the code for that parameter is stored.
- (2) Next, while displaying the general parameter codes, press until the address of the code is displayed, and make note of the two code digits currently stored at that address**.
- (3) In the case of 3-digit channel range frequencies (which occupy one and a half addresses), key in only the hundreds and tens of MHz digits now, and press again to select the next address. Then go on to the next step.

* Channel range frequencies are keyed in directly as three decimal MHz digits, as indicated in Table I. All other parameters are hexadecimally coded.

** Any time you key in a new parameter code, the new digit will appear at the right end of the display. Therefore, to avoid disrupting the order of the parameters in the address space, you must always enter two code digits, even when you only wish to change one of them. This is the reason for taking note of both code digits: one may have to be re-entered.




































- (4) Key in the two code digits: entering the one that should finally appear at the right end of the display last (the first code entered will shift one place to the left when the second is entered). One of these digits will be the one you are altering, and the other will be one of the two you noted in step (2).
- (5) When the display shows the parameter codes you desire, press  to set them into the memory.
- (6) Switch the FYG-4 off before displaying or altering channel data, or downloading.

Table I. General Parameter Address Space Utilization

Circled numbers indicate data digit locations in the EEPROM address space - NOT actual values. Groupings of digits for each General Parameter are shown at the right. Actual parameter values associated with the codes are shown in Tables II - V.

Address	Data	Group	Parameter & Value (or Table Reference)
0 2	 	→	Lowest Receive Frequency (3 digits, MHz)
0 3	 	→	Channel Spread, in MHz (see Table II)
0 4	 	→	Lowest Transmit Freq. (3 digits, MHz)
0 5	 	→	PLL Prescale/Ref. Frequency (Table III)
0 6	 	→	1st IF (Table IV)
0 7	 	→	Time Out Timer Period (Table V)
0 8	 	→	BCLO (0 = ENABLED, F = DISABLED)
0 9	 	→	For Miscellaneous Options (see Option Instructions for Data Codes)
0 A	 		
0 B	 		
0 C	 		
0 D	 		
0 E	 		
0 F	 		
1 0	 		
1 1	 		
1 2	 		

NOTE: All data in unused addresses after address 07 should be set to "FF".

TABLE II. Channel Spread Parameter Codes

This is the difference, in MHz, between the highest and lowest operating frequencies (transmit or receive) to be programmed in the transceiver.

Code Digit	1	2	3	4	5	6	7	8	9	0
Spread (MHz)	4	8	12	16	20	24	28	32	36	40

TABLE III. PLL Prescaler/Reference Frequency Parameter Codes

This code represents a combination of prescaler dividing ratio and (divided) reference frequency in the PLL circuit of the transceiver.

Code Digit	0	1	2	3	4	5	6
Prescaler Ratio	128	128	128	128	64	64	64
Reference (kHz)	5	6.25	10	12.5	5	6.25	10

TABLE IV. 1st Intermediate Frequency

This is the frequency of the 1st IF of the transceiver, in MHz. Positive values indicate additive mixing at the 1st mixer, negative values indicate subtractive mixing.

Code Digits	0F	1F	2F	3F	4F	5F	6F
1st IF	16.9	21.4	45.0	54.5	58.1	-16.9	-21.4

TABLE V. Time Out Timer Period

This is the maximum allowable length (in seconds) of continuous transmission, after which the transceiver will return to receive automatically. Note that the Time Out Timer is only active on channels where it is enabled (by setting another code in the Channel Programming Procedure).

Code	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Time	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480

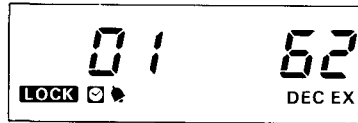
Displaying Channel Parameters

Please take a moment to refer back to the Channel Parameters in section II.B in Flowchart 1 on page 6. If the source transceiver from which you have uploaded the FYG-4 was already programmed with channel data, you may want to review the data before making additions or changes. Also, after programming new channel data you may want to confirm that it has been entered as you intended before downloading to a target transceiver. Otherwise, if you know that the source transceiver has not been previously programmed with channel data, skip right to Programming New Channel Data.

To view previously programmed channel data:

With the TX/RX switch set to RX, turn on the POWER switch (this brings up the Simulation Mode)

(Sample Display:)



The FYG-4 display shows a channel number at the left, and, if the CTCSS option is installed and activated for decode, a CTCSS code number (Table VI) with "DEC" underneath. A bell icon also appears beneath the channel number indicating the keypad beeper is active. If an optional 5-Tone Unit or DTMF decoder is installed and requires access to data in the General Parameters in memory for operation on the selected channel, "EX" is displayed at the lower right corner.

Slide the TX/RX switch to TX to check the CTCSS code (if installed) for transmission ("ENC" is displayed underneath, if active). Also, if the time-out timer is armed on this channel, a clock icon will appear next to the bell icon, and after the programmed time-out period, the display will revert to the receive state (so that you can check the time-out timer period). Make certain to return the TX/RX switch to the RX position before proceeding.

NOTE: When the TX/RX switch is set to TX the keypad is disabled, as the FYG-4 is simulating transmission. Set this switch back to RX to re-enable the keypad.

To display the receive frequency of this channel, press \boxed{c} \boxed{DM} . When the receive frequency is displayed, you can then check the transmit frequency by sliding the TX/RX switch to TX, then return the switch to RX.

Press the down and up arrow keys to select other channels for checking.

Programming New Channel Data

Data for each channel is stored in seven consecutive blocks, each consisting of one, two or three or seven digits, as follows;

Parameter	No. of Digits	Valid Range (Decimal)
Channel No.	two	00 to 79
Receive Freq.	seven	*
Transmit Freq.	seven	*
Rx CTCSS Tone Code	three	021 to 062 and 100**
Tx CTCSS Tone Code	three	" " " "
Optional Unit	one	0 (Enable) or 1 (Disable)
Time-Out Timer	one	" " " " "

↓	↙	↘	↘	↘	↘	↘
Ch No.	Rx Frequency	Tx Frequency	Rx Tone	Tx Tone	Opt.	TOT

* All channel frequencies must conform to the General Parameters already programmed. That is, they must be above the low channel frequency limits, within the programmed band, and be on a multiple of the PLL reference frequency.

** exc. 22, 24, 26, 28 & 29. Invalid entries are accepted by FYG-4, but results are unpredictable in transceiver.

To program any parameter the required number of digits must be entered, followed by the $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ key, which will cause the FYG-4 to accept the new value and access the next parameter (note, however, digits previously entered remain on the display until a new entry is started). If a parameter does not need to be changed, pressing only $\begin{matrix} \text{CLEAR} \\ \blacktriangle \end{matrix}$ will cause that parameter to be skipped, and the next one accessed.

The following procedure describes how to enter all new data for one channel. The KEYPAD ERROR RECOVERY box on page 16 describes what to do if you make a mistake. See also the New Channel Programming Example on page 19.

- (1) Press and hold the $\begin{matrix} \text{WRITE} \\ 1 \end{matrix}$ key while turning the FYG-4 POWER switch on (the display should remain blank).
- (2) Press $\begin{matrix} \blacktriangledown \\ \blacktriangledown \end{matrix}$ four times to activate the Write mode for data entry (the display should now show two zeros, indicating that the FYG-4 is ready to accept a channel number).
- (3) Enter two digits for the Channel Number you wish to program*. Confirm that the display now shows this number in the rightmost two digit locations. If you want to clear any previous data in this channel, press $\begin{matrix} \text{CLEAR} \\ \blacktriangle \end{matrix}$.
- (4) Press $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ to step to the next parameter (Receive Frequency).
- (5) Enter seven digits** for the receive frequency, confirm the display, and then press $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ again to step to transmit frequency.

* When fewer than nine channels are to be installed, number the channels 00, 10, 20, 30, ..., 70.

** A decimal appears at the center of the display whenever the FYG-4 is expecting a 7-digit frequency entry.

- (6) If the transmit frequency is the same (ie., simplex channel), just press again to set it equal to the receive frequency and step to the CTCSS rx tone. Otherwise (for a semi-duplex channel) enter seven digits for the transmit frequency, and press to step to CTCSS rx tone.
- (7) If CTCSS tones are required on the channel being programmed*, refer to Table VI to determine the 3-digit code that corresponds with the desired CTCSS rx (decode) tone frequency (if no rx tone is required, the code is "100"). Enter these digits and then press to step to the CTCSS tx tone.
- (8) Repeat step (7) for the CTCSS tx tone, if different from the rx tone. Then press to step to the option switch.
- (9) Enter "1" (disable) unless a 5-Tone or DTMF decoder option (or other special option using the EEPROM) is being used in the target transceiver. Otherwise, enter "0" (enable). Then press to step to the time-out timer switch.
- (10) Enter "1" (disable) if the time-out timer is to be disarmed on this channel. Otherwise**, enter "0". Press once more.

The display will now return to two zeros, indicating the FYG-4 is ready to accept another channel number for programming. When finished programming all required channels, switch the FYG-4 OFF to exit the Write mode. You may then want to check the channel data (page 12) before downloading to the target transceiver(s) (page 7).

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- * The FTS-14 must be installed in target transceiver(s).
 - ** Time-Out Period is the same for all channels on which the timer is enabled, and is set as a General Parameter.

Reprogramming (Altering) Channel Data

If the Channel Data in the FYG-4 already includes some channel data that you require, that data does not need to be reprogrammed. Just follow the procedure above for the channels that need some parameters changed, pressing only $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ at each step where an existing parameter should be left unchanged. For example, if you only want to disable the time-out timer on an existing channel, after selecting the channel number and pressing $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$, press $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ five times (to step over the other parameters), then enter 1 to disable the timer, and finally press the $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ key to return to the double zeros.

KEYPAD ERROR RECOVERY

While keying in channel parameters, if you accidentally hit a wrong digit, keep entering digits until there are at least enough displayed to match the length of the parameter. Then, without pressing $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$, simply re-enter the parameter again.

For 7-digit frequency parameters, the invalid digits will be written over (from right to left). Otherwise, for shorter parameters, the invalid digits will be pushed to the left on the display, and the FYG-4 will ignore them when you press $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ to store the parameter. That is, only the digits that are in the right-most locations will be accepted, although up to seven digits may be displayed. For example, if you want to select channel 20, but accidentally press 22, just go ahead and press 20. The display will show "2220", but since the channel number parameter is only two digits long, only the "20" at the right will be accepted when you press $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ ("2220" will remain on the display until new digits are entered).

If you pressed $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ before you noticed the entered data is wrong, abort this channel by pressing the $\begin{matrix} \text{SET} \\ \text{DE} \end{matrix}$ key repeatedly until double zeros are displayed. Then re-enter the channel number and proceed from step (4) of the programming procedure.

TABLE VI. CTCSS Tone Codes (for FTS-14)

When the FTS-14 CTCSS Tone Squelch Unit is installed in the transceiver, EIA standard RS-220-A subaudible tones may be selected independently for receiving and transmitting, on each channel. Each tone frequency is stored in memory as a 3-digit code, with the first digit always zero if a tone is selected, or one if disabled. Available tone frequencies and their corresponding codes are as follows;

Code	Freq.	Group	Code	Freq.	Group	Code	Freq.	Group
021	91.5	C	040	173.8	A	050	123.0	A
023	85.4	C	041	167.9	B	051	118.8	B
025	79.7	C	042	162.2	A	052	114.8	A
027	74.4	C	043	156.7	B	053	110.9	B
030	250.3	A	044	151.4	A	054	107.2	A
031	241.8	B	045	146.2	B	055	103.5	B
032	233.6	A	046	141.3	A	056	100.0	A
033	225.7	B	047	136.5	B	057	94.8	B
034	218.1	A	048	131.8	A	058	88.5	A
035	210.7	B	049	127.3	B	059	82.5	B
036	203.5	A				060	77.0	A
037	192.8	B				061	71.9	B
038	186.2	A				062	67.0	A
039	179.9	B				100	no CTCSS	

PROGRAMMING EXAMPLES

General Parameter Programming Example

Sample parameter values for this Example are;

Lowest Receive Frequency	= 450.000 MHz
Maximum Channel Spread	= 40 MHz
Lowest Transmit Frequency	= 430 MHz
PLL Reference Frequency	= 12.5 kHz and 1/128 div.
1st Intermediate Frequency	= 54.5 MHz
Time-Out Timer Period	= 60 seconds
BCLO (Busy Channel Lock Out)	= disabled
Miscellaneous Options	= none

Press Key	Display	Comment
WRITE 1	WITH POWER SW ON	Power ON
▼		
▼		
▼		
▼	00	Enable Write Mode
SET DE	02xx	
4	02x4	Lowest Receive Frequency
5	0245	
SET DE	03xx	
0	03x0	

Press Key	Display	Comment
0	0300	Maximum Channel Spread
SET DE	04xx	
4	04x4	Lowest Transmit Freq.
3	0443	
SET DE	05xx	
0	05x0	
3	0503	PLL Reference Frequency
SET DE	06xx	
3	06x3	1st IF
F/IN #	063F	
SET DE	07xx	
WRITE 1	07x1	Time-Out Timer Period
F/IN #	071F	BCLO disable
SET DE	08FF	
SET DE	09FF	Miscellaneous Options
SET DE	0AFF	
SET DE	0bFF	
SET DE	0cFF	
SET DE	0dFF	
SET DE	0EFF	
SET DE	0FFF	
SET DE	10FF	
SET DE	11FF	
SET DE	12FF	
SET DE	0245	

Power OFF

New Channel Programming Example

Sample parameter values for this Example are;

Channel No. = 01
 Receive Freq. = 450.5000 MHz
 Transmit Freq. = 430.5000 MHz
 Rx CTCSS Tone Code= 058 (88.5 Hz)
 Tx CTCSS Tone Code= 059 (82.5 Hz)
 Optional Unit none
 Time-Out Timer disarmed

Channel No. = 25
 Receive Freq. = 469.8625 MHz
 Transmit Freq. = 467.5125 MHz
 Rx CTCSS Tone Code= 210.7 Hz
 Tx CTCSS Tone Code= 210.7 Hz
 Optional Unit none
 Time-Out Timer disarmed

Note that the receive and transmit frequencies in this example correspond with the frequency limits, channel spread and PLL steps in the General Parameter Programming Example.

Press Key	Display	Comment
WRITE 1	WITH POWER SW ON	Power ON
▲ ▼		Enable Write Mode
▲ ▼		
▲ ▼		
▲ ▼	00	
0	0	Channel No.01
WRITE 1	01	
SET DE	01	

Press Key	Display	Comment
[4]	. 4	Receive Freq.
[5]	. 45	
[0]	. 450	
[5]	.4505	
[0]	4.5050	
[0]	45.0500	
[0]	450.5000	
SET DE	450.5000	
[4]	. 4	Transmit Freq.
[3]	. 43	
[0]	. 430	
[5]	.4305	
[0]	4.3050	
[0]	43.0500	
[0]	430.5000	
SET DE	430.5000	
[0]	0	RX CTCSS Tone Code
[5]	05	
[8]	058	
SET DE	058	
[0]	0	TX CTCSS Tone Code
[5]	05	
[9]	059	
SET DE	059	
WRITE 1	1	Optional Unit none
SET DE	1	
WRITE 1	1	TOT disarmed
SET DE	00	

Press Key	Display	Comment
<input type="button" value="2"/>	2	Channel No.25
<input type="button" value="5"/>	25	
<input type="button" value="SET"/> <input type="button" value="DE"/>	. 25	
<input type="button" value="4"/>	. 4	Receive Freq.
<input type="button" value="6"/>	. 46	
<input type="button" value="9"/>	. 469	
<input type="button" value="8"/>	.4698	
<input type="button" value="6"/>	4.6986	
<input type="button" value="2"/>	46.9862	
<input type="button" value="5"/>	469.8625	
<input type="button" value="SET"/> <input type="button" value="DE"/>	469.8625	
<input type="button" value="4"/>	. 4	
<input type="button" value="6"/>	. 46	
<input type="button" value="7"/>	. 467	
<input type="button" value="5"/>	.4675	
<input type="button" value="WRITE"/> <input type="button" value="1"/>	4.6751	
<input type="button" value="2"/>	46.7512	
<input type="button" value="5"/>	467.5125	
<input type="button" value="SET"/> <input type="button" value="DE"/>	467.5125	
<input type="button" value="0"/>	0	RX CTCSS Tone Code
<input type="button" value="3"/>	03	
<input type="button" value="5"/>	035	
<input type="button" value="SET"/> <input type="button" value="DE"/>	035	
<input type="button" value="SET"/> <input type="button" value="DE"/>	035	TX CTCSS Tone Code (=RX CTCSS Tone Code)

Press Key	Display	Comment
WRITE 1	i	Optional Unit none
SET DE	i	
SET DE	00	TOT disarmed
		Power OFF

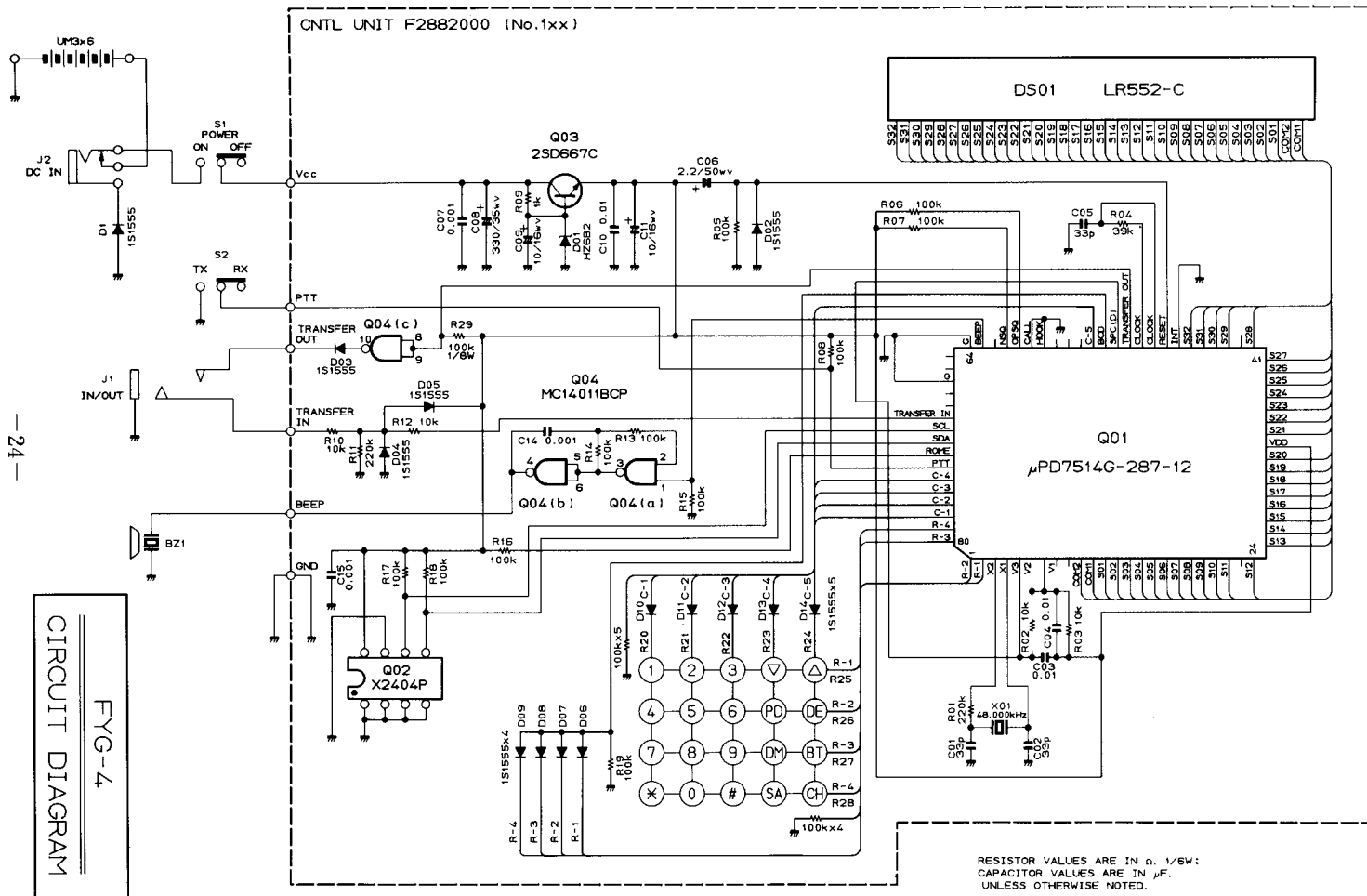


FIG-4
CIRCUIT DIAGRAM