YAESU
The radio

FTDX101D

CAT Operation Reference Manual

YAESU MUSEN CO., LTD.

CAT (Computer Aided Transceiver) Operation

Overview

The CAT (Computer Aided Transceiver) System in the **FTDX101D** transceiver provides control of frequency, VFO, memory, and other settings such as dual-channel memories and diversity reception using an external personal computer. This allows multiple control operations to be fully automated with single mouse clicks, or keystroke operations on the computer keyboard.

Using the RS-232C Cable (Refer to figure 1)

The **FTDX101D** transceiver has a built-in level converter, allowing direct connection from the rear-panel RS-232C jack to the serial port of your computer without the need of any external boxes.

When using the RS-232C cable, set Menu item [OPERATION SETTING] → [GENERAL] → [TUNER/232C SELECT] to "RS232C".

You will need a serial cable for connection to the RS-232C (serial or COM port) connector on your computer. Purchase a ***standard serial cable*** (not the so-called "null modem" type), ensuring it has the correct gender and number of pins (some serial COM port connectors use a 9-pin rather than 25-pin configuration). If your computer uses a custom connector, you may have to construct the cable. In this case, refer to the technical documentation supplied with your computer for correct data connection.

Using the USB Cable (Refer to figure 2)

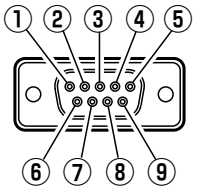
Note: A USB driver is required for remote control from a computer. Download the driver from the Yaesu website (http://www.yaesu.com).

The **FTDX101D** transceiver has a built-in USB to Dual UART Bridge, allowing direct connection from the rear-panel USB jack to the USB jack of your computer without the need of any external boxes.

You will need a USB cable to connect to the USB jack on your computer.

YAESU MUSEN does not produce CAT System operating software due to the wide variety of personal computers and operating systems in use today. However, the information provided in this chapter explains the serial data structure and opcodes used by the CAT system. This information, along with the short programming examples, is intended to help you start writing programs on your own. As you become more familiar with CAT operation, you can customize programs for your operating needs and utilize the full operating potential of this system.

Connection



Pin No.	Pin Name	I/O	Function
①	N/A	---	---
②	SERIAL OUT	Output	Outputs the Serial Data from the transceiver to the computer.
③	SERIAL IN	Input	Inputs the Serial Data from the computer to the transceiver.
④	N/A	---	---
⑤	GND	---	Signal Ground
⑥	N/A	---	---
⑦	RTS	---	---
⑧	CTS	---	---
⑨	N/A	---	---

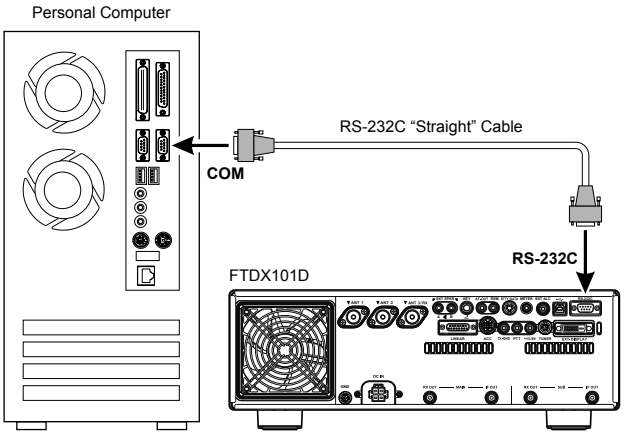


Figure 1

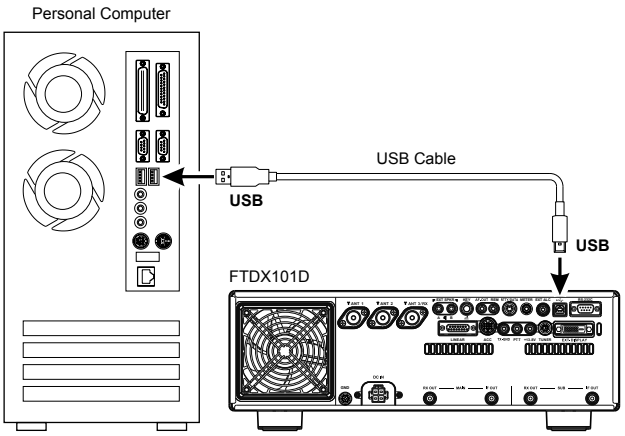


Figure 2

Control Command

A computer control command is composed of an alphabetical command, various parameters, and the terminator that signals the end of the control command.

Example: Set the MAIN Band frequency to 14.250000 MHz.

FA	**014250000**	**;**
↑	↑	↑
Command	Parameter	Terminator

There are three commands for the **FTDX101D** as shown below:

Set command: Set a particular condition (to the **FTDX101D**)

Read command: Reads an answer (from the **FTDX101D**)

Answer command: Transmits a condition (from the **FTDX101D**)

For example, note the following case of the FA command (Set the MAIN Band frequency):

- To set the MAIN Band frequency to 14.250000 MHz, the following command is sent from the computer to the transceiver:
  "**FA014250000;**" (Set command)
- To read the MAIN Band frequency, the following command is sent from the computer to the transceiver:
  "**FA;**" (Read command)
- When the Read command above has been sent, the following command is returned to the computer:
  "**FA014250000;**" (Answer command)

Alphabetical Commands

A command consists of 2 alphabetical characters.

You may use either lower or upper case characters. The commands available for this transceiver are listed in the "PC Control Command Tables" on the following pages.

Parameters

Parameters are used to specify information necessary to implement the desired command.

The parameters to be used for each command are predetermined. The number of digits assigned to each parameter is also predetermined. Refer to the "Control Command List" and the "Control Command Tables" to configure the appropriate parameters.

When configuring parameters, be careful not to make the following mistakes.

For example,
when the correct parameter is "**IS00+1000**" (IF SHIFT):

IS001000;
Not enough parameters specified (No direction (+) given for the IF shift)

IS00+100;
Not enough digits (Only three frequency digits given)

IS00_+_1000;
Unnecessary characters between parameters

IS00+10000;
Too many digits (Five frequency digits given)

Note: If a particular parameter is not applicable to the **FT-DX101D**, the parameter digits should be filled using any character except the ASCII control codes (00 to 1Fh) and the terminator (**;**).

Terminator

To signal the end of a command, it is necessary to use a semicolon (**;**). The digit where this special character must appear differs depending on the command used.

CAT (Computer Aided Transceiver) Operation

Command	Function	Set	Read	Ans.	AI
AB	MAIN BAND TO SUB Band	O	X	X	X
AC	ANTENNA TUNER CONTROL	O	O	O	O
AG	AF GAIN	O	O	O	O
AI	AUTO INFORMATION	O	O	O	X
AM	MAIN BAND TO MEMORY CHANNEL	O	X	X	X
AN	ANTENNA NUMBER	O	O	O	O
BA	SUB BAND TO MAIN BAND	O	X	X	X
BC	AUTO NOTCH	O	O	O	O
BD	BAND DOWN	O	X	X	X
BI	BREAK-IN	O	O	O	O
BM	SUB BAND TO MEMORY CHANNEL	O	X	X	X
BP	MANUAL NOTCH	O	O	O	O
BS	BAND SELECT	O	X	X	X
BU	BAND UP	O	X	X	X
BY	BUSY	X	O	O	O
CH	CHANNEL UP/DOWN	O	X	X	X
CN	CTCSS/DCS NUMBER	O	O	O	O
CO	CONTOUR	O	O	O	O
CS	CW SPOT	O	O	O	O
CT	CTCSS	O	O	O	O
DA	DIMMER	O	O	O	X
DN	DOWN	O	X	X	X
DT	DATE AND TIME	O	O	O	X
ED	ENCORDER DOWN	O	X	X	X
EM	ENCODE MEMORY	O	O	O	X
EN	ENCODE	O	X	X	X
EU	ENCORDER UP	O	X	X	X
EX	MENU	O	O	O	O
FA	FREQUENCY MAIN BAND	O	O	O	O
FB	FREQUENCY SUB BAND	O	O	O	O
FN	FINE TUNING	O	O	O	O
FS	FAST STEP	O	O	O	O
FT	FUNCTION TX	O	O	O	O
GT	AGC FUNCTION	O	O	O	O
ID	IDENTIFICATION	X	O	O	X
IF	INFORMATION	X	O	O	O
IS	IF-SHIFT	O	O	O	O
KM	KEYER MEMORY	O	O	O	X
KP	KEY PITCH	O	O	O	O
KR	KEYER	O	O	O	O
KS	KEY SPEED	O	O	O	O
KY	CW KEYING	O	X	X	X
LK	LOCK	O	O	O	O
LM	LOAD MESSEGE	O	O	O	X
MA	MEMORY CHANNEL TO MAIN BAND	O	X	X	X
MB	MEMORY CHANNEL TO SUB BAND	O	X	X	X
MC	MEMORY CHANNEL	O	O	O	X
MD	MODE	O	O	O	O
MG	MIC GAIN	O	O	O	O
ML	MONITOR LEVEL	O	O	O	O
MR	MEMORY READ	X	O	O	X
MS	METER SW	O	O	O	O
MT	MEMORY CHANNEL WRITE/TAG	O	O	O	X
MW	MEMORY WRITE	O	X	X	X
MX	MOX SET	O	O	O	O
NA	NARROW	O	O	O	O
NB	NOISE BLANKER	O	O	O	O

Command	Function	Set	Read	Ans.	AI
NL	NOISE BLANKER LEVEL	O	O	O	O
NR	NOISE REDUCTION	O	O	O	O
OI	OPPOSITE BAND NFORMATION	X	O	O	O
OS	OFFSET (Repeater Shift)	O	O	O	O
PA	PRE-AMP (IPO)	O	O	O	O
PB	PLAY BACK	O	O	O	X
PC	POWER CONTROL	O	O	O	O
PL	SPEECH PROCESSOR LEVEL	O	O	O	O
PR	SPEECH PROCESSOR	O	O	O	O
PS	POWER SWITCH	O	O	O	X
QI	QMB STORE	O	X	X	X
QR	QMB RECALL	O	X	X	X
QS	QUICK SPLIT	O	X	X	X
RA	RF ATTENUATOR	O	O	O	O
RC	CLAR CLEAR	O	X	X	X
RD	CLAR DOWN	O	X	X	X
RF	ROOFING FILTER	O	O	O	O
RG	RF GAIN	O	O	O	O
RI	RADIO INFORMATION	X	O	O	O
RL	NOISE REDUCTION LEVEL	O	O	O	O
RM	READ METER	X	O	O	O
RS	RADIO STATUS	X	O	O	X
RT	CLAR	O	O	O	O
RU	CLAR UP	O	X	X	X
SC	SCAN	O	O	O	O
SD	SEMI BREAK-IN DELAY TIME	O	O	O	O
SF	SUB DIAL	O	O	O	O
SH	WIDTH	O	O	O	O
SM	S METER	X	O	O	X
SQ	SQUELCH LEVEL	O	O	O	O
ST	SPLIT	O	O	O	O
SV	SWAP VFO	O	X	X	X
SY	SYNC	O	O	O	O
TX	TX SET	O	O	O	O
UL	UNLOCK	X	O	O	O
UP	UP	O	X	X	X
VD	VOX DELAY TIME	O	O	O	O
VG	VOX GAIN	O	O	O	O
VM	[V/M] KEY FUNCTION	O	X	X	X
VS	VFO SELECT	O	O	O	O
VT	VCT(VC TUNE)	O	O	O	O
VX	VOX	O	O	O	O
XT	TX CLAR	O	O	O	O
ZI	ZERO IN	O	X	X	X

CAT (Computer Aided Transceiver) Operation

AB	MAIN BAND TO SUB BAND									
Set	1	2	3	4	5	6	7	8	9	10
	A	**B**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

AC	ANTENNA TUNER CONTROL									
Set	1	2	3	4	5	6	7	8	9	10
	A	**C**	P1	P2	P3	;				
Read	1	2	3	4	5	6	7	8	9	10
	A	**C**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	A	**C**	P1	P2	P3	;				

P1 0: Fixed
P2 0: Fixed
P3 0: Tuner "OFF"
1: Tuner "ON"
2: Tuning Start / Tuning Stop

AG	AF GAIN									
Set	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	P2	P2	P2	;			
Read	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	A	**G**	P1	P2	P2	P2	;			

P1 0: MAIN BAND
1: SUB BAND
P2 000 - 255

AI	AUTO INFORMATION									
Set	1	2	3	4	5	6	7	8	9	10
	A	**I**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	A	**I**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	A	**I**	P1	;						

P1 0: Auto Information "OFF"
1: Auto Information "ON"

This parameter is set to "0" (OFF) automatically when the transceiver is turned "OFF".

AM	MAIN BAND TO MEMORY CHANNEL									
Set	1	2	3	4	5	6	7	8	9	10
	A	**M**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

AN	ANTENNA NUMBER									
Set	1	2	3	4	5	6	7	8	9	10
	A	**N**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	A	**N**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	A	**N**	P1	P2	P4	;				

P1 0: MAIN BAND
1: SUB BAND
P2 1: ANT1
2: ANT2
3: ANT3
P4 0: Fixed

BA	SUB BAND TO MAIN BAND									
Set	1	2	3	4	5	6	7	8	9	10
	B	**A**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

BC	AUTO NOTCH									
Set	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	B	**C**	P1	P2	;					

P1 0: MAIN BAND
1: SUB BAND
P2 0: Auto Notch "OFF"
1: Auto Notch "ON"

CAT (Computer Aided Transceiver) Operation

BD	**BAND DOWN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN BAND 1: SUB BAND
	B	**D**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

BI	**BREAK-IN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Break-in “OFF” 1: Break-in “ON”
	B	**I**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	B	**I**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	B	**I**	P1	;							

BM	**SUB BAND TO MEMORY CHANNEL**									
Set	1	2	3	4	5	6	7	8	9	10
	B	**M**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

BP	**MANUAL NOTCH**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN BAND 1: SUB BAND P2 0: Manual NOTCH “ON/OFF” 1: Manual NOTCH LEVEL P3 P2=0 000: “OFF” 001: “ON” P2=1 001 - 320 (NOTCH Frequency : x 10 Hz)
	B	**P**	P1	P2	P3	P3	P3	;			
Read	1	2	3	4	5	6	7	8	9	10	
	B	**P**	P1	P2	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	B	**P**	P1	P2	P3	P3	P3	;			

BS	**BAND SELECT**										
Set	1	2	3	4	5	6	7	8	9	10	P1 00: 1.8 MHz 01: 3.5 MHz 02: 5 MHz 03: 7 MHz 04: 10 MHz 05: 14 MHz 06: 18 MHz 07: 21 MHz 08: 24.5 MHz 09: 28 MHz 10: 50 MHz 11: GEN 12: MW 13: - 14: - 15: - 16: - 17: 70 MHz
	B	**S**	P1	P1	;						
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

BU	**BAND UP**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN BAND 1: SUB BAND
	B	**U**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

BY	**BUSY**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN BAND RX BUSY “OFF” 1: MAIN BAND RX BUSY “ON” P2 0: SUB BAND RX BUSY “OFF” 1: SUB BAND RX BUSY “ON”
Read	1	2	3	4	5	6	7	8	9	10	
	B	**Y**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	B	**Y**	P1	P2	;						

CH	**CHANNEL UP/DOWN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Memory Channel “UP” 1: Memory Channel “DOWN”
	C	**H**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

CAT (Computer Aided Transceiver) Operation

CN	**CTCSS TONE FREQUENCY**										
Set	1	2	3	4	5	6	7	8	9	10	
	C	**N**	P1	P2	P3	P3	P3	;			
Read	1	2	3	4	5	6	7	8	9	10	
	C	**N**	P1	P2	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	C	**N**	P1	P2	P3	P3	P3	;			

P1 0: MAIN BAND
1: SUB BAND
P2 0: CTCSS
P3 000 - 049: Tone Frequency Number (See Table 1)

CO	**CONTOUR**										
Set	1	2	3	4	5	6	7	8	9	10	
	C	**O**	P1	P2	P3	P3	P3	P3	;		
Read	1	2	3	4	5	6	7	8	9	10	
	C	**O**	P1	P2	;						
Answer	1	2	3	4	5	6	7	8	9	10	
	C	**O**	P1	P2	P3	P3	P3	P3	;		

P1 0: MAIN BAND
1: SUB BAND
P2 0: CONTOUR "ON/OFF"
1: CONTOUR FREQ
2: APF "ON/OFF"
3: APF FREQ
P3 P2=0 0000: CONTOUR "OFF"
0001: CONTOUR "ON"
P2=1 0010 - 3200
(CONTOUR Frequency:10 - 3200Hz)
P2=2 0000: APF "OFF"
0001: APF "ON"
P2=3 0000 - 0050 (APF Frequency: -250 - 250 Hz)

CS	**CW SPOT**										
Set	1	2	3	4	5	6	7	8	9	10	
	C	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	C	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	C	**S**	P1	;							

P1 0: OFF
1: ON

CT	**CTCSS**										
Set	1	2	3	4	5	6	7	8	9	10	
	C	**T**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	C	**T**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	C	**T**	P1	P2	;						

P1 0: MAIN BAND
1: SUB BAND
P2 0: CTCSS "OFF"
1: CTCSS ENC/DEC
2: CTCSS ENC

Table 1 (CTCSS Tone Chart)

000	67.0 Hz	009	91.5 Hz	018	123.0 Hz	027	162.2 Hz	036	189.9 Hz	045	229.1 Hz
001	69.3 Hz	010	94.8 Hz	019	127.3 Hz	028	165.5 Hz	037	192.8 Hz	046	233.6 Hz
002	71.9 Hz	011	97.4 Hz	020	131.8 Hz	029	167.9 Hz	038	196.6 Hz	047	241.8 Hz
003	74.4 Hz	012	100.0 Hz	021	136.5 Hz	030	171.3 Hz	039	199.5 Hz	048	250.3 Hz
004	77.0 Hz	013	103.5 Hz	022	141.3 Hz	031	173.8 Hz	040	203.5 Hz	049	254.1 Hz
005	79.7 Hz	014	107.2 Hz	023	146.2 Hz	032	177.3 Hz	041	206.5 Hz	-	-
006	82.5 Hz	015	110.9 Hz	024	151.4 Hz	033	179.9 Hz	042	210.7 Hz	-	-
007	85.4 Hz	016	114.8 Hz	025	156.7 Hz	034	183.5 Hz	043	218.1 Hz	-	-
008	88.5 Hz	017	118.8 Hz	026	159.8 Hz	035	186.2 Hz	044	225.7 Hz	-	-

DA	**DIMMER**											
Set	1	2	3	4	5	6	7	8	9	10	11	
	D	**A**	P1	P1	P2	P2	P3	P3	P4	P4	;	
Read	1	2	3	4	5	6	7	8	9	10	11	
	D	**A**	;									
Answer	1	2	3	4	5	6	7	8	9	10	11	
	D	**A**	P1	P1	P2	P2	P3	P3	P4	P4	;	

P1 00: Fixed
P2 00: Fixed
P3 00 - 20: TFT Display Brightness Level
P4 00 - 20: LED Indicators Brightness Level

DN	**MIC DWN**									
Set	1	2	3	4	5	6	7	8	9	10
	D	**N**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

DT	**DATE AND TIME**									
Set	1	2	3	4	5	6	7	~	n-1	n
	D	**T**	P1	P2	P2	P2	P2	~	P2	**;**
Read	1	2	3	4	5	6	7	8	9	10
	D	**T**	P1	;						
Answer	1	2	3	4	5	6	7	~	n-1	n
	D	**T**	P1	P2	P2	P2	P2	~	P2	**;**

P1 0: Date
1: Time (UTC)
P2 P1=0 yyyymmdd (Year/Month/Date)
P1=1 hhmmss (Hour/Minute/Second, 24 hour time system)

CAT (Computer Aided Transceiver) Operation

ED	ENCORDER DOWN									
Set	1	2	3	4	5	6	7	8	9	10
	E	D	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: MAIN ENCODER 5: MAIN CONT ENCODER
1: MPVD 6: SUB NOTCH ENCODER
2: MIC/SPEED ENCODER 7: SUB CONT ENCODER
3: PROC/PITCH ENCODER 8: MULTI
4: MAIN NOTCH ENCODER
P2 01 - 99: Frequency Steps

EM	ENCODE MEMORY									
Set	1	2	3	4	5	6	7		54	55
	E	M	P1	P2	P3	P3	P3	~	P3	;
Read	1	2	3	4	5	6	7		54	55
	E	M	P1	P2	;					
Answer	1	2	3	4	5	6	7		54	55
	E	M	P1	P2	P3	P3	P3	~	P3	;

P1 0: RTTY
1: DATA
P2 0: - 3: 3 ch
1: 1 ch 4: 4 ch
2: 2 ch 5: 5 ch
P3 Message Characters (up to 50 characters) (ASCII)

EN	ENCODE									
Set	1	2	3	4	5	6	7	8	9	10
	E	N	P1	P2	;					
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: RTTY
1: DATA
P2 0: - 3: 3 ch
1: 1 ch 4: 4 ch
2: 2 ch 5: 5 ch

EU	ENCORDER UP									
Set	1	2	3	4	5	6	7	8	9	10
	E	U	P1	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 0: MAIN ENCODER 5: MAIN CONT ENCODER
1: MPVD 6: SUB NOTCH ENCODER
2: MIC/SPEED ENCODER 7: SUB CONT ENCODER
3: PROC/PITCH ENCODER 8: MULTI
4: MAIN NOTCH ENCODER
P2 01 - 99: Frequency Steps

EX	MENU											
Set	1	2	3	4	5	6	7	8	9		nn	**
	E	X	P1	P1	P2	P2	P3	P3	P4	~	P4	;
Read	1	2	3	4	5	6	7	8	9	10	nn	**
	E	X	P1	P1	P2	P2	P3	P3	;			
Answer	1	2	3	4	5	6	7	8	9		nn	**
	E	X	P1	P1	P2	P2	P3	P3	P4	~	P4	;

P1 : 01 - 05
P2 : 01 - 07
P3 : 01 - 23
P2 : Parameter (See Table)

CAT (Computer Aided Transceiver) Operation

P1	P2	P3	Function	P2	Digits
01 (RADIO SETTING)	01 (MODE SSB)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		05	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		06	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	1
		07	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		08	SSB OUT SELECT	0: MAIN 1: SUB	1
		09	SSB OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		10	TX BPF SEL	0: 50 ~ 3050 1: 100 ~ 2900 2: 200 ~ 2800 3: 300 ~ 2700 4: 400 ~ 2600	1
		11	SSB MOD SOURCE	0: MIC 1: REAR	1
		12	REAR SELECT	0: DATA 1: USB	1
		13	RPORT GAIN	0 ~ 100 (P2 = 000 ~ 100)	3
		14	RPTT SELECT	0: DAKY 1: RTS 2: DTR	1
	02 (MODE AM)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		05	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		06	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	2
		07	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		08	AM OUT SELECT	0: MAIN 1: SUB	1
		09	AM OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		10	TX BPF SEL	0: 50 ~ 3050 1: 100 ~ 2900 2: 200 ~ 2800 3: 300 ~ 2700 4: 400 ~ 2600	1
		11	AM MOD SOURCE	0: MIC 1: REAR	1
		12	MIC GAIN	1000: MCVR 0000 ~ 0100: FIX	1
		13	REAR SELECT	0: DATA 1: USB	1
		14	RPORT GAIN	0 ~ 100 (P2 = 000 ~ 100)	3
		15	RPTT SELECT	0: DAKY 1: RTS 2: DTR	1
	03 (MODE FM)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		05	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		06	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	2
		07	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		08	FM OUT SELECT	0: MAIN 1: SUB	1
		09	FM OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		10	FM MOD SOURCE	0: MIC 1: REAR	1
		11	MIC GAIN	1000: MCVR 0000 ~ 0100: FIX	1
		12	REAR SELECT	0: DATA 1: USB	1
		13	RPORT GAIN	0 ~ 100 (P2 = 000 ~ 100)	3
		14	RPTT SELECT	0: DAKY 1: RTS 2: DTR	1
		15	RPT SHIFT(28MHz)	0 ~ 1000 kHz (P2 = 0000 ~ 1000, 10 kHz/step)	4
		16	RPT SHIFT(50MHz)	0 ~ 4000 kHz (P2 = 0000 ~ 4000, 10 kHz/step)	4
	04 (MODE PSK/DATA)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	DATA MODE	0: PSK 1: OTHERS	1
		05	OTHER SHIFT (SSB)	0 ~ 3000 Hz (P2 = 0000 ~ 3000, 10 Hz steps)	4
		06	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		07	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		08	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	2
		09	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		10	FM OUT SELECT	0: MAIN 1: SUB	1
		11	FM OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		12	TX BPF SEL	0: 50 ~ 3050 1: 100 ~ 2900 2: 200 ~ 2800 3: 300 ~ 2700 4: 400 ~ 2600	1
		13	DATA MOD SOURCE	0: MIC 1: REAR	1
		14	REAR SELECT	0: DATA 1: USB	1
		15	RPORT GAIN	0 ~ 100 (P2 = 000 ~ 100)	3
		16	RPTT SELECT	0: DAKY 1: RTS 2: DTR	1
	05 (MODE RTTY)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	POLARITY-RX	0: NOR 1: REV	1
		05	POLARITY-TX	0: NOR 1: REV	1
		06	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		07	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		08	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	2
		09	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		10	DATA OUT SELECT	0: MAIN 1: SUB	1
		11	RTTY OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		12	SHIFT PORT	0: SHIFT 1: DTR 2: RTS	1
		13	MARK FREQUENCY	1: 1275 Hz 2: 2125 Hz	1
		14	SHIFT FREQUENCY	1: 170 Hz 1: 200 Hz 2: 425 Hz 3: 850 Hz	1
	06 (ENCDEC PSK)	01	PSK MODE	0: BPSK 1: QPSK	1
		02	DECODE AFC RANGE	0: 8 1: 1.5 2: 30 Hz	1
		03	QPSK POLARITY RX	0: NOR 1: REV	1
		04	QPSK POLARITY TX	0: NOR 1: REV	1
		05	QPSK TX LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3

CAT (Computer Aided Transceiver) Operation

P1	P2	P3	Function	P2	Digits
01 (RADIO SETTING)	07 (ENCDEC RTTY)	01	RX USOS	0: DISABLE 1: ENABLE	1
		02	TX USOS	0: DISABLE 1: ENABLE	1
		03	RX NEW LINE CODE	0: CR or LF or CR+LF 1: CR,LF,CR+LF	1
		04	TX AUTO CR+LF	0: DISABLE 1: ENABLE	1
		05	TX DIDDLE	0: OFF 1: BLANK 2: LTRS	1
		06	BAUDOT CODE	0: CCIT 1: US	1
02 (CW SETTING)	01 (MODE CW)	01	AGC FAST DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		02	AGC MID DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		03	AGC SLOW DELAY	20 ~ 4000 msec (P2= 0020 ~ 4000, 20 msec/step)	4
		04	LCUT FREQ	00: OFF 01: 100 Hz ~ 19: 1000 Hz (50 Hz steps)	2
		05	LCUT SLOP	0: 6 dB/oct 1: 18 dB/oct	1
		06	HCUT FREQ	00: OFF 01: 700 Hz ~ 67: 4000 Hz (50 Hz steps)	2
		07	HCUT SLOPE	0: 6 dB/oct 1: 18 dB/oct	1
		08	CW OUT SELECT	0: MAIN 1: SUB	1
		09	CW OUT LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		10	CW AUTO MODE	0: OFF 1: 50 MHz 2: ON	1
		11	CW BK-IN TYPE	0: SEMI 1: FULL	1
		12	CW BK-IN DELAY	30 ~ 3000 msec (P2 = 0030 ~ 3000, 10 msec/step)	4
		13	CW WAVE SHAPE	0: 1 msec 1: 2 msec 2: 4 msec 3: 6 msec	1
		14	CW FREQ DISPLAY	0: DIRECT FREQ 1: PITCH OFFSET	1
		15	PC KEYING	0: OFF 1: DAKY 2: RTS 3: DTR	1
		16	QSK DELAY TIME	0: 15 msec 1: 20 msec 2: 25 mesc 3: 30 msec	1
	02 (KEYER)	01	F KEYER TYPE	0: OFF 1: BUG 2: ELEKEY-A 3: ELEKEY-B 4: ELEKEY-Y 5: ACS	1
		02	F KEYER DOT/DASH	0: NOR 1: REV	1
		03	R KEYER TYPE	0: OFF 1: BUG 2: ELEKEY-A 3: ELEKEY-B 4: ELEKEY-Y 5: ACS	1
		04	R KEYER DOT/DASH	0: NOR 1: REV	1
		05	CW WEIGHT	2.5 ~ 4.5 (P2 = 25 ~ 45)	2
		06	NUMBER STYLE	0: 1290 1: AUNO 2: AUNT 3: A2NO 4: A2NT 5: 12NO 6: 12NT	1
		07	CONTEST NUMBER	001 ~ 999	3
		08	CW MEMORY 1	0: TEXT 1: MESSAGE	1
		09	CW MEMORY 2	0: TEXT 1: MESSAGE	1
		10	CW MEMORY 3	0: TEXT 1: MESSAGE	1
		11	CW MEMORY 4	0: TEXT 1: MESSAGE	1
		12	CW MEMORY 5	0: TEXT 1: MESSAGE	1
		13	REPEAT INTERVAL	1 ~ 60 sec (P2 = 01 ~ 60)	2
	03 (DECODE CW)	01	CW DECODE BW	0: 25 1: 50 2: 100 3: 250 (Hz)	1
03 (OPERATION SETTING)	01 (GENERAL)	01	DECODE RX SELECT	0: MAIN 1: SUB	1
		02	HEADPHONE MIX	0: SEPARATE 1: COMBINE-1 2: COMBINE-2	1
		03	ANT3 SELECT	0: TRX 1: RX ANT	
		04	NB WIDTH	0: 1 ms 1: 3 ms 2: 10 ms	1
		05	NB REJECTION	0: 10 dB 1: 30 dB 2: 50 dB	1
		06	BEEP LEVEL	0 ~ 100 (P2 = 000 ~ 100)	3
		07	RF/SQL VR	0: RF 1: SQL	1
		08	TUNER/232C SELECT	0: TUNER 1: RS232C	1
		09	232C RATE	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	1
		10	232C TIME OUT TIMER	0: 10 msec 1: 100 msec 2: 1000 msec 3: 3000 msec	1
		11	CAT RATE	0: 4800 bps 1: 9600 bps 2: 19200 bps 3: 38400 bps	1
		12	CAT TIME OUT TIMER	0: 10 msec 1: 100 msec 2: 1000 msec 3: 3000 msec	1
		13	CAT RTS	0: DISABLE 1: ENABLE	1
		14	QMB CH	0: 5ch 1: 10ch	1
		15	MEM GROUP	0: DISABLE 1: ENABLE	1
		16	QUICK SPLIT INPUT	0: DISABLE 1: ENABLE	1
		17	QUICK SPLIT FREQ	–20 kHz ~ +00 (or –00) ~ +20 kHz (P2= –20 ~ +00 or –00 ~ +20)	3
		18	TX TIME OUT TIMER	0 (OFF) ~ 30 min (P2= 00 ~ 30)	2
		19	MIC SCAN	0: DISABLE 1: ENABLE	1
		20	MIC SCAN RESUME	0: PAUSE 1: TIME	1
		21	REF FREQ ADJ	–25 ~ +00 (or –00) ~ +25 (P2= –25 ~ +00 or –00 ~ +25)	3
		22	CS DIAL	00: RF POWER 01: MONI LEVEL 02: DNR LEVEL 03: NB LEVEL 04: VOX GAIN 05: VOX DELAY 06: ANTI VOX 07: STEP DIAL 08: MEM CH 09: GROUP 10: R.FIL	2
		23	KEYBOARD LANGUAGE	00: JAPANESE 01: ENGLISH(US) 02: ENGLISH(UK) 03: FRENCH 04: FRENCH(CA) 05: GERMAN 06: PORTUGUESE 07: PORTUGUESE(BR) 08: SPANISH 09: SPANISH(LATAM) 10: ITALIAN	2
	02 (RX-DSP)	01	APF WIDTH	0: NARROW 1: MEDIUM 2: WIDE	1
		02	CONTOUR LEVEL	–40 ~ 0 ~ +20 (P2 = –40 ~ –00 or +00 ~ +20)	3
		03	CONTOUR WIDTH	01 ~ 11	2
		04	DNR LEVEL	01 ~ 15	2
		05	IF NOTCH WIDTH	0: NARROW 1: WIDE	1

CAT (Computer Aided Transceiver) Operation

P1	P2	P3	Function	P2	Digits
03 (OPERATION SETTING)	03 (TX AUDIO)	01	PROC TYPE	0: COMP 1: AMC	1
		02	AMC RELEASE TIME	0: FAST 1: MID 2: SLOW	1
		03	PRMTRC EQ1 FREQ	00 : OFF 01: 100 02: 200 03: 300 04: 400 05: 500 06: 600 07: 700 Hz	2
		04	PRMTRC EQ1 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		05	PRMTRC EQ1 BWTH	01 ~ 10	2
		06	PRMTRC EQ2 FREQ	00: OFF 01: 700 02: 800 03: 900 04: 1000 05: 1100 06: 1200 07: 1300 08: 1400 09: 1500 Hz	2
		07	PRMTRC EQ2 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		08	PRMTRC EQ2 BWTH	01 ~ 10	2
		09	PRMTRC EQ3 FREQ	00 : OFF 01: 1500 02: 1600 03: 1700 04: 1800 05: 1900 06: 2000 ~ 18: 3200 Hz	2
		10	PRMTRC EQ3 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		11	PRMTRC EQ3 BWTH	01 ~ 10	2
		12	P PRMTRC EQ1 FREQ	00 : OFF 01: 100 02: 200 03: 300 04: 400 05: 500 06: 600 07: 700 Hz	2
		13	P PRMTRC EQ1 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		14	P PRMTRC EQ1 BWTH	01 ~ 10	2
		15	P PRMTRC EQ2 FREQ	00: OFF 01: 700 02: 800 03: 900 04: 1000 05: 1100 06: 1200 07: 1300 08: 1400 09: 1500 Hz	2
		16	P PRMTRC EQ2 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		17	P PRMTRC EQ2 BWTH	01 ~ 10	2
		18	P PRMTRC EQ3 FREQ	00 : OFF 01: 1500 02: 1600 03: 1700 04: 1800 05: 1900 06: 2000 ~ 18: 3200 Hz	2
		19	P PRMTRC EQ3 LEVEL	–10 ~ 0 ~ +10 (P2 = –10 ~ –00 or +00 ~ +10)	3
		20	P PRMTRC EQ3 BWTH	01 ~ 10	2
	04 (TX GNRL)	01	HF MAX POWER	5 ~ 100 (P2 = 005 ~ 100)	3
		02	50M MAX POWER	5 ~ 100 (P2 = 005 ~ 100)	3
		03	70M MAX POWER	5 ~ 50 (P2 = 005 ~ 050)	3
		04	AM MAX POWER	5 ~ 25 (P2 = 005 ~ 025)	3
		05	VOX SELECT	0: MIC 1: DATA	1
		06	DATA VOX GAIN	0 ~ 100 (P2 = 000 ~ 100)	3
		07	EMERGENCY FREQ TX	0: DISABLE 1: ENABLE	1
	05 (TUNING)	01	SSB/CW DIAL STEP	0: 5 1: 10 (Hz)	1
		02	RTTY/PSK DIAL STEP	0: 5 1: 10 (Hz)	1
		03	CH STEP	0: 1 1: 2.5 2: 5 (kHz)	1
		04	AM CH STEP	0: 2.5 1: 5 2: 9 3: 10 4: 12.5 5: 25 (kHz)	1
		05	FM CH STEP	0: 5 1: 6.25 2: 10 3: 12.5 4: 20 5: 25 (kHz)	1
		06	MAIN STEPS PER REV.	0: 250 1: 500 2: 1000	1
		07	MPVD STEPS PER REV.	0: 250 1: 500	1
04 (DISPLAY SETTING)	01 (DISPLAY)	01	MY CALL.	Up to 12 characters	12
		02	MY CALL TIME	0: OFF 1: 0.5 2: 1 3: 2 4: 3 5: 5 (sec)	1
		03	SCREEN SAVER	0: OFF 1: 15 2: 30 3: 60 (min)	1
		04	TFT CONTRAST	00 ~ 20	2
		05	DIMMER TFT	00 ~ 20	2
		06	DIMMER LED	00 ~ 20	2
		07	MOUSE POINTER SPEED	00 ~ 20	2
		08	FREQ STYLE	0: LIGHT 1: BOLD	1
	02 (SCOPE)	01	RBW	0: HIGH 1: MID 2: LOW	1
		02	SCOPE CTR	0: FILTER 1: CAR POINT	1
		03	2D DISP SENSITIVITY	0: NORMAL 1: HI	1
		04	3DSS DISP SENSITIVITY	0: NORMAL 1: HI	1
	03 (EXT-MONITOR)	01	EXT DISPLAY	0: DISABLE 1: ENABLE	1
		02	PIXEL	0: 800x480 1: 800x600	1
05 (EXTENTION SETTING)	01 (DATE&TIME)	01	DAY	-	-
		02	MONTH	-	-
		03	YEAR	-	-
		04	HOUR	-	-
		05	MINUTE	-	-
	02 (SD CARD)	01	MEM LIST LOAD	-	-
		02	MEM LIST SAVE	-	-
		03	MENU LOAD	-	-
		04	MENU SAVE	-	-
		05	INFORMATION	-	-
		06	FIRMWARE UPDATE	-	-
		07	FORMAT	-	-
	03 (SOFT VERSION)	01	-	-	-
	04 (CALIBRATION)	01	-	-	-
	05 (RESET)	01	MEMORY CLEAR	-	-
		02	MENU CLEAR	-	-
		03	ALL RESET	-	-

CAT (Computer Aided Transceiver) Operation

FA	**FREQUENCY MAIN BAND**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000030000 - 075000000 (Hz)
	F	**A**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									
Read	1	2	3	4	5	6	7	8	9	10	
	F	**A**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**A**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									

FB	**FREQUENCY SUB BAND**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000030000 - 075000000 (Hz)
	F	**B**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									
Read	1	2	3	4	5	6	7	8	9	10	
	F	**B**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**B**	P1	P1	P1	P1	P1	P1	P1	P1	
	11	12	13	14	15	16	17	18	19	20	
	P1	;									

FN	**FINE TUNING**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Fine Tuning “OFF” 1: Fine Tuning “ON”
	F	**N**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	F	**N**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**N**	P1	;							

FS	**FAST STEP**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band FAST Key “OFF” 1: MAIN Band FAST Key “ON” 2: SUB Band FAST Key “OFF” 3: SUB Band FAST Key “ON” 4: MAIN Band FAST Key “OFF” / SUB Band FAST Key “OFF” 5: MAIN Band FAST Key “ON” / SUB Band FAST Key “OFF” 6: MAIN Band FAST Key “OFF” / SUB Band FAST Key “ON” 7: MAIN Band FAST Key “ON” / SUB Band FAST Key “ON”
	F	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	F	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**S**	P1	;							

FT	**FUNCTION TX**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band: TX/RX 1: SUB Band: TX/RX 2: MAIN Band Transmitter: TX 3: SUB Band Transmitter: TX P2 0: MAIN Band Transmitter: TX 1: SUB Band Transmitter: TX
	F	**T**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	F	**T**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	F	**T**	P2	;							

GT	**AGC FUNCTION**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: AGC “OFF” 1: AGC “FAST” 2: AGC “MID” 3: AGC “SLOW” 4: AGC “AUTO” P3 0: AGC “OFF” 1: AGC “FAST” 2: AGC “MID” 3: AGC “SLOW” 4: AGC “AUTO-FAST” 5: AGC “AUTO-MID” 6: AGC “AUTO-SLOW”
	G	**T**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	G	**T**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	G	**T**	P1	P3	;						

ID	**IDENTIFICATION**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0681: FTDX101D
Read	1	2	3	4	5	6	7	8	9	10	
	I	**D**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	I	**D**	P1	P1	P1	P1	;				

CAT (Computer Aided Transceiver) Operation

IF	INFORMATION									
Set	1	2	3	4	5	6	7	8	9	10
Read	1	2	3	4	5	6	7	8	9	10
	I	**F**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	I	**F**	P1	P1	P1	P2	P2	P2	P2	P2
	11	12	13	14	15	16	17	18	19	20
	P2	P2	P2	P2	P3	P3	P3	P3	P3	P4
	21	22	23	24	25	26	27	28	29	30
	P5	P6	P7	P8	P9	P9	P10	;		

P1 001-099 (Memory Channel) P2 VFO-A Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, --: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: RX CLAR "OFF" 1: RX CLAR "ON"
P5 0: TX CLAR "OFF" 1: TX CLAR "ON"
P6 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L
8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U
D: AM-N E: PKT F: DATA-FM-N
P7 0: VFO 1: Memory 2: Memory Tune 3: Quick Memory Bank (QMB)
4: - 5: PMS
P8 0: OFF 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

IS	IF-SHIFT									
Set	1	2	3	4	5	6	7	8	9	10
	I	**S**	P1	P2	P3	P4	P4	P4	P4	;
Read	1	2	3	4	5	6	7	8	9	10
	I	**S**	P1	;						
Answer	1	2	3	4	5	6	7	8	9	10
	I	**S**	P1	P2	P3	P4	P4	P4	P4	;

P1 0: MAIN Band RX
1: SUB Band RX
P2 0: (Fixed)
P3 + / -
P4 0 ~ 1200 Hz (20 Hz steps)

KM	KEYER MEMORY									
Set	1	2	3	4	5	6	7	~	n-1	n
	K	**M**	P1	P2	P2	P2	P2	~	P2	;
Read	1	2	3	4	5	6	7	8	9	10
	K	**M**	P1	;						
Answer	1	2	3	4	5	6	7	~	n-1	n
	K	**M**	P1	P2	P2	P2	P2	~	P2	;

P1 1 - 5 : Keyer Memory Channel Number
P2 Message Characters (up to 50 characters)

KP	KEY PITCH									
Set	1	2	3	4	5	6	7	8	9	10
	K	**P**	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10
	K	**P**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	K	**P**	P1	P1	;					

P1 00: 300 Hz - 75: 1050 Hz (10Hz steps)

KR	KEYER									
Set	1	2	3	4	5	6	7	8	9	10
	K	**R**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
	K	**R**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	K	**R**	P1	;						

P1 0: KEYER "OFF"
1: KEYER "ON"

KS	KEY SPEED									
Set	1	2	3	4	5	6	7	8	9	10
	K	**S**	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10
	K	**S**	;							
Answer	1	2	3	4	5	6	7	8	9	10
	K	**S**	P1	P1	P1	;				

P1 004 - 060 (WPM)

KY	CW KEYING									
Set	1	2	3	4	5	6	7	8	9	10
	K	**Y**	P1	;						
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

P1 1: Keyer Memory "1" Playback 6: Message Keyer "1" Playback
2: Keyer Memory "2" Playback 7: Message Keyer "2" Playback
3: Keyer Memory "3" Playback 8: Message Keyer "3" Playback
4: Keyer Memory "4" Playback 9: Message Keyer "4" Playback
5: Keyer Memory "5" Playback A: Message Keyer "5" Playback

CAT (Computer Aided Transceiver) Operation

LK	**LOCK**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band DIAL Lock "OFF" 1: MAIN Band DIAL Lock "ON" 2: SUB Band DIAL Lock "OFF" 3: SUB Band DIAL Lock "ON" 4: MAIN Band DIAL Lock "OFF" / SUB Band DIAL Lock "OFF" 5: MAIN Band DIAL Lock "ON" / SUB Band DIAL Lock "OFF" 6: MAIN Band DIAL Lock "OFF" / SUB Band DIAL Lock "ON" 7: MAIN Band DIAL Lock "ON" / SUB Band DIAL Lock "ON"
	L	**K**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	L	**K**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	L	**K**	P1	;							

LM	**LOAD MESSEGE**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: DVS P2 0: DVS (Recording Stop) 1: DVS (CH "1" Recording Start/Stop) 2: DVS (CH "2" Recording Start/Stop) 3: DVS (CH "3" Recording Start/Stop) 4: DVS (CH "4" Recording Start/Stop) 5: DVS (CH "5" Recording Start/Stop)
	L	**M**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	L	**M**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	L	**M**	P1	P2	;						

MA	**MEMORY CHANNEL TO MAIN BAND**									
Set	1	2	3	4	5	6	7	8	9	10
	M	**A**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

MB	**MEMORY CHANNEL TO SUB BAND**									
Set	1	2	3	4	5	6	7	8	9	10
	M	**B**	;							
Read	1	2	3	4	5	6	7	8	9	10
Answer	1	2	3	4	5	6	7	8	9	10

MC	**MEMORY CHANNEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 001 - 099: Regular Memory Channel P1L: P1L P1U: P1U ~ P9L: P9L P9U: P9U EMG: EMG
	M	**C**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	M	**C**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**C**	P1	P1	P1	;					

MD	**OPERATING MODE**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band RX 1: SUB Band RX P2 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L 8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U D: AM-N E: PKT F: DATA-FM-N
	M	**D**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	**D**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**D**	P1	P2	;						

MG	**MIC GAIN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000 - 100
	M	**G**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	M	**G**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**G**	P1	P1	P1	;					

ML	**MONITOR LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MONI "ON/OFF" 1: MONI Level P2 P1=0 000: MONI "OFF" 001: MONI "ON" P1=1 000 - 100
	M	**L**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	M	**L**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**L**	P1	P2	P2	P2	;				

CAT (Computer Aided Transceiver) Operation

MR MEMORY CHANNEL READ

Set

1	2	3	4	5	6	7	8	9	10

Read

1	2	3	4	5	6	7	8	9	10
M	**R**	P0	P0	P0	;				

Answer

1	2	3	4	5	6	7	8	9	10
M	**R**	P1	P1	P1	P2	P2	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P3	P3	P3	P3	P3	P4
21	22	23	24	25	26	27	28	29	30
P5	P6	P7	P8	P9	P9	P10	;		

P0/1 001-099 (Memory Channel) P2 VFO-A Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, --: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: RX CLAR "OFF" 1: RX CLAR "ON"
P5 0: TX CLAR "OFF" 1: TX CLAR "ON"
P6 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L
8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U
D: AM-N E: PKT F: DATA-FM-N
P7 0: VFO 1: Memory
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

MS METER SW

Set

1	2	3	4	5	6	7	8	9	10
M	**S**	P1	P2	;					

Read

1	2	3	4	5	6	7	8	9	10
M	**S**	;							

Answer

1	2	3	4	5	6	7	8	9	10
M	**S**	P1	P2	;					

P1 MAIN P2 SUB
0: POW 0: ALC
1: COMP 1: VDD
2: TEMP 2: ID
3: SWR

MT MEMORY CHANNEL WRITE/TAG

Set

1	2	3	4	5	6	7	8	9	10
M	**T**	P1	P1	P1	P2	P2	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P3	P3	P3	P3	P3	P4
21	22	23	24	25	26	27	28	29	30
P5	P6	P7	P8	P9	P9	P10	P11	P12	P12
31	32	33	34	35	36	37	38	39	40
P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
41	42	43	44	45	46	47	48	49	50
;									

Read

1	2	3	4	5	6	7	8	9	10
M	**T**	P0	P0	P0	;				

Answer

1	2	3	4	5	6	7	8	9	10
M	**T**	P1	P1	P1	P2	P2	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P3	P3	P3	P3	P3	P4
21	22	23	24	25	26	27	28	29	30
P5	P6	P7	P8	P9	P9	P10	P11	P12	P12
31	32	33	34	35	36	37	38	39	40
P12	P12	P12	P12	P12	P12	P12	P12	P12	P12
41	42	43	44	45	46	47	48	49	50
;									

P0/1 001-099 (Memory Channel) P2 VFO-A Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, --: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: RX CLAR "OFF" 1: RX CLAR "ON"
P5 0: TX CLAR "OFF" 1: TX CLAR "ON"
P6 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L
8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U
D: AM-N E: PKT F: DATA-FM-N
P7 Set: 0: (Fixed) / Read: 0: VFO 1: Memory
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift
P11 0: (Fixed)
P12 TAG Characters (up to 12 characters) (ASCII)

MW MEMORY CHANNEL WRITE

Set

1	2	3	4	5	6	7	8	9	10
M	**W**	P1	P1	P1	P2	P2	P2	P2	P2
11	12	13	14	15	16	17	18	19	20
P2	P2	P2	P2	P3	P3	P3	P3	P3	P4
21	22	23	24	25	26	27	28	29	30
P5	P6	P7	P8	P9	P9	P10	;		

Read

1	2	3	4	5	6	7	8	9	10

Answer

1	2	3	4	5	6	7	8	9	10

P1 001-099 (Memory Channel) P2 Frequency (Hz)
P3 Clarifier Direction +: Plus Shift, --: Minus Shift
Clarifier Offset: 0000 - 9999 (Hz)
P4 0: RX CLAR "OFF" 1: RX CLAR "ON"
P5 0: TX CLAR "OFF" 1: TX CLAR "ON"
P6 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L
8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U
D: AM-N E: PKT F: DATA-FM-N
P7 00: (Fixed)
P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC
P9 00: (Fixed)
P10 0: Simplex 1: Plus Shift 2: Minus Shift

MX MOX SET

Set

1	2	3	4	5	6	7	8	9	10
M	**X**	P1	;						

Read

1	2	3	4	5	6	7	8	9	10
M	**X**	;							

Answer

1	2	3	4	5	6	7	8	9	10
M	**X**	P1	;						

P1 0: MOX "OFF"
1: MOX "ON"

CAT (Computer Aided Transceiver) Operation

NA	**NARROW**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: OFF 1: ON
	M	**A**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	M	**A**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	M	**A**	P1	P2	;						

NB	**NOISE BLANKER STATUS**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: Noise Blanker “OFF” 1: Noise Blanker “ON”
	N	**B**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	N	**B**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	N	**B**	P1	P2	;						

NL	**NOISE BLANKER LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Fixed P2 000 - 010
	N	**L**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	N	**L**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	N	**L**	P1	P2	P2	P2	;				

NR	**NOISE REDUCTION**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: Noise Reduction “OFF” 1: Noise Reduction “ON”
	N	**R**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	N	**R**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	N	**R**	P1	P2	;						

OI	**OPPOSITE BAND INFORMATION**										
Set	1	2	3	4	5	6	7	8	9	10	P1 001-099 (Memory Channel) P2 VFO-B Frequency (Hz) P3 Clarifier Direction +: Plus Shift, --: Minus Shift Clarifier Offset: 0000 - 9999 (Hz) P4 0: RX CLAR “OFF” 1: RX CLAR “ON” P5 0: TX CLAR “OFF” 1: TX CLAR “ON” P6 MODE 1: LSB 2: USB 3: CW-U 4: FM 5: AM 6: RTTY-L 7: CW-L 8: DATA-L 9: RTTY-U A: DATA-FM B: FM-N C: DATA-U D: AM-N E: PKT E: DATA-FM-N P7 0: VFO 1: Memory P8 0: CTCSS “OFF” 1: CTCSS ENC/DEC 2: CTCSS ENC P9 0: (Fixed) P10 0: Simplex 1: Plus Shift 2: Minus Shift
Read	1	2	3	4	5	6	7	8	9	10	
	O	**I**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	O	**I**	P1	P1	P1	P2	P2	P2	P2	P2	
	11	12	13	14	15	16	17	18	19	20	
	P2	P2	P2	P2	P3	P3	P3	P3	P3	P4	
	21	22	23	24	25	26	27	28	29	30	
	P5	P6	P7	P8	P9	P9	P10	;			

OS	**OFFSET (REPEATER SHIFT)**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: Simplex 1: Plus Shift 2: Minus Shift *: This command can be activated only with an FM mode.
	O	**S**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	O	**S**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	O	**S**	P1	P2	;						

PA	**PRE-AMP (IPO)**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: IPO 1: AMP 1 2: AMP 2
	P	**A**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	**A**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**A**	P1	P2	;						

CAT (Computer Aided Transceiver) Operation

PB	**PLAY BACK**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: DVS P2 0: DVS (Playback Stop) 1: DVS (CH "1" Playback Start) 2: DVS (CH "2" Playback Start) 3: DVS (CH "3" Playback Start) 4: DVS (CH "4" Playback Start) 5: DVS (CH "5" Playback Start)
	P	**B**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	**B**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**B**	P1	P2	;						

PC	**POWER CONTROL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 005 -100
	P	**C**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	P	**C**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**C**	P1	P1	P1	;					

PL	**SPEECH PROCESSOR LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 000 -100
	P	**L**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	P	**L**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**L**	P1	P1	P1	;					

PR	**SPEECH PROCESSOR LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Speech Processor 1: Parametric Microphone Equalizer P2 1: "OFF" 2: "ON"
	P	**R**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	P	**R**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**R**	P1	P2	;						

PS	**POWER SWITCH**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: POWER "OFF" 1: POWER "ON" This command requires dummy data be initially sent. Then after one second and before two seconds the command is sent.
	P	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	P	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	P	**S**	P1	;							

QI	**QMB STORE**										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**I**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

QR	**QMB RECALL**										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**R**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

QS	**QUICK SPLIT**										
Set	1	2	3	4	5	6	7	8	9	10	
	Q	**S**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

CAT (Computer Aided Transceiver) Operation

RA	**RF ATTENUATOR**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: OFF 1: 6dB 2: 12dB 3: 18dB
	R	**A**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	R	**A**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**A**	P1	P2	;						

RC	**CLAR CLEAR**										
Set	1	2	3	4	5	6	7	8	9	10	
	R	**C**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

RD	**CLAR DOWN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0000 - 9999 (Hz)
	R	**D**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

RF	**ROOFING FILTER**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 1: 12kHz 2: 3kHz 3: 1.2kHz (option) 4: 600Hz 5: 300Hz (option)
	R	**F**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	R	**F**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**F**	P1	P2	;						

RG	**RF GAIN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 000 - 255
	R	**G**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	R	**G**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**G**	P1	P2	P2	P2	;				

RI	**RADIO INFORMATION**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Hi-SWR 3: REC 4: PLAY P2 0: OFF 1: ON
Read	1	2	3	4	5	6	7	8	9	10	
	R	**I**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**I**	P1	P2	;						

RL	**NOISE REDUCTION LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 01 - 15
	R	**L**	P1	P2	P2	;					
Read	1	2	3	4	5	6	7	8	9	10	
	R	**L**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**L**	P1	P2	P2	;					

RM	**READ METER**										
Set	1	2	3	4	5	6	7	8	9	10	P1=0 P2: Left side Meter 0 - 255 P3: Right side Meter 0 - 255 P1= 1: S (MAIN Band) 2: S (SUB Band) 3: COMP 4: ALC 5: PO 6: SWR 7: IDD 8: VDD 9: TEMP P2: 0 - 255 P3: 0
Read	1	2	3	4	5	6	7	8	9	10	
	R	**M**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**M**	P1	P2	P2	P2	P3	P3	P3	;	

CAT (Computer Aided Transceiver) Operation

RS	**RADIO STATUS**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: NORMAL MODE 1: MENU MODE
Read	1	2	3	4	5	6	7	8	9	10	
	R	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**S**	P1	;							

RT	**CLAR**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: RX Clarifier “OFF” 1: RX Clarifier “ON”
	R	**T**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	R	**T**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	R	**T**	P1	;							

RU	**RX CLARIFIER PLUS OFFSET**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0000 - 9999 (Hz)
	R	**U**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

SC	**SCAN**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Scan “OFF” 1: Scan “ON” (UP ward) 2: Scan “ON” (DOWN ward)
	S	**C**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	S	**C**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**C**	P1	;							

SD	**CW BREAK-IN DELAY TIME**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0030 - 3000 msec
	S	**D**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	**D**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**D**	P1	P1	P1	P1	;				

SF	**SUB DIAL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MPVD 1: MULTI knob P2 P1=0 1: CLAR 2: VCT 3: SUB 4: CS P1=1 0: RF POWER 1: MONI LEVEL 2: DNR LEVEL 3: NB LEVEL 4: VOX GAIN 5: VOX DELAY 6: ANTI VOX 7: STEP DIAL 8: MEM CH 9: GROUP A: R.FIL B: SPEED C: PEAK D: COLOR E: LEVEL
	S	**F**	P1	P2	;						
Read	1	2	3	4	5	6	7	8	9	10	
	S	**F**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**F**	P1	P2	;						

CAT (Computer Aided Transceiver) Operation

SH	**WIDTH**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0 (Fixed) P3 00 (See Table)
	S	**H**	P1	P2	P3	P3	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	**H**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**H**	P1	P2	P3	P3	;				

Command	**Bandwidth**							
P3	SSB (Narrow)	SSB (Wide)	CW (Narrow)	CW (Wide)	RTTY (Narrow)	RTTY (Wide)	PSK (Narrow)	PSK (Wide)
00 (Default)	1500 Hz	2400 Hz	500 Hz	2400 Hz	300 Hz	500 Hz	300 Hz	500 Hz
01	200 Hz	-	50 Hz	-	50 Hz	-	50 Hz	-
02	400 Hz	-	100 Hz	-	100 Hz	-	100 Hz	-
03	600 Hz	-	150 Hz	-	150 Hz	-	150 Hz	-
04	850 Hz	-	200 Hz	-	200 Hz	-	200 Hz	-
05	1100 Hz	-	250 Hz	-	250 Hz	-	250 Hz	-
06	1350 Hz	-	300 Hz	-	300 Hz	-	300 Hz	-
07	1500 Hz	-	350 Hz	-	350 Hz	-	350 Hz	-
08	1650 Hz	-	400 Hz	-	400 Hz	-	400 Hz	-
09	1800 Hz	1800 Hz	450 Hz	-	450 Hz	-	450 Hz	-
10	-	1950 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz	500 Hz
11	-	2100 Hz	-	600 Hz	-	600 Hz	-	600 Hz
12	-	2200 Hz	-	800 Hz	-	800 Hz	-	800 Hz
13	-	2300 Hz	-	1200 Hz	-	1200 Hz	-	1200 Hz
14	-	2400 Hz	-	1400 Hz	-	1400 Hz	-	1400 Hz
15	-	2500 Hz	-	1700 Hz	-	1700 Hz	-	1700 Hz
16	-	2600 Hz	-	2000 Hz	-	2000 Hz	-	2000 Hz
17	-	2700 Hz	-	2400 Hz	-	2400 Hz	-	2400 Hz
18	-	2800 Hz	-	3000 Hz	-	3000 Hz	-	3000 Hz
19	-	2900 Hz	-	-	-	-	-	-
20	-	3000 Hz	-	-	-	-	-	-
21	-	3200 Hz	-	-	-	-	-	-

SM	**S-METER READING**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 000 - 255
Read	1	2	3	4	5	6	7	8	9	10	
	S	**M**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**M**	P1	P2	P2	P2	;				

SQ	**SQUELCLH LEVEL**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: Fixed P2 000 - 100
	S	**Q**	P1	P2	P2	P2	;				
Read	1	2	3	4	5	6	7	8	9	10	
	S	**Q**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**Q**	P1	P2	P2	P2	;				

ST	**SPLIT**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: SPLIT “OFF” 1: SPLIT “ON” 2: SPLIT “ON” + 5 kHz Up
	S	**T**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	S	**T**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**T**	P1	;							

SV	**SWAP VFO**										
Set	1	2	3	4	5	6	7	8	9	10	Exchanges the MAIN band and SUB band frequency data.
	S	**V**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

SY	**SYNC**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: SYNC “OFF” 1: SYNC “ON” 2: SYNC “ON” + Copy (Frequency, Mode)
	S	**Y**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	S	**Y**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	S	**Y**	P1	;							

CAT (Computer Aided Transceiver) Operation

TX	TX SET										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: RADIO TX "OFF" CAT TX "OFF" 1: RADIO TX "OFF" CAT TX "ON" 2: RADIO TX "ON" CAT TX "OFF" (Answer)
	T	**X**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	T	**X**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	T	**X**	P1	;							

UL	PLL UNLOCK STATUS										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: PLL "Lock" 1: PLL "Unlock"
Read	1	2	3	4	5	6	7	8	9	10	
	U	**L**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	U	**L**	P1	;							

UP	MIC UP										
Set	1	2	3	4	5	6	7	8	9	10	
	U	**P**	;								
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

VD	VOX DELAY TIME / DATA VOX DELAY TIME										
Set	1	2	3	4	5	6	7	8	9	10	P1 0030 - 3000 msec (10 msec multiples) VD command has different parameters to be changed according to the setting of Menu item [OPERATION SETTING] → [TX GENERAL] → [VOX SELECT]. "MIC": VOX DELAY "DATA": DATA VOX DELAY
	V	**D**	P1	P1	P1	P1	;				
Read	1	2	3	4	5	6	7	8	9	10	
	V	**D**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**D**	P1	P1	P1	P1	;				

VG	VOX GAIN										
Set	1	2	3	4	5	6	7	8	9	10	P1 000 - 100
	V	**G**	P1	P1	P1	;					
Read	1	2	3	4	5	6	7	8	9	10	
	V	**G**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**G**	P1	P1	P1	;					

VM	MAIN BAND TO MEMORY CHANNEL										
Set	1	2	3	4	5	6	7	8	9	10	
	V	**M**	;			;					
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

VS	VFO SELECT										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band Operation 1: Sub Band Operation
	V	**S**	P1	;							
Read	1	2	3	4	5	6	7	8	9	10	
	V	**S**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**S**	P1	;							

VT	VCT (VC TUNE)										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: MAIN Band 1: SUB Band P2 0: OFF 1: ON 2: Default P3 + - P4 0 ~ 9 P5 0 ~ 255 (VCT Meter) P6 0: VC TUNE (not installed) 1: VC TUNE
	V	**T**	P1	P2	P3	P4	;				
Read	1	2	3	4	5	6	7	8	9	10	
	V	**T**	P1	;							
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**T**	P1	P2	P5	P5	P5	P6	;		

VX	**VOX STATUS**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: VOX "OFF" 1: VOX "ON"
	V	**X**	P1	;		;					
Read	1	2	3	4	5	6	7	8	9	10	
	V	**X**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	V	**X**	P1	;							

XT	**TX CLAR**										
Set	1	2	3	4	5	6	7	8	9	10	P1 0: TX CLAR "OFF" 1: TX CLAR "ON"
	X	**T**	P1	;		;					
Read	1	2	3	4	5	6	7	8	9	10	
	X	**T**	;								
Answer	1	2	3	4	5	6	7	8	9	10	
	X	**T**	P1	;							

ZI	**ZERO IN**										
Set	1	2	3	4	5	6	7	8	9	10	(CW AUTO ZERO IN Function)
	Z	**I**	;			;					
Read	1	2	3	4	5	6	7	8	9	10	
Answer	1	2	3	4	5	6	7	8	9	10	

YAESU
The radio

YAESU MUSEN CO., LTD.
Tennozu Parkside Building
2-5-8 Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-0002 Japan

YAESU USA
6125 Phyllis Drive, Cypress, CA 90630, U.S.A.

YAESU UK
Unit 12, Sun Valley Business Park, Winnall Close
Winchester, Hampshire, SO23 0LB, U.K.

1904-A