

KENWOOD

INTERFACE KIT

**IF-10A
IF-10B
IF-10C**

INSTRUCTION MANUAL

KENWOOD CORPORATION

© PRINTED IN JAPAN B50-8209-10(K,M)(MC)
93/12 11 10 9 8 7 6 5 4 3 2 1 9 2/12 11 10 9 8 7 6

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate the computer with respect to the receiver. Plug the computer into a different outlet so that computer and receiver are on different branch circuit. If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington DC 20402, Stock No. 004-000-00345-4.

WARNING

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

This equipment requires a shielded cable for interconnection to the RS-232C interface unit model IF-232C. Please use a cable supplied with IF-232C for interconnect to this unit. For the interface to a computer, please consult with the IF-232C instruction manual.

Thank you for purchasing this new interface kit.

IMPORTANT:

Please read this Instruction Manual carefully before placing the unit in service.

SAVE THIS INSTRUCTION MANUAL.

This instruction manual describes both the IF-10A, the IF-10B, and the IF-10C. When appropriate, separate descriptions are given for these three items.

IF-10A: INTERFACE KIT FOR THE TS-711A/711E/811A/

811B/811E

IF-10B: INTERFACE KIT FOR THE TS-940S

IF-10C: INTERFACE KIT FOR THE TS-140S/680S

The IF-10A/10B/10C interface kit is designed to be installed internally in transceivers such as the TS-140S/680S/711A/711E/811A/811B/811E/940S to allow computer assisted control of various transceiver operating parameters. Control is performed via the computers RS-232C terminal via the IF-232C interface (level translator).

The following explicit definitions apply in this manual:

Note : If disregarded, inconvenience only, no risk of equipment damage or personal injury.

Caution: Equipment damage may occur, but not personal injury.

1. BEF

Notes on ins
Do not place
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light, near a h
etc.

1. BEFORE

2. SPECIFI

2-1. SPE

2-2. ACC

3. INSTAL

3-1. IF-1

3-2. IF-1

3-3. IF-1

4. OPERAT

4-1. PRE

COI

4-2. COI

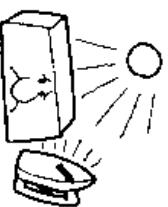
4-3. COI

5. SCHEM

1. BEFORE OPERATION

Notes on installation

Do not place the unit in a place which is exposed to direct sunlight, near a heating appliance, etc.



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2. SPECIFICATIONS AND ACCESSORIES

2-1. SPECIFICATIONS

2-1-1. Interface

Communication method Serial interface, full-duplex

Transfer rate 4800 BPS
(bits per second)

Synchronization Start-stop
(Asynchronous)

Bit construction 1 start bit, 8 character bits, 2 stop bits

Parity None

Signal format TTL level

2-1-2. Terminal Connections

| Pin No. | Signal Name | | I/O |
|----------|-------------------------|-----------------|--------|
| 1 | GND | Signal ground | Output |
| 2 | $\overline{\text{TXD}}$ | Transmit data | Output |
| 3 | $\overline{\text{RXD}}$ | Receive data | Input |
| 4 (Note) | CTS | Transmit enable | Input |
| 5 | RTS | Receive enable | Output |
| 6 | NC | No connection | |

Note: _____
For the TS-940S pin 4 is +5V.

GND:

This is the signal ground terminal.

TxD:

The transmit data is the serial data from the transceiver to the computer. The output utilizes negative logic.

RxD:

The receive data is the serial data from the computer to the transceiver. The input utilizes negative logic.

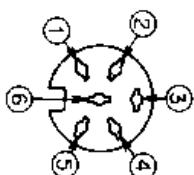
CTS:

This signal is supplied from the computer, and is used to inhibit transmit data from the transceiver when the computer is not ready to receive. The input utilizes positive logic. (Transmit data is stopped by a logic low.) [Except TS-940S]

RTS:

This signal is applied to the computer, and is used to inhibit transmit data from the computer when the transceiver is not ready to receive it. The output utilizes positive logic. (Inhibit is requested when the level is low.)

Connector pin configuration



(Viewed from the rear)

2-2. ACCESSORIES

The following accessories are supplied with the unit. Confirm that all are present.

1. EPROM (IF-10A/10B only) .. (MBM2732A-30) .. 1 ea.
2. Boss (IF-10A only) (J32-0795-04) 2 ea.
3. Pan head screw (IF-10A/10C only) (N30-2605-41) 2 ea.

4. Self tapping screw (IF-10B only) (N35-2605-41) 2 ea.
5. Brazier head tapping screw (IF-10C only) (NB7-2606-46) 4 ea.
6. DIN connector bracket (IF-10A/10C only) (EO6-0655-05) 1 ea.

7. Instruction manual (B50-8209-xx) 1 ea.

Note:

The IF-10A/10B/10C does not include computer software, guidelines are provided but due to the wide variety of computers available, all of which have their own languages it is left up to the owner to design his or her own software package.

3. INSTALLATION

3-1. IF-10A

Caution: _____

Before removing the cover be sure to disconnect the power cable, or damage may result to the radio or interface kit.

1. Remove the eight screws securing the upper cover using a #2 Phillips screwdriver.
2. Remove the two screws marked \ominus from the control unit, and install the supplied bosses.
3. Plug the interface board onto the 7 pin connector (J5) and 9 pin connector (J6) as shown in the illustration.
4. Secure the circuit board using the two screws removed in step number 2.
5. Remove the plastic plug that is currently installed in the ACC1 jack area, at the upper rear corner of the radio.
6. Install the DIN connector using the bracket supplied, as shown in the illustration.
7. Install the EEPROM (Erasable and Programmable Read Only Memory) into the vacant socket on the circuit board.

Caution: _____

Align the notch.

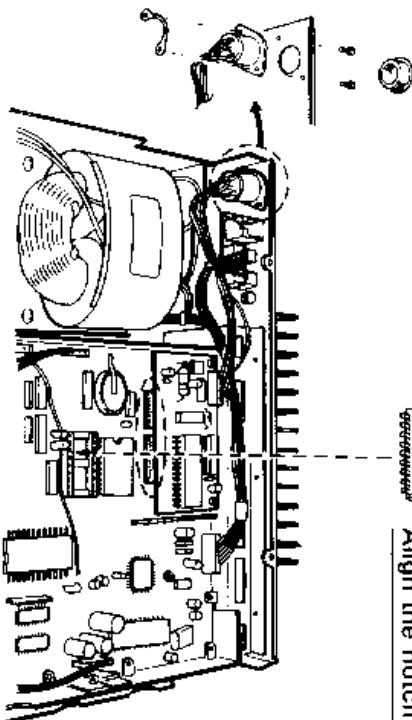


Fig. 3-1

Caution: _____

Align the notch on the EEPROM with the notch in the socket, or damage to the EEPROM and or circuit board may result!

8. Replace the top cover.

3-2. IF-10B

Caution:

Before removing the cover be sure to disconnect the power cable, or damage may result to the radio or interface kit.

1. Remove the eight screws securing the transceiver's upper cover, using a #2 Phillips head screwdriver, and remove the top cover. (Fig. 3-2)
2. Remove the four screws that secure the speaker mounting bracket to the chassis and swing the bracket up towards the AT (antenna tuner) unit. Be especially careful of the wiring harness. Don't stretch the cable harness. (Fig. 3-3, Fig. 3-4)
3. Next remove the eight screws that secure the shield covering Digital A unit. Swing the cover to the side. Again be careful of the wiring harness. (Fig. 3-5)
4. Place the interface unit on the hexagonal boss on the Digital A unit, and secure it with the screws provided with the interface kit.
5. Connect the connector on Digital A unit to the interface unit as shown in Fig. 3-6.
6. Install the expansion EPROM (Erasable and Programmable Read Only Memory) into the vacant socket on the digital unit. Orientation of this component is critical for proper operation of the radio, and interface.
7. Replace the shield cover. Do not pinch any wires under the cover when you tighten it down.
8. Reinstall the speaker mounting bracket, confirming that the connector located on the left side of the digital A unit is secure, and not pinched under the bracket.

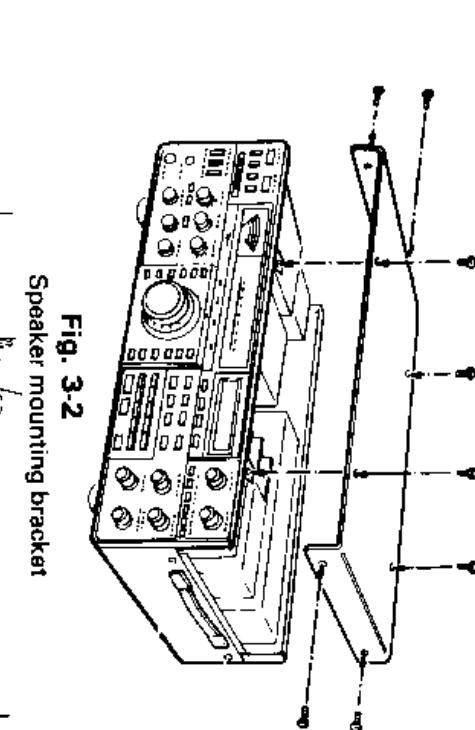


Fig. 3-2
Speaker mounting bracket

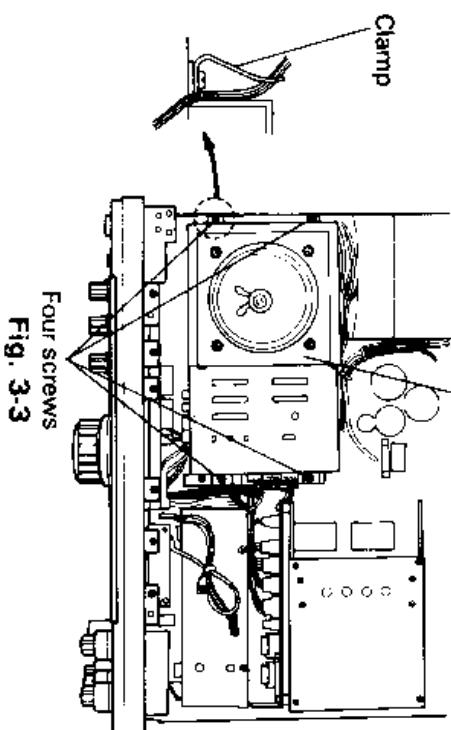


Fig. 3-3

Caution: _____
Install the EPROM so that the notch in the end is on the same end as the notch in the IC socket.

Eight screws Speaker mounting bracket
Shield cover

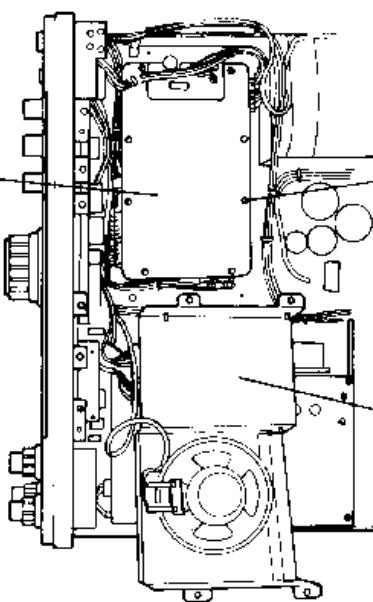
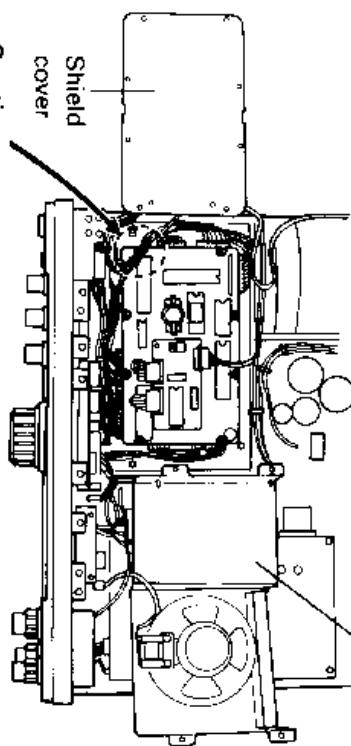


Fig. 3-4

Speaker mounting bracket



Caution:
Don't stretch the cable harness.

Fig. 3-5

Caution: Align the notch.
EPROM

Connect the
connectors.

EPROM socket



Digital A unit
(X54-1830-00)
IF-10B

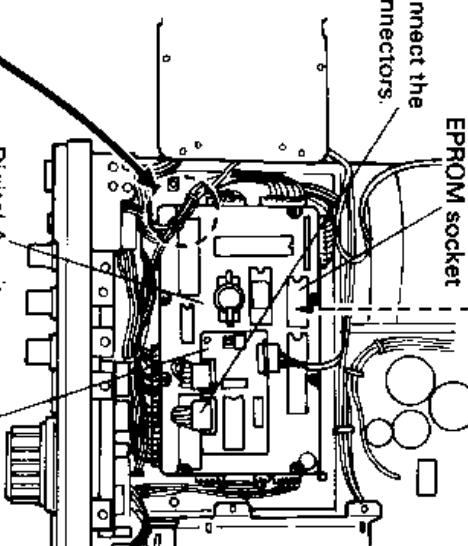


Fig. 3-6

3-3. IF-10C

Refer to the TS-140S/680S manual for installation instructions.

4. OPERATION

Caution: _____

Turn the POWER switch OFF before making connections.

4-1. PRECAUTIONS FOR COMPUTER-CONNECTED OPERATION

When connecting the transceiver with a computer, check the following points.

1. Are the connections correct?

The transceiver output should be connected to the computer input and the transceiver input to the computer output.

Example:

Transceiver's transmission data — Computer's receive data

Transceiver's RTS — Computer's CTS

2. Is the computer's transmission rate 4800 BPS (bits per second)?

3. Is the computer's bit configuration correct?

1 start bit, 8 character bits, 2 stop bits, no parity.

4-2. CONTROL OPERATION

Most computers handle data in the form of "bits", and "bytes". A bit is the smallest piece of information that the computer can handle. A byte is composed of 8 bits. This is the most convenient form for most computer data. This data may be sent in the form of either serial

or parallel data strings. The parallel mode is faster, but more complicated, while the serial form is slower it requires less complicated equipment, and therefore is less expensive.

Serial transmission of data occurs over a single line using time-division methods. This use of a single line also offers the advantage of reducing the number of errors due to line noise.

For control of the transceiver via the computer only three lines are theoretically required: transmit data ($\overline{\text{TXD}}$), receive data ($\overline{\text{RXD}}$), and ground (GND). From a practical standpoint it is also necessary to incorporate some means of controlling when this data transfer will occur. We don't want the computer and transceiver sending information at the same time! This is controlled by the RTS and the CTS lines.

The IF-232C and the IF-10A/10B/10C are used in conjunction to provide voltage conversion. RS-232C deals in voltages above and below TTL levels, and must be converted to prevent damage to the transceiver. This interface/conversion is handled by the IF-232C.

The actual command sequence would be similar to those described below:

For example, the radio is placed into the transmit mode whenever the character string "TX" is sent from the computer. The character string "TX" is called a command. It tells the transceiver to do something. There are approximately 21 to 30 different commands available for control of the transceiver.

These commands may be incorporated into a computer program written in BASIC or any other high level language such as PASCAL, etc. Programming methods vary from computer to computer so please refer to the instruction manuals included with your terminal program, and computer.

4-3. COMMANDS

The illustration below demonstrates that a command is composed of two alphabetical characters, various parameters, and the terminator to signal the end of the command.

Example:

FA 00007000000 ; Command to set
↑ ↑ ↑ VFO A to 7 MHz.
Command Parameters Terminator

4-3-1. Command Description

A command may consist of either lower or upper case alphabetical characters.

4-3-2. Parameter Description

(Refer to the parameter list.)
Parameters are used to specify specific information necessary to implement the desired command. The exact number of parameters necessary for each command is predetermined. If a particular parameter is not applicable to the transceiver you are controlling the

parameter digits should be filled using any character except the terminator ";"

For example the MC (Memory channel selector) command uses two parameters, 1 column to specify the memory bank number, and 2 columns to specify the memory channel number. To specify CH9 of memory bank number 1, the command would be:

"MC109;" The memory bank number is not necessary when programming the TS-140S/680S/711A/711E/811A/811B/811E so the command could be as given above "MC 109" or as: "MC _ 09;" In this case a blank has been used to fill the parameter block for the memory bank number.

The following are examples of bad commands:
"MC09;" No memory bank specification (not enough parameters)

"MC19;" Not enough digits in the memory channel parameter, i.e. CH9 should be given as "09".

"MC _ 1 _ 09 _;" Unnecessary characters between parameters.

"MC 1009;" No terminator

Parameter list

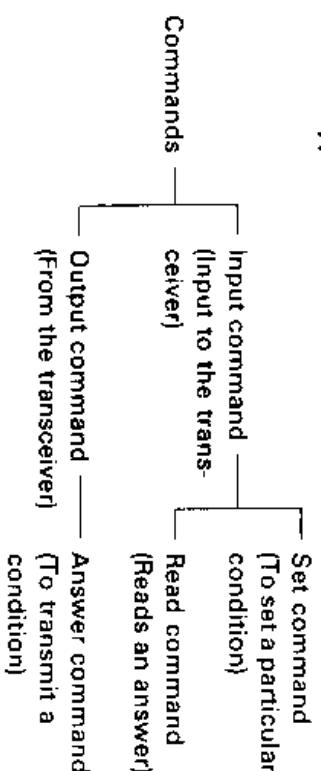
| Format No. | Name | Number of columns | Format |
|------------|----------------|-------------------|--|
| 1 | SW | 1 | 0 = OFF 1 = ON |
| 2 | MODE | 1 | 1 = LSB 4 = FM 7 = CWN 2 = USB 5 = AM 3 = CW 6 = FSK (FSK: TS-940S only) (AM: TS-140S/680S/940S only) (CWN: TS-140S/680S only) |
| 3 | FUNCTION | 1 | 0 = VFO A 2 = MEMORY 1 = VFO B 3 = COM (COM: TS-711A/711E/811A/ 811B/811E only) |
| 4 | FREQUENCY | 11 | Represented in Hz, using 11 columns. Example: 00007200000 is 7.2 MHz 10 GHz 1 MHz 1 kHz 1 Hz |
| 5 | RIT FREQUENCY | 5 | The first column is "+" or "-", and the remaining four columns indicate the frequency in Hz. Example: +5320 is +5.32 kHz |
| 6 | STEP FREQUENCY | 5 | Represented in Hz, using 5 columns. (TS-711A/711E/ 811A/811B/811E/940S only) |
| 7 | MEMORY CHANNEL | 2 | Represented in two columns. Example: 02 is CH2 |
| 8 | MEMORY BANK | 1 | Represented using one col- umn. (TS-940S only) |

| Format No. | Name | Number of columns | Format |
|------------|------------------------------------|-------------------|--|
| 9 | MEMORY CHANNEL SPLIT SPECIFICATION | 1 | 0 = Receive 1 = Transmit (TS-140S/680S/711A/711E/ 811A/811B/811E only) |
| 10 | MEMORY LOCKOUT | 1 | 0 = Not locked out 1 = Locked out (TS-140S/680S/711A/711E/ 811A/811B/811E only) |
| 11 | TX/RX | 1 | 0 = Receive 1 = Transmit |
| 12 | PASSBAND | 2 | Represented using two col- umns, from 00 to 31. "00" is the normal or wide position and "31" is the narrowest bandwidth (TS-940S only) |
| 13 | OFFSET | 1 | 0 = SIMPLEX 2 = - 1 = + (TS-711A/711E/811A/ 811B/811E only) |
| 14 | TONE FREQUENCY | 2 | Represented using two col- umns, from 01 to 37. This corresponds to the number displayed on the MCH dis- play during tone select opera- tion. (TS-711A/811A/811B only) |
| 15 | CALL SIGN | 6 | Represented using 6 col- umns. Example: WDD6DJY (TS-711A/711E/811A/ 811B/811E/940S only) |
| 16 | MODEL NO. | 3 | Three column number speci- fying each set. |

4-3-3. Terminator

To signal the end of a command it is necessary to use a special character. The character that has been selected for use is the semicolon ";" . This special character must appear as the last character in a particular command string.

4-3-4. Types of Commands



Commands can be classified as shown in the chart above. For example, with the FA (Frequency of VFO A) command.

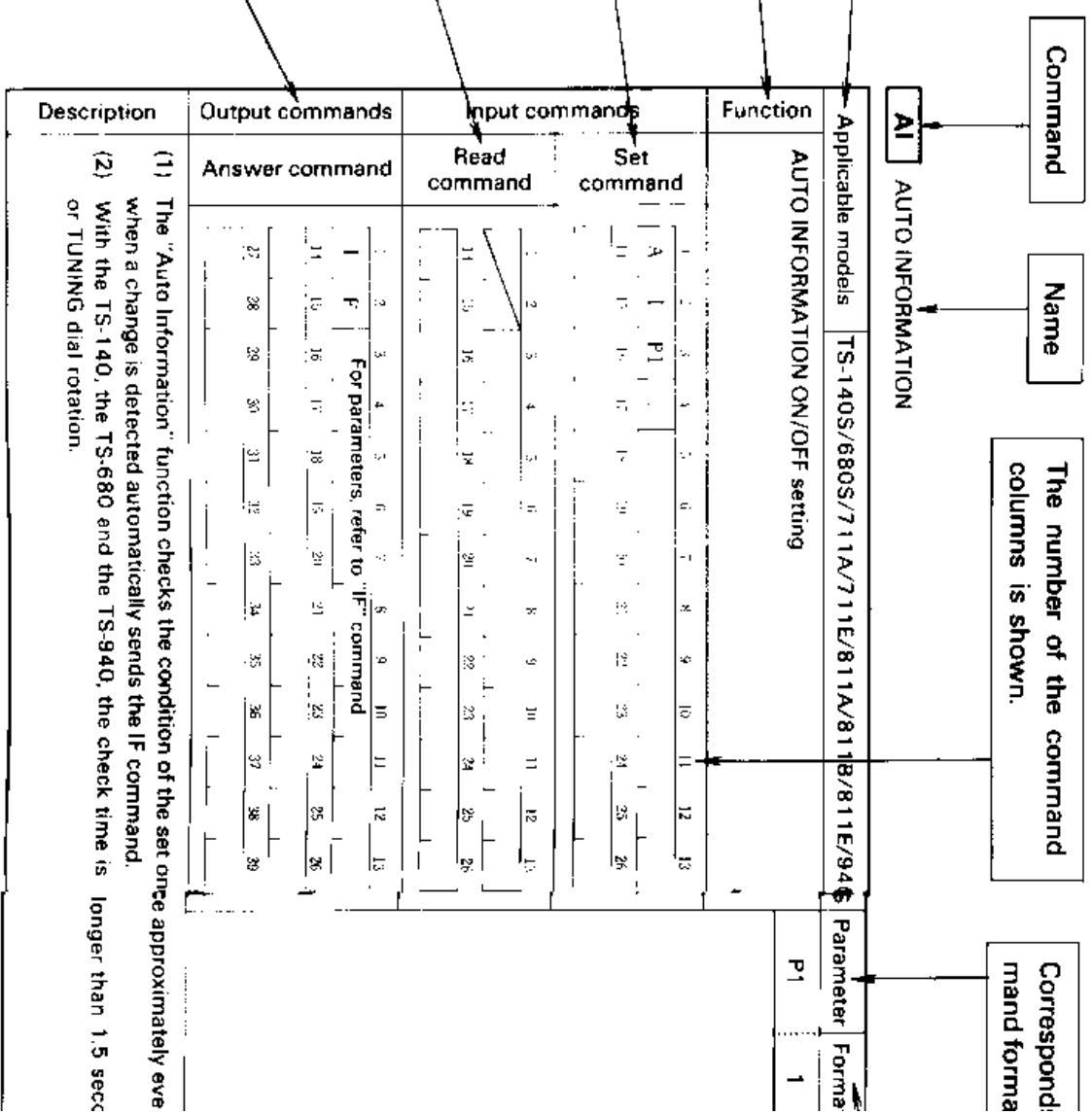
- To set the frequency at 7 MHz, the command sent from the computer to the transceiver is:
"FA0000700000;" (Set command)
- To read the frequency of VFO A, the command sent from the computer to the transceiver is:
"FA;" (Read command)
- When the read command, above, has been sent, the command returned to the computer is:
"FA0000700000;" (Answer command)

4-3-5. Error Messages

In addition to the answer command, the transceiver will send one of the following error messages:

| | |
|---|---|
| ? | <p>○ When the command syntax is incorrect. ○ When the command was not executed due to the current status of the transceiver, even though the command syntax was correct.</p> <p>Note: _____</p> <p>Occasionally this message may not appear due to microprocessor transients in the transceiver.</p> |
| E | <p>When a communication error occurs, such as an overrun error or framing error occurs during serial data transmissions.</p> |
| O | <p>When the receive data is sent but processing cannot be completed.</p> |

4-3-6. How to read the command tables



The format of the command is shown. When oblique lines are drawn in the 1st and 2nd columns there is no set command.

The format of the command for reading the sets condition is shown. When oblique lines are drawn in the 1st and 2nd columns, there is no read command.

The format of the command for reading the sets condition is shown. When oblique lines are drawn in the 1st and 2nd columns, there is no read command.

The format of the command output from the transceiver is shown. When oblique lines are drawn in the 1st and 2nd columns, there is no answer command.

| Parameter | Format | Parameter function |
|-----------|--------|--------------------|
| P1 | 1 | AI ON/OFF |

Corresponds to the parameter of the command format.

Corresponds to the format No. in the parameter list. For the parameter formats, refer to the parameter list.

Indicates the parameters function.

be approximately every 1.5 seconds and

longer than 1.5 seconds during scanning

Usage of command, details of functions, and cautions are described.

4.3.7. Command Use Precautions

| Model | Precaution |
|--|---|
| TS-140S/ 680S/711A/ 711E/811A/ 811B/811E/ 940S | The control characters (00 to 1FH) when included in receive data are ignored. |
| TS-140S/ 680S/940S | Program execution may be delayed during rapid encoder rotation. |
| TS-940S | The MW (Memory Write) command cannot be executed during memory channel operation. |

| Model | Precaution |
|---------|--|
| TS-940S | Receive data is not processed when directly entering the frequency from the keyboard or while the T-F SET key is depressed. |
| TS-811A | Note: When the microprocessor is reset, as when changing the lithium battery, re-enter M.CH1 first by pressing the M.IN switch, or improper operation may result when operating with computer. |

TS-140S/
680S/711A/
711E/811A/
811B/811E

To enter the transmitter frequency for split frequency operations using the MW command, enter any number from 1 thru 7 as the mode and either a "0" or a "1" to indicate the memory channel lockout status.

4.3.8. Command List

| Command | Function | Model | Page |
|---------|------------------|--------------------|------|
| AI | AUTO INFORMATION | TS-140S TS-680S | 16 |
| AT | ANTENNA TUNER | ○ | 17 |
| DI | DCS ID | ○ | 18 |
| DN/UP | DOWN/UP | ○ | 19 |
| DS | DCS | ○ | 20 |

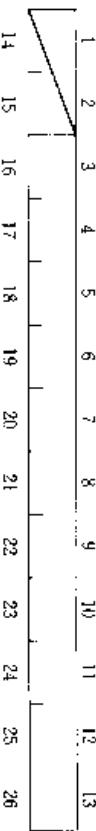
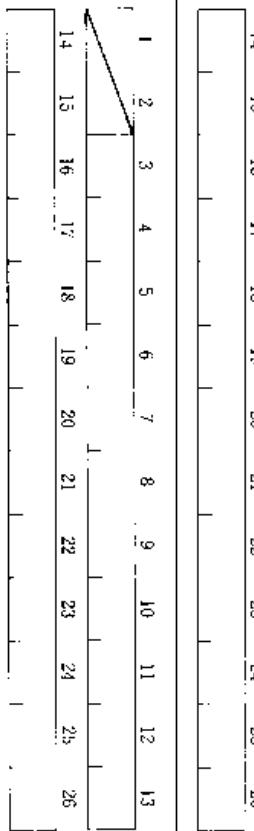
| Command | Function | Model | | | | | | Page |
|---------|--------------------------------------|--------------------|---------|---------|--------------------|---------|---------|------|
| | | TS-140S TS-680S | TS-711A | TS-711E | TS-811A TS-811B | TS-811E | TS-940S | |
| FA/FB | FREQUENCY VFO A/FREQUEN- CY VFO B | ○ | ○ | ○ | ○ | ○ | ○ | 21 |
| FN | FUNCTION | | | | | | | 22 |
| HD | SCAN HOLD | | | | | | | 23 |
| ID | | | | | | | | 24 |
| IF | | | | | | | | 25 |
| LK | INFORMATION | | | | | | | 26 |
| LO | LOCK | | | | | | | 27 |
| MC | LOCAL | | | | | | | 28 |
| MD | MEMORY CHANNEL | | | | | | | 29 |
| MR | MODE | | | | | | | 30 |
| MS | MEMORY READ | | | | | | | 31 |
| MW | MEMORY SCAN | | | | | | | 32 |
| OS | MEMORY WRITE | | | | | | | 33 |
| RC | OFFSET | | | | | | | 34 |
| RD/RU | RIT CLEAR | | | | | | | 35 |
| RT | RIT DOWN/RIT UP | | | | | | | 36 |
| RX/TX | RIT | | | | | | | 37 |
| SC | RX/TX | | | | | | | 38 |
| SH/SL | SCAN | | | | | | | 39 |
| | SLOPE | | | | | | | |
| | TUNE LOW | | | | | | | |
| SP | TUNE HIGH/SLOPE | | | | | | | |
| ST | SPLIT | | | | | | | |
| TN | TUNE STEP | | | | | | | |
| TO | TONE NUMBER | | | | | | | |
| VB | TONE | | | | | | | |
| VR | VBT | | | | | | | |
| XT | VOICE RECALL | | | | | | | |
| | XIT | | | | | | | |

* This command is not applicable to "KENWOOD" versions of the TS-711E/811E.

AI AUTO INFORMATION

| Applicable models | TS-140S/680S/711A/711E/811A/811B/811E/940S | Parameter | Format | Parameter function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------|---|---------------------------------------|--------|--------------------|----|----|----|----|----|----|----|----|----|----|---|---|---------------------------------------|---|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| AUTO INFORMATION ON/OFF setting | | P1 | 1 | AI ON/OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Input commands | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>A</td><td>I</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | A | I | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A | I | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Read command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Output commands | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Answer command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>I</td><td>F</td><td colspan="10">For parameters, refer to "IF" command</td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | I | F | For parameters, refer to "IF" command | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I | F | For parameters, refer to "IF" command | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Description | (1) The "Auto Information" function checks the condition of the set once approximately every 1.5 seconds and when a change is detected automatically sends the IF command. (2) With the TS-140, the TS-680 and the TS-940 the check time is longer than 1.5 seconds during scanning or TUNING dial rotation. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

AT**ANTENNA TUNER**

| Description | Output commands | Input commands | Function | Parameter | Format | Parameter function |
|-------------|-----------------|---|---------------------------------|-----------|--------|--------------------|
| | | | Antenna tuner standby operation | | | |
| | Answer command |  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 | | | | |
| | |  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 | Read command | | | |

DI DCS ID

| Applicable models | TS-711A/711E/811A/811B/811E | | |
|-----------------------|---|--------|--------------------------------|
| Function | Parameter | Format | Parameter function |
| DCS call sign readout | P1 | 15 | Call sign of your station |
| | P2 | 15 | Call sign of receiving station |
| Input commands | | | |
| Set command | | | |
| Read command | | | |
| Output commands | | | |
| Answer command | | | |
| Description | The call sign of the receiving station should read out as soon as a signal is received. The analysis of incoming call signs is continuous. However the call sign may be incorrectly display due to noise. | | |

DN **UP** DOWN/UP

| Description | Output commands | Input commands | Function | | | | | | | | | | | | |
|-------------|-----------------|----------------|--|----|----|----|----|----|----|----|----|-----------|----|----|----|
| | | | Same function as microphone UP/DOWN switch | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | | | DN | : | | | | | | | | | | | |
| | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | <u>23</u> | 24 | 25 | 26 |
| | | | | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | <u>10</u> | 11 | 12 | 13 |
| | | | <u>14</u> | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | | | <u>14</u> | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | | | <u>14</u> | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | | |
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | | | <u>14</u> | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | | |
| | | | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

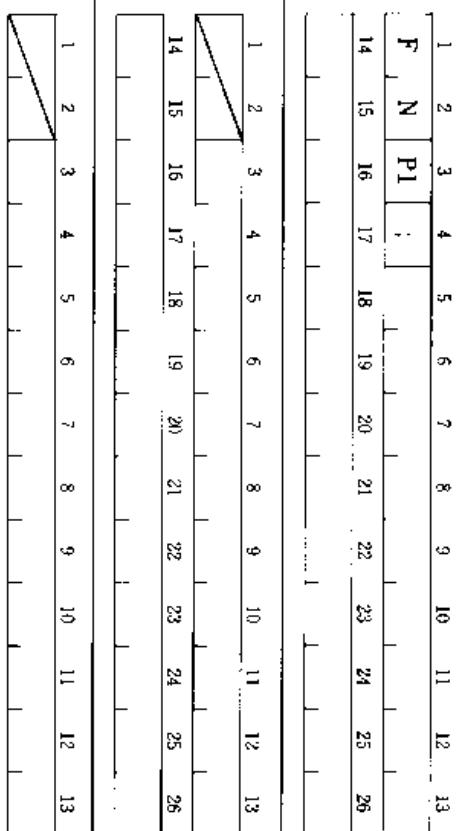
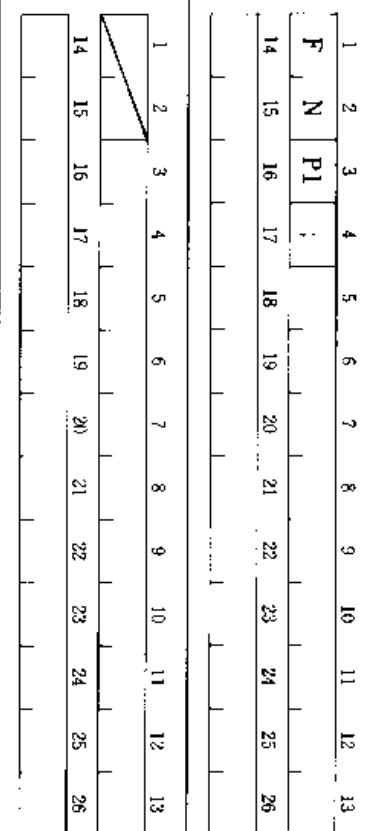
DS DCS

| Applicable models | | Parameter | | Format | Parameter function | |
|---|-----------------|-----------------------------|--|----------|--------------------|--|
| DCS system ON/OFF selection and readout | | P1 | | 1 | DCS ON/OFF | |
| Description | Output commands | Input commands | | Function | | |
| | Answer command | Read command Set command | | | | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 D S P1 : 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] [] 1 2 3 4 5 6 7 8 9 10 11 12 13 D S : 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] [] | | | | | | |
| 1 2 3 4 5 6 7 8 9 10 11 12 13 D S P1 : 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] 1 2 3 4 5 6 7 8 9 10 11 12 13 D S : 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] | | | | | | |

FA**FB****FREQUENCY VFO A/FREQUENCY VFO B**

| Description | Applicable models | Parameter | Format | Parameter function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|--|------------------|---------------|---------------------------|----|----|----|----|----|----|----|----|----|----|---|---|--|--|--|--|--|--|--|--|--|--|--|---|---|--|--|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|---|--|--|--|--|--|--|--|--|--|--|--|--|---|---|---|---|---|---|---|---|---|----|----|----|----|---|---|--|--|--|--|--|--|--|--|--|--|--|---|---|--|--|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|---|--|--|--|--|--|--|--|--|--|--|--|--|
| | VFO A and VFO B frequency selection and readout | P1 | 4 | FREQUENCY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>V</td><td>A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>F</td><td>B</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>E</td><td>A</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>F</td><td>B</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | V | A | | | | | | | | | | | | F | B | | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | : | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | E | A | | | | | | | | | | | | F | B | | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | : | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| V | A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | B | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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FN FUNCTION

| Description | Output commands | Input commands | Function |
|-------------|-----------------|--|---|
| | | VFO A and VFO B MEMORY COM setting (COM: TS-711/811 Only) | Applicable models TS-140S/680S/711A/711E/811A/811B/811E/940S |
| | | Set command Read command | Parameter P1 Format 3 Parameter function FUNCTION |
| | Answer command |   | |

HD SCAN HOLD

| Applicable model | TS-940S | Parameter | Format | Parameter function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|-----------------|---|----------|--------------------|----|----|----|----|----|----|----|----|----|----|----|---|---|----|---|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|---|---|---|--|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|---|---|----|---|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|----|---|---------------------|
| Description | Output commands | Input commands | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <p>Set command</p> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>H</td><td>D</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr> </table> <p>Read command</p> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>H</td><td>D</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr> </table> <p>Answer command</p> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>H</td><td>D</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td></tr> <tr><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td><td>.</td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | H | D | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | H | D | : | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | . | . | . | . | . | . | . | . | . | . | . | . | . | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | H | D | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | . | . | . | . | . | . | . | . | . | . | . | . | . | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | . | . | . | . | . | . | . | . | . | . | . | . | . | Temporary scan. | P1 | 1 | SCAN HOLD ON/OFF |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | D | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | D | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| H | D | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| . | . | . | . | . | . | . | . | . | . | . | . | . | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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ID ID

| Description | Output commands | Input commands | Parameter | Format | Parameter function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|-----------------|---|-----------|--------|--------------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|-----------|
| | | <p>Set command</p> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>[]</td><td>[]</td></tr> </table> <p>Read command</p> <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>[]</td><td>[]</td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | P1 | 16 | MODEL No. |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | TS-140/680: 006 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | TS-711 : 001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | TS-811 : 002 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | TS-940 : 003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

IF INFORMATION

| Applicable models | TS-140S/680S/711A/711E/811A/811B/811E/940S | | | Parameter | Format | Parameter function |
|--|--|-----|----|--|--------|--------------------|
| Display of transceivers current condition | | P1 | 4 | DISPLAY FREQUENCY | | |
| | | P2 | 6 | STEP FREQUENCY (TS-711A/711E/811A/811B/811E/940S only) | | |
| | | P3 | 5 | RIT FREQUENCY | | |
| | | P4 | 1 | RIT ON/OFF | | |
| | | P5 | 1 | XIT ON/OFF (TS-711A/711E/811A/811B/811E/940S only) | | |
| | | P6 | 8 | MEMORY BANK (TS-940S only) | | |
| | | P7 | 7 | MEMORY CHANNEL | | |
| | | P8 | 11 | TX/RX | | |
| | | P9 | 2 | MODE | | |
| | | P10 | 3 | FUNCTION | | |
| | | P11 | 1 | SCAN ON/OFF | | |
| | | P12 | 1 | SPLIT ON/OFF | | |
| | | P13 | 1 | TONE ON/OFF (TS-711A/711E/811A/811B/811E only)* | | |
| | | P14 | 14 | TONE FREQUENCY (TS-711A/811A/811B only) | | |
| | | P15 | 13 | OFFSET(TS-711A/711E/811A/811B/811E only) | | |
| Description | Output commands | | | | | |
| (1) When the frequency step of the TS-711A/711E/811A/811B/811E is changed, the step frequency of the IF command will hold the previous value until the frequency is changed. | Answer command | | | | | |
| (2) * This command is not applicable to "KENWOOD" versions of the TS-711E/811E. | | | | | | |

LK LOCK

| Description | Output commands | Input commands | | Function |
|-------------|-----------------|--|---|---------------------------------|
| | | Set command | Read command | |
| | LOCK | 1 2 3 4 5 6 7 8 9 10 11 12 13 L K P1 ; 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] [] [] | 1 2 3 4 5 6 7 8 9 10 11 12 13 L K ; 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] [] | LOCK ON/OFF setting and display |
| | Answer command | 1 2 3 4 5 6 7 8 9 10 11 12 13 L K P1 ; 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] [] | 1 2 3 4 5 6 7 8 9 10 11 12 13 L K ; 14 15 16 17 18 19 20 21 22 23 24 25 26 [] [] [] [] [] [] [] [] [] [] [] | Parameter function |
| | | P1 | 1 | LOCK ON/OFF |

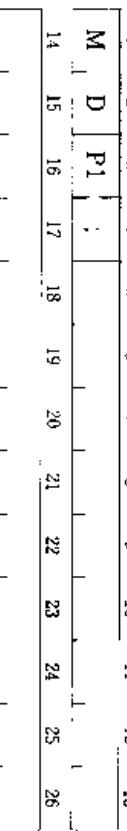
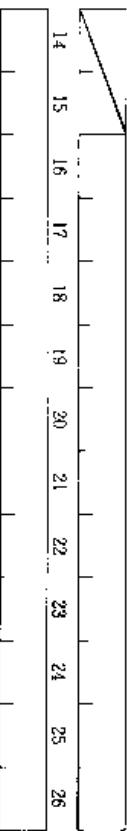
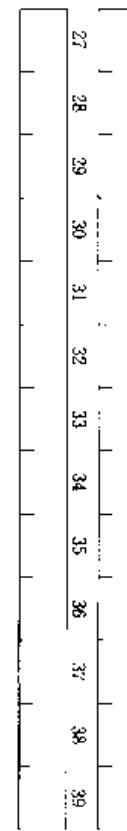
LO LOCAL

| Applicable model | Parameter | Format | Parameter function |
|---|-----------------|--------------------|--------------------|
| When a personal computer is used to control VBT etc., the transceivers associated controls are disabled. This command releases control back to the transceivers controls. | | | |
| Function | | | |
| Input commands | Set command | | |
| Read command | Output commands | Parameter | Format |
| Description | Answer command | Parameter function | |
| When the VB, SL, SH, MC or TX command is executed, the associated switches and controls will not function until the LO command is sent from the computer. | | | |

MC MEMORY CHANNEL

With the TS-940, this command will disable the MEMORY BANK switch associated top cover switch.

MD MODE

| Description | Output commands | Input commands | Function |
|-------------|-----------------|--|--|
| | | Set command  Read command  | Mode setting P1 2 MODE |
| | Answer command |  | |

MR MEMORY READ

| Applicable models | TS-140S/680S/711A/711E/811A/811B/811E/940S | | | | | | | | | | Parameter | Format | Parameter function | |
|-------------------|--|--|--|--|--|--|--|--|--|--|-----------|--------|--|--|
| Memory display | | | | | | | | | | | P1 | 9 | SPLIT SPECIFICATION | |
| Function | | | | | | | | | | | P2 | 8 | MEMORY BANK (TS-940S only) | |
| | | | | | | | | | | | P3 | 7 | MEMORY CHANNEL | |
| | | | | | | | | | | | P4 | 4 | FREQUENCY | |
| | | | | | | | | | | | P5 | 2 | MODE | |
| | | | | | | | | | | | P6 | 10 | MEMORY LOCKOUT (TS-140S/680S/711A/ 711E/811A/811B/ 811E only) | |
| | | | | | | | | | | | P7 | 1 | TONE ON/OFF (TS-711A/711E/811A/ 811B/811E only)* | |
| | | | | | | | | | | | P8 | 14 | TONE FREQUENCY (TS-711A/811A/811B only) | |
| | | | | | | | | | | | P9 | 13 | OFFSET (TS-711A/711E/ 811A/811B/811E only) | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Description | Output commands | | | | | | | | | | | | | |
| | Answer command | | | | | | | | | | | | | |

- (1) All parameters are set to OFF when the memory channel is vacant.
- (2) * This command is not applicable to "KENWOOD" versions of the TS-711E/811E.
- (3) With the TS-140 and the TS-680 to recall the lowest operating frequency of the section use P1 = 1, and to recall the highest operating frequency use P1 = 0.

MS MEMORY SCAN

| Description | Output commands | Input commands | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------|-----------------|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|---|---|----|---|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Applicable model TS-940S Memory scan ON/OFF and display | Parameter P1 Format 1 Parameter function MEMORY SCAN ON/OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Set command <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>M</td><td>S</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>[]</td><td>[]</td></tr> </table> Read command <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>M</td><td>S</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>[]</td><td>[]</td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | M | S | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | M | S | : | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | S | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | S | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Answer command <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>M</td><td>S</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td>[]</td><td>[]</td></tr> <tr><td>27</td><td>28</td><td>29</td><td>30</td><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td></tr> <tr><td>[]</td><td>[]</td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | M | S | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | S | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | [] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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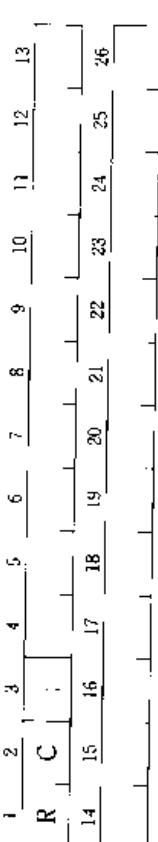
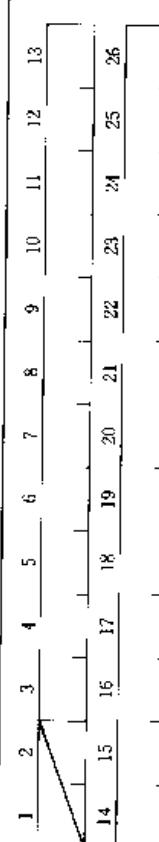
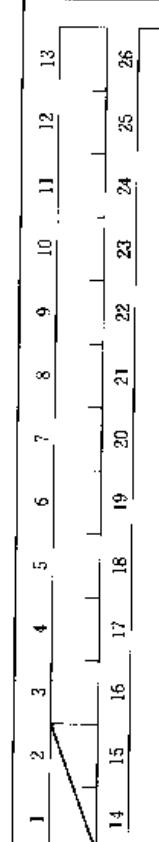
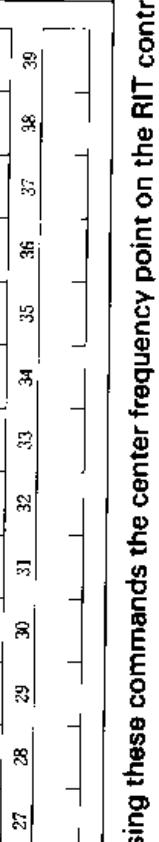
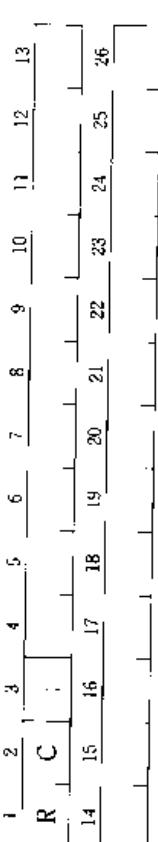
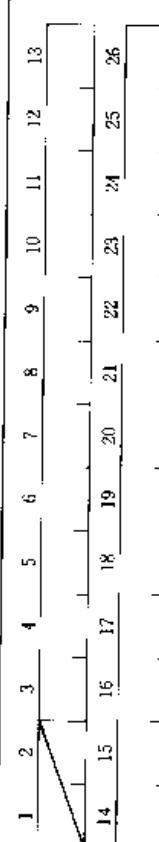
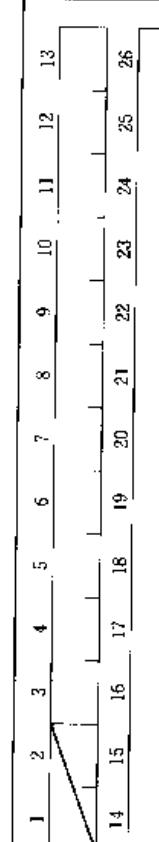
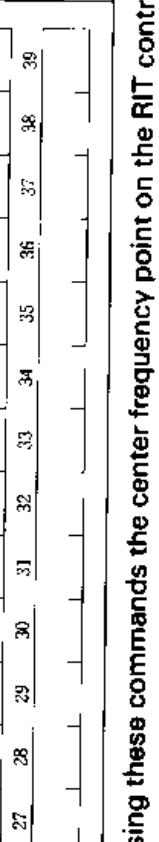
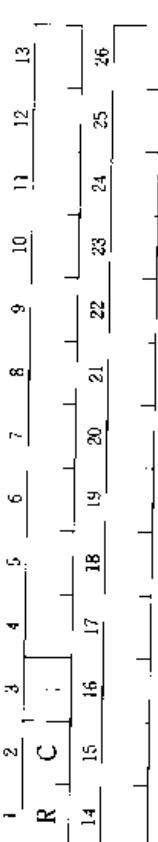
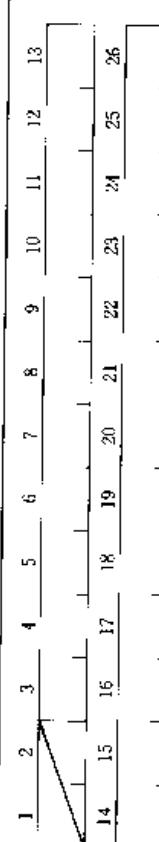
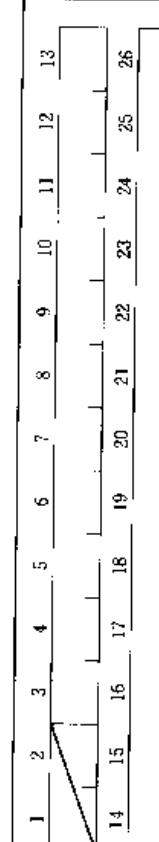
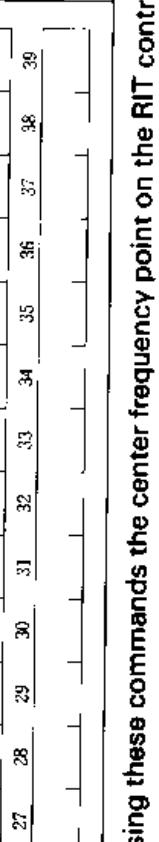
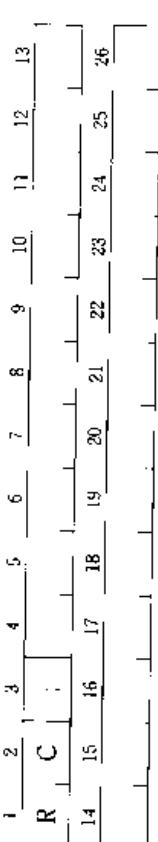
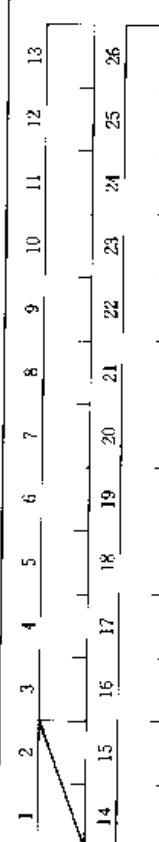
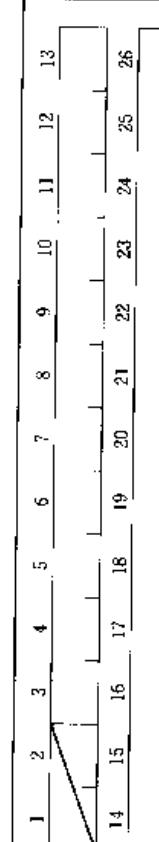
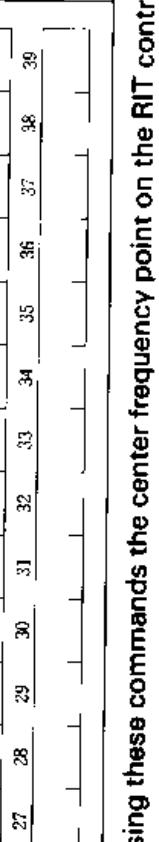
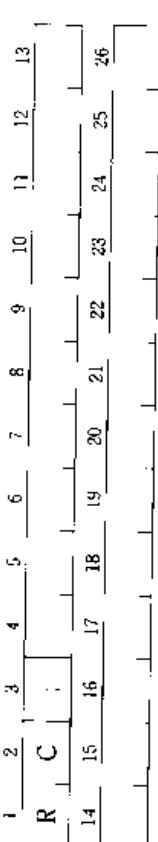
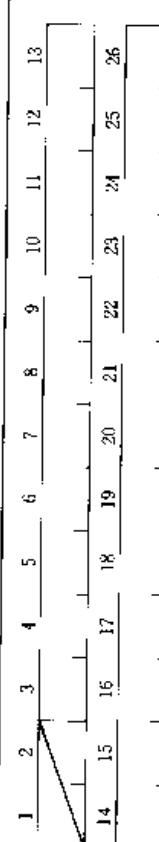
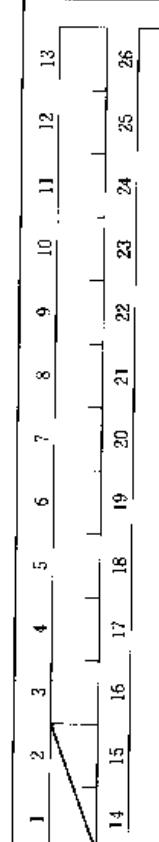
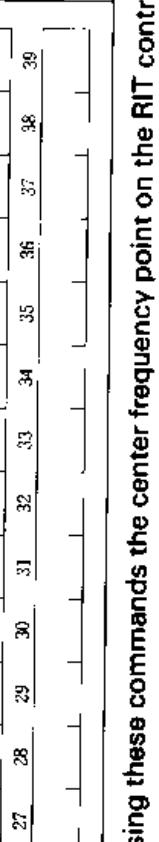
MW MEMORY WRITE

| Applicable models | TS-140S/680S/711A/711E/811A/811B/811E/940S | | Parameter | Format | Parameter function |
|---------------------|---|-----------------------|-----------|--|--------------------|
| Memory entry | | P1 | 9 | SPLIT SPECIFICATION | |
| | | P2 | 8 | MEMORY BANK (TS-940S only) | |
| | | P3 | 7 | MEMORY CHANNEL | |
| | | P4 | 4 | FREQUENCY | |
| | | P5 | 2 | MODE | |
| | | P6 | 10 | MEMORY LOCKOUT (TS-140S/680S/711A/ 711E/811A/811B/ 811E only) | |
| | | P7 | 1 | TONE ON/OFF (TS-711A/711E/811A/ 811B/811E only)* | |
| | | P8 | 14 | TONE FREQUENCY (TS-711A/811A/811B/ 811E only) | |
| | | P9 | 13 | OFF SET (TS-711A/711E/811A/ 811B/811E only) | |
| Description | Output commands | Input commands | | | Function |
| | Read command | Set command | | | |
| | Answer command | | | | |
| (1) | The MW command is valid when all parameters have been correctly entered. | | | | |
| (2) | When all effective frequency columns are "0", the memory is set to an open channel. | | | | |
| (3) | When the split channel of the TS-140S/680S/711A/711E/811A/811B/811E is open, the transceiver will be set for the same transmit and receive frequencies, i.e. simplex. | | | | |
| (4) | * This command is not applicable to "KENWOOD" versions of the TS-711E/811E. | | | | |
| (5) | With the TS-140 and the TS-680 to recall the lowest operating frequency of the section use P1 = 1, and to recall the highest operating frequency use P1 = 0. | | | | |

- (1) The MW command is valid when all parameters have been correctly entered.
 - (2) When all effective frequency columns are "0", the memory is set to an open channel.
 - (3) When the split channel of the TS-140S/680S/711A/711E/811A/811B/811E is open, the transceiver will be set for the same transmit and receive frequencies, i.e. simplex.
 - (4) * This command is not applicable to "KENWOOD" versions of the TS-711E/811E.
 - (5) With the TS-140 and the TS-680 to recall the lowest operating frequency of the section use P1 = 1, and to recall the highest operating frequency use P1 = 0.

OS
OFFSET

RC RIT CLEAR

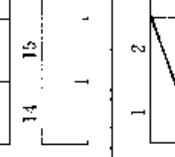
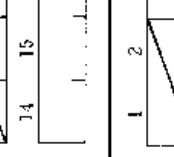
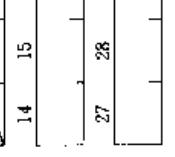
| Description | Output commands | Answer command | Read command | Set command | RIT frequency clearance | Applicable models |
|-------------|---|---|---|---|---|--|
| Function |     |     |     |     |     | TS-140S/680S/711A/711E/811A/811B/811E/940S |

When using these commands the center frequency point on the RIT control may not coincide with the center point printed on the front panel. The center point will coincide with the position of the RIT control before these commands were initiated. (TS-140S/680S only)

RD **RU** RIT DOWN/RIT UP

| Applicable models | TS-140S/680S/711A/711E/811A/811B/811E/940S | Parameter | Format | Parameter function |
|-----------------------|---|--|--------|--------------------|
| RIT frequency UP/DOWN | | | | |
| Function | | | | |
| Set command | 1 2 3 4 5 6 7 8 9 10 11 12 13 R D R U 14 15 16 17 18 19 20 21 22 23 24 25 26 | | | |
| Read command | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 | | | |
| Answer command | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 | | | |
| Description | Output commands 27 28 29 30 31 32 33 34 35 36 37 38 39 | When using these commands the center frequency point on the RIT control may not coincide with the center point printed on the front panel. The center point will coincide with the position of the RIT control before these commands were initiated. (TS-140S/680S only) | | |

RT

| Applicable models | | TS-140S/680S/711A/711E/811A/811B/811E/940S | | | | | | | | | | | | Parameter | Format | Parameter function | |
|---|---|--|---|---|--|--|--|--|--|--|---|---|---|---|--------|--------------------|--|
| RIT ON/OFF setting | | | | | | | | | | | | | | P1 | 1 | RIT ON/OFF | |
| Function | | | | | | | | | | | | | | | | | |
| | | 1 R 14 15 16 17 18 19 20 21 22 23 24 25 26 | 2 T 15 16 17 18 19 20 21 22 23 24 25 26 | 3 P1 1 1 1 1 1 1 1 1 1 1 1 1 | 4 : 1 1 1 1 1 1 1 1 1 1 1 1 | 5 : 1 1 1 1 1 1 1 1 1 1 1 1 | 6 : 1 1 1 1 1 1 1 1 1 1 1 1 | 7 : 1 1 1 1 1 1 1 1 1 1 1 1 | 8 : 1 1 1 1 1 1 1 1 1 1 1 1 | 9 : 1 1 1 1 1 1 1 1 1 1 1 1 | 10 : 1 1 1 1 1 1 1 1 1 1 1 1 | 11 : 1 1 1 1 1 1 1 1 1 1 1 1 | 12 : 1 1 1 1 1 1 1 1 1 1 1 1 | 13 : 1 1 1 1 1 1 1 1 1 1 1 1 | | | |
| Set command | Read command | Input commands | Output commands | Answer command | Description | | | | | | | | | | | | |
|  |  |  |  |  | | | | | | | | | | | | | |

SC SCAN

| Description | Output commands | Answer commands | Read command | Set command | Applicable models | Parameter | Format | Parameter function |
|---------------------|-----------------|-----------------|--------------|-------------|--|-----------|--------|--------------------|
| Scan ON/OFF setting | | | | | TS-140S/680S/711A/711E/811A/811B/811E/940S | P1 | 1 | SCAN ON/OFF |

SH **SL** SLOPE TUNE HIGH/SLOPE TUNE LOW

| Applicable model | TS-940S | Parameter | Format | Parameter function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|--|-----------|--------|--------------------|----|----|----|----|----|----|----|----|----|----|-----|-----|----|---|--|--|--|--|--|--|--|--|--|----|----|----|----|----|----|----|----|----|----|----|----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Function | Slope tune band setting and readout. | P1 | 12 | PASSBAND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Set command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>S.H</td><td>S.L</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | S.H | S.L | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S.H | S.L | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Read command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>S.H</td><td>S.L</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | S.H | S.L | : | | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S.H | S.L | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Answer command | <table border="1"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td></tr> <tr><td>S.H</td><td>S.L</td><td>P1</td><td>:</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | S.H | S.L | P1 | : | | | | | | | | | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| S.H | S.L | P1 | : | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Description | The execution of this command will disable the transceivers associated front panel controls. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

SP SPLIT

ST STEP

| Applicable models | | TS-711A/711E/811A/811B/811E | | | | | | | | | | Parameter | Format | Parameter function |
|---------------------|-----------------|-----------------------------|----|----|----|----|----|----|----|----|----|-----------|--------|--------------------|
| STEP ON/OFF setting | | | | | | | | | | | | P1 | 1 | STEP ON/OFF |
| Function | | | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | S T P1 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | Set command | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | Read command | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | Answer commands | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | | | | | | | | | | | | | | |
| | | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| | | | | | | | | | | | | | | |
| | Description | | | | | | | | | | | | | |

TN TONE NUMBER

| Applicable models | | TS-711A/811A/811B | | | | | | | | | | | | Parameter | | Format | | Parameter function | | | |
|----------------------------|----|-------------------|----|----|----|----|----|----|----|----|----|----|----|--------------|----|----------------|--|--------------------|--|-------------|--|
| Sub-tone frequency setting | | | | | | | | | | | | | | P1 | | 14 | | TONE FREQUENCY | | | |
| Function | | Set command | | | | | | | | | | | | Read command | | Answer command | | Output commands | | Description | |
| T | N | P1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | |
| 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | | | | | | | | |
| 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | | | | | | | | | |

TO TONE

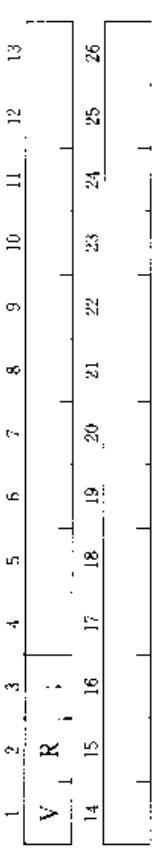
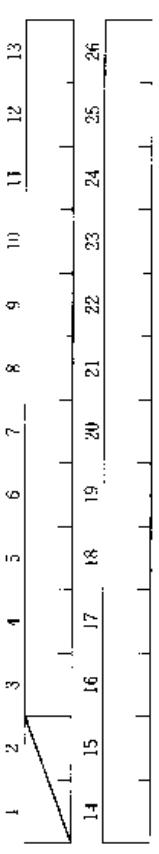
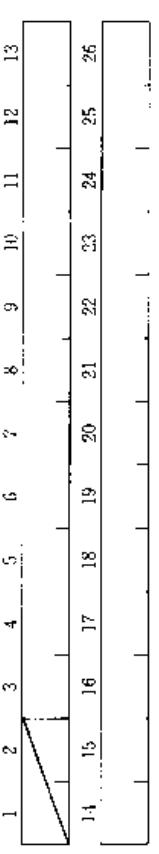
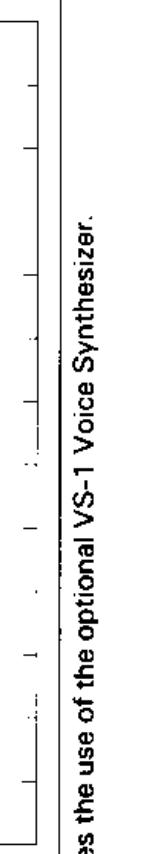
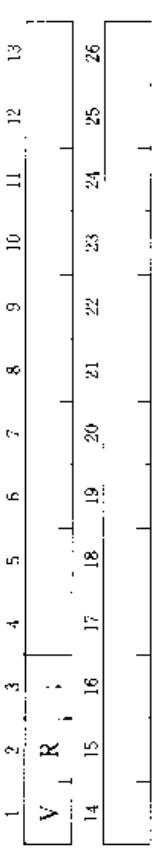
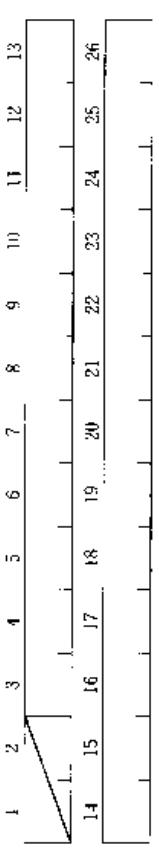
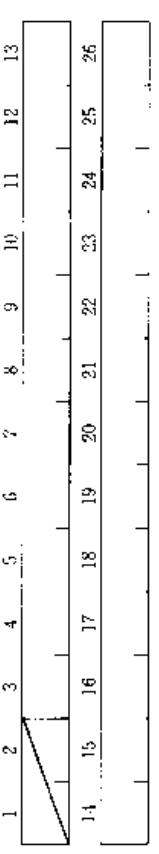
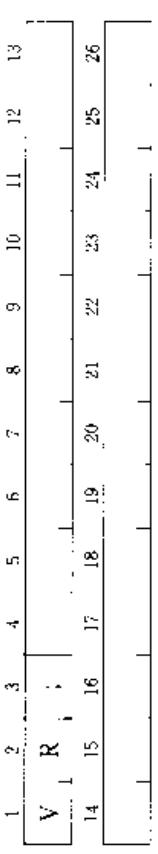
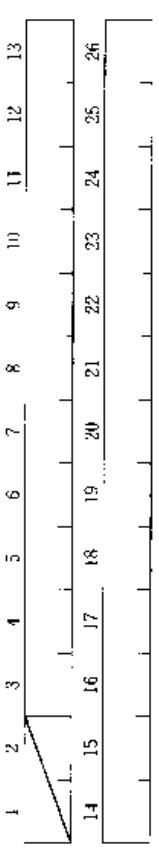
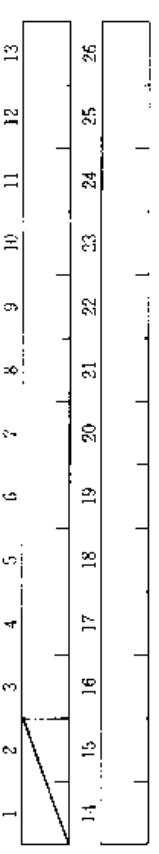
| Description | Output commands | Output commands | Answer command | Read command | Set command | Input commands | Function | Parameter | Format | Parameter function |
|------------------------------------|-----------------|-----------------|----------------|--------------|-------------|----------------|----------|-----------|--------|--------------------|
| TONE TONE ON/OFF setting | | | | | | | P1 | 1 | 1 | TONE ON/OFF |

* This command is not applicable to "KENWOOD" versions of the TS-711E/811E.

VBT

| Function | Applicable model | TS-940S | | | Parameter function |
|----------------------------------|------------------|---------|---|----|--|
| | | | P1 | 12 | |
| VBT passband setting and display | | | | | |
| Set command | | | 1 2 3 4 5 6 7 8 9 10 11 12 13 V B P1 ; 14 15 16 17 18 19 20 21 22 23 24 25 26 | | |
| Read command | | | 1 2 3 4 5 6 7 8 9 10 11 12 13 V B ; 14 15 16 17 18 19 20 21 22 23 24 25 26 | | |
| Answer command | | | 1 2 3 4 5 6 7 8 9 10 11 12 13 V B P1 ; 14 15 16 17 18 19 20 21 22 23 24 25 26 | | |
| Description | | | Output commands 27 28 29 30 31 32 33 34 35 36 37 38 39 | | The execution of this command disables the transceivers associated front panel controls. |

VR VOICE RECALL

| Description | Output commands | Answer command | Read command | Set command | Input commands | Parameter | Format | Parameter function |
|----------------------------------|--|---|--|--|--|---|---|---|
| Generation of synthesized voice. |    |  |  |    |    | 1 2 3 4 5 6 7 8 9 10 11 12 13 | 1 2 3 4 5 6 7 8 9 10 11 12 13 | 1 2 3 4 5 6 7 8 9 10 11 12 13 |

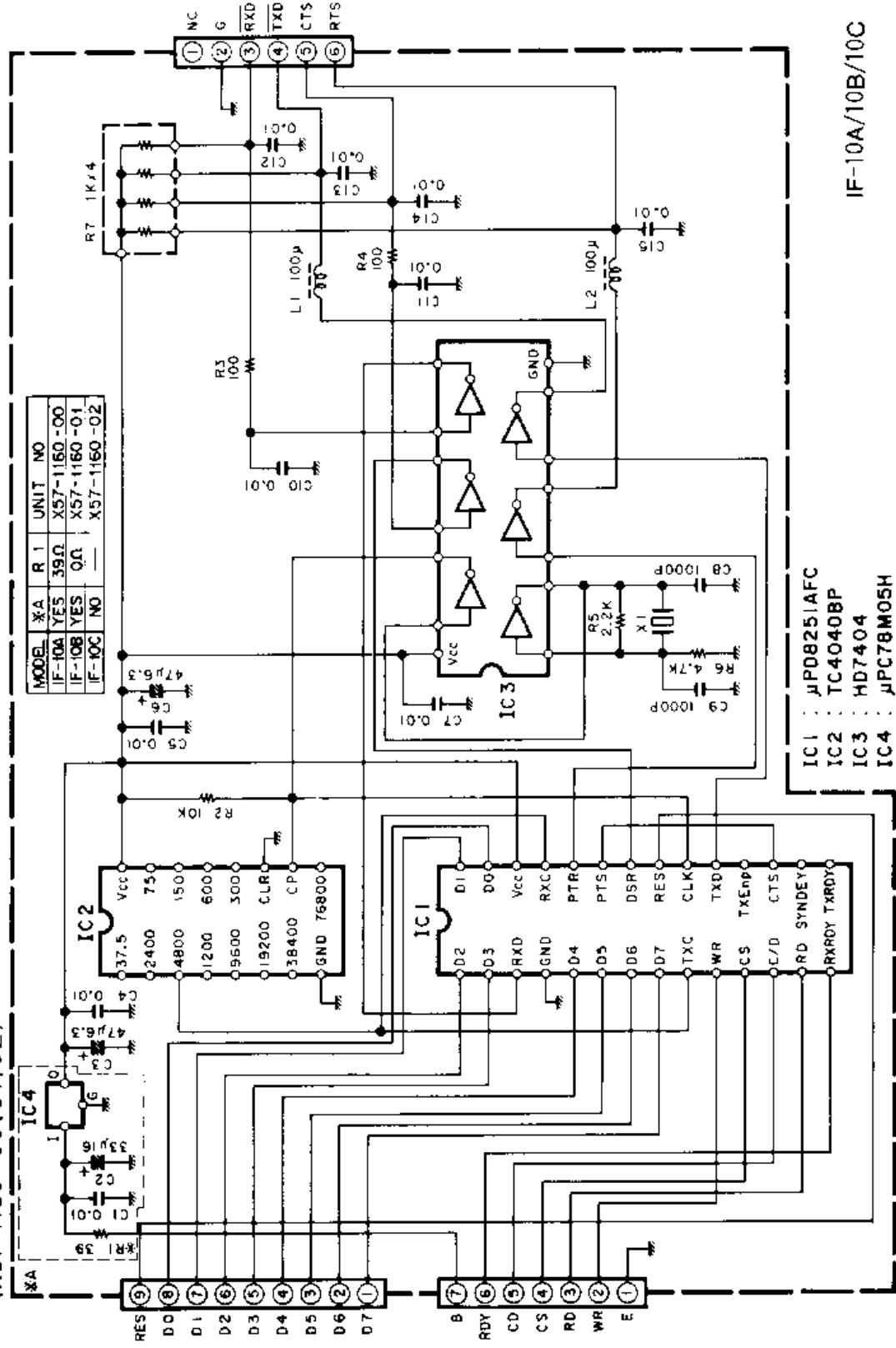
Requires the use of the optional VS-1 Voice Synthesizer.

XT XIT

| Applicable model | | TS-940S | | | | | | | | | | | | Parameter | | Format | | Parameter function | |
|------------------|--|--------------------|--|--|--|--|--|--|--|--|--|--|--|-----------|--|--------|--|--------------------|--|
| Function | | XIT ON/OFF setting | | | | | | | | | | | | P1 | | 1 | | XIT ON/OFF | |
| | | | | | | | | | | | | | | | | | | | |
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5. SCHEMATIC DIAGRAM

(X57-1160-00,01,02)



X57-1160-00,01,02
IF-10A/10B/10C

IC1 : μP0825|AFC
IC2 : TC4040BP
IC3 : HD7404
IC4 : μPC78M05H