

# Kenwood TH-F6A Computer Control Reference

K9DCI

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Ver 2.0

This is a condensed and edited version, with additional information, of the information in a document by John May, K6MAY, entitled:

Kenwood TH-F6A/TH-F7E

Protocol Specification

By John May, K6MAY

<http://www.k6may.com/KenwoodTHF6Tip1.shtml>

## *Fine Print*

*While care was taken to be accurate, this document may contain errors and may not contain all functional commands. The starting point for this document was John May's document. During the preparation of this document all errors found were corrected, yet some may still be present. Not all commands were exhaustively examined and some may have errors or omissions. No investigation was done looking for non printing command op-codes and many of the things stated here were seen as being correct, but were not exhaustively studied under all conditions or for all commands. The home brew level converter shown herein and both a terminal program and Excel macros doing serial I/O on a PC were used to examine and verify the behavior of commands and verify the changes and additions to the information in John's document. Send any comments or corrections to me at my call at the ARRL forwarding service ([callsign@arrl.net](mailto:callsign@arrl.net))*

## Version history

1.0 9/04 original released version.

1.1 10/4/04 Wording cleanup in front, note that PV is not permanent. Change from the word "Request" to "Sent" in the Modify examples.

1.11 3/3/05 changed Mhz to MHz.

1.12 4/6/05 Added scan aborts page 5 and clarified the command exceptions on the bottom of page 7. Added URL for John's doc. Clarified the level converter Q3 circuit description.

1.2 8/2/05 Improved notes about Fine Step on page 4 and in Command Parameter Tables, Pg 8 and Commands FQ & FST on pg 18.

1.3 11/6/06 Corrected note about Air Band 8.33 kHz steps programming and added references in respective commands. Also added some clarification of Control (active) receiver.

- Fixed MR example. Mem number in radio response shown is 20, but note said 013.
- Fixed MW Note and example to show that the split byte may be either 0 or 1 to erase a memory.
- PL code 39 in table, page p, was incorrectly shown as 49.
- Mention that there are three Call channels in CR and CW commands.
- Added Call channel Tx Split Read example.
- Call channels have no alpha Name capability.
- Improved the notes on 6.25, 8.33 and 12.5 kHz step programming.
- Added notes indicating the Tx Step must be the same as the Rx Step.

1.4 (2/9/07) Added clarification of Call channel selection in MC command.

1.5 (3/23/07) Level converter page. Added comment about the live mic. Added comment about optional 1uH chokes and rearranged the connector descriptions.

1.6a (8/11/07) Level converter. Corrected note to read Q2 (was a nonexistent Q3). Clarified that the F6 mic input is live in PC mode.

Page 8. Note added for Rx A Steps.

TSP Operands were reversed.

MGL command: Added note reminding about the space after the command

MD command. Only applicable to Rx B. Rx A only does FM.

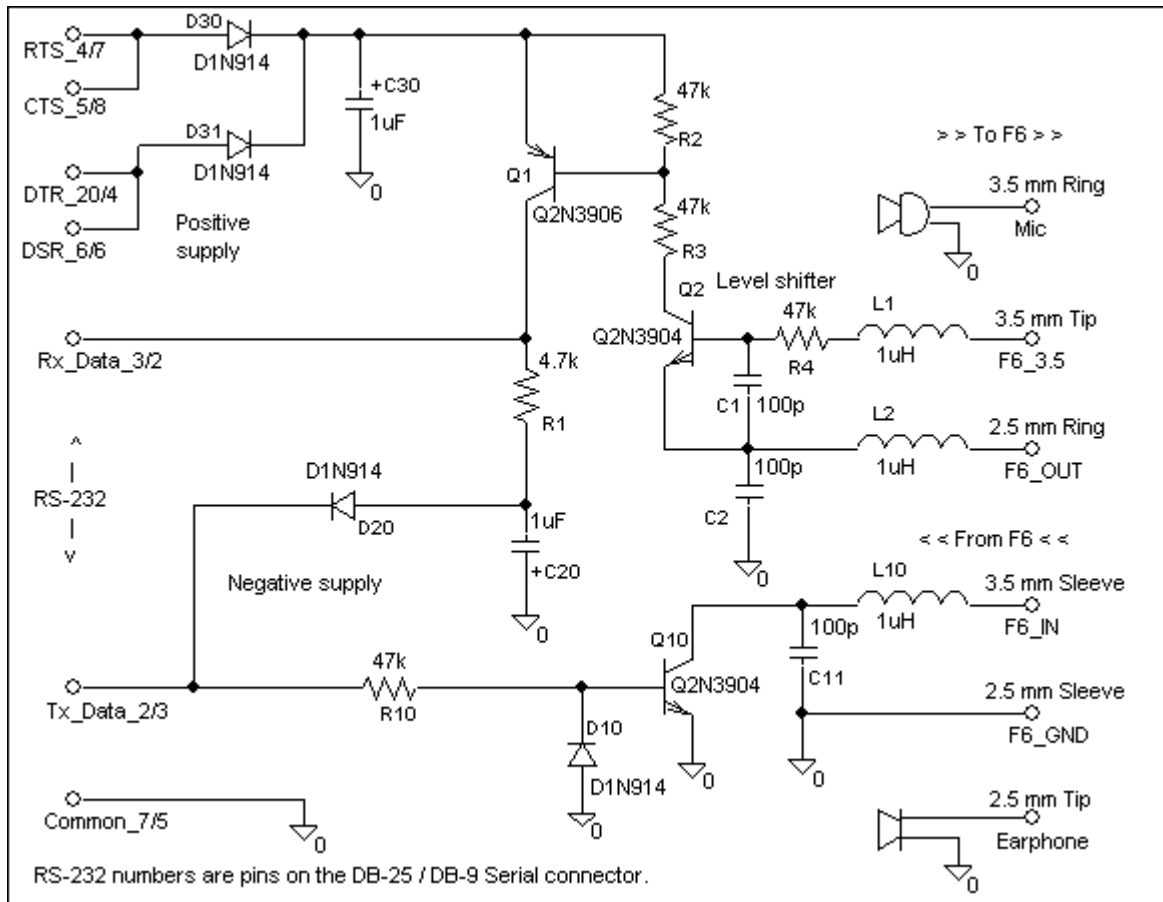
1.7 (10/14/07) Clarified that VMC does not change control Rx (except for INFO).

1.8 (10/21/07) Level converter: Added connector info, Mic and Earphone to converter schematic.

1.9 (10/25 - 1/10/08) Added notes about off-receiver response for several commands. Changed Sets to Set/Read on several command descriptions. Added units change note to FL command.

Added MCP note on Pg 7. Added "Rx" to Frequency Parameter Table Pg 8.

Added "<" to 470 in Modulation table. Completed additional detail on Air 8.33 and Fine Step programming. Removed reference to 6.25 and 12.5 kHz steps as being awkward. Misc cleanup. Corrected LF to CR for command terminator character, Pg. 4. Added Appendix.



TH-F6 Level Converter By Steve Noskowitz, K9DCI. Aug. 2004 Because the F6 has the 3.5 v source available, I used a unique method, requiring few components, to provide level shifting which accommodates the wide variation in serial port voltages (5 to 12 v). Transistor Q2 uses this voltage at its base allowing the collector compliance to allow the wide range of serial port voltage.

The level converter was initially modeled in Pspice and this is the schematic.

Radio plug connections:

F6\_GND -- 2.5 mm sleeve.

F6\_OUT -- 2.5 mm ring.

Receiver audio -- 2.5 mm tip.

F6\_IN -- 3.5 mm sleeve.

Microphone (electret voltage supplied) -- 3.5 mm ring.

F6\_3.5 -- 3.5 mm tip. This measures 3.9 v. on my radio.

The 1uH chokes are optional. An inexpensive (\$1.00) source of 2.5 mm plugs and wire is the cell phone hands free ear bud & mic in the dollar store. The small wire tins easily. The ear bud on the one I found was connected to the 2.5 mm ring – I rewired it to the tip and listen to the radio with the computer connected. The microphone input of the TH-F9A is also live in PC control mode and supplies the electret supply voltage.

The vast majority of the information in this document comes from John May's document. Because I found it awkward switching between the commands and the many parameter tables often making errors because for the similarity of table names, I rewrote John's document in this command reference form. This reduced it's size and, I feel, makes command construction easier.

I also added information for some commands that John did not find. This includes:

- The complete list of frequency steps
- Additional VMC operands; INFO & Fine Step enable/disable.
- DCS code parameters & more frequency step information
- Memory clear, corrected INFO channel designators
- Annotated examples, clarifications and misc. findings.

This work was motivated, in part, because the TH-F6 is quite blind friendly. Even so, there are modes, such as visual scan and volume balance (set to 0-100), which can be inadvertently entered making life difficult when you can't see the display. One of my goals is to write a simple executable which backs the F6 out of all such modes for local blind hams.

### General

The radio MENU 9 enables Computer control; select PC.

The serial data parameters are 9600, 8, 1, none. No other speeds are available.

Commands are sent as upper or lower case ASCII text Characters (bytes). Commands start with a two to four letter mnemonic followed by a space and zero to 15 parameters, separated by commas. All commands terminate with a CR character (hex 0D or decimal 13). Responses are in upper case. Some commands require a receiver to be an "active" receiver (on the display) in order to change parameters; some require it to be the "control" receiver (controllable by keyboard, i.e. with the pointer) and some require neither.

Most commands perform two functions. One is a request to the radio for status or data, called "Status Request". The other is data to be loaded into the radio or a function to execute, called "Modify". The status request is an abbreviated form with only enough parameters to determine what data is requested. The three primary memory read/write commands have no Status Request, but are in pairs (CR/CW, MR/MW, VR/VW)

The radio will respond or echo all commands (except SR) with something resembling a partial or full command string. Radio responses also end with a CR character.

Commands not recognized at all, give a response of "?".

Commands which are recognized, but either have invalid parameters or cannot be executed, because of some other condition being required, give a response of "N".

Extra characters tacked on the end of a valid command are ignored, but are echoed.

There is a 126 character buffer. If more than 126 characters are sent before a carriage return the radio responds with "O".

The radio is tuned to multiples of the step size, however, this has some unusual behaviors. Frequency entry from the keyboard, only allows frequencies of even 1 kHz to be entered, but the radio will jump to a valid channel step. To get to the in-between frequency steps, use the click-tune knob. Computer commands can program all valid frequencies if specified correctly.

Via computer, using 8.33 steps, is irregular. See the Appendix for details.

The VFO, Memory and CALL WRITE commands (VW, MW, CW) and the request command (VR, MR, CR) responses have long strings of parameters which are described in the example for the CALL READ CR command. The radio only responds with the two character mnemonic for these three WRITE commands.

The MEMORY WRITE MW and CALL WRITE CW commands store in memory without updating the display or synthesizer. The radio only loads the data into the synthesizer when a location is first selected. The synthesizer will tune to the new frequency when that memory location is selected again.

In a WRITE string, it is possible to have the enable characters for Tx Tone, CT and DCS all set to '1' at the same time. Only one is enabled. CT overrides T. DCS overrides both T and CT.

In the CT mode, the same sub audible frequency is used for Tx and Rx.

There is also a memory location for the VFO of each receive band (three for Rx A and 11 for Rx B). The VFO WRITE command stores in these VFO memory locations like the MEMORY WRITE and CALL WRITE commands do for those other memory locations. However, the VFO Write command will act immediately if that particular band is active.

The FQ command has an immediate effect. It immediately loads data into the synthesizer even if in the MR or CALL channel mode and does not update the display.

Split refers to a non standard transmit offset. This is programmed in two steps. First, the receiver frequency with most parameters, then, the transmit frequency with only frequency and step. See the Frequency Parameter Table on page 8. The split parameter determines which. See the MW and CW examples.

Though not verified for all commands, it appears that any command will cause abort of keyboard entered modes waiting for a parameter such as BAL, TONE SEL, SQL, STEP select. A computer command also aborts all scan modes VISUAL, group (MHZ), MR and VFO.

The display does not show 33 Hz. steps. This is not a synthesizer function, but is done by warping a crystal oscillator and these steps may not be precise.

To reduce the confusion of using the single term "band" (as Kenwood does in the manual) to refer both to the two receivers and the frequency bands of the receivers, I refer to the two receivers as receivers [Rx] and the frequency segments of the receivers (3 for Rx A and 11 for Rx B) as bands [Band]. Similar changes were made for the word "mode".

Because the term "channel" usually refers to a radio frequency, I use the term memory location for a memory, or simply "memory x" unless it conflicts with the mnemonic or makes sense otherwise.

For brevity, I occasionally use the term "PL" (Motorola's term) for CTCSS.

The expanded text names for some of the commands were made more in line with the letter mnemonic. For example ANT = Antenna, bar enable; and NSFT = Noise Shift. The parameter (or operand) names for some of the commands were changed from the simple [val] to be more meaningful.

The external Mic and Speaker connections are active in PC control mode. A home brew level converter can include them, or an adapter, with plugs and jacks can be used between radio and converter to bring out the connections for an external speaker and mic.

It should be noted the commands for the TM-D700, TM-D7 and the TH-G71 use a similar general format.

<b>Command</b>	<b>Description</b>	<b>Menu Item</b>
ANT	Antenna, Bar Enable	26
APO	Automatic Power Off	18
ARO	Auto Repeater Offset	5
ASC	Auto Simplex Check	n/a
ATT	Attenuator Enable	n/a
BAL	Balance Volumes between receivers	n/a
BAT	Battery Type	30
BC	Band (Receiver) Control	n/a
BEL	Bell alert on received signal	n/a
BEP	Beep for keypad	19
BY	Busy (Squelch)	n/a
CKEY	CALL Key set up	23
CNT	Contrast of display	16
CR	Call Channel Read [ much information ]	n/a
CW	Call Channel Write	n/a
DATP	Data Packet Speed	28
DL	Dual Listen Enable	n/a
DLK	DTMF Lockout during transmit	14
DM	DTMF Memory content	10
DMN	DTMF Memory Name (Alpha)	10
DW	Down	n/a
ELK	Enable Locked tuning	7
FL	Frequency Limits	n/a
FQ	Frequency and Step Size & (Fine Step Enable)	n/a
FST	Fine Step Tuning (Size)	n/a
ID	Identity of Radio	n/a
LAN	Language for menu names	27
LK	Lock Keypad	n/a
LMP	Lamp	n/a
MC	Memory Channel activate (MR)	n/a
MD	Modulation Type	n/a
MES	Message at Power-On	15

Command	Description	Menu Item
MGL	Memory Group Link	2
MNA	Memory Name	n/a
MNF	Memory Name Frequency display toggle	n/a
MR	Memory Read (0-400, Lx, Ux, I-x, Pri)	n/a
MRM	Memory Recall Method	3
MW	Memory Write (0-400, Lx, Ux, Ix, Pri)	n/a
NAR	Narrow FM	29
NSFT	Noise Shift (Beat Shift)	25
PC	Power Control (Tx Output)	n/a
PT	Pause Time DTMF (character pause)	13
PV	Program VFO Limits	4
RBN	Receive Band Number	n/a
RX	Receive	n/a
SCR	Scan Resume	1
SQ	Squelch Setting	n/a
SR	System Reset	31
SV	Save Battery (time)	17
TH	Tx Hold for 1750	24
TSP	Tone Speed DTMF	11
TT	Transmit Tone	n/a
TX	Transmit	n/a
TXH	Tx Hold (between DTMF digits)	12
TXS	Transmit Stop (inhibit)	8
TYD	Type ID (of radio)	n/a
UP	Up	n/a
VMC	VFO, MR, CALL recall mode	n/a
VOX	VOX Enable	n/a
VR	VFO Read	n/a
VW	VFO Write	n/a
VXB	VOX on Busy (squelch)	20
VXD	VOX Drop Delay	22
VXG	VOX Gain	21

### **No commands are known for**

Any radio scan mode including Group (MHZ), MR, VFO, Visual, CTCSS & DCS scans. Either to enter the mode, or tell when it stops on a channel or tone.

Channel-only display mode (see manual for this).

Permanent Band limit change (FL), monitor (un squelch) button, S-Meter level, remote control code & mode.

FYI: Kenwood's MCP vers 0 beta sends VOX 0 first when uploading (thus it is not in the file) and also sends the following invalid requests: CR 3,0; VR 3; PV 3; PC 2; PC 3; NAR 3; NAR 5.

### Command Parameter Tables

**NOTE: Most commands have the respective parameter tables in the command description. These are the larger tables used in the various read and write commands.**

**Frequency Band Table**

[band]	Rx	Name - Freq MHz.	[band]	Rx	Name - Freq MHz.
[ham] 0	A	2m 137-<174	8	B	Air 108-<137
[ham] 1	A	1.25m 216-<260	9	B	2m 137-<174
[ham] 2	A	70cm 410-<470	A	B	VHF TV 174-<216
4	B	AM 0.1-<1.8	B	B	1.25m 216-<400
5	B	HF 1.8-<29.7	C	B	70cm 400-<470
6	B	6m 29.7-<54	D	B	UHF TV 470-<806
7	B	FM 54-<108	E	B	23cm 806-<1300

Band 3 appears to be invalid. The cellular band is locked out – 824-849 & 869-894 on the TH-F6

**Rx Frequency Parameter Table.** See commands CW, MR, MW, VR, VW.

Field	Value	Description	Split Use
freq	11	11 digits in Hz.	yes
step	0-B	See Step Table. Tx Step MUST = Rx	yes
shift/offset	0, 1, 2	0 = none or split, 1 = positive, 2 = negative	no
rev	0, 1	0 = Normal, 1 = Reverse T and R.	no
T-PL enable	0, 1	1 = Tx PL Tone on <sup>1</sup>	no
R-PL enable	0, 1	1 = CTCSS on (overrides T-PL) <sup>1</sup>	no
DCS enable	0, 1	1 = DCS on (overrides R & T PL) <sup>1</sup>	no
tone #	00-41	See Sub audible Table	no
CTCSS #	00-41	See Sub audible Table	no
DCS #	000-103	See DCS Code Table	no
Tx freq offset	9 digits	9 digits in Hz. <=59.95 MHz.	no
mod	0 - 5	See Modulation Table	no
Scan Lockout	0, 1	0 = Scan, 1 = Skip	no

<sup>1</sup> Setting multiple sub audibles (=1) is accepted, however, only the furthest to the right (CT,DCS) is active.

See CALL READ, CR, for a typical [freq] string.

**SPLIT OPERATION NOTES:**

Split refers to a non standard or non-automatic transmit frequency offset (see ARO). From the keypad, to load the Tx frequency requires holding the PTT while either pushing the MENU joystick or the MR button. For computer programming, the split character (byte) determines if the Rx or Tx frequency is being stored. Only the frequency and step size are sent or echoed when modifying or reading the split Tx freq. The Tx Step MUST be the same as the Rx Step. See the CW, MW and VW commands.

**Step Table** The radio is tuned to multiples of these steps.

[step]	Step Size	[step]	Step Size
0	5.0 kHz (< 470 MHz.)	6	15.0 kHz (< 470 MHz.)
1	6.25 kHz (< 470 MHz.)	7 <sup>2</sup>	20.0 kHz
2	8.33 kHz (Air band <sup>3</sup> )	8 <sup>2</sup>	25.0 kHz
3	9.0 kHz (AM band)	9 <sup>2</sup>	30.0 kHz
4 <sup>2</sup>	10.0 kHz	A <sup>2</sup>	50.0 kHz
5 <sup>2</sup>	12.5 kHz	B <sup>2</sup>	100.0 kHz

**Modulation Table**

[mod]	Modulation	Range
0	FM	0.1 – <1300 MHz.
1	WFM	29.7 – <1300 MHz.
2	AM	0.1 – <1300 MHz.
3	LSB	0.1 – <470 MHz.
4	USB	0.1 – <470 MHz.
5	CW	0.1 – <470 MHz.

<sup>2</sup> Only these are available at 470 Mhz. and above.

<sup>3</sup> In the Air band for 8.33 kHz steps, most frequencies ending in 333 or 667 must be rounded to the nearest 10 Hz. i.e. ...330 and ...670. Some ("00118,108.330") can not. If programmed (e.g. FQ) as ...333 or ...667, Fine Step is turned on in whatever step size it was on (it is not set to the best step). Turning Fine Step on with VMC 1,4 changes the display, turning it off with VMC 1,0 does not change the display.

Rx A only does 5, 6.25, 10, 12.5, 15, 20, 25, 30, 50 and 100 KHz. (not 8.33 or 9kHz.)

**Fine Step Table**

[val]	Step Size	Description
0	33 Hz	Fine Step only available on Rx B SSB, CW and AM and only <470 MHz. When in Fine step, FM and WFM will be unavailable.
1	100 Hz	
2	500 Hz	Via computer, Fine Step is automatically enabled if needed and available.
3	1000 Hz	This requires the frequency to be specified to the correct step multiple.



**Command Parameter Tables (cont.)****Sub Audible Code # Table**

#	Tone	#	Tone	#	Tone	#	Tone	#	Tone	#	Tone
00	67.0	07	85.4	14	107.2	21	136.5	28	173.8	35	218.1
01	69.3	08	88.5	15	110.9	22	141.3	29	179.9	36	225.7
02	71.9	09	91.5	16	114.8	23	146.2	30	186.2	37	229.1
03	74.4	10	94.8	17	118.8	24	151.4	31	192.8	38	233.6
04	77.0	11	97.4	18	123.0	25	156.7	32	203.5	39	241.8
05	79.7	12	100.0	19	127.3	26	162.2	33	206.5	40	250.3
06	82.5	13	103.5	20	131.8	27	167.9	34	210.7	41	254.1

**Digital Coded Squelch (DCS) code # Table**

#	DCS	#	DCS	#	DCS	#	Code	#	Code	#	Code
000	023	020	125	040	245	060	356	080	506	100	732
001	025	021	131	041	246	061	364	081	516	101	734
002	026	022	132	042	251	062	365	082	523	102	743
003	031	023	134	043	252	063	371	083	526	103	754
004	032	024	143	044	255	064	411	084	532		
005	036	025	145	045	261	065	412	085	546		
006	043	026	152	046	263	066	413	086	565		
007	047	027	155	047	265	067	423	087	606		
008	051	028	156	048	266	068	431	088	612		
009	053	029	162	049	271	069	432	089	624		
010	054	030	165	050	274	070	445	090	627		
011	065	031	172	051	306	071	446	091	631		
012	071	032	174	052	311	072	452	092	632		
013	072	033	205	053	315	073	454	093	654		
014	073	034	212	054	325	074	455	094	662		
015	074	035	223	055	331	075	462	095	664		
016	114	036	225	056	332	076	464	096	703		
017	115	037	226	057	343	077	465	097	712		
018	116	038	243	058	346	078	466	098	723		
019	122	039	244	059	351	079	503	099	731		

**Memory Code Table**

[mem]	Memory Type
000 – 399	400 memory locations
L0 – L9	10 lower scan limit locations
U0 – U9	10 upper scan limit locations
I-0 – I-9	10 information channels
Pr1, Pr2	2 priority channels

**VMC Parameter Table**

[vmc]	Mode
0	VFO also Fine Step Tuning off
1	MR
2	CALL
3	Fine Step Enable (VFO mode only)
4	INFO channels recall

**ANT            Antenna, Bar Enable**

**Description:**

Enable/Disable, or read the bar antenna (below 10.1 MHz.)

Menu Item # 26

**Command:**

Status Request: ANT

Modify: ANT [val]

Response: ANT [val]

Where:	<u>[val]</u>	Bar antenna
	0	Disabled - SMA
	1	Enabled - Bar

**Example:**

Sent: ANT                      Request status of bar antenna.

Response: ANT 0              Response: bar antenna off.

Sent: ANT 1                    Turn bar antenna on.

Response: ANT 1              Confirm: bar antenna on.

**APO            Automatic Power Off**

**Description:**

Enable/Disable, or read the Automatic Power Off (APO) feature.

Menu Item 18

The transceiver switches OFF automatically if no keys or controls are pressed or adjusted, and no signal is received for the selected time. A warning beep sounds one minute before the transceiver switches OFF.

**Command:**

Status Request: APO

Modify: APO [val]

Response: APO [val]

Where:	<u>[val]</u>	Time
	0	Off
	1	30 min
	2	60 min

**Example:**

Sent: APO                      Request status of automatic power off.

Response: APO 1              Response: automatic power off is on.

Sent: APO 0                    Disable automatic shut off.

Response: APO 0              Confirm: automatic power off is off.

**ARO            Auto Repeater Offset**

**Description:**

Enable/Disable, or read the Auto Repeater Offsets (ARO).

Menu Item 05

Automatically selects an offset direction, according to the frequency selected.

**Command:**

Status Request: ARO

Modify: ARO [auto]

Response: ARO [auto]

Where:	<u>[auto]</u>	State
	0	Off
	1	On

**Example:**

Sent: ARO                      Request status of ARO

Response: ARO 0              Response: ARO is off.

Sent: ARO 1                    Enable ARO.

Response: ARO 1              Confirm: ARO on.

**ASC Auto Simplex Check**

**Description:**

Enable/Disable, or read Auto Simplex Checking for a given Receiver. Menu Item n/a  
Periodically checks the signal strength on TH-FA transmit frequency to see if it is strong enough to allow contact without a repeater.

**Command:**

Status Request: ASC [Rx]  
Modify: ASC [Rx],[state]  
Response: ASC [Rx],[state]  
Where: 

[Rx]	A/B	[state]	State
0	A	0	Off
1	B	1	On

**Notes:** The response is "N" for the off Rx (DL off). See DL.

**Example:**

Sent: ASC 0 Request status of ASC on Rx A.  
Response: ASC 0,0 Response: ASC is off on Rx A.  
Sent: ASC 1,1 Enable Rx B ASC.  
Response: ASC 1,1 Confirm: Rx B ASC is on.

**ATT Attenuator Enable / Disable**

**Description:**

Enable/Disable, or read the attenuator. Menu Item n/a  
Use to attenuate nearby or extremely strong signals to prevent overload.  
The attenuator is approximately 20 DB when ON.

**Command:**

Status Request: ATT  
Modify: ATT [State]  
Response: ATT [State]  
Where: 

[State]	State
0	No Atten.
1	Atten. in line

**Example:**

Sent: ATT Request status of attenuator.  
Response: ATT 1 Response: attenuator is on.  
Sent: ATT 0 Turn attenuator off.  
Response: ATT 0 Confirm: attenuator is off.

**BAL Balance Receiver Volumes**

**Description:**

Set/Read the volume balance between A and B bands. Menu Item n/a

**Command:**

Status Request: BAL  
Modify: BAL [val]  
Response: BAL [val]  
Where: 

[val]	A Rx	B Rx
0	100%	0%
1	75%	25%
2	50%	50%
3	25%	75%
4	0%	100%

**Notes:**

Default value is 2 (both A and B bands equal).

**Example:**

Sent: BAL Request Balance setting.  
Response: BAL 2 Response: Balance is set to 2.  
Sent: BAL 0 Set balance to 100% Rx A.  
Response: BAL 0 Confirm: balance to 100% Rx A.

**BAT Battery Type**

**Description:**

Set/Read the battery type.  
Used for estimating the remaining battery capacity.

Menu Item 30

**Command:**

Status Request: BAT

Modify: BAT [val]

Response: BAT [val]

Where:	[val]	Type
	0	Lithium
	1	Alkaline

**Example:**

Sent: BAT Request battery type.  
Response: BAT 0 Response: battery type is lithium.  
Sent: BAT 1 Set battery type to alkaline.  
Response: BAT 1 Confirm: battery type is alkaline.

**BC Band (Receiver) Control**

**Description:**

Set/Read the Control (active) receiver.  
Selects the A Rx or B Rx for Control.

Menu Item n/a

**Command:**

Status Request: BC

Modify: BC [Rx]

Response: BC [Rx]

Where:	[Rx]	A/B
	0	A
	1	B

**Notes:**

See ASC, DL, FQ, FST and VMC.

**Example:**

Sent: BC Request Rx control status.  
Response: BC 0 Response: Control set to Rx A.  
Sent: BC 1 Make Rx B Control.  
Response: BC 1 Confirm: Control is on Rx B.

**BEL Bell Alert on Received Signal**

**Description:**

Enable/Disable, or read the bell (tone) alert function.  
Provides an audible alarm when signals are received.

Menu Item n/a

**Command:**

Status Request: BEL [Rx]

Modify: BEL [Rx],[val]

Response: BEL [Rx],[val]

Where:	[Rx]	A/B	[val]	State
	0	A	0	Off
	1	B	1	On

**Notes:** The response is "N" for the off Rx (DL off). See DL.

**Example:**

Sent: BEL 0 Request Status of tone alert on Rx A.  
Response: BEL 0,0 Response: tone alert is off.  
Sent: BEL 1,1 Enable tone alert for Rx B.  
Response: BEL 1,1 Confirm: tone alert is enabled for Rx B.

**BEP      Beep for keypad**

**Description:**

Enable/Disable, or read the beep function.

Menu Item 19

**Command:**

Status Request: BEP

Modify: BEP [val]

Response: BEP [val]

Where:	<u>[val]</u>	<u>State</u>
	0	Off
	1	On

**Example:**

Sent: BEP                      Request Status of beep function.

Response: BEP 1              Response: beep function is on.

Sent: BEP 0                    Turn keypad beeps off.

Response: BEP 0              Confirm: beep function is off.

**BY      Busy Squelch**

**Description:**

Displays Squelch status of a receiver.

Menu Item n/a

**Command:**

Status Request: BY [Rx]

Response: BY [Rx], [stat]

Where:	<u>[Rx]</u>	<u>A/B</u>	<u>[stat]</u>	<u>State</u>
	0	A	0	Not busy (squelch closed - quiet)
	1	B	1	Busy (unsquelched)

**Notes:**

The response is "N" for the off Rx (DL off). See DL.

**Example:**

Sent: BY 0                      Request squelch Status of A Rx.

Response: BY 0,1              Confirm: A Rx is receiving.

**CKEY      CALL Key Set Up**

**Description:**

Set/Read the function for the Call key.

If Call is set, the Call key toggles to the call Channel and back.

If 1750 Hz is set, the Call key forces the transceiver to transmit a 1750 Hz tone.

Menu Item 23

**Command:**

Status Request: CKEY

Modify: CKEY [val]

Response: CKEY [val]

Where:	<u>[val]</u>	<u>Time</u>
	0	Call
	1	1750 Hz

**Example:**

Sent: CKEY                      Request Call key setting.

Response: CKEY 0              Response: Call key is set to Call.

Sent: CKEY 1                    Set Call key function to 1750 Hz.

Response: CKEY 1              Confirm: Call key is 1750 Hz.

**CNT Contrast of Display**

**Description:**

Set/Read the display contrast.

Menu Item 16

**Command:**

Status Request: CNT

Modify: CNT [val]

Response: CNT [val]

Where:	[val]	Contrast	[val]	Contrast	[val]	Contrast
	01	Lightest	08	Default	15	...
	02	...	09	...	16	Darkest

**Notes:** Lowest value is 1 unlike other parameters.

**Example:**

Sent: CNT Request display contrast.  
 Response: CNT 08 Response: display contrast is 08.  
 Sent: CNT 09 Set display contrast to 09.  
 Response: CNT 09 Confirm: display contrast is 09.

**CR Call Channel Read**

**Description:**

Returns the saved data for one of the three Ham band Call channels.

Menu Item n/a

**Command:**

Status Request: CR [ham], [split]

Response: CR [ham], [split], [freq] For full band table see Command Parameter Tables at front.

Where:	[ham]	Band	[split]	Frequency
	0	2m	0	Receive & auto offset.
	1	1.25m	1	Transmit - only if programmed as a non auto split.
	2	70cm		Responds with "N" if not loaded with split Tx freq

[split] see Split Operation notes page 8

[freq] Multi-bytes from the FREQUENCY Parameter Table at front. Scan Lockout excluded.

Response format:

CR ham, split, freq, step, Tx offset dir., reverse, Tone-enable, CTSS-enable, DCS-enable, tone-#, CTSS-#, DCS #, offset, Mode

**Example:**

Sent: CR 0,0 Request call channel data. 2M, Split Rx.

Response: CR 0,0,00141990000,6,0,0,0,0,0,25,09,001,000700000,0 (no lockout)

Sent CR 0,1 Request Call channel split Tx data for 2M

Response: CR 0,1,00146880000,0 Tx Step Must be same as Rx Step.  
 Responds with N if no Tx programmed.

Interpretation of the above response.

Parameter:	result	Code in string	Details
ham (Band)	2M	(0)	Band Table [0, 1, 2 only]
Split	Rx freq	(0)	Split Operation Notes
Freq	141.990	(00141990000)	11 digits in Hz.
Step	15 kHz.	(6)	Step Table
Offset	none	(0)	Frequency Parameter Table
Rev	off	(0)	Frequency Parameter Table
Tone-enable	off	(0)	Frequency Parameter Table
PL-enable	off	(0)	Frequency Parameter Table
DCS-enable	off	(0)	Frequency Parameter Table
tone-freq	151.4	(25)	Sub audible Table
PL freq	88.5	(09)	Sub audible Table
DCS code	065	(011)	DCS Code Table
Offset	700KHz	(000700000)	9 digits in Hz.
Mode	FM	(0)	Modulation Table

**CW Call Channel Write**

**Description:**

Enters data to one of the three ham band Call channel.

Menu Item n/a

**Function:**

Saves data associated with the Call channel

**Command:**

Modify: CW [split],[freq] No Status Request, see CR.

Response: CW

Where: [split] see Split Channel Table and Notes in Command Parameter Tables at front.

[freq] see Frequency Parameter Table in Command Parameter Tables at front.

**Notes:** Scan Lockout excluded.

No ham band parameter is required. The frequency determines the frequency band. There appears to be no Call channel clear capability. Call channels have no Name.

**Example:**

split freq stp of R T CT DCS T# C# DCS Offset Mode  
Sent: CW 0,00141990000,6,0,0,0,0,0,25,09,001,000700000,0 (no lockout)

Load call channel data. Also clears the Split Tx data.

Response: CW Confirmation response is only the mnemonic.

split freq stp  
Sent: CW 1,00141590000,6 400 KHz. split Load call channel split Tx data.

Response: CW Confirmation response is only the mnemonic.

**DATP Data Packet Speed**

**Description:**

Set/Read Packet interface Speed. Options are 1200 or 9600 bps.

Menu Item 28

**Command:**

Status Request: DATP

Modify: DATP [val]

Response: DATP [val]

Where: [val] Speed  
0 1200 bps  
1 9600 bps

**Example:**

Sent: DATP Request Packet Speed.

Response: DATP 0 Transceiver responds Packet Speed in 1200 bps.

Sent: DATP 1 Set interface for a Packet Speed of 9600 bps.

Response: DATP 1 Confirm: 9600 baud

**DL Dual Listen Enable**

**Description:**

Enable/Disable, or Read both receivers.

Menu Item n/a

**Command:**

Status Request: DL

Modify: DL [dual]

Response: DL [dual]

Where: [dual] Mode  
0 Single Rx  
1 Dual Rx

**Notes:**

See BC, FQ, FST and VMC.

**Example:**

Sent: DL Request Dual Receiver Status.

Response: DL 0 Transceiver in single receive.

Sent: DL 1 Enable both receivers.

Response: DL 1 Confirm: Dual receivers.

**DLK DTMF Lockout During Transmit**

**Description:**

Enable/Disable, or Read the DTMF tones on transmit.  
Locked = no tones in transmit.

Menu Item 14

**Command:**

Status Request: DLK  
Modify: DLK [lock]  
Response: DLK [lock]  
Where:        [lock]    State  
                  0        Off  
                  1        On

**Example:**

Sent: DLK                            Request Status of DTMF Lock.  
Response: DLK 0                    Response: DTMF Lock is off.  
Sent: DLK 1                        Turn DTMF Lock on.  
Response: DLK 1                    Confirm: DTMF Lock is on.

**DM DTMF Memory Content**

**Description:**

Reads or stores one of 10 DTMF memory locations.

Menu Item 10

**Command:**

Status Request: DM [loc] to get DTMF memory number location.  
Modify: DM [loc], [digits] to set number in DTMF memory number location.  
Response: DM [loc], [digits]  
Where: [loc] = 00, 01... 08, 09  
          [digits] = 0-9, \*, #, A,B,C,D

**Notes:**

[digits] is a maximum of 16 digits.

**Example:**

Sent: DM 00                            Request the DTMF number stored at 00.  
Response: DM 00,                    Response: 00 is an empty location.  
Sent: DM 01,18005551212            Set DTMF 01 to 18005551212.  
Response: DM 01,18005551212 Confirm: DTMF 01 is 18005551212.

**DMN DTMF Memory Name (Alpha)**

**Description:**

Set/Read one of the 10 DTMF memory names.

Menu Item 10

**Command:**

Status Request: DMN [loc] to get DTMF memory name location.  
Modify: DMN [loc], [name] to set name in DTMF memory name location.  
Response: DM [loc], [name]  
Where: [loc] = 00, 01... 08, 09  
          [name] = Any of the available characters

**Notes:**

[name] is a maximum of 8 characters.

**Example:**

Sent: DMN 01                            Request the name contents of DTMF 01.  
Response: DMN 01,John            Response: DTMF 01 contains John  
Sent: DMN 09,Home                Set DTMF 09 name to "Home".  
Response: DMN 09,Home            Confirm: DTMF 09 contents is "Home".



**DW**            **Down**

**Description:**

Move down one memory in MR or down one currently set step in VFO.

Menu Item n/a

**Command:**

Modify: DW

Response: DW

**Notes:**

Same as rotating Tuning Control one click counter-clockwise. With Fine Step enabled, this steps to the next nearest multiple of the current Fine Step whether or not it started on a multiple. See UP.

**Example:**

Sent: DW            Request VFO move down.

Response: DW    Confirm: VFO moves down.

**ELK**            **Enable Locked Tuning**

**Description:**

Enable/Disable, or Read Enable Tune while locked.

Menu Item 07

Frequency can be tuned when transceiver is locked. See Lock Keypad, LK

**Command:**

Status Request: ELK

Modify: ELK [val]

Response: ELK [val]

Where:	<u>[val]</u>	<u>State</u>
	0	Off – No tuning when locked.
	1	On – tuning while locked.

**Example:**

Sent: ELK            Request Status of Tune Enable.

Response: ELK 0    Response: Tune Enable is off.

Sent: ELK 1        Turn Tune Enable on.

Response: ELK 1    Confirm: Tune Enable is on.

**FL**            **Frequency Limits**

**Description:**

Request a list of fixed band limits for receiver bands.

Menu Item n/a

**Command:**

Status Request: FL [Rx]

Response: FL [Rx], [list]

Where:	<u>[Rx]</u>	<u>A/B Rx</u>
	0	A
	1	B

[list] is 7 digits in 10 KHz. steps below 108 MHz and 5 digits in MHz. above 108 MHz.

**Notes:** There appears to be no modifying command. These appear to be fixed and not related to the memory locations LO through U9 nor the PV command. The response is the same regardless of the state of DL. Also note change in units between 0010800,00108 from 10 KHz. to MHz.

**Example:**

Sent: FL 0            Request frequency limits of A Rx.

Response: FL 0,00137,00174,00216,00260,00410,00470

Transceiver Responds with limits of A Rx.

Sent: FL 1            Request frequency limits of B Rx.

Response: FL 1,0000010,0000180,0000180,0002970,0002970,0005400,0005400,0010800,0010800,00137,00137,00174,00174,00216,00216,00400,00400,00470,00470,00806,00806,01300

**FQ Frequency, Step & (Fine Step enable/disable)**

**Description:**

Reads / Immediately sets the Control (active) synthesizer frequency and step size. Menu Item n/a

**Command:**

Status Request: FQ

Modify: FQ [freq], [step]

Response: FQ [freq], [step]

Where: [freq] is an eleven (11) digit frequency in Hz.

[step]	Step Size	[step]	Step Size
0	5.0 kHz (< 470 MHz.)	6	15.0 kHz (< 470 MHz.)
1	6.25 kHz (< 470 MHz.)	7 *	20.0 kHz
2	8.33 kHz (Air band)	8 *	25.0 kHz
3	9.0 kHz (AM band)	9 *	30.0 kHz
4 *	10.0 kHz	A *	50.0 kHz
5 *	12.5 kHz	B *	100.0 kHz

\* Only these above 470 Mhz. † For Air band 8.33 kHz steps, see Step Table Note<sup>3</sup> on page 8.

**Notes:**

FQ does not change the name text showing in the display if on an MR, INFO or CALL channel. Fine Step is enabled (VMC 1, 3) and frequency set when the frequency is on any Fine Step multiple rounded to the Hz., but the Fine Step size is not changed to make it appropriate. See FST & Appendix .

**Example:**

Sent: FQ Request current frequency and step.  
 Response: FQ 00052910000,0 Response: 52.91 MHz with 5.0 kHz step  
 Sent: FQ 00105500000,4 Set transceiver to 105.500 MHz with a 10.0 kHz step  
 Response: FQ 00105500000,4 Confirm:

**FST Fine Step Tuning (Size)**

**Description:**

Set/Read fine-tuning step size on Rx B only. Does not enable Fine Step. Menu Item n/a  
 Only available below 470 MHz. and in SSB, CW and AM. When enabled, FM and WFM are unavailable.

**Command:**

Status Request: FST

Modify: FST [val]

Response: FST [val] Where:

[val]	Step Size
0	33 Hz
1	100 Hz
2	500 Hz
3	1000 Hz

**Notes:**

Only this command changes the Fine step size. See VMC and FQ for Fine Step enable / disable.

**Example:**

Sent: FST Request fine-tuning step size.  
 Response: FST 0 Response: step size is 33 Hz.  
 Sent: FST 2 Set the fine tuning step size to 500 Hz.  
 Response: FST 2 Confirm: FINE Step 500 Hz.

**ID Identity of Radio**

**Description:**

Requests the radio identification. Menu Item n/a  
 Commonly used to validate that the radio is in communication with computer.

**Command:**

Status Request: ID

Response: ID [id]

Where: ID = TH-F6

**Example:**

Sent: ID Request ID of transceiver.  
 Response: ID TH-F6 Response: it is a TH-F6.

**LAN      Language of Menu****Description:**

Set/Read menu item language - English or Japanese (Katakana).

Menu Item 27

**Command:**

Status Request: LAN to get language.

Modify: LAN [lang] to set language.

Response: LAN [lang]

Where:      [lang]      Language

0      English

1      Japanese (Katakana)

**Example:**

Sent: LAN      Request menu language.

Response: LAN 0      Response: language is English.

Sent: LAN 1      Set menu language to Japanese.

Response: LAN 1      Confirm: Menu in Japanese.

**LK      Lock Keypad****Description:**

Enable/Disable, or Read the keypad lockout.

Menu Item n/a

Disables most keys to prevent accidental activation – See Enable Locked Tuning, ELK

**Command:**

Status Request: LK

Modify: LK [val]

Response: LK [val]

Where:      [val]      State

0      Unlocked

1      Locked

**Example:**

Sent: LK      Request Status of keypad lock.

Response: LK 0      Response: not locked.

Sent: LK 1      Lock keypad.

Response: LK 1      Confirm: keypad is locked.

**LMP      Lamp****Description:**

Turn on/off, or Read the display light.

Menu Item n/a

**Command:**

Status Request: LMP

Modify: LMP [val]

Response: LMP [val]

Where:      [val]      State

0      Off

1      On

**Example:**

Sent: LMP      Request lamp status.

Response: LMP 0      Response: lamp is off.

Sent: LMP 1      Turn lamp on.

Response: LMP 1      Confirm: lamp on.

**MC Memory Channel Activate (MR)**

**Description:**

Activate a memory location by its designator (not alpha name).

Menu Item n/a

**Command:**

Status Request: MC [Rx]

Modify: MC [Rx], [mem]

Response: MC [Rx], [mem]

Where:	[Rx]	A/B	[mem]	Memory Type
	0	A	000 – 399	400 memory locations (in MR recall mode VMC [Rx],1)
	1	B	L0 – L9	10 lower scan limit locations (in MR recall mode VMC [Rx],1)
			U0 – U9	10 upper scan limit locations (in MR recall mode VMC [Rx],1)
			I-0 – I-9	10 information channels (in Info recall mode VMC [Rx],4)
			PR1, PR2	2 priority channels (in MR recall mode VMC [Rx],1)

**Notes:**

Must be in appropriate location recall mode as indicated. (use VMC command) If Response is “N”, transceiver is not set to proper VMC mode. The target Rx must be on, not necessarily control.

Also, MC is not needed for Call channels. Use This sequence, BC Rx, VMC Rx,0, RBN band, VMC Rx,2

**Example:**

Sent: MC 0 Request active memory location for Rx A.

Response: MC 0,005 Response: Rx B set to 005.

Sent: MC 1,299 Set Rx B to memory location 299.

Response: MC 1,299 Confirm: Rx B set to 299.

**MD Modulation type**

**Description:**

Set/Read modulation mode of Rx B when it is Control (active). Rx A only does FM. Menu Item n/a

**Command:** Rx A accepts only a mode 0 (FM) command and responds to a status request.

Status Request: MD

Modify: MD [mod]

Response: MD [mod]

Where:	[mod]	Modulation	Range	[mod]	Modulation	Range
	0	FM	0.1 – 1300 MHz.	3	LSB	0.1 – 470 MHz.
	1	WFM	29.7 – 1300 MHz.	4	USB	0.1 – 470 MHz.
	2	AM	0.1 – 1300 MHz.	5	CW	0.1 – 470 MHz.

**Example:**

Sent: MD Request current modulation mode

Response: MD 0 Response: FM.

Sent: MD 2 Request that modulation be set to AM. (Rx B only).

Response: MD 2 Confirm: mod is AM. (Rx B only)

**MES Message at Power-On**

**Description:**

Set/Read the power on greeting message.

Menu Item 15

**Command:**

Status Request: MES

Modify: MES [message]

Response: MES [message]

Where: [message] Any eight (8) of the available characters

**Example:**

Sent: MES Request power on message.

Response: MES John May Response: message is “John May”.

Sent: MES K6MAY Set turn-on message to “K6MAY”.

Response: MES K6MAY Confirm: new message.

**MGL Memory Group Link**

**Description:**

Set/Read the Memory Group Links.

Menu Item 02

**Command:**

Status Request: MGL

Modify: MGL [string]

Response: MGL [string]

Where: [string] Group numbers (0-7) which are shown are combined into one large scan group.

**Notes:**

\* = space character. Though meaningless, it is valid for only one group to be marked for linking.

**Example:** Remember the normal space after the "MGL".

Sent: MGL Request the Status of memory group link.

Response: MGL\*\*1\*3\*5\*7 Response: 1,3,5,7 groups are linked.

Sent: MGL\*\*\*2\*\*\*6\* Request that groups 2 and 6 be linked.

Response: MGL\*\*\*2\*\*\*6\* Confirm.

**MNA Memory Name**

**Description:**

Set/Read alphanumeric name of memory location.

Menu Item n/a

**Command:**

Status Request: MNA [mem]

Modify: MNA [mem],[name]

Response: MNA [mem],[name]

Where:

[mem]	Memory Type
000 – 399	400 memory locations
L0 – L9	10 lower scan limit locations
U0 – U9	10 upper scan limit locations
I-0 – I-9	10 information channels
PR1, PR2	2 priority channels

**Notes:**

[name] is a maximum of eight (8) characters, extras are ignored. Request gets a response of "N" if no alpha is programmed. Ending with the comma clears the name.

**Example:**

Sent: MNA 001 Request name of memory location 001

Response: MNA 001,RPTR Response: location 001 is "RPTR"

Sent: MNA 256,NASA-TV Set name of location 256 to "NASA-TV".

Response: MNA 256,NASA-TV Confirm: location 256 is "NASA-TV".

Sent: MNA Pr1, Erase name (include comma at end)

Response: MNA Pr1, Confirm: location name erased (comma is present).

**MNF Memory Name / Freq Display**

**Description:**

Set/Read alpha/frequency mode for the display.

Menu Item n/a

**Command:**

Status Request: MNF

Modify: MNF [val]

Response: MNF [val]

Where:

[val]	Mode
0	Name
1	Frequency

**Notes:**

Changes mode of both A and B displays.

**Example:**

Sent: MNF Request the Name/Freq status of display.

Response: MNF 0 Response: display shows memory Names.

Sent: MNF 1 Enable display to show Frequencies.

Response: MNF 1 Confirm: Frequencies are displayed.

**MR Memory Read**

**Description:**

Reads a memory location.  
See Command Parameter Tables at front.

Menu Item n/a

**Command:**

Status Request: MR [split], [mem]

Response: MR [split], [mem],[freq]

Where:	[mem]	Memory Type
	000 – 399	400 memory locations.
	L0 – L9	10 lower scan limit locations.
	U0 – U9	10 upper scan limit locations.
	I-0 – I-9	10 information channels.
	PR1, PR2	2 priority channels.

[split] see Split Channel operation notes in Command Parameter Tables at front.

[freq] see Frequency Parameter Table in Command Parameter Tables at front.

**Notes:**

N is the response for an empty (unprogrammed) memory location. For Air band 8.33 kHz steps, see Step Table Note on page 8.

**Example:**

Sent: MR 0,020 Read Rx memory location 020.

split mem freq stp of R T CT DCS T# C# D# Offset Mod lock  
 Response: MR 0,020,00147120000,0,0,0,0,1,0,14,12,000,000000000,0,0  
 Values from location 020. 147.12, no offset, 100HZ CTSS tone.

Sent: MR 1,080 Read split Tx memory location 80.

split mem freq stp  
 Response: MR 1,020,00146120000,0 1 MHz. neg split.  
 Responds with "N" if not programmed as a split.

**MRM Memory Recall Method**

**Description:**

Set/Read the memory recall method.

Menu Item 03

When set to "Current band" tuning in VFO or MR only cycles through the current Frequency band. Requires that the band key be pushed or the joystick pushed left/right to go to select stored frequencies in other frequency bands. Stepping through the bands follows the frequency band numbers shown in the PV and RBN commands.

**Command:**

Status Request: MRM

Modify: MRM [val]

Response: MRM [val]

Where:	[val]	Method
	0	All bands
	1	Current band

**Example:**

Sent: MRM Request current Memory Recall restriction.

Response: MRM 0 Response: MRM is "All Bands".

Sent: MRM 1 Set MRM to "Current Band".

Response: MRM 1 Confirm: MRM is "Current Band".

**MW Memory Write**

**Description:**

Store frequency and data in a memory location or clear it.

Menu Item n/a

**Command:**

Modify: MW [split],[mem],[freq]

Response: MW [split],[mem],[freq]

Where: [split] see Split Operation notes in the Command Parameter Tables at front.

[mem]	Memory Type
000 – 399	400 memory locations.
L0 – L9	10 lower scan limit locations.
U0 – U9	10 upper scan limit locations.
I-0 – I-9	10 information channels.
PR1, PR2	2 priority channels.

[freq] see Frequency Parameter Table in the Command Parameter Tables at front.

**Note:** Writing with split = either 0 or 1 and no parameters after the channel location [mem] clears the memory location. If the target memory is active, the radio is put into VFO mode. If an INFO location is cleared, the radio is put into VFO mode, but the factory default Weather frequency and name is restored. All the above channels can have a split programmed and be used as a normal Rx and Tx ham band channel. Offsets and splits can be programmed in non ham band frequencies and the reverse function operates. However the limit for Split offset was not studied (at 1296 a Tx split frequency of 894 can be programmed) For Air band 8.33 kHz steps, see Step Table Note on page 8.

**Example:**

```
split mem freq stp of R T CT DCS T# C# D# offset Mod lock
Sent: MW 0,020,00147120000,0,1,0,0,1,0,14,12,000,000600000,0,0
```

Set memory location 020 to 147.12 MHz with a 5.0 kHz step, FM, CTSS=100.0 Hz. No offset, reverse, tone, DCS or lockout.

Response: MW Confirmation response is only the mnemonic.

```
split mem freq stp
Sent: MW 1,020,00146120000,0 Set split Tx freq, 146.12 Tx Step MUST be the same as the Rx.
```

Response: MW Confirmation response is only the mnemonic.

```
split mem
Sent: MW 0,020 Clears entire Rx, Tx and mnemonic data. Split byte may be either 0 or 1.
```

Response: MW Confirmation response is only the mnemonic.

**NAR Narrow FM**

**Description:**

Enable/Disable, or Read the Narrow FM modulation of a Ham band.

Menu Item 29

**Function:**

Selects between:

- Off - wide FM (5 KHz) deviation or
- On - narrow FM (2.5 KHz) deviation.

**Command:**

Status Request: NAR [ham]

Modify: NAR [ham],[nar]

Response: NAR [ham],[nar]

Where:

[ham]	Ham Band	[nar]	State
0	2m	0	Wide
1	1.25m	1	Narrow
2	70cm		

**Notes:**

An unmodified F6 accepts this command. The receive audio gain is increased.

**Example:**

Sent: NAR 0 Request FM width setting of 2m FM.

Response: NAR 0,0 Response: FM wide.

Sent: NAR 1,1 Set the 1.25 m band modulation to narrow FM.

Response: NAR 1,1 Confirm: 1.25 m band narrow FM.

**NSFT Noise Shift (Beat Shift)**

**Description:**

Set/Read Beat Shift function.

Menu Item 25

Pick one to reduce harmonics from microprocessors clock oscillator.

**Command:**

Status Request: NSFT

Modify: NSFT [sft]

Response: NSFT [sft]

Where:	<u>[sft]</u>	<u>State</u>
	0	Off
	1	On

**Example:**

Sent: NSFT Request Status of Beat Shift.

Response: NSFT 1 Response: Beat Shift is on.

Sent: NSFT 0 Turn beat Shift off.

Response: NSFT 0 Confirm: Shift off.

**PC Power Control (Tx power)**

**Description:**

Set/Read the transmit power assigned to each receiver.

Menu Item n/a

**Command:**

Status Request: PC [Rx]

Modify: PC [Rx], [pwr]

Response: PC [Rx], [pwr]

Where:	<u>[Rx]</u>	<u>A/B Rx</u>	<u>[pwr]</u>	<u>Level</u>
	0	A	0	H
	1	B	1	L
			2	EL

**Notes:** The response is valid regardless of the state of DL.

**Example:**

Sent: PC 0 Request power output for Rx A

Response: PC 0,0 Response: power output is High on Rx A.

Sent: PC 1,2 Set power level assigned to Rx B to EL.

Response: PC 1,2 Confirm: Rx B is EL.

**PT Pause Time, DTMF (character)**

**Description:**

Set/Read the DTMF memory character space duration.

Menu Item 13

**Command:**

Status Request: PT

Modify: PT [val]

Response: PT [val]

Where:	<u>[val]</u>	<u>Duration</u>	<u>[val]</u>	<u>Duration</u>
	0	100 ms	4	1000 ms
	1	250 ms	5	1500 ms
	2	500 ms	6	2000 ms
	3	750 ms		

**Example:**

Sent: PT Request DTMF pause duration.

Response: PT 2 Response: pause duration is 500 ms.

Sent: PT 5 Set pause to 1500 ms.

Response: PT 5 Confirm: pause of 1500 ms.



**PV Program VFO limits**

**Description:**

Set/Read VFO mode tuning limits for a Ham bands Rx A.

Menu Item 04

**Command:**

Status Request: PV [ham]

Modify: PV [ham],[f1], [f2]

Response: PV [ham],[fL], [fH]

Where:	[ham]	Rx	Band	- Freq MHz.
	0	A	2m	137-174
	1	A	1.25m	216-260
	2	A	70cm	410-470

[fL], [fH] = lower and upper frequency limits. Five (5) digit frequency in MHz.

**Notes:**

Rx can not be tuned outside the limits set here. Does not effect FL. These settings are volatile.

**Example:**

Sent: PV 0 Request VFO limit of 2 m band.

Response: PV 0,00137,00173 Transceiver responds it's 137-173 MHz.

Sent: PV 1,00223,00225 Set VFO limits of 1.25 m band.

Response: PV 1,00223,00225 Confirm: limits of 223-225 MHz.

**RBN Receive Band Number**

**Description:**

Set/Read the specified band's VFO memory  
Specified Rx must be in control and in VFO mode & .

Menu Item n/a

**Command:**

Status Request: RBN

Modify: RBN [band]

Response: RBN [band]

Where:	[band]	Rx	Name	- Freq MHz.	[band]	Rx	Name	- Freq MHz.
[ham]	0	A	2m	137-174	8	B	Air	108-137
[ham]	1	A	1.25m	216-260	9	B	2m	137-174
[ham]	2	A	70cm	410-470	A	B	VHF TV	174-216
	4	B	AM	0.1-1.8	B	B	1.25m	216-400
	5	B	HF	1.8-29.7	C	B	70cm	400-470
	6	B	6m	29.7-54	D	B	UHF TV	470-806
	7	B	FM	54-108	E	B	23cm	806-1300

The cellular band is locked out – 824-849 & 869-894

**Note:** The band number also specifies the associated receiver which must be in control – See BC and VMC and VW.

**Example:**

Sent: RBN Get current band.

Response: RBN 0 Current band is 2 m.

Sent: RBN A Set current band to VHF-TV.

Response: RBN A Confirm: band A, VHF-TV

**RX Receive**

**Description:**

Switches transceiver to receive mode.

Menu Item n/a

**Command:**

Modify: RX There is no Status Request.

Response: RX

**Example:**

Sent: RX Set transceiver to receiver mode.

Response: RX Confirm:

**SCR Scan Resume**

**Description:**

Set/Read the Scan Resume method.

Menu Item 01

**Command:**

Status Request: SCR

Modify: SCR [val]

Response: SCR [val]

Where:	[val]	Method
	0	Time (resume after time)
	1	Carrier (wait for carrier drop)
	2	Seek (stop scanning on signal)

**Example:**

Sent: SCR Request scan resume method.

Response: SCR 0 Response: is Time.

Sent: SCR 2 Set scan resume method to Seek.

Response: SCR 2 Confirm: Seek

**SQ Squelch Setting**

**Description:**

Set/Read the squelch level.

Menu Item n/a

**Command:**

Status Request: SQ [Rx]

Modify: SQ [Rx], [lev]

Response: SQ [Rx], [lev]

Where:	[Rx]	A/B	[lev]	Setting
	0	A	00	Open
	1	B	05	Tight

[lev] is a value from 00-05.

**Notes:**

The response is "N" for the off Rx (DL off). See BC, DL, FQ, FST and VMC.

**Example:**

Sent: SQ 0 Request squelch level for Rx A.

Response: SQ 0,05 Response: squelch level for Rx A is 05.

Sent: SQ 1,01 Set Rx B squelch to level 01.

Response: SQ 1,01 Confirm. Rx B squelch level 01.

**SR System Reset**

**Description:**

Performs selected reset function.

Menu Item 31

**Command:**

Modify: SR [val]

Response: No Response:

Where:	[val]	Reset	[val]	Reset
	0	No	2	Menu
	1	VFO	3	Full

**Example:**

Sent: SR 1 Perform VFO Reset.

Response: None is sent.

**SV Save Battery**

**Description:**

Set/Read the Battery saver time off-time.

Menu Item 17

**Command:**

Status Request: SV

Modify: SV [val]

Response: SV [val]

Where:	[val]	Time (s)	[val]	Time (s)
	0	Off	5	1.0 (default)
	1	0.2	6	2.0
	2	0.4	7	3.0
	3	0.6	8	4.0
	4	0.8	9	5.0

**Example:**

Sent: SV Request Battery Saver time.  
 Response: SV 5 Transceiver reports 1.0 sec.  
 Sent: SV 7 Set the save off-time to 3.0 sec.  
 Response: SV 7 Confirm: 3.0 sec.

**TH Tx Hold for 1750**

**Description:**

Enable/Disable, or Read the 1750 Hz Transmitter hold function.

Menu Item 24

When enabled, holds the radio in transmit for 2 seconds after the CALL button released then the CALL 1750 Hz tone function is enabled (TH-F7E only).

**Command:**

Status Request: TH

Modify: TH [val]

Response: TH [val]

Where:	[val]	State
	0	Off
	1	On

**Example:**

Sent: TH Request: of 1750 Hz Hold function.  
 Response: TH 0 Response: 1750 Hz Hold is off.  
 Sent: TH 1 Enable the 1750 Hz. Tx Hold.  
 Response: TH 1 Confirm: 1750 Hz Hold on

**TSP Tone Speed DTMF**

**Description:**

Set/Read the DTMF memory send Speed.

Menu Item 11

**Command:**

Status Request: TSP

Modify: TSP [val]

Response: TSP [val]

Where:	[val]	Speed
	0	Fast
	1	Slow

**Example:**

Sent: TSP Request current DTMF Speed.  
 Response: TSP 0 Response: Speed is slow.  
 Sent: TSP 1 Set DTMF Speed to fast.  
 Response: TSP 1 Confirm: fast speed.

**TT            Transmit Tone**

**Description:**

Transmit a 1750Hz tone until a RX command is received.

Menu Item n/a

**Command:**

Modify: TT

Response: TT

**Notes:**

May be stopped by RX command.

**Example:**

Sent: TT            Transmit a 1750 Hz tone.

Response: TT    Confirm.

**TX            Transmit**

**Description:**

Switch transceiver to transmit until RX command received.

Menu Item n/a

**Command:**

Modify: TX

Response: TX [Rx]

**Example:**

Sent: TX            Key the transmitter.

Response: TX 1    Confirm: transmitting via Rx B

**TXH          Tx hold DTMF**

**Description:**

Enable/Disable, or Read the 2 second hold after DTMF button press.

Menu Item 12

**Command:**

Status Request: THX

Modify: THX [val]

Response: THX [val]

Where:	[val]	State
	0	Off de-key upon key release
	1	On 2 second hold

**Example:**

Sent: TXH            Request Status of DTMF Hold.

Response: TXH 0    Response: DTMF Hold is off.

Sent: TXH 1            Enable DTMF Tx Hold.

Response: TXH 1    Confirm: DTMF hold on.

**TXS          Transmit Stop (Inhibit)**

**Description:**

Inhibits Transmit function from computer and PTT button.

Menu Item 08

Prevents accidental or unauthorized transmission.

**Command:**

Status Request: TXS

Modify: TXS [val]

Response: TXS [val]

Where:	[val]	State
	0	Off Transmitting possible
	1	On Transmitter disabled

**Notes:**

The display shows "TX INHIBIT!" when PTT pressed while disabled.

**Example:**

Sent: TXS            Get state of Transmitter Inhibit.

Response: TXS 0    Transmitter Inhibit is off.

Sent: TXS 1            Inhibit Transmit.

Response: TXS 1    Confirm: transmission inhibited.

**TYD            Type ID of radio**

**Description:**

Displays the radio type.

Menu Item n/a

**Command:**

Status Request: TYD

**Example:**

Sent: TYD                      Request radio type.

Response: TYD KK,0F    Confirm:

**UP                Up**

**Description:**

Moves up one memory location or one frequency step.

Menu Item n/a

**Command:**

Modify: UP

Response: UP

**Notes:**

Same as rotating Tuning Control one click clockwise. With Fine Step enabled, this steps to the next nearest multiple of the current Fine Step whether or not it started on a multiple. See DW.

**Example:**

Sent: UP                      Have transceiver move up.

Response: UP    Confirm:

**VMC            VFO, MR, CALL, INFO & Fine Step**

**Description:**

Select VFO, MR, CALL, or INFO memory of the active (control) Rx. (each frequency band, 0-E, has a VFO memory) VMC does not change the control Rx except for VMC 0,4.    Menu Item n/a

**Command:**

Status Request: VMC [Rx]

Modify: VMC [Rx], [vmc].

Response: VMC [Rx], [vmc]

Where:	[Rx]	A/B	[vmc]	Mode
	0	A	0	VFO also Fine Step Tuning off
	1	B	1	MR
			2	CALL
			3	Fine Step Enable (VFO mode Rx A only)
			4	INFO channels recall (always sets Rx B)

VMC 0,3 is invalid (N response)

VMC 0,4 switches from Rx A to B

**Notes:** The response is "N" for the off Rx (DL off) and for the non control Rx (DL on). See BC, FQ and FST. Starting from MR, CALL or INFO, VMC 1,0 is needed before VMC 1,3.

**Example:** VMC 1,4 updates the display, turning Fine off with VMC 1,0 does not.

Sent: VMC 0                      Request vmc of A Rx.

Response: VMC 0,0            Transceiver responds A Rx is in VFO.

Sent: VMC 1,1                      Set Rx B to MR.

Response: VMC 1,1            Confirm: Rx B MR

**VOX            VOX Transmit Enable**

**Description:**

Enable / Disable VOX.

Menu Item n/a

**Command:**

Status Request: VOX

Modify: VOX [vox]

Response: VOX [vox]

Where:	[vox]	State
	0	Off
	1	Enabled

**Example:**

Sent: VOX                      Request to enable VOX.

Response: VOX 0            Response: VOX is off.

Sent: VOX 1                      Enable VOX.

Response: VOX 1 Confirm: VOX is on.

**VR VFO Read**

**Description:**

Reads data of the specified band VFO.

Menu Item n/a

See parameter tables in Command Parameter Tables at front.

**Command:**

Status Request: VR [band]

Response: VR [band],[freq]

Where: [band] Rx Name - Freq MHz. [band] Rx Name - Freq MHz.

[ham]	0	A	2m	137-174	8	B	Air	108-137
[ham]	1	A	1.25m	216-260	9	B	2m	137-174
[ham]	2	A	70cm	410-470	A	B	VHF TV	174-216
	4	B	AM	0.1-1.8	B	B	1.25m	216-400
	5	B	HF	1.8-29.7	C	B	70cm	400-470
	6	B	6m	29.7-54	D	B	UHF TV	470-806
	7	B	FM	54-108	E	B	23cm	806-1300

The cellular band is locked out – 824-849 & 869-894

[freq] See Freq Parameter Table in Command Parameter Tables at front. Scan Lockout excluded.

**Note:** The band number here also specifies the associated receiver.

This addresses ONLY the VFO setting, not a Tx frequency for split.

For Air band 8.33 kHz steps, see Step Table Note on page 8.

**Example:**

Sent: VR 9 Request data for Rx B 2 m VFO band.

band freq stp of R T CT DCS T# C# D# offset Mod  
 Response: VR 9,00145330000,0,1,0,1,0,0,41,00,000,000600000,0

A frequency of 145.33 MHz. CTCSS is on at 254.1 Hz. Neg. offset of 600 KHz., FM

**VW VFO Write**

**Description:**

Loads data into the specified band VFO, but does not activate it. See RBN.

Menu Item n/a

See Command Parameter Tables at front.

**Command:**

Modify: VW [band],[freq] There is no Status Request, see VR.

Response: VW

Where: [band] is from the Command Parameter Tables at front.

[freq] See Freq Parameter Table, Command Parameter Tables at front. Scan Lockout excluded.

**Note:** See Receive Band number RBN & VMC to listen on a VFO frequency.

This loads ONLY the VFO setting, not a Tx frequency for split.

See BC, RBN and VMC.

For Air band 8.33 kHz steps, see Step Table Note on page 8.

**Example:**

band freq stp of R T CT DCS T# C# D# offset Mod  
 Sent: VW 9,00145330000,0,1,0,1,0,0,41,00,000,000600000,0

Request VFO to 145.33 MHz. CT = 254.1 Hz. Offset of 600 KHz., FM

Response: VW Confirmation response is only the mnemonic.

**VXB VOX On Busy**

**Description:**

Force VOX transmission even if Rx A or B squelch open.

Menu Item 20

**Command:**

Status Request: VXB

Modify: VXB [val]

Response: VXB [val]

Where: [State] State

0 Off - Audio will not cause key-up if squelch opens.

1 On - Audio will activate the VOX if squelch is open.

**Note:** Does not disable VOX if it is enabled.

**Example:**

Sent: VXB Request Status Request of VOX on Busy.

Response: VXB 0 Transceiver responds VOX on Busy is off.

Sent: VXB 1 Enable VOX on Busy.

Response: VXB 1 Confirm: VOX on Busy is on.

**VXD VOX Drop Delay**

**Description:**

Set/Read the VOX dropout Delay time.

Menu Item 22

**Command:**

Status Request: VXD

Modify: VXD [val]

Response: VXD [val]

Where: [val] Time [val] Time

0 250 ms 0 250 ms

1 500 ms 4 1500 ms

2 750 ms 5 2000 ms

3 1000 ms 6 3000 ms

**Note:** Does not disable VOX if it is enabled.

**Example:**

Sent: VXD Request VOX delay time.

Response: VXD 1 Response: VOX delay time is 500 ms.

Sent: VXD 0 Set VOX delay time to 250 ms.

Response: VXD 0 Confirm: VOX dropout delay time is 250 ms.

**VXG VOX Gain**

**Description:**

Set/Read the VOX Gain.

Menu Item 21

**Command:**

Status Request: VXG

Modify: VXG [val]

Response: VXG [val]

Where: [val] is a number from 0 to 9. The default value is 4.

**Note:** Does not disable VOX if it is enabled.

**Example:**

Sent: VXG Request VOX gain.

Response: VXG 4 Response: VOX gain is 4.

Sent: VXG 9 Set VOX gain to level 9.

Response: VXG 9 Confirm: VOX gain level is 9.

**Appendix**

**Air Band 8.33 kHz. step programming.**

From the radio keyboard, you can only enter to the 1 kHz. digit. To get the 'odd' frequencies (x.33 and x.67) you enter it as a rounded up frequency and the radio accepts it down to the next lower multiple.

8.33 kHz. steps  
 Enter      Result  
 118.009 -> 118.00833  
 118.517 -> 118.51667

I haven't checked the entire 108 – 137 MHz. range, but for several one MHz. segments, the following is what I observed.

Not all frequencies can be programmed with the FQ command. The first 100 kHz. of each MHz. (e.g. 119.000 – 119.100) can be programmed by rounding the FQ frequency to the nearest 10 Hz. (as displayed on the radio) . Starting in this first 100 kHz., you can also use UP and DW to step into the unprogrammable region above the first 100 kHz.

FQ command	Result
FQ 0011900000,2	119.000
FQ 00119008330,2	119.00833
FQ 00119016670,2	119.01667
....	....
FQ 00119091670,2	119.09167
FQ 00119100000,2	119.100

From here to the next MHz. the odd frequencies (x.33 & x.67) won't program (response N). In addition, the even frequencies (x.x00, x.x25, x.x50 & x.x75) have the Fine step Enabled rather than using the basic 8.33 kHz. step.

FQ command	Result	Expected
FQ 00119108330,2	N	119108.33
FQ 00119116670,2	N	119116.67

In addition, I observed frequencies sent to the even kHz. to program by auto-enabling Fine step, e.g. 119109.00

I also noted frequencies with a non-zero Hz. digit to enable Fine Step.

I haven't fully investigated how the Kenwood MCP programs the VFOs, but the x.33 & x.66 frequencies appear to be programmed using Fine Step and the even 25 kHz frequencies do not.

**6.25 kHz. and 12.5 kHz. step programming.**

These appear to program via computer as expected.

The keyboard "Round-Up" method also works for 6.25 kHz. and 12.5 kHz steps. From the radio keyboard, you can only enter to the 1 kHz. digit. To get the 'odd' frequencies (xx6.25, x12.5) you enter it as a rounded up frequency and the radio accepts it down to the next lower multiple.

6.25 kHz steps		12.5 kHz steps	
Enter	Result	Enter	Result
7.107	-> 7.10625	118.013	-> 118.0125
223.507	-> 223.50625	118.038	-> 118.0375