

**KENWOOD**

INTERFACE KIT

**IF-10A**

**IF-10B**

**IF-10C**

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**INSTRUCTION MANUAL**

KENWOOD CORPORATION

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. BEFORE**

**Notes on installation**

Do not place in a location which is exposed to direct light, near a heat source, etc.

**1. BEFORE**

**2. SPECIFICATIONS**

2-1. SPECIFICATIONS

2-2. ACCESSORIES

**3. INSTALLATION**

3-1. IF-10A

3-2. IF-10B

3-3. IF-10C

**4. OPERATION**

4-1. PREPARATION

CONNECTIONS

4-2. CONTROLS

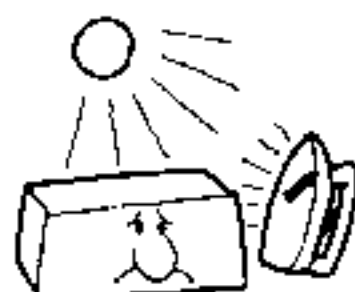
4-3. COMPARISON

**5. SCHEMATIC**

# 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

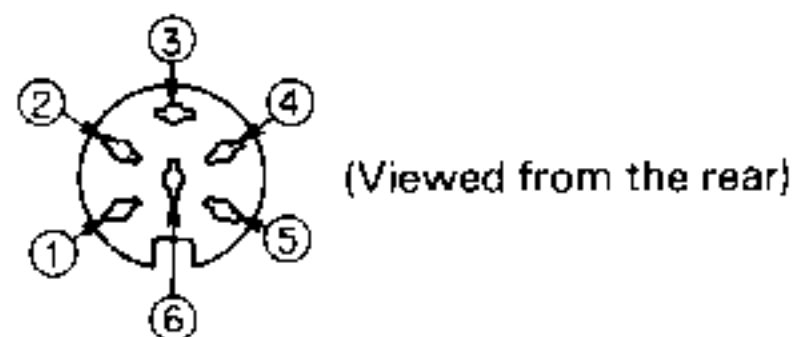
Pin No.	Signal Name		I/O
1	GND	Signal ground	
2	$\overline{\text{TXD}}$	Transmit data	Output
3	$\overline{\text{RXD}}$	Receive data	Input
4 (Note)	CTS	Transmit enable	Input
5	RTS	Receive enable	Output
6	NC	No connection	

#### Note:

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

- GND:** This is the signal ground terminal.
- $\overline{\text{TXD}}$ :** The transmit data is the serial data from the transceiver to the computer. The output utilizes negative logic.
- $\overline{\text{RXD}}$ :** 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



## 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) ..... (N87-2606-46) ..... 4 ea.
6. DIN connector bracket  
(IF-10A/10C only) ..... (E06-0655-05) ..... 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.

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## 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 ⊖ 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 EPROM (Erasable and Programmable Read Only Memory) into the vacant socket on the circuit board.

**Caution:** \_\_\_\_\_

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

8. Replace the top cover.

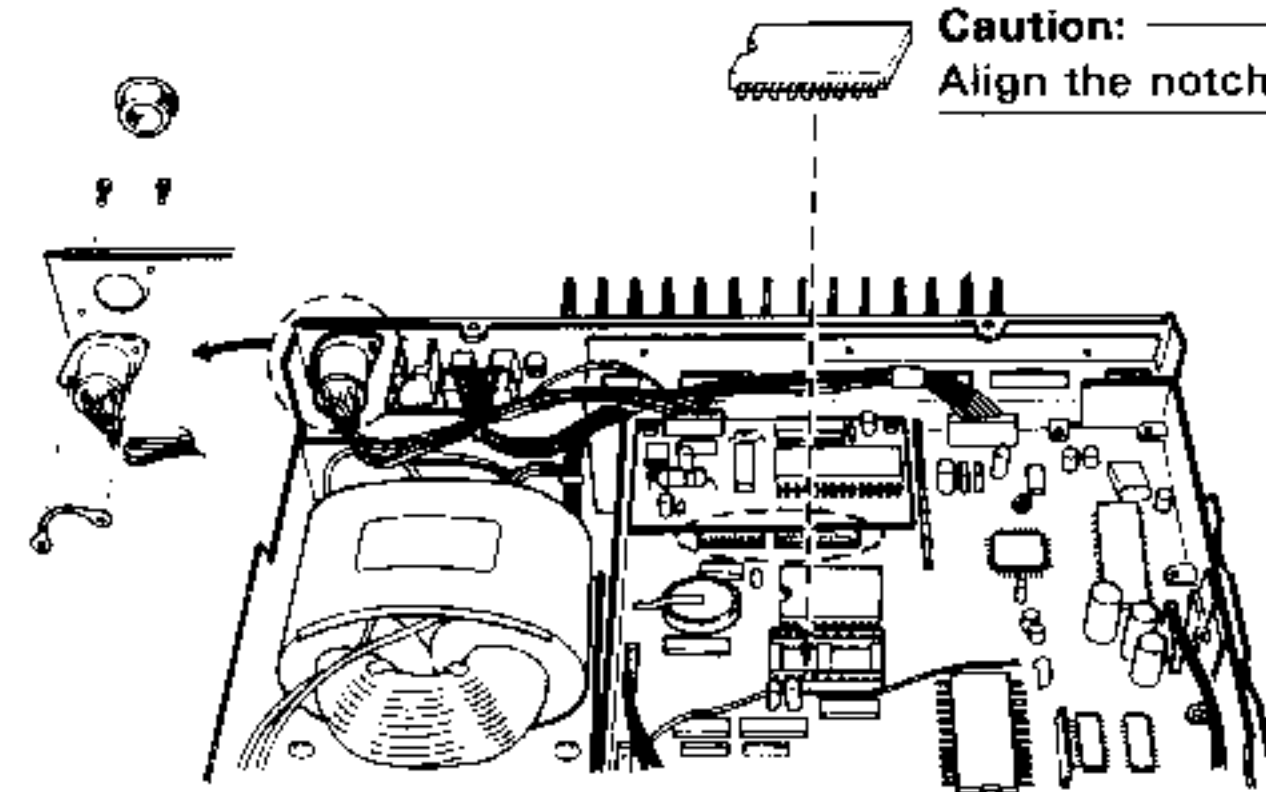


Fig. 3-1

## 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.

### Caution:

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

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.
9. Replace the top cover.

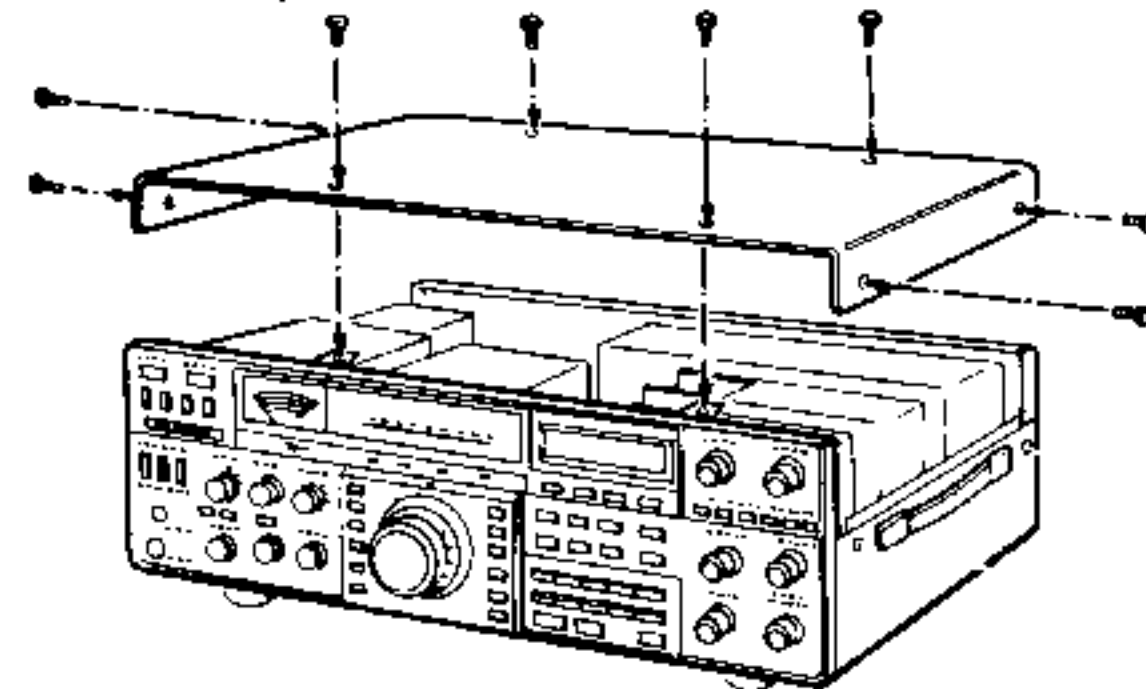
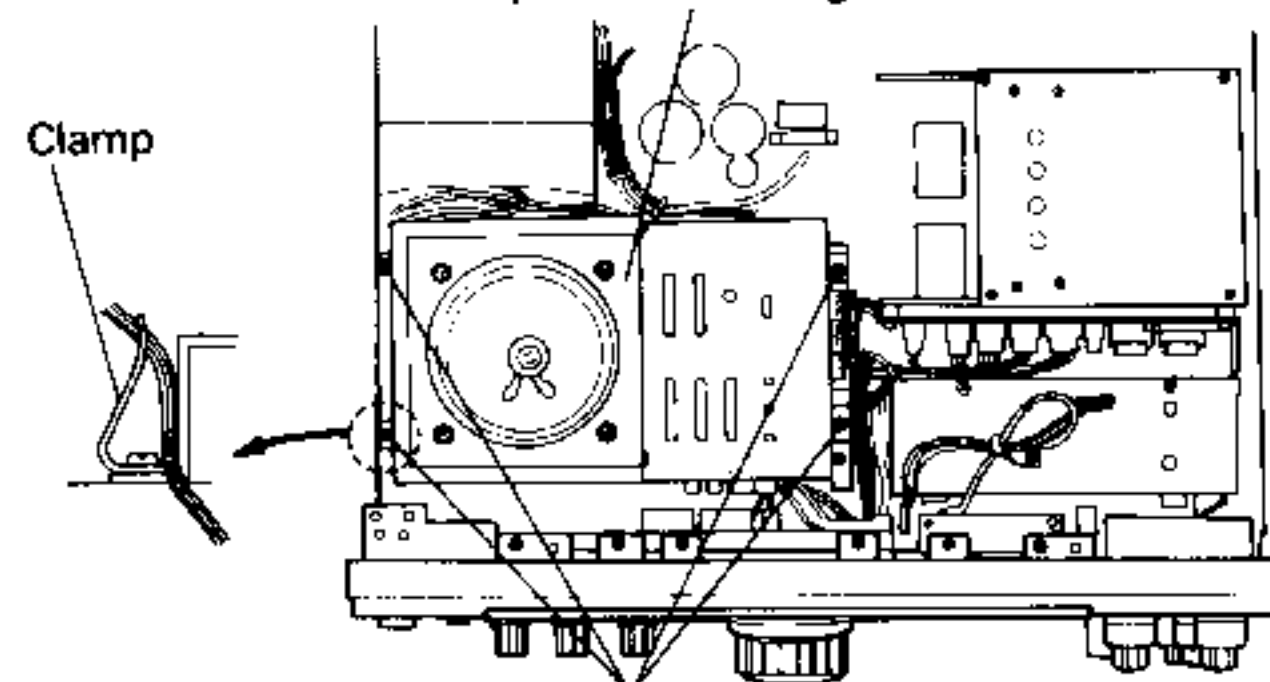
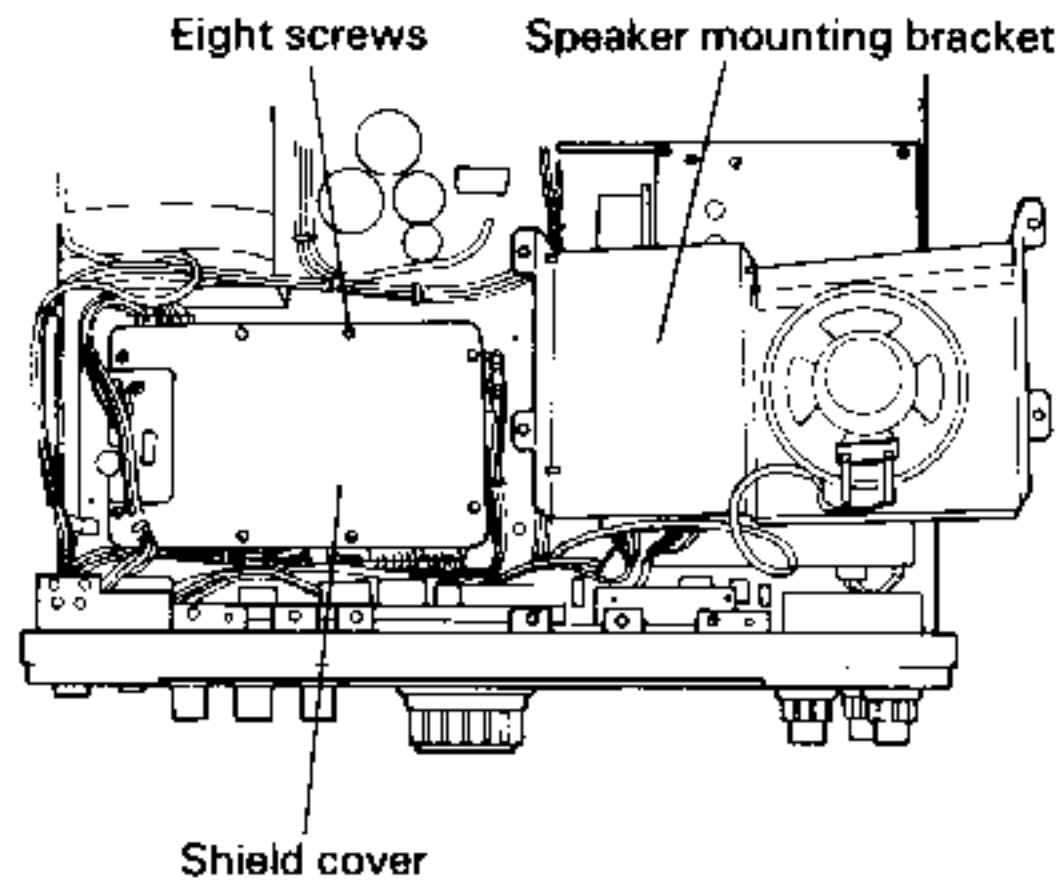


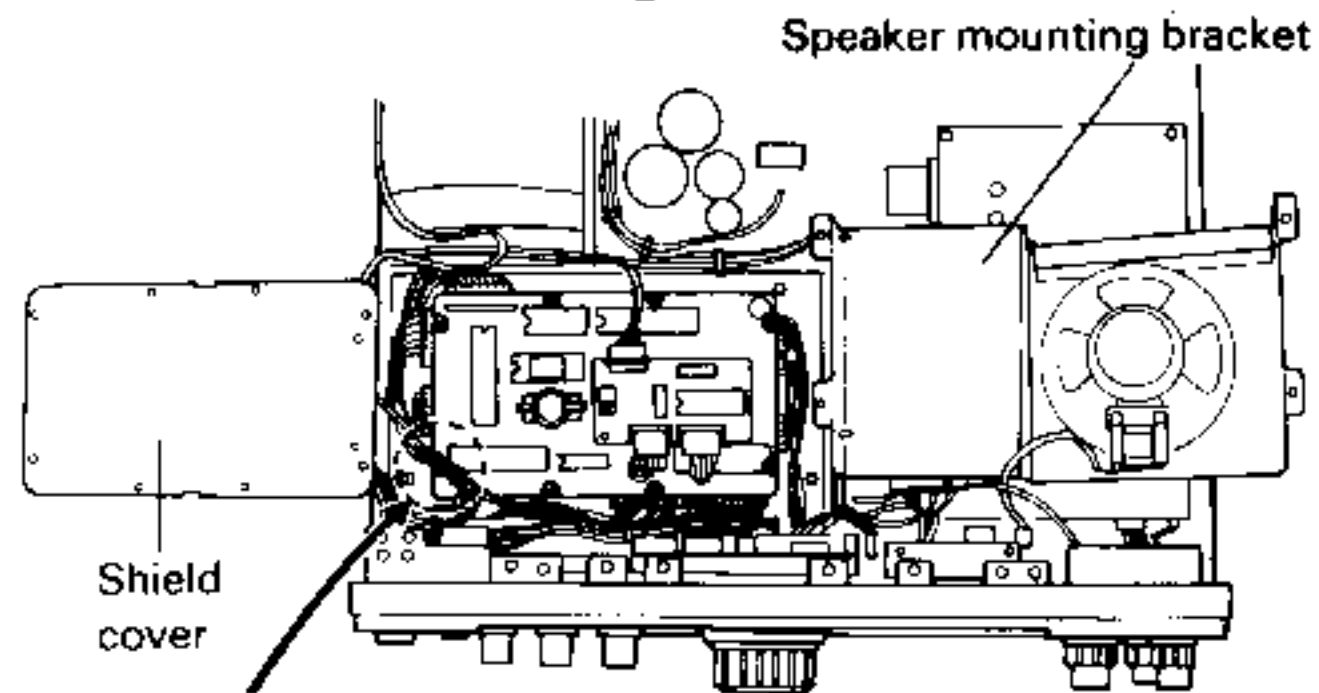
Fig. 3-2  
Speaker mounting bracket



Four screws  
Fig. 3-3

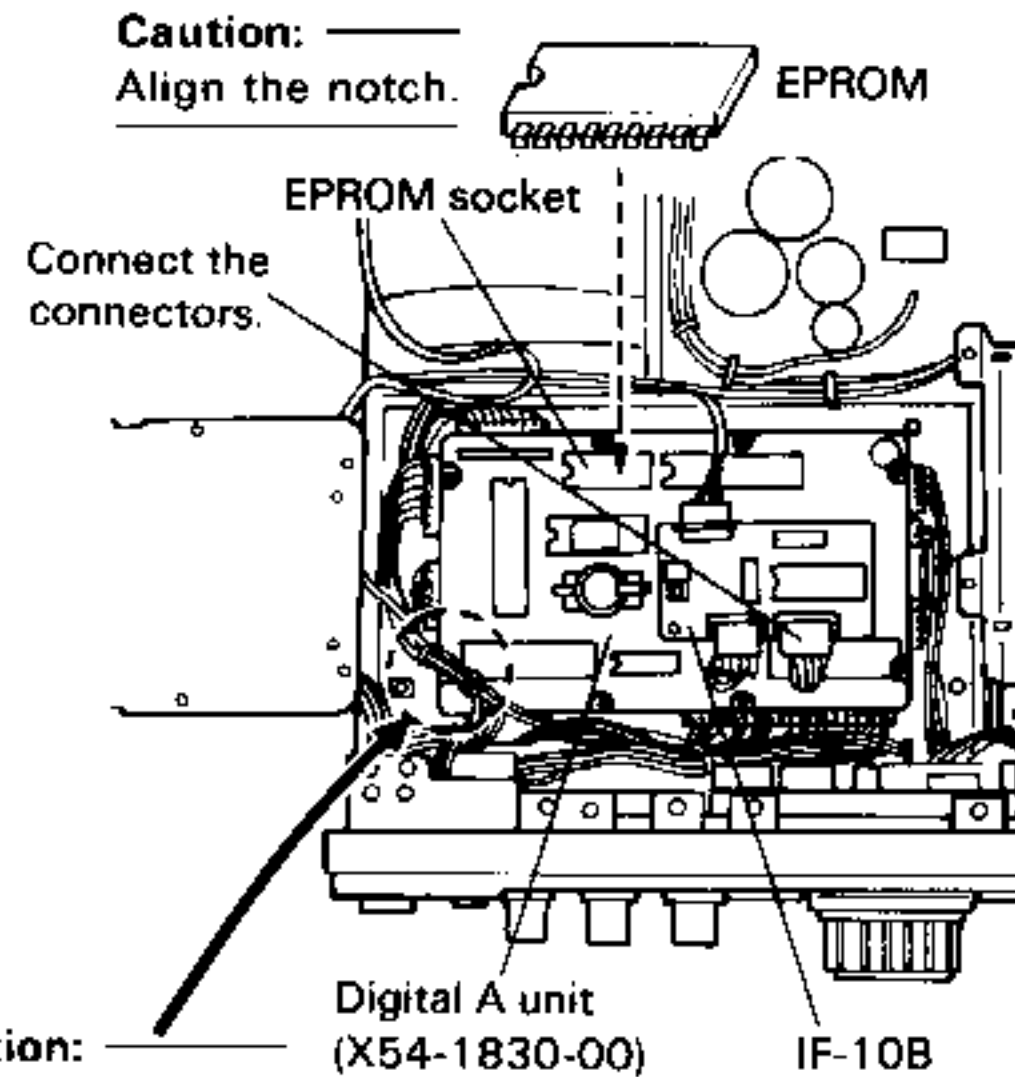


**Fig. 3-4**



**Caution:**  
Don't stretch the cable harness.

**Fig. 3-5**



**Caution:**  
Don't stretch  
the cable harness.

**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

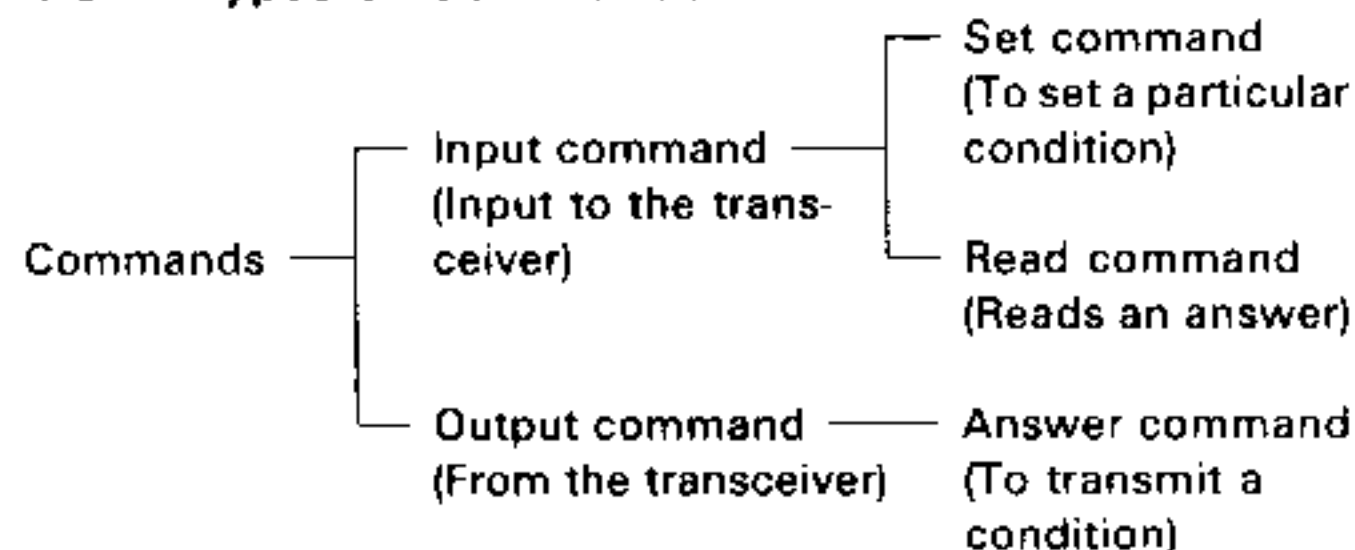
Format No.	Name	Number of columns	Format
1	SW	1	0=OFF 1=ON
2	MODE	1	1=LSB 4=FM 7=CWN 2=USB 5=AM 3=CW 6=FSK (FSK: TS-940S only) (AM: TS-140S/680S/940S only) (CWN: TS-140S/680S only)
3	FUNCTION	1	0=VFO A 2=MEMORY 1=VFO B 3=COM (COM: TS-711A/711E/811A/811B/811E only)
4	FREQUENCY	11	Represented in Hz, using 11 columns. <b>Example:</b> 0000720000 is 7.2 MHz 
5	RIT FREQUENCY	5	The first column is "+" or "-", and the remaining four columns indicate the frequency in Hz. <b>Example:</b> +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. <b>Example:</b> 02 is CH2
8	MEMORY BANK	1	Represented using one column. (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 columns, 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	STONE FREQUENCY	2	Represented using two columns, from 01 to 37. This corresponds to the number displayed on the M.CH display during tone select operation. (TS-711A/811A/811B only)
15	CALL SIGN	6	Represented using 6 columns. <b>Example:</b> WD6DJY (TS-711A/711E/811A/811B/811E/940S only)
16	MODEL NO.	3	Three column number specifying 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:  
"FA00007000000;" ..... (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:  
"FA00007000000;" ..... (Answer command)

### 4-3-5. Error Messages

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

?;	<ul style="list-style-type: none"> <li>○ When the command syntax is incorrect.</li> <li>○ When the command was not executed due to the current status of the transceiver, even though the command syntax was correct.</li> </ul> <p><b>Note:</b> _____ Occasionally this message may not appear due to microprocessor transients in the transceiver.</p>
E;	When a communication error occurs, such as an overrun error or framing error occurs during serial data transmissions.
O;	When the receive data is sent but processing cannot be completed.

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

Command	Name	The number of the command columns is shown.	Corresponding command format																																																				
AI	AUTO INFORMATION																																																						
Applicable models for the command	Applicable models	TS-140S/680S/711A/711E/811A/811B/811E/940	Parameter																																																				
Function of the command	Function	AUTO INFORMATION ON/OFF setting	P1																																																				
The format of the command is shown. When oblique lines are drawn in the 1st and 2nd columns there is no set command.	Input commands	<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>11</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> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	A	I	P1											11	15	16	17	18	19	20	21	22	23	24	25	26	Format													
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A	I	P1																																																					
11	15	16	17	18	19	20	21	22	23	24	25	26																																											
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.	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>11</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> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	/	/												11	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																																											
/	/																																																						
11	15	16	17	18	19	20	21	22	23	24	25	26																																											
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.	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="11">For parameters, refer to "IF" command</td> </tr> <tr> <td>11</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>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> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	I	F	For parameters, refer to "IF" command											11	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																																											
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11	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	<p>(1) The "Auto Information" function checks the condition of the set once approximately every 1.5 seconds when a change is detected automatically sends the IF command.</p> <p>(2) With the TS-140, the TS-680 and the TS-940, the check time is longer than 1.5 seconds or TUNING dial rotation.</p>																																																						

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.

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

Parameter	Format	Parameter function
P1	1	AI ON/OFF

Use approximately every 1.5 seconds and longer than 1.5 seconds during scanning

#### 4-3-7. Command Use Precautions

Model	Precaution
TS-140S/ 680S/711A/ 711E/811A/ 811B/811E/ 940S	The control characters (OO to IFH) 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	<b>Note:</b> _____ 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 statue.

#### 4-3-8. Command List

Command	Function	Model						Page
		TS-140S TS-680S	TS-711A	TS-711E	TS-811A TS-811B	TS-811E	TS-940S	
AI	AUTO INFORMATION	○	○	○	○	○	○	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/FREQUENCY VFO B	○	○	○	○	○	○	21
FN	FUNCTION	○	○	○	○	○	○	22
HD	SCAN HOLD						○	23
ID	ID	○	○	○	○	○	○	24
IF	INFORMATION	○	○	○	○	○	○	25
LK	LOCK	○	○	○	○	○	○	26
LO	LOCAL						○	27
MC	MEMORY CHANNEL	○	○	○	○	○	○	28
MD	MODE	○	○	○	○	○	○	29
MR	MEMORY READ	○	○	○	○	○	○	30
MS	MEMORY SCAN						○	31
MW	MEMORY WRITE	○	○	○	○	○	○	32
OS	OFFSET		○	○	○	○		33
RC	RIT CLEAR	○	○	○	○	○	○	34
RD/RU	RIT DOWN/RIT UP	○	○	○	○	○	○	35
RT	RIT	○	○	○	○	○	○	36
RX/TX	RX/TX	○	○	○	○	○	○	37
SC	SCAN	○	○	○	○	○	○	38
SH/SL	SLOPE TUNE HIGH/SLOPE TUNE LOW						○	39
SP	SPLIT	○	○	○	○	○	○	40
ST	STEP		○	○	○	○		41
TN	TONE NUMBER		○		○			42
TO	TONE		○	○*	○	○*		43
VB	VBT						○	44
VR	VOICE RECALL		○	○	○	○	○	45
XT	XIT						○	46

\* 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																																																																														
Function	AUTO INFORMATION ON/OFF setting		P1	1	AI ON/OFF																																																																													
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																																						
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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																																							
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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> </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													
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Description	<p>(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.</p> <p>(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.</p>																																																																																	



**AT** ANTENNA TUNER

Applicable model		TS-940S	Parameter	Format	Parameter function
Function	Antenna tuner standby operation				
Input commands	Set command				
	Read command				
Output commands	Answer command				
Description					

**DI** DCS ID

Applicable models		TS-711A/711E/811A/811B/811E		Parameter	Format	Parameter function	
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	<p>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.</p>						

**DN** **UP** DOWN/UP

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function																																																																																
Function	Same function as microphone UP/DOWN switch																																																																																				
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>DN</td><td>UP</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	DN	UP												14	15	16	17	18	19	20	21	22	23	24	25	26																																									
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**DS** DCS

Applicable models		TS-711A/711E/811A/811B/811E											Parameter	Format	Parameter function																																																																														
Function	DCS system ON/OFF selection and readout												P1	1	DCS ON/OFF																																																																														
	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>D</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><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	D	S	P1	:										14	15	16	17	18	19	20	21	22	23	24	25	26																																									
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**FA** **FB** FREQUENCY VFO A/FREQUENCY VFO B

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function																																																																																										
Function	VFO A and VFO B frequency selection and readout		P1	4	FREQUENCY																																																																																										
	Input commands	<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 colspan="2">F A</td> <td colspan="11">P1</td> </tr> <tr> <td colspan="2">F B</td> <td colspan="11"></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 colspan="11"></td> </tr> </table>	1	2	3	4	5	6	7	8	9	10	11	12	13	F A		P1											F B													14	15	16	17	18	19	20	21	22	23	24	25	26	:																																								
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**FN** FUNCTION

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function																																																		
Function	VFO A and VFO B MEMORY COM setting (COM: TS-711/811 Only)		P1	3	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>F</td><td>N</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> </table>			1	2	3	4	5	6	7	8	9	10	11	12	13	F	N	P1	:										14	15	16	17	18	19	20	21	22	23	24	25	26											
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Description																																																							

**HD** SCAN HOLD

Applicable model		TS-940S											Parameter	Format	Parameter function																																																																													
Function	Temporary scan.											P1	1	SCAN HOLD ON/OFF																																																																														
	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>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>													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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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>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														27	28	29	30	31	32	33	34	35	36	37	38	39													
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**ID** ID

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function	
Function	Model No. readout for transceiver recognition.		P1	16	MODEL No. TS-140/680: 006 TS-711 : 001 TS-811 : 002 TS-940 : 003	
	Input commands	Set command				
		Read command				
Output commands	Answer command					
Description						



**IF** INFORMATION

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S		Parameter	Format	Parameter function	
Function	Display of transceivers current condition			P1	4	DISPLAY FREQUENCY	
				P2	6	STEP FREQUENCY (TS-711A/711E/811A/811B/811E/940S only)	
Input commands	Set command				P3	5	RIT FREQUENCY
	Read command				P4	1	RIT ON/OFF
Output commands	Answer command				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	<p>(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.</p> <p>(2) * This command is not applicable to "KENWOOD" versions of the TS-711E/811E.</p>						

**LK** LOCK

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S											Parameter	Format	Parameter function																																																																														
Function	LOCK ON/OFF setting and display											P1	1	LOCK ON/OFF																																																																															
	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>L</td><td>K</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	L	K	P1	:										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>L</td><td>K</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	L	K	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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**LO** LOCAL

Applicable model	TS-940S	Parameter	Format	Parameter function	
Function	<p>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.</p>				
Input commands	Set command				
	Read command				
Output commands	Answer command				
Description	<p>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.</p>				

**MC** MEMORY CHANNEL

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S											Parameter	Format	Parameter function
Function	Memory channel setting											P1	8	MEMORY BANK (TS-940S only)	
												P2	7	MEMORY CHAN- NEL	
Input commands	Set command														
	Read command														
Output commands	Answer command														
Description	With the TS-940, this command will disable the MEMORY BANK switch associated top cover switch.														

**MD** MODE

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function																																																																														
Function	Mode setting		P1	2	MODE																																																																														
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>M</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>	1	2	3	4	5	6	7	8	9	10	11	12	13	M	D	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																																											
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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></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> <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														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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**MR** MEMORY READ

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S		Parameter	Format	Parameter function	
Function	Memory display			P1	9	SPLIT SPECIFICATION	
				P2	8	MEMORY BANK (TS-940S only)	
Input commands	Set command				P3	7	MEMORY CHANNEL
	Read command				P4	4	FREQUENCY
Output commands	Answer command				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	<p>(1) All parameters are set to OFF when the memory channel is vacant.</p> <p>(2) * This command is not applicable to "KENWOOD" versions of the TS-711E/811E.</p> <p>(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.</p>						

**MS** MEMORY SCAN

Applicable model		TS-940S	Parameter	Format	Parameter function																																																																														
Function	Memory scan ON/OFF and display		P1	1	MEMORY SCAN ON/OFF																																																																														
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>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><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	M	S	P1	:										14	15	16	17	18	19	20	21	22	23	24	25	26																																										
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**MW** MEMORY WRITE

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S		Parameter	Format	Parameter function	
Function	Memory entry			P1	9	SPLIT SPECIFICATION	
				P2	8	MEMORY BANK (TS-940S only)	
Input commands	Set command				P3	7	MEMORY CHANNEL
					P4	4	FREQUENCY
Input commands	Read command				P5	2	MODE
					P6	10	MEMORY LOCKOUT (TS-140S/680S/711A/ 711E/811A/811B/ 811E only)
Output commands	Answer command				P7	1	TONE ON/OFF (TS-711A/711E/811A/ 811B/811E only)*
					P8	14	TONE FREQUENCY (TS-711A/811A/811B/ only)
Output commands	Answer command				P9	13	OFF SET (TS-711A/711E/811A/ 811B/811E only)
Description	(1) The MW command is valid when all parameters have be 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

Applicable models		TS-711A/711E/811A/811B/811E	Parameter	Format	Parameter function
Function	OFFSET setting		P1	13	OFFSET
	Input commands	Set command			
		Read command			
Output commands	Answer command				
Description					

**RC** RIT CLEAR

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function
Function	RIT frequency clearance				
Input commands	Set command				
	Read command				
Output commands	Answer command				
Description	<p>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)</p>				

**RD** **RU** RIT DOWN/RIT UP

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S	Parameter	Format	Parameter function
Function	RIT frequency UP/DOWN				
Input commands	Set command				
	Read command				
Output commands	Answer command				
Description	<p>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)</p>				

**RT** RIT

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

**RX** **TX** RX/TX

Applicable models	TS-140S/680S/711A/711E/811A/811B/811E/940S		Parameter	Format	Parameter function		
Function	RX: For receive operation TX: For transmit operation						
	Input commands	Set command					
			Read command				
Output commands	Answer command						
Description	With the TS-940 place the stand-by switch to REC.						

**SC** SCAN

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S											Parameter	Format	Parameter function																																																																														
Function	Scan ON/OFF setting											P1	1	SCAN ON/OFF																																																																															
	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>S</td><td>C</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	S	C	P1	:										14	15	16	17	18	19	20	21	22	23	24	25	26																																									
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**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																																																																
	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>S</td><td>H</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>L</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> </table>			1	2	3	4	5	6	7	8	9	10	11	12	13	S	H	P1	:										L													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>S</td><td>H</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>L</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>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> </table>			1	2	3	4	5	6	7	8	9	10	11	12	13	S	H	P1	:										L													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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Description	The execution of this command will disable the transceivers associated front panel controls.																																																																				

**SP** SPLIT

Applicable models		TS-140S/680S/711A/711E/811A/811B/811E/940S											Parameter	Format	Parameter function																																																																											
Function	SPLIT ON/OFF setting											P1	1	SPLIT ON/OFF																																																																												
	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>S</td><td>P</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 colspan="13">                         </td> </tr> </table>											1	2	3	4	5	6	7	8	9	10	11	12	13	S	P	P1	:										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 colspan="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 colspan="13">                         </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 colspan="13">                         </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														27	28	29	30	31	32	33	34	35	36	37	38	39													
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**ST** STEP

Applicable models		TS-711A/711E/811A/811B/811E											Parameter	Format	Parameter function	
Function	STEP ON/OFF setting											P1	1	STEP ON/OFF		
	Input commands	Set command														
			Read command													
Output commands	Answer command															
Description																

**TN** TONE NUMBER

Applicable models		TS-711A/811A/811B	Parameter	Format	Parameter function
Function	Sub-tone frequency setting		P1	14	TONE FREQUENCY
	Input commands	Set command			
		Read command			
Output commands	Answer command				
Description					

**TO** TONE

Applicable models		TS-711A/711E/811A/811B/811E*											Parameter	Format	Parameter function																																																			
Function	TONE ON/OFF setting											P1	1	TONE ON/OFF																																																				
	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>T</td><td>O</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> </table>											1	2	3	4	5	6	7	8	9	10	11	12	13	T	O	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> </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																
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Description	* This command is not applicable to "KENWOOD" versions of the TS-711E/811E.																																																																	

Applicable model		TS-940S											Parameter	Format	Parameter function																																																																													
Function	VBT passband setting and display											P1	12	PASSBAND																																																																														
	Input commands	<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>V</td><td>B</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	V	B	P1	:										14	15	16	17	18	19	20	21	22	23	24	25	26																																									
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Description	The execution of this command disables the transceivers associated front panel controls.																																																																																											

**VR** VOICE RECALL

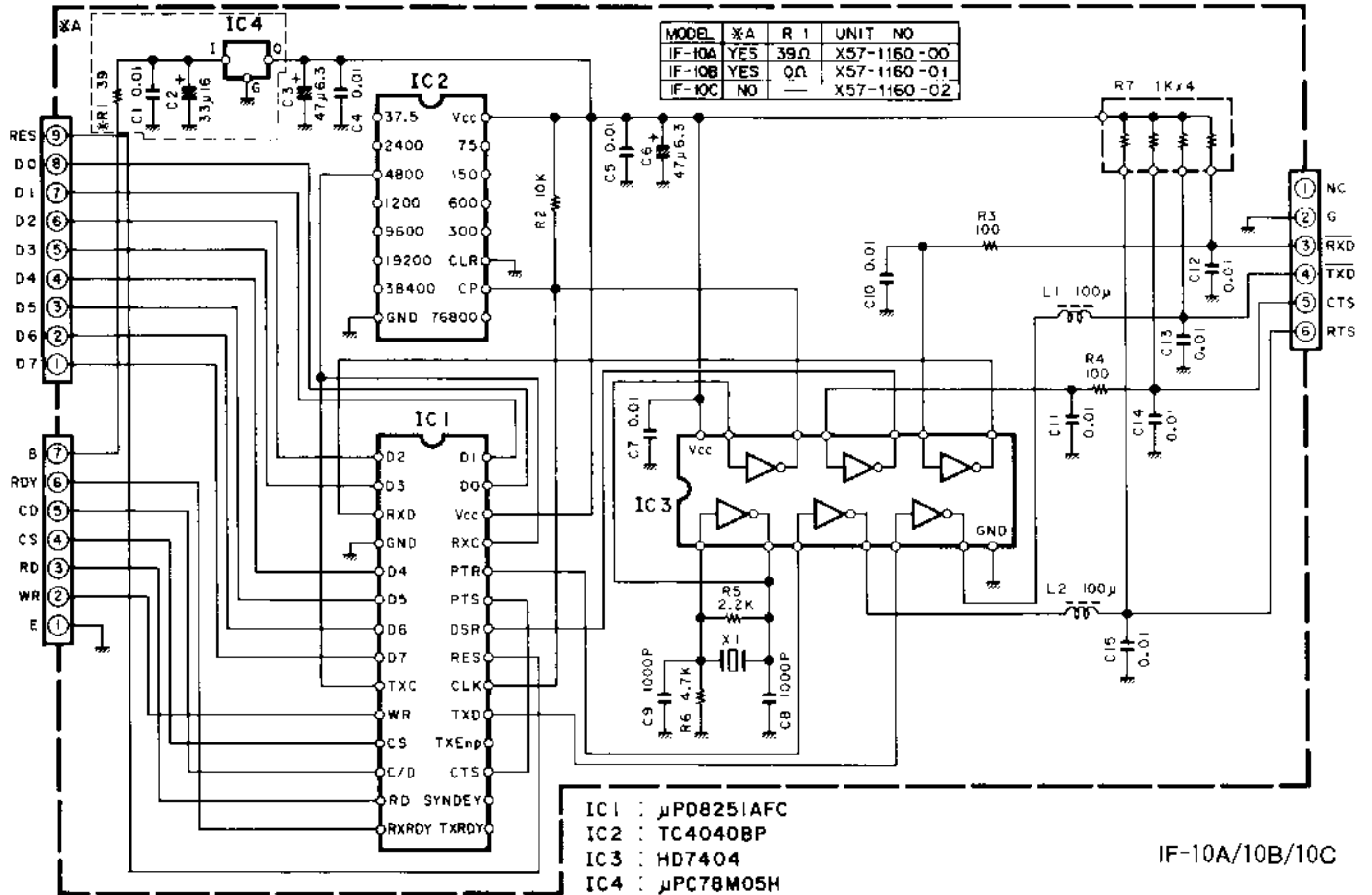
Applicable models	TS-711A/711E/811A/811B/811E/940S		Parameter	Format	Parameter function
Function	Generation of synthesized voice.				
	Input commands	Set command			
		Read command			
Output commands	Answer command				
Description	Requires the use of the optional VS-1 Voice Synthesizer.				

**XT** XIT

Applicable model		TS-940S											Parameter	Format	Parameter function	
Function	XIT ON/OFF setting												P1	1	XIT ON/OFF	
	Input commands	Set command														
		Read command														
	Output commands	Answer command														
Description																

# 5. SCHEMATIC DIAGRAM

(X57-1160-00,01,02)



# **K4XL's** **BAMA**

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