

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

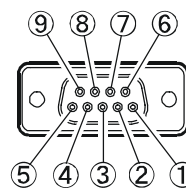
OVERVIEW

The CAT (Computer Aided Transceiver) System in the **FT-450** 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 as single mouse clicks or keystroke operations on the computer keyboard.

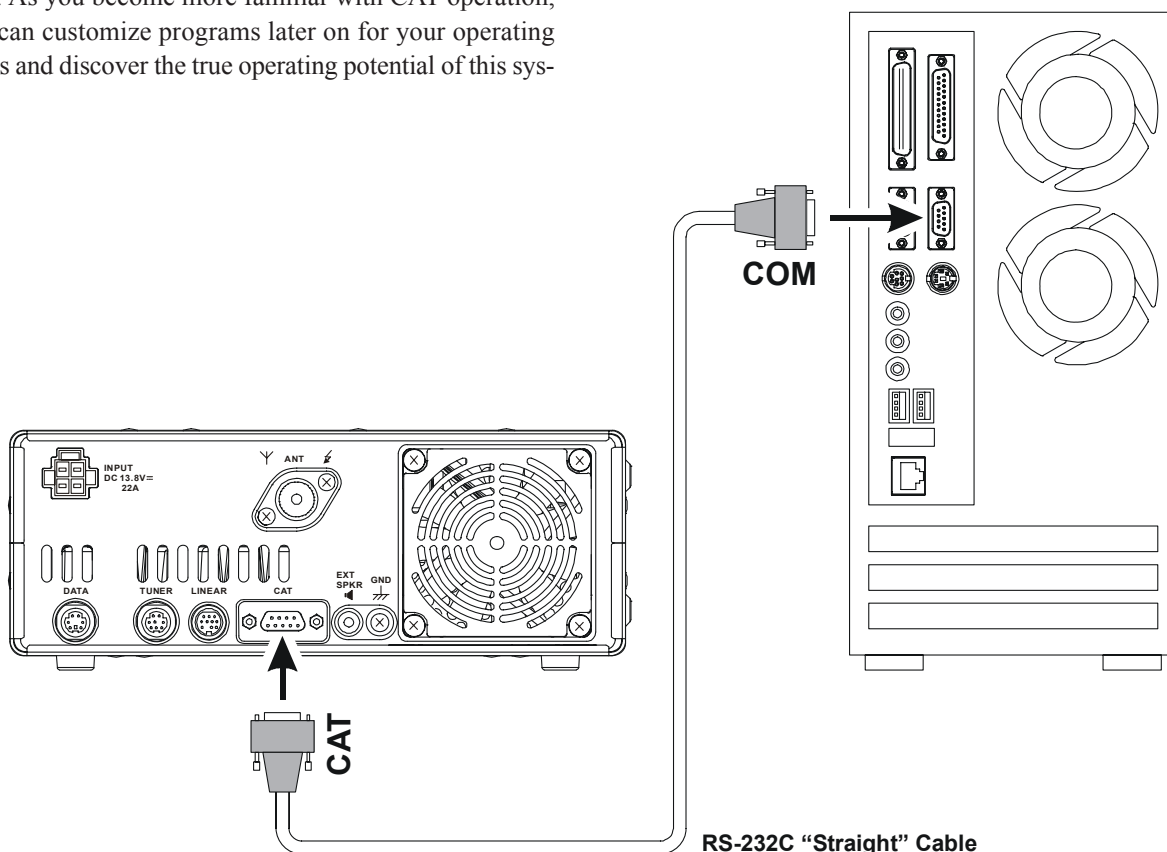
The **FT-450** has a built-in level converter, allowing direct connection from the rear-panel **CAT** jack to the serial port of your computer without the need of any external boxes. You will need a serial cable for connection to the RS-232C (serial or COM port) connector on your computer. Purchase a 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.

Vertex Standard 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 later on for your operating needs and discover the true operating potential of this system.

CAT JACK



| 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 | Input | When the computer is not ready to receive data, this port goes "L" to inhibit transmit data from the transceiver. |
| ⑧ | CTS | Output | When the transceiver is not ready to receive data, this port goes "L" to inhibit the transmit data from the computer. |
| ⑨ | N/A | — | — |



CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

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 VFO-A frequency to 14.250000 MHz.

| | | |
|-----------|-----------------|------------|
| FA | 14250000 | ; |
| ↑ | ↑ | ↑ |
| Command | Parameter | Terminator |

There are three types of commands for the **FT-450** as shown below:

Set command: Set a particular condition
(to the **FT-450**)

Read command: Reads an answer
(from the **FT-450**)

Answer command: Transmits a condition
(from the **FT-450**)

For example, note the following in the case of the FA command (Set the VFO-A frequency):

To set the VFO-A frequency to 14.250000 MHz, the following command is sent from the computer to the transceiver:

“**FA14250000;**” (Set command)

To read the VFO-A 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:

“**FA14250000;**” (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 correct parameter is “**IS0+1000**” (IF SHIFT):

IS01000;

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

IS0+100;

Not enough digits (Only three frequency digits given)

IS0+_1000;

Unnecessary characters between parameters

IS0+10000;

Too many digits (Five frequency digits given)

Note: If a particular parameter is not applicable to the **FT-450**, 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

CONTROL COMMAND LIST

| COMMAND | FUNCTION | SET | READ | ANS. | AI | COMMAND | FUNCTION | SET | READ | ANS. | AI |
|---------|-----------------------|-----|------|------|----|---------|---------------------------|-----|------|------|----|
| AC | ANTENNA TUNER CONTROL | 0 | 0 | 0 | 0 | MW | MEMORY WRITE | 0 | X | X | X |
| AG | AF GAIN | 0 | 0 | 0 | 0 | NA | NARROW | 0 | 0 | 0 | 0 |
| AI | AUTO INFORMATION | 0 | 0 | 0 | X | NB | NOISE BLANKER | 0 | 0 | 0 | 0 |
| BD | BAND DOWN | 0 | X | X | X | NR | NOISE REDUCTION | 0 | 0 | 0 | 0 |
| BI | BREAK-IN | 0 | 0 | 0 | 0 | OI | OPPOSITE BAND INFORMATION | X | 0 | 0 | X |
| BP | MANUAL NOTCH | 0 | 0 | 0 | 0 | OS | OFFSET (REPEATER SHIFT) | 0 | 0 | 0 | 0 |
| BS | BAND SELECT | 0 | X | X | X | PA | PRE-AMP (IPO) | 0 | 0 | 0 | 0 |
| BU | BAND UP | 0 | X | X | X | PB | PLAY BACK | 0 | 0 | 0 | X |
| BY | BUSY | X | 0 | 0 | 0 | PC | POWER CONTROL | 0 | 0 | 0 | 0 |
| CH | CHANNEL UP/DOWN | 0 | X | X | X | PS | POWER SWITCH | 0 | 0 | 0 | X |
| CN | CTCSS NUMBER | 0 | 0 | 0 | 0 | QI | QMB STORE | 0 | X | X | X |
| CO | CONTOUR | 0 | 0 | 0 | 0 | QR | QMB RECALL | 0 | X | X | X |
| CS | CW SPOT | 0 | 0 | 0 | 0 | QS | QUICK SPLIT | 0 | X | X | X |
| CT | CTCSS | 0 | 0 | 0 | 0 | RA | RF ATTENUATOR | 0 | 0 | 0 | 0 |
| DA | DIMMER | 0 | 0 | 0 | X | RC | CLAR CLEAR | 0 | X | X | X |
| DN | MIC DOWN | 0 | X | X | X | RD | CLAR DOWN | 0 | X | X | X |
| DS | DIMMER SWITCH | 0 | 0 | 0 | 0 | RG | RF GAIN | 0 | 0 | 0 | 0 |
| ED | ENCODER DOWN | 0 | X | X | X | RI | RADIO INFORMATION | X | 0 | 0 | 0 |
| EU | ENCODER UP | 0 | X | X | X | RL | NOISE REDUCTION LEVEL | 0 | 0 | 0 | 0 |
| EX | MENU | 0 | 0 | 0 | 0 | RM | READ METER | X | 0 | 0 | 0 |
| FA | FREQUENCY VFO-A | 0 | 0 | 0 | 0 | RP | RESET POWER ON | 0 | X | X | X |
| FB | FREQUENCY VFO-B | 0 | 0 | 0 | 0 | RS | RADIO STATUS | X | 0 | 0 | 0 |
| FS | FAST STEP | 0 | 0 | 0 | 0 | RT | CLAR | 0 | 0 | 0 | 0 |
| FT | FUNCTION TX | 0 | 0 | 0 | 0 | RU | CLAR UP | 0 | X | X | X |
| GT | AGC FUNCTION | 0 | 0 | 0 | 0 | SC | SCAN | 0 | 0 | 0 | 0 |
| ID | IDENTIFICATION | X | 0 | 0 | X | SD | SEMI BREAK-IN DELAY TIME | 0 | 0 | 0 | 0 |
| IF | INFORMATION | X | 0 | 0 | 0 | SH | WIDTH | 0 | 0 | 0 | 0 |
| IS | IF-SHIFT | 0 | 0 | 0 | 0 | SM | S METER | X | 0 | 0 | 0 |
| KM | KEYER MEMORY | 0 | 0 | 0 | X | SQ | SQUELCH LEVEL | 0 | 0 | 0 | 0 |
| KP | KEY PITCH | 0 | 0 | 0 | 0 | ST | STEP | 0 | 0 | 0 | 0 |
| KR | KEYER | 0 | 0 | 0 | 0 | SV | SWAP VFO | 0 | X | X | X |
| KS | KEY SPEED | 0 | 0 | 0 | 0 | TS | TXW | 0 | 0 | 0 | 0 |
| KY | CW KEYING | 0 | X | X | X | TX | TX SET | 0 | 0 | 0 | 0 |
| LK | LOCK | 0 | 0 | 0 | 0 | UL | UNLOCK | X | 0 | 0 | 0 |
| LM | LOAD MESSEGE | 0 | 0 | 0 | X | UP | MIC UP | 0 | X | X | X |
| MC | MEMORY CHANNEL | 0 | 0 | 0 | X | VD | VOX DELAY TIME | 0 | 0 | 0 | 0 |
| MD | MODE | 0 | 0 | 0 | 0 | VG | VOX GAIN | 0 | 0 | 0 | 0 |
| MG | MIC GAIN | 0 | 0 | 0 | 0 | VM | [V/M] KEY FUNCTION | 0 | X | X | X |
| MK | MODE KEY | 0 | X | X | X | VR | VOICE | 0 | 0 | 0 | X |
| ML | MONITOR LEVEL | 0 | 0 | 0 | 0 | VS | VFO SELECT | 0 | 0 | 0 | 0 |
| MR | MEMORY READ | X | 0 | 0 | X | VV | VFO TO VFO | 0 | 0 | 0 | 0 |
| MS | METER SW | 0 | 0 | 0 | 0 | VX | VOX | 0 | 0 | 0 | 0 |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| 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 | |

| CN | CTCSS TONE FREQUENCY | | | | | | | | | | |
|--------|----------------------|---|----|----|----|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 00 - 49: Tone Frequency Number (See Table 1) |
| | C | N | 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 | |

| CO | CONTOUR | | | | | | | | | | |
|--------|---------|---|----|----|----|----|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0: CONTOUR "ON/OFF" 1: CONTOUR Frequency P3 When P2=0, -2: CONTOUR "ON" -12 dB -1: CONTOUR "ON" -6 dB 00: CONTOUR "OFF" +1: CONTOUR "ON" +6 dB +2: CONTOUR "ON" +12 dB When P2=1, 01 ~ 07: 250 Hz 08 ~ 13: 500 Hz 14 ~ 19: 1 kHz 20 ~ 25: 2 kHz 26 ~ 32: 4 kHz |
| | C | O | P1 | P2 | P3 | P3 | ; | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

| CS | CW SPOT | | | | | | | | | | |
|--------|---------|---|----|---|---|---|---|---|---|----|--------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: OFF 1: ON |
| | C | S | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

| CT | CTCSS | | | | | | | | | | |
|--------|-------|---|----|----|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0: CTCSS "OFF" 1: CTCSS ENC/DEC "ON" 2: CTCSS ENC "ON" |
| | C | T | P1 | P2 | ; | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

| DA | DIMMER | | | | | | | | | | |
|--------|--------|---|----|----|----|----|---|---|---|----|----------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 00 - 04 P2 00: Fixed |
| | D | A | P1 | 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 | |

| 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 | |

| DS | DIMMER SWITCH | | | | | | | | | | |
|--------|---------------|---|----|---|---|---|---|---|---|----|--------------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: DIMMER "OFF" 1: DIMMER "ON" |
| | D | S | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |

TABLE 1

| CTCSS TONE CHART | | | | | | | | | | | |
|------------------|---------|----|----------|----|----------|----|----------|----|----------|----|----------|
| 00 | 67.0 Hz | 09 | 91.5 Hz | 18 | 123.0 Hz | 27 | 162.2 Hz | 36 | 189.9 Hz | 45 | 229.1 Hz |
| 01 | 69.3 Hz | 10 | 94.8 Hz | 19 | 127.3 Hz | 28 | 165.5 Hz | 37 | 192.8 Hz | 46 | 233.6 Hz |
| 02 | 71.9 Hz | 11 | 97.4 Hz | 20 | 131.8 Hz | 29 | 167.9 Hz | 38 | 196.6 Hz | 47 | 241.8 Hz |
| 03 | 74.4 Hz | 12 | 100.0 Hz | 21 | 136.5 Hz | 30 | 171.3 Hz | 39 | 199.5 Hz | 48 | 250.3 Hz |
| 04 | 77.0 Hz | 13 | 103.5 Hz | 22 | 141.3 Hz | 31 | 173.8 Hz | 40 | 203.5 Hz | 49 | 254.1 Hz |
| 05 | 79.7 Hz | 14 | 107.2 Hz | 23 | 146.2 Hz | 32 | 177.3 Hz | 41 | 206.5 Hz | -- | -- |
| 06 | 82.5 Hz | 15 | 110.9 Hz | 24 | 151.4 Hz | 33 | 179.9 Hz | 42 | 210.7 Hz | -- | -- |
| 07 | 85.4 Hz | 16 | 114.8 Hz | 25 | 156.7 Hz | 34 | 183.5 Hz | 43 | 218.1 Hz | -- | -- |
| 08 | 88.5 Hz | 17 | 118.8 Hz | 26 | 159.8 Hz | 35 | 186.2 Hz | 44 | 225.7 Hz | -- | -- |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| ED | | ENCODER DOWN | | | | | | | | | |
|-----------|----------|---------------------|----|----|----|---|---|---|---|----|-------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0:Fixed P2 01-99: Steps |
| | 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 | |
| | | | | | | | | | | | |

| EU | | ENCODER UP | | | | | | | | | |
|-----------|----------|-------------------|----|----|----|---|---|---|---|----|-------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0:Fixed P2 01-99: Steps |
| | 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 | |
| | | | | | | | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| EX | MENU | | | | | | | | | | P1 001-064 (MENU Number) P2 Parameter (See Table 2) |
|--------|------|---|----|----|----|----|----|---|----|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | nn | ** | |
| | E | X | P1 | P1 | P1 | P2 | P2 | ~ | P2 | ; | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | E | X | P1 | P1 | P1 | ; | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | nn | ** | |
| | E | X | P1 | P1 | P1 | P2 | P2 | ~ | P2 | ; | |

TABLE 2

| P1 | FUNCTION | P2 |
|-----|--------------------------|---|
| 001 | EXT MNU | 0: OFF 1: ON |
| 002 | AM & FMDIAL | 0: DISABLE 1: ENABLE |
| 003 | APO TIME | 00 (OFF) ~ 01 (hour) ~ 12 (hour) |
| 004 | BEACON TIME | 000 (OFF) ~ 001 (sec) ~ 255 (sec) |
| 005 | BEACON TEXT | --- |
| 006 | BEEP TONE | 0: 440 Hz 1: 880 Hz 2: 1760 Hz |
| 007 | BEEPVOL | 000 (FIX 0) ~ 100 (FIX100) or 101 (LNK-50) ~ 151 (LNK0) ~ 201 (LNK+50) |
| 008 | CAT RTS | 0: DISABLE 1: ENABLE |
| 009 | CAT TIME OUT TIME | 0: 10 msec 1: 100 msec 2: 1000 msec 3: 3000 msec |
| 010 | CATRATE | 1: 4800 bps 2: 9600 bps 3: 19200 bps 4: 38400 bps 5: DATA |
| 011 | CLAR DIAL / SEL | 0: DIAL 1: SEL |
| 012 | CLOCK SHIFT | 0: OFF 1: ON |
| 013 | DISP CONTRAST | 01 ~ 24 |
| 014 | CW AUTO MODE | 0: OFF 1: ON |
| 015 | CW BFO | 0: USB 1: LSB 2: AUTO |
| 016 | CW DELAY | 0000 (FULL) / 0030 (msec) ~ 3000 (msec) |
| 017 | CW KEY REVERSE | 0: NORMAL 1: REVERSE |
| 018 | CW QSK | 0: 15 msec 1: 20 msec 2: 25 msec 3: 30 msec |
| 019 | CW PADDLE | 0: KEY 1: MIC |
| 020 | CWPITCH | 00 - 02: 400 Hz 03 - 04: 500 Hz 05 - 06: 600 Hz 07 - 08: 700 Hz 09 - 15: 800 Hz |
| 021 | CWSPEED | 04 (wpm) ~ 60 (wpm) |
| 022 | CW SIDE TONE | 000 (FIX 0) ~ 100 (FIX100) or 101 (LNK-50) ~ 151 (LNK0) ~ 201 (LNK+50) |
| 023 | CW TRAINING | 0: N (Numeric Character Only) 1: A (Alphabet Character Only) 2: M (Mixed: Numeric and Alphabet Character) |
| 024 | CW WEIGHT | 25 (1:2.5) ~ 45 (1:4.5) |
| 025 | DATA DISP | -300 (-3000 Hz) ~ +000 (0 Hz) ~ +300 (+3000 Hz) |
| 026 | DATA MODE | 0: RTTY 1: USER-L 2: USER-U |
| 027 | Not Used | --- |
| 028 | Not Used | --- |
| 029 | DIAL STEP | 0: 1 Hz 1: 10 Hz 2: 20 Hz 3: 100 Hz 4: 200 Hz |
| 030 | DIG VOX | 000 (OFF) ~ 100 |
| 031 | EMERGENCY | 0: OFF 1: ON |
| 032 | KEY HOLD TIME | 0: 0.5 sec 1: 1.0 sec 2: 1.5 sec 3: 2.0 sec |
| 033 | LOCK MODE | 0: FREQ 1: PANEL 2: ALL |
| 034 | M-TUNE | 0: OFF 1: ON |
| 035 | MEMORY GROUP | 0: OFF 1: ON |
| 036 | MEMORY TAG | 0: TAG-OFF 1: TAG NAME |
| 037 | MIC EQ | 0 ~ 9 |
| 038 | MIC GAIN | 0: LOW 1: NOR 2: HIGH |
| 039 | MIC AUTO SCAN | 0: OFF 1: ON |
| 040 | MY BAND | See Table 3 |
| 041 | MY MODE | See Table 4 |
| 042 | MIC-DOWN PG | See Table 5 |
| 043 | MIC-FAST PG | See Table 5 |
| 044 | MIC-UP PG | See Table 5 |
| 045 | METER PEAK HOLD | 0: OFF 1: ON |
| 046 | PANEL'S CUSTOM SWITCH | See Table 5 |
| 047 | QUICK SPLIT FREQ | -20 (kHz) ~ +00 (kHz) ~ +20 (kHz) |
| 048 | RF POWER SET | 005 ~ 100 |
| 049 | REPEATER SHIFT DIRECTION | 0: SIMPLEX 1: +SHIFT 2: - SHIFT |
| 050 | REPEATER SHIFT OFFSET | 000 (0 MHz) ~ 999 (99.9 MHz) |
| 051 | RTTY SHIFT | 1: 170 Hz 2: 200 Hz 3: 425 Hz 4: 850 Hz |
| 052 | RTTY TONE | 1: 1275 Hz 2: 2125 Hz |
| 053 | RTTY RX POLARITY | 0: NORMAL 1: REVERSE |
| 054 | RTTY TX POLARITY | 0: NORMAL 1: REVERSE |
| 055 | SCAN RESUME | 00: BUSY 01 (TIME: 1 sec) ~ 10 (TIME: 10 sec) |
| 056 | SEL DIAL MODE | 0: CW Sidetone Level 1: CW KEYER Speed 2: 100kHz Step 3: 1MHz Step 4: MIC GAIN Set 5: RF Power Set |
| 057 | SQL TYPE | 0: OFF 1: ENC 2: ENC DEC |
| 058 | SQL/RF GAIN | 0: SQL 1: RF GAIN |
| 059 | STBY BEEP | 0: OFF 1: ON |
| 060 | TONE FREQ | See Table 6 |
| 061 | TOT TIME | 00 (OFF) ~ 01 (minute) ~ 20 (minute) |
| 062 | TUNER/ATAS | 0: ATAS 1: EXT ATU 2: INT ATU 3: INTRATU 4: F TRANS |
| 063 | VOX DELAY | 01 (100 msec) ~ 30 (300 msec) |
| 064 | VOXGAIN | 001 ~ 255 |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

TABLE 3

| MY BAND | | | |
|---------|----------------|-----|---------------|
| P2 | FUNCTION | P2 | FUNCTION |
| 000 | 1.8 MHz "OFF" | 100 | 1.8 MHz "ON" |
| 001 | 3.5 MHz "OFF" | 101 | 3.5 MHz "ON" |
| 003 | 7 MHz "OFF" | 103 | 7 MHz "ON" |
| 004 | 10 MHz "OFF" | 104 | 10 MHz "ON" |
| 005 | 14 MHz "OFF" | 105 | 14 MHz "ON" |
| 006 | 18 MHz "OFF" | 106 | 18 MHz "ON" |
| 007 | 21 MHz "OFF" | 107 | 21 MHz "ON" |
| 008 | 24.5 MHz "OFF" | 108 | 24.5 MHz "ON" |
| 009 | 28 MHz "OFF" | 109 | 28 MHz "ON" |
| 010 | 50 MHz "OFF" | 110 | 50 MHz "ON" |

TABLE 4

| MY MODE | | | |
|---------|-----------------------|----|----------------------|
| P2 | FUNCTION | P2 | FUNCTION |
| 01 | LSB "OFF" | 11 | LSB "ON" |
| 02 | USB "OFF" | 12 | USB "ON" |
| 03 | CW "OFF" | 13 | CW "ON" |
| 04 | FM "OFF" | 14 | FM "ON" |
| 05 | AM "OFF" | 15 | AM "ON" |
| 06 | DATA (RTTY-LSB) "OFF" | 16 | DATA (RTTY-LSB) "ON" |
| 07 | CW-R "OFF" | 17 | CW-R "ON" |
| 08 | USER-L "OFF" | 18 | USER-L "ON" |
| 09 | DATA (RTTY-USB) "OFF" | 19 | DATA (RTTY-USB) "ON" |
| 0A | N.A. | 1A | N.A. |
| 0B | FM-N "OFF" | 1B | FM-N "ON" |
| 0C | USER-U "OFF" | 1C | USER-U "ON" |

TABLE 5

| P2 | FUNCTION | |
|----|----------|---|
| 01 | MONI | Activates the Monitor function. |
| 02 | N/A | No Function. |
| 03 | P/B | Activates the Digital Voice Recorder. |
| 04 | PLAY1 | Send the CW message, which is memorized in BEACON TEXT 1. |
| 05 | PLAY2 | Send the CW message, which is memorized in BEACON TEXT 2. |
| 06 | PLAY3 | Send the CW message, which is memorized in BEACON TEXT 3. |
| 07 | QSPL | Activates Quick Split Operation |
| 08 | SPOT | Generates a CW Spot Tone when using CW mode. |
| 09 | SQLOFF | Opens the noise squelch. |
| 10 | SWR | Transmits a 10 watts carrier (CW mode) to measure the SWR ratio. |
| 11 | TXW | Monitor the transmit frequency when Split Frequency operation is engaged. |
| 12 | VCC | Display the DC supply voltage. |
| 13 | VOICE2 | Announces the current S-meter reading, operating frequency (with resolution to the displayed 100 Hz digit), and operating mode. |
| 14 | VM1MONI | Play back the voice message, which is memorized in Voice Memory 1. |
| 15 | VM1REC | Store the voice message into Voice Memory 1. |
| 16 | VM1TX | Send the voice message, which is memorized in Voice Memory 1. |
| 17 | VM2MONI | Play back the voice message, which is memorized in Voice Memory 2. |
| 18 | VM2REC | Store the voice message into Voice Memory 2. |
| 19 | VM2TX | Send the voice message, which is memorized in Voice Memory 2. |
| 20 | DOWN | Decreases the VFO frequency by one step or moves the memory channel to the next-lowest channel. |
| 21 | FAST | Set to the same function as the front panel's [FAST] button. |
| 22 | UP | Increases the VFO frequency by one step or moves the memory channel to the next-highest channel. |
| 23 | DSP | Set to the same function as the front panel's [DSP] button. |
| 24 | ATT/IPO | Set to the same function as the front panel's [ATT/IPO] button. |
| 25 | NB | Set to the same function as the front panel's [NB] button. |
| 26 | AGC | Set to the same function as the front panel's [AGC] button. |
| 27 | MODEDN | Set to the same function as the front panel's [MODE▼] button. |
| 28 | MODEUP | Set to the same function as the front panel's [MODE▲] button. |
| 29 | DSP/SEL | Set to the same function as the front panel's [DSP/SEL] button. |
| 30 | KEYER | Set to the same function as the front panel's [KEYER] button. |
| 31 | CLAR | Set to the same function as the front panel's [CLAR] button. |
| 32 | BANDDN | Set to the same function as the front panel's [BAND▼] button. |
| 33 | BANDUP | Set to the same function as the front panel's [BAND▲] button. |
| 34 | A=B | Set to the same function as the front panel's [A=B] button. |
| 35 | A/B | Set to the same function as the front panel's [A/B] button. |
| 36 | LOCK | Set to the same function as the front panel's [LOCK] button. |
| 37 | TUNE | Set to the same function as the front panel's [TUNE] button. |
| 38 | VOICE | Announce the current operating frequency (with resolution to the displayed 100 Hz digit) and operating mode. |
| 39 | MW | Copies the current operating data from the VFO into the currently selected memory channel. |
| 40 | V/M | Toggles frequency control between VFO and memory system. |
| 41 | HOME | Recall the "Home" (favorite frequency) channel. |
| 42 | RCL | Recall the QMB (Quick Memory Bank) memory. |
| 43 | VOX | Activate the VOX (automatic voice-actuated transmitter switching) feature. |
| 44 | STO | Copies operating data into QMB (Quick Memory Bank) Memory. |
| 45 | STEP | Enables the setting of the frequency step of the [DSP/SEL] knob by the [DSP/SEL] knob. |
| 46 | SPLIT | Activates split frequency operation between VFO-A and VFO-B. |
| 47 | PMS | Engages Programmable Memory Scan (PMS). |
| 48 | SCAN | Initiates the upward scanning of VFO frequencies or memory channels. |
| 49 | MENU | Engage the "Menu" mode. |
| 50 | DIMMER | Enables adjustment of the display dimmer level by the [DSP/SEL] knob. |
| 51 | MTR | Change the meter function in the transmit mode. |

TABLE 6

| CTCSS TONE CHART | | | | | | | | | | | |
|------------------|---------|----|----------|----|----------|----|----------|----|----------|----|----------|
| 00 | 67.0 Hz | 09 | 91.5 Hz | 18 | 123.0 Hz | 27 | 162.2 Hz | 36 | 189.9 Hz | 45 | 229.1 Hz |
| 01 | 69.3 Hz | 10 | 94.8 Hz | 19 | 127.3 Hz | 28 | 165.5 Hz | 37 | 192.8 Hz | 46 | 233.6 Hz |
| 02 | 71.9 Hz | 11 | 97.4 Hz | 20 | 131.8 Hz | 29 | 167.9 Hz | 38 | 196.6 Hz | 47 | 241.8 Hz |
| 03 | 74.4 Hz | 12 | 100.0 Hz | 21 | 136.5 Hz | 30 | 171.3 Hz | 39 | 199.5 Hz | 48 | 250.3 Hz |
| 04 | 77.0 Hz | 13 | 103.5 Hz | 22 | 141.3 Hz | 31 | 173.8 Hz | 40 | 203.5 Hz | 49 | 254.1 Hz |
| 05 | 79.7 Hz | 14 | 107.2 Hz | 23 | 146.2 Hz | 32 | 177.3 Hz | 41 | 206.5 Hz | — | — |
| 06 | 82.5 Hz | 15 | 110.9 Hz | 24 | 151.4 Hz | 33 | 179.9 Hz | 42 | 210.7 Hz | — | — |
| 07 | 85.4 Hz | 16 | 114.8 Hz | 25 | 156.7 Hz | 34 | 183.5 Hz | 43 | 218.1 Hz | — | — |
| 08 | 88.5 Hz | 17 | 118.8 Hz | 26 | 159.8 Hz | 35 | 186.2 Hz | 44 | 225.7 Hz | — | — |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| IS | IF-SHIFT | | | | | | | | | | |
|-----------|-----------------|----------|----|-----|----|----|----|----|---|----|------------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0000 ~ 1000 (Hz) |
| | I | S | P1 | -/+ | P2 | P2 | P2 | P2 | ; | | |
| 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 | P2 | P2 | P2 | ; | | |

| KM | KEYER MEMORY | | | | | | | | | | |
|-----------|---------------------|----------|----|----|----|----|----|---|----|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | ~ | 43 | ** | P1 1 - 3 : Beacon Text Channel Number P2 Message Characters (up to 40 characters) |
| | 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 | ~ | 43 | ** | |
| | K | M | P1 | P2 | P2 | P2 | P2 | ~ | P2 | ; | |

| KP | KEY PITCH | | | | | | | | | | |
|-----------|------------------|----------|----|----|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 02: 400 Hz 04: 500 Hz 06: 600 Hz 08: 700 Hz 10: 800 Hz |
| | 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 | ; | | | | | | |

| KR | KEYER | | | | | | | | | | |
|-----------|--------------|----------|----|---|---|---|---|---|---|----|------------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: KEYER "OFF" 1: KEYER "ON" |
| | 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 | ; | | | | | | | |

| KS | KEY SPEED | | | | | | | | | | |
|-----------|------------------|----------|----|----|----|---|---|---|---|----|--------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 004 - 060 (WPM) |
| | 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 | ; | | | | | |

| KY | CW KEYING | | | | | | | | | | |
|-----------|------------------|----------|----|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 6: Beacon Text "1" Playback 7: Beacon Text "2" Playback 8: Beacon Text "3" Playback |
| | 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 | |
| | | | | | | | | | | | |

| LK | LOCK | | | | | | | | | | |
|-----------|-------------|----------|----|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: DIAL Lock "OFF" 1: 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 MESSAGE | | | | | | | | | | | |
|-----------|---------------------|----------|----|----|---|---|---|---|---|----|---|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: VOICE MEMORY 1: DIGITAL VOICE RECORDER | P2 When P1=0 0: VOICE MEMORY RECORDING STOP 1: VOICE MEMORY 1 RECORDING 2: VOICE MEMORY 2 RECORDING When P1=1 0: DIGITAL VOICE RECORDER STOP 1: DIGITAL VOICE RECORDER START |
| | 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 | ; | | | | | | | |

| MC | MEMORY CHANNEL | | | | | | | | | | |
|-----------|-----------------------|----------|----|----|----|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 001 - 504: Memory Channel Number 001 - 500: Regular Memory Channel 501: P1L Channel 502: P1U Channel 503: P2L Channel 504: P2U Channel |
| | 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 | ; | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| MD | OPERATING MODE | | | | | | | | | | |
|--------|----------------|---|----|----|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 MODE 1: LSB 2: USB 3: CW 4: FM 5: AM 6: DATA (RTTY-LSB) 7: CW-R 8: USER-L 9: DATA (RTTY-USB) B: FM-N C: USER-U |
| | 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 - 085: MIC GAIN "L" 086 - 170: MIC GAIN "M" 171 - 255: MIC GAIN "H" |
| | 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 | ; | | | | | |

| MK | MODE KEY | | | | | | | | | | |
|--------|----------|---|----|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 KEY 7: MODE UP 8: MODE DOWN 9: REVERSE (@CW MODE) |
| | M | K | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | | | | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | | | | | | | | | | | |

| ML | MONITOR LEVEL | | | | | | | | | | |
|--------|---------------|---|----|----|----|----|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 000: MONITOR "OFF" 001: MONITOR "ON" |
| | 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 | ; | | | | |

| MR | MEMORY CHANNEL READ | | | | | | | | | | |
|--------|---------------------|----|----|----|----|-----|----|----|----|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 Memory Channel Number P2 Memory Channel 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 4: FM 5: AM 6: DATA (RTTY-LSB) 7: CW-R 8: USER-L 9: DATA (RTTY-USB) B: FM-N C: USER-U P7 0: VFO 1: Memory P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC P9: Tone Number (See Table 1) P10 0: Simplex 1: Plus Shift 2: Minus Shift |
| | | | | | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | M | R | P1 | P1 | P1 | ; | | | | | |
| 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 | P3 | P3 | P3 | P3 | P3 | P4 | P5 | |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| | P6 | P7 | P8 | P9 | P9 | P10 | ; | | | | |

| MS | METER SW | | | | | | | | | | |
|--------|----------|---|----|---|---|---|---|---|---|----|------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 1: ALC 2: PO 3: SWR |
| | M | S | P1 | ; | | | | | | | |
| 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 | ; | | | | | | | |

| MW | MEMORY CHANNEL WRITE | | | | | | | | | | |
|--------|----------------------|----|----|----|----|-----|----|----|----|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 Memory Channel Number P2 Memory Channel 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 4: FM 5: AM 6: DATA (RTTY-LSB) 7: CW-R 8: USER-L 9: DATA (RTTY-USB) B: FM-N C: USER-U P7 0: Fixed P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC P9: Tone Number (See Table 1) P10 0: Simplex 1: Plus Shift 2: Minus Shift |
| | M | W | P1 | P1 | P1 | P2 | P2 | P2 | P2 | P2 | |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| | P2 | P2 | P2 | P3 | P3 | P3 | P3 | P3 | P4 | P5 | |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| | 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 | |
| | | | | | | | | | | | |

| NA | NARROW | | | | | | | | | | |
|--------|--------|---|----|----|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0: Bandwidth Middeum 1: Bandwidth Narrow |
| | M | A | P1 | P2 | ; | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | N | A | P1 | ; | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | N | A | P1 | P2 | ; | | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| NB | NOISE BLANKER STATUS | | | | | | | | | | |
|-----------|-----------------------------|----------|----|----|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed 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 | ; | | | | | | |

| NR | NOISE REDUCTION | | | | | | | | | | |
|-----------|------------------------|----------|----|----|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed 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 Current 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 4: FM 5: AM 6: DATA (RTTY-LSB) 7: CW-R 8: USER-L 9: DATA (RTTY-USB) B: FM-N C: USER-U P7 0: VFO 1: Memory 2: Memory Tune 3: Quick Memory Bank (QMB) P8 0: CTCSS "OFF" 1: CTCSS ENC/DEC 2: CTCSS ENC P9: Tone Number (See Table 1) 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 | P3 | P3 | P3 | P3 | P3 | P4 | P5 | |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | |
| | P6 | P7 | P8 | P9 | P10 | ; | | | | | |

| OS | OFFSET (REPEATER SHIFT) | | | | | | | | | | |
|-----------|--------------------------------|----------|----|----|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0: Simplex 1: Plus Shift 2: Minus Shift *: FM mode only |
| | 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: Fixed P2 0: IPO "ON" 1: IPO "OFF" |
| | 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 | ; | | | | | | |

| PB | PLAY BACK | | | | | | | | | | |
|-----------|------------------|----------|----|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: STOP 1: VOICE MEMORY 1 PLAYBACK 2: VOICE MEMORY 2 PLAYBACK 6: DIGITAL VOICE RECORDER PLAYBACK |
| | P | B | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | P | B | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | P | B | P1 | ; | | | | | | | |

| PC | POWER CONTROL | | | | | | | | | | |
|-----------|----------------------|----------|----|----|----|---|---|---|---|----|--------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 000 - 255 |
| | 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 | ; | | | | | |

| 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 | ; | | | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| 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 | |
| | | | | | | | | | | | |

| RA | RF ATTENUATOR | | | | | | | | | | |
|--------|---------------|---|----|----|---|---|---|---|---|----|-----------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 0: OFF 1: ON |
| | 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 | CLARIFIER MINUS OFFSET | | | | | | | | | | |
|--------|------------------------|---|----|----|----|----|---|---|---|----|---------------------|
| 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 | |
| | | | | | | | | | | | |

| RG | RF GAIN | | | | | | | | | | |
|--------|---------|---|----|----|----|----|---|---|---|----|-----------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed 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 1: MIC-EQ 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: Fixed P2 01 - 11 |
| | 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 | ; | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| RM | READ METER | | | | | | | | | | |
|-----------|-------------------|----|----|----|----|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Depends of the Front Panel's METER Switch 1: S Meter 4: ALC Meter 5: PO Meter 6: SWR Meter P2 000 - 255 |
| 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 | ; | | | | | |

| RP | RESET POWER ON | | | | | | | | | | |
|-----------|-----------------------|---|---|---|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Resetting the Microprocessor (Full Reset) |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | R P | ; | | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | R P | ; | | | | | | | | | |

| 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" |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | R T | P1 | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | R T | P1 | ; | | | | | | | | |

| RU | CLARIFIER PLUS OFFSET | | | | | | | | | | |
|-----------|------------------------------|----|----|----|----|---|---|---|---|----|---------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0000 - 9999 (Hz) |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | R U | P1 | P1 | P1 | P1 | ; | | | | | |
| 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" (Upward) 2: Scan "ON" (Downward) |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | S C | P1 | ; | | | | | | | | |
| 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 0000: Full Break-in 0030 - 3000 (msec) |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | S D | P1 | P1 | P1 | P1 | ; | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | S D | P1 | P1 | P1 | P1 | ; | | | | | |

| SH | WIDTH | | | | | | | | | | |
|-----------|--------------|----|----|----|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0:Fixed P2 00 - 10 (Narrow) 11 - 21 (Normal) 22 - 31 (Wide) P3 00 (Narrow) 16 (Normal) 31 (Wide) |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | S H | P1 | P2 | P2 | ; | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | S H | P1 | P3 | P3 | ; | | | | | | |

| SM | S-METER READING | | | | | | | | | | |
|-----------|------------------------|----|----|----|----|---|---|---|---|----|-----------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed 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 | ; | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| SQ | SQUELCH LEVEL | | | | | | | | | | |
|-----------|----------------------|----------|----|----|----|----|---|---|---|----|-----------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: Fixed P2 000 - 255 |
| | 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 | STEP | | | | | | | | | | |
|-----------|-------------|----------|----|---|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 FM AM LSB/USB/CW FM 0: 5.0 kHz 2.5 kHz 1.0 kHz P1 6: 25.0 kHz 1: 6.25 kHz 5.0 kHz 2.5 kHz 7: 50.0 kHz 2: 10.0 kHz 9.0 kHz 5.0 kHz 3: 12.5 kHz 10.0 kHz 4: 15.0 kHz 12.5 kHz 5: 20.0 kHz 25.0 kHz |
| | 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 | |
| | S | V | ; | | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | | | | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | | | | | | | | | | | |

| TS | TXW | | | | | | | | | | |
|-----------|------------|----------|----|---|---|---|---|---|---|----|--------------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: TXW "OFF" 1: TXW "ON" |
| | T | S | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | T | S | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | T | S | P1 | ; | | | | | | | |

| 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 | | | | | | | | | | |
|-----------|-----------------------|----------|----|----|----|----|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0100 - 3000 msec (100 msec multiples) |
| | 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 - 255 |
| | 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 | ; | | | | | |

CAT (COMPUTER AIDED TRANSCEIVER) OPERATION

CONTROL COMMAND TABLES

| VM | [V/M] KEY FUNCTION | | | | | | | | | | |
|-----------|---------------------------|----------|---|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Toggles frequency control between the VFO and Memory System. |
| | V | M | ; | | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | M | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | M | ; | | | | | | | | |

| VR | VOICE | | | | | | | | | | |
|-----------|--------------|----------|----|---|---|---|---|---|---|----|---|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: VOICE "OFF" 1: VOICE 1 "ON" 2: VOICE 2 "ON" |
| | V | R | P1 | ; | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | R | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | R | P1 | ; | | | | | | | |

| VS | VFO SELECT | | | | | | | | | | |
|-----------|-------------------|----------|----|---|---|---|---|---|---|----|-------------------------|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | P1 0: VFO-A 1: VFO-B |
| | 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 | ; | | | | | | | |

| VV | VFO TO VFO | | | | | | | | | | |
|-----------|-------------------|----------|---|---|---|---|---|---|---|----|--|
| Set | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Copy the displayed VFO data to the opposite VFO. |
| | V | V | ; | | | | | | | | |
| Read | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | V | ; | | | | | | | | |
| Answer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | V | V | ; | | | | | | | | |

| 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 | ; | | | | | | | |