

# FURUNO

# OPERATOR'S MANUAL

**SSB RADIOTELEPHONE**

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**MODEL FS-1503**

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**FURUNO ELECTRIC CO., LTD.**  
NISHINOMIYA, JAPAN

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• Your Local Agent/Dealer

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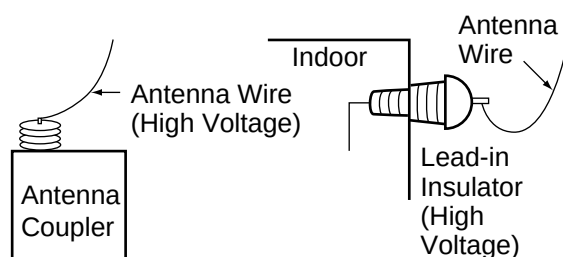


# SAFETY INSTRUCTIONS

## DANGER

**Never touch the SSB antenna, antenna coupler or lead-in insulator when the SSB radiotelephone is transmitting.**

High voltage which will cause death or serious injury is present at the locations mentioned above when the SSB radiotelephone is transmitting.



## WARNING



**Do not open the equipment.**

Hazardous voltage which can cause electrical shock exists inside the equipment. Only qualified personnel should work inside the equipment.

**Immediately turn off the power at the switchboard if water leaks into the equipment or something is dropped in the equipment.**

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

**Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

## WARNING

**Do not place liquid-filled containers on the top of the equipment.**

Fire or electrical shock can result if a liquid spills into the equipment.

**Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.**

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

**Make sure no rain or water splash leaks into the equipment.**

Fire or electrical shock can result if water leaks in the equipment.

**Keep heater away from equipment.**

A heater can melt the equipment's power cord, which can cause fire or electrical shock.

**Use the proper fuse.**

Fuse rating is shown on the equipment. Use of a wrong fuse can result in equipment damage.

**Do not operate the equipment with wet hands.**

Electrical shock can result.

## CAUTION

**A warning label is attached to the equipment. Do not remove the label. If the label is missing or illegible, contact a FURUNO agent or dealer.**



Name: Warning Label (1)  
Type: 86-003-1011-0  
Code No.: 100-236-230

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# INTRODUCTION

FURUNO Electric Company thanks you for selecting the FS-1503 MF/HF SSB Radiotelephone. We are confident you will discover why FURUNO has become synonymous with quality and reliability. To get maximum performance from your unit, please carefully read and follow the recommended procedures for operation and maintenance.

The FS-1503 is an all-purpose radiotelephone system especially designed for marine mobile communication in the frequency range 1.6 to 27.5 MHz. All ITU channels are preprogrammed. In addition, TX/RX frequencies can be preprogrammed into an E<sup>2</sup> PROM having a capacity of 199 frequency pairs.

## Features

- Station name entry available (channels 0-1 – 0-65)
- 2182 key provides for immediate selection of 2182 kHz (at FULL power automatically)
- Scan and Sweep receiving functions
- Where permitted user may program both Rx and Tx frequencies or Rx frequencies
- PROM stores all ITU SSB and TELEX frequencies
- Optional dummy load (in the Antenna Coupler) permits checking of transmitter
- Effective noise blanker cancels pulse noise
- Advanced voice and/or level-detecting type squelch circuit filters out noise and/or level
- Remote Station RB-500 available (requires optional REMOTE-B Board)
- System diagnostics program
- DSC and NBDP connections (requires optional REMOTE-A Board)

# 1. OPERATION

## 1.1 System Configuration

The basic FS-1503 consists of a Transceiver Unit, an Antenna Coupler, and an MIC. The figure below shows the FS-1503 system and optional equipment.

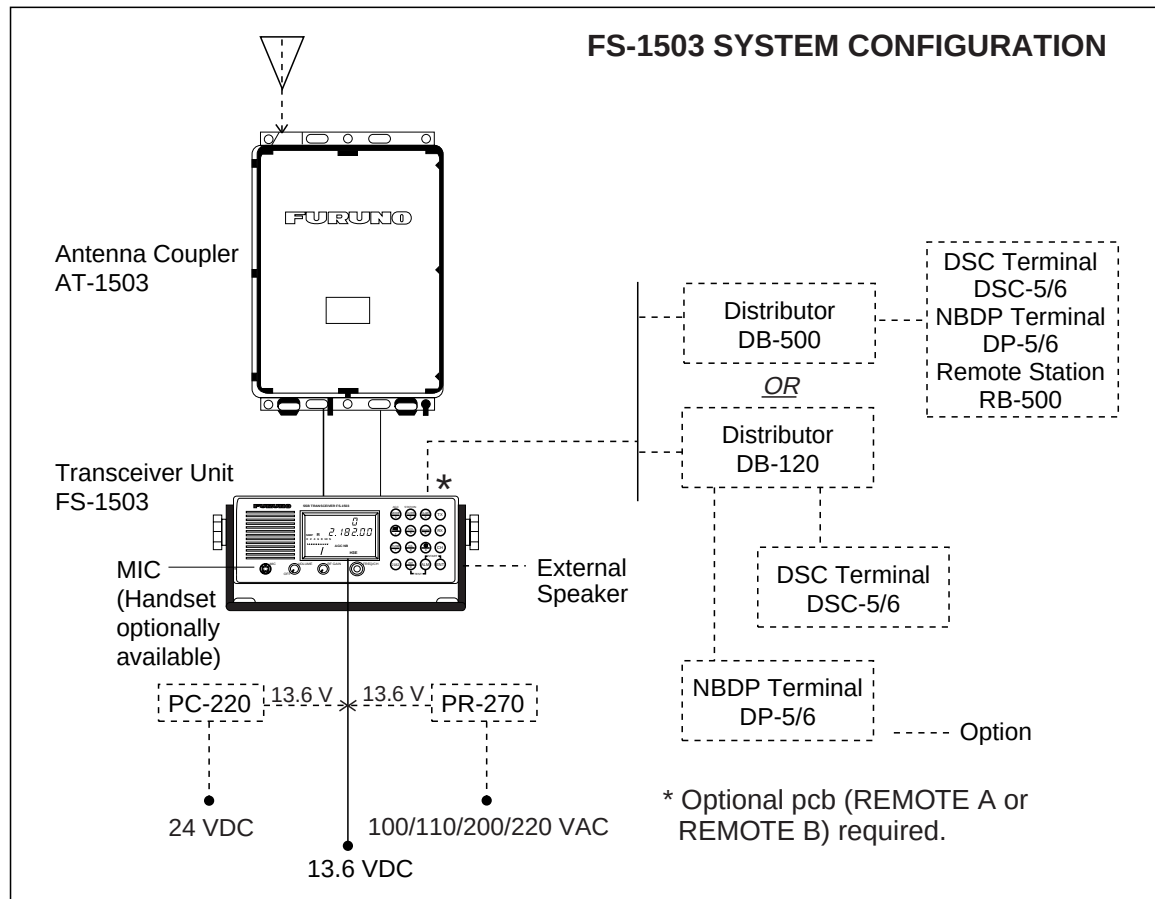


Figure 1-1 FS-1503 system configuration

## 1.2 Transceiver Unit Description

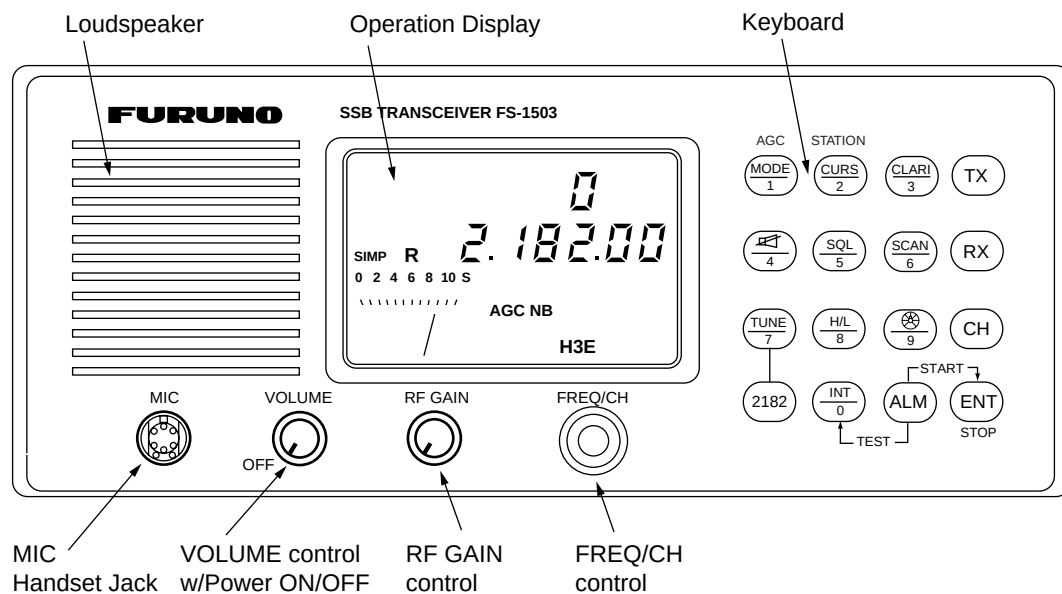


Figure 1-2 Transceiver unit

### Rotary controls

- VOLUME** Turns the power on and off and adjusts the loudspeaker volume.
- RF GAIN** Adjusts the receiver sensitivity.
- FREQ/CH** Changes frequency digit selected by the cursor and switches user/ITU channel and band.

### Keys

- [MODE/1]** Selects a class of emission and turns AGC on/off. Press the [MODE/1] key repeatedly until the wanted class of emission appears. To turn AGC on or off, press the [MODE/1] key while pressing and holding down the [ENT] key.
- [CURS/2]** Each pressing switches between band and channel when entering channels, or shifts among last four places when entering frequency. Pressing together with the [ENT] key displays station name or Rx frequency on the second line.
- [CLARI/3]** Adjusts the receiver frequency for fine tuning when the frequency is set in terms of Channel No. Not active in direct frequency entry. The adjustable range is  $\pm 150$  Hz in 10 Hz steps ( $\pm 5$  kHz in 100 Hz steps on H3E).
- [TX]** Selects a Tx frequency.
- [/4]** Turns the internal or external loudspeaker on/off. The speaker mark appears on the display when the speaker is off.
- [SQL/5]** Turns the squelch function on/off. "SQ" appears on the display when the squelch function is on.

|           |                                                                                                                                                                                                                                                   |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [SCAN/6]  | Turns the scan/sweep function on or off. “SCAN” or “SWEEP” appears on the display when the scan or sweep function is on.                                                                                                                          |
| [RX]      | Selects an Rx frequency.                                                                                                                                                                                                                          |
| [TUNE/7]  | Tunes the antenna coupler. “TUNE” appears during tuning, and “OK” appears after tuning is successfully completed.                                                                                                                                 |
| [H/L /8]  | Alternately selects high or low output power.                                                                                                                                                                                                     |
| [☼/9]     | Adjusts backlighting of the keyboard and the display.                                                                                                                                                                                             |
| [CH]      | Enables entry of channel (by ten key).                                                                                                                                                                                                            |
| [2182]    | Selects 2182 kHz on H3E (J3E may be selected depending on system setting).                                                                                                                                                                        |
| [INT/0]   | Calls “remote station” (if connected). Press this key, enter station no. and then press [ENT] key.                                                                                                                                                |
| [ALM]     | Releases the two-tone alarm for 45 seconds. To transmit the alarm, press the [ENT] key while holding down the [ALM] key. To silence it, press the [ENT/STOP] key or the [ALM] key. Never press [ALM] + [ENT] except when own ship is in distress. |
| [ENT]     | Concludes data entry.                                                                                                                                                                                                                             |
| [0]...[9] | Enter numeric data.                                                                                                                                                                                                                               |

## Indications

The operation display provides the operational status by various marks and indications. Shown below are the location and meaning of all available indications. They do not appear all at once but when the related parts appear with respect to the mode selected.

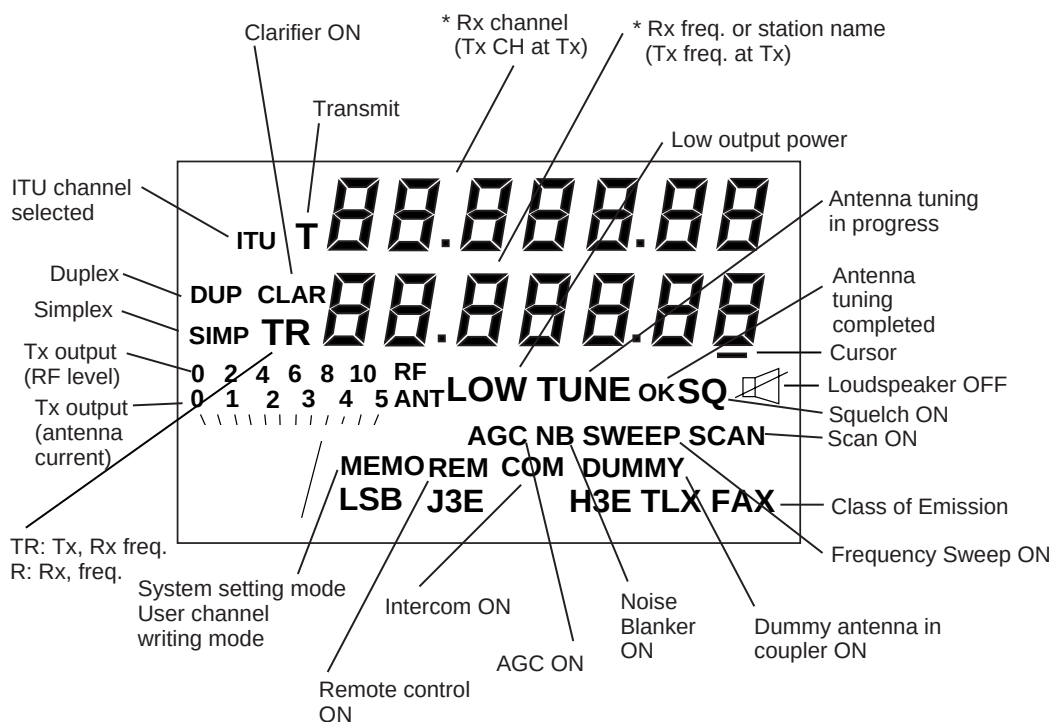


Figure 1-3 Indications



## 1.3 Turning the Power On/Off

The power switch is combined with the [VOLUME] control. Turn the [VOLUME] control clockwise until you hear a click. Further clockwise rotation of the control raises the loudspeaker volume. To turn off the power, turn the control fully counterclockwise until you hear the click.

## 1.4 Adjusting the Backlighting

The [⊗/9] key adjusts the backlighting for the operation display and the keyboard. Each time the key is pressed, the backlighting changes in the sequence of high, medium, low and off.

## 1.5 Turning the Loudspeaker On/Off

When you are using a handset and therefore do not require the internal or external loudspeaker, you can turn it off by pressing the loudspeaker [🔊/4] key. The “loudspeaker off mark” (🔊) appears.

## 1.6 Turning the Squelch On/Off

The squelch mutes the audio output in the absence of an incoming signal. Each time [SQL/5] is pressed, the squelch is turned on or off. When radio noise is too jarring during stand-by condition, it may be muted by activating the squelch. “SQ” appears when the squelch function is active.

**Note:** The squelch is disabled on the class of emission TLX or FAX; “SQ” blinks.

## 1.7 Selecting Class of Emission, Turning AGC On/Off

### Selecting class of emission

The [MODE/1] key selects the class of emission. Each time the key is pressed, the class of emission changes in the sequence of LSB, J3E, H3E, TLX (J2B) and FAX (F3C).

| <u>Indication</u> | <u>Symbol</u> | <u>Class of Emission</u>                                                                         |
|-------------------|---------------|--------------------------------------------------------------------------------------------------|
| LSB*              | J3E           | Single Sideband radiotelephony(LSB)                                                              |
| J3E               | J3E           | Single Sideband radiotelephony(USB)                                                              |
| H3E               | H3E           | Equivalent to AM radiotelephony. Only at 2182 kHz for transmitting, any frequency for receiving. |
| TLX*              | J2B           | Radio Telex                                                                                      |
| FAX*              | F3C           | Reception of weather facsimile broadcast                                                         |

\* Available with system setting by FURUNO authorized service agent.

## Turning AGC on/off

AGC is automatically turned on when frequency is changed, and “AGC” appears when AGC is active. To turn AGC on or off manually, press the [MODE/1] key while pressing and holding down the [ENT] key.

## 1.8 Selecting Frequency

Frequency can be selected by:

- Direct key entry (Free selection within marine bands for ship stations where a qualified Radio Operator is available.)
- Channel number entry
- [FREQ/CH] control

A receiving frequency can be selected by one of the above methods, but there is a restriction in selecting a transmitting frequency. This depends on how the equipment is programmed according to the national radio regulation.

Frequencies are indicated by:

Voice frequencies: Designated by the **CARRIER** frequency. Assigned frequencies are 1.4 kHz higher than the carrier frequencies.

Telex, DSC: Designated by the **CENTER** frequencies.

| <b>TX Freq Selection</b> | <b>Setting</b>                                              |
|--------------------------|-------------------------------------------------------------|
| Free selection           | NO                                                          |
| ITU channels             | All channels in the APPENDIX indicated by CH and frequency. |
| User channels            | YES, indicated by CH/station name. Preset by FURUNO agent.  |

## Direct frequency entry

Rx frequency may can be entered manually. (Tx frequency may also be entered where permitted.)

## Rx frequency

To set for a receive frequency of 1636.4 kHz, for example;

Press [RX], [1], [6], [3], [6], [4], [ENT] in this order. Entry of the decimal point is not required.

## Tx frequency

To set for a transmit frequency of 2061.4 kHz, for example;

Press [TX], [2], [0], [6], [1], [4], [ENT].

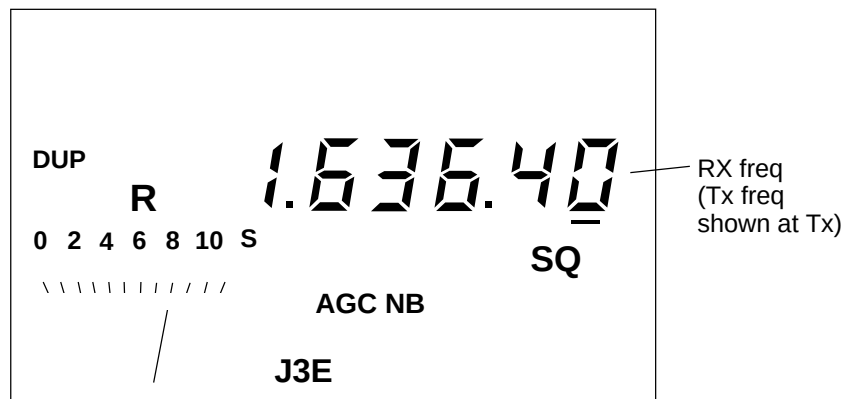


Figure 1-4 Sample frequency display

- The [CURS/2] key shifts the cursor among last 4 places (J3E) or two places to left of decimal and one place to right of decimal (H3E).
- To modify a value at a particular digit (Rx frequency only), use the [FREQ/CH] control; it changes the value above the cursor.

## Paired Rx/Tx frequency

To set for 2161 kHz simplex channel, for instance, press as below;

[TX]\*, [RX]\*, [2], [1], [6], [1], [0], [ENT]

*Do not forget to enter the last zero in the above example. The last numeral represents the 1/10 decimal place. Simply hitting [TX], [RX], [2], [1], [6], [1], [ENT] will set 216.1 kHz.*

\* Order of pressing may be reversed, that is, you may press [RX] first.

## User channels

You can recall user channels through the keyboard by channel numbers. Once a channel is selected with the keyboard, the channel can be changed with the [FREQ/CH] control.

For how to write user channels, see Chapter 3. 199 user channels ( 0-01 to 0-99 and 1-00 to 1-99) can be programmed in addition to ITU channels.

To call the channel 1-20, for example:

Tx only

Press [TX], [CH], [1], [2], [0], [ENT]

RX only

---

Press [RX], [CH], [1], [2], [0], [ENT]TX and RX paired

---

Press [CH], [1], [2], [0], [ENT]

**Note:** The standard sets provide readout of Rx CH No. and Rx frequency in kHz. When transmitting, Tx CH and Tx freq. are displayed. Pressing the [ENT] key displays both Tx and Rx frequencies.

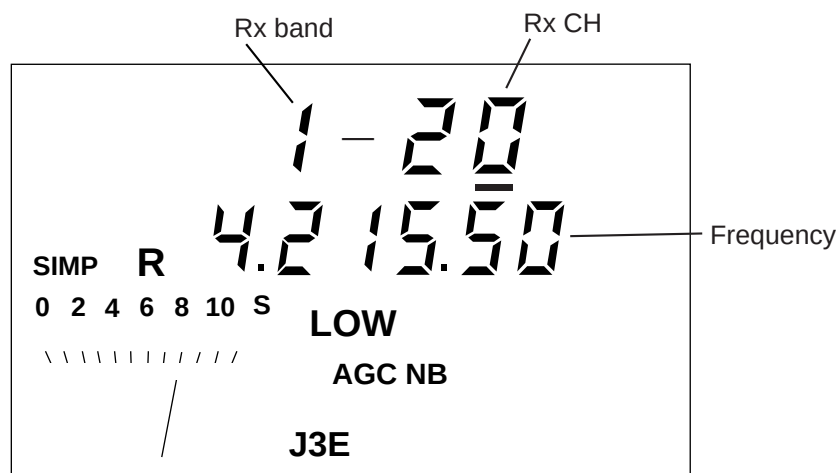


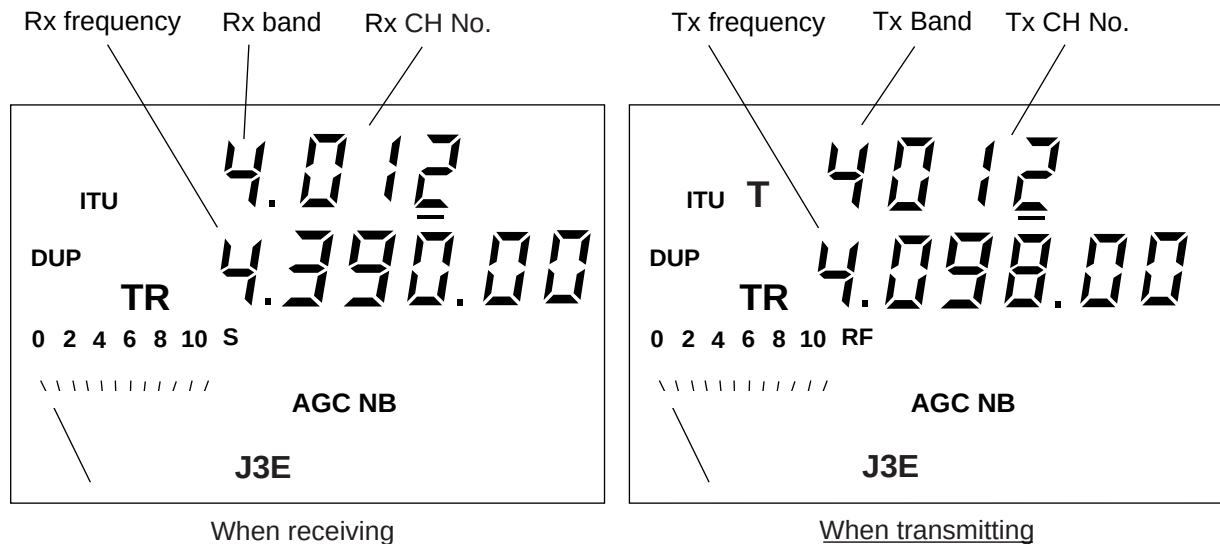
Figure 1-5 Sample user channel (Rx)

- The [CURS/2] key shifts the cursor to band or channel number.
- To change channel number use the [FREQ/CH] control; it changes the number above the cursor, a band or channel designator.
- The [ENT] key temporarily displays both Tx and Rx frequencies.

## ITU telephony channels (SSB)

To recall ITU SSB channel 412, for example, select J3E with the [MODE/1] key.

Press [CH], [4], [1], [2], [ENT], and a combination of Tx frequency of 4098 kHz and Rx frequency of 4390 kHz is selected. To select only Rx or Tx frequency, hit [RX] or [TX] first.



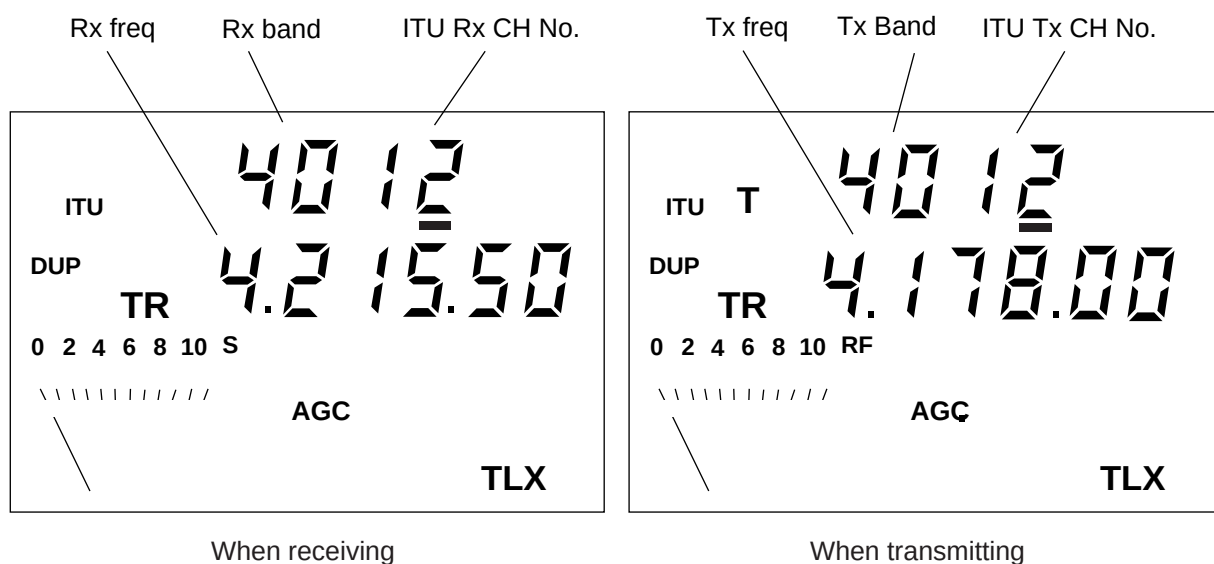
*Figure 1-6 Sample displays of ITU telephony channel*

- The [CURS/2] key shifts the cursor to band or channel number.
- To change channel number use the [FREQ/CH] control; it changes the number above the cursor, a band or channel designator.
- The [ENT] key temporarily displays both Tx and Rx frequencies.

## ITU TELEX channels

To select the ITU TELEX channel 4012, for example, first select TLX with the [MODE/1] key. This radiotelephone is furnished with J2B class of emission. The J2B is compatible with F1B which may be used on other parties. You do not have to worry about F1B or J2B; you can just select TELEX mode for narrow-band direct-printing.

Press [CH], [4], [0], [1], [2], [ENT], and a combination of TX frequency of 4178.0 kHz and RX frequency of 4215.5 kHz is selected with the display as below. To select only RX or TX frequency, hit [RX] or [TX] to begin.



Identify frequencies by referring to the APPENDIX. Entering 412 reads 4012 as above. Tx and Rx frequencies can be read temporarily.

*Figure 1-7 Sample display of ITU telex channel*

- The [CURS/2] key shifts the cursor to band or channel number.
- To change channel number use the [FREQ/CH] control; it changes the number above the cursor, a band or channel designator.
- The [ENT] key temporarily displays both Tx and Rx frequencies.
- You can recall an ITU channel by entering 3 or 4 digits. To recall ITU telex channel 4012 by three digits, for example, select "TLX" then enter 412 (instead of 4012).
- Tx frequency/Rx frequency or Tx CH/Rx CH indication can be selected through the system settings. Ask your dealer.

## 1.9 Displaying Station Name

User channels 0-01 to 0-65 can be registered with a name, and it or the Rx frequency can be displayed on the second line of the display. This function is available when a system setting is set to display both channel and frequency. See page 3-3 for how to register station name.

1. Press [ENT] and [CURS/2] keys together. Each time those keys are pressed together, Rx frequency or station name is displayed on the second line of the display.
2. When station name is displayed, you may press the [ENT] key to display Tx and Rx frequency temporarily.

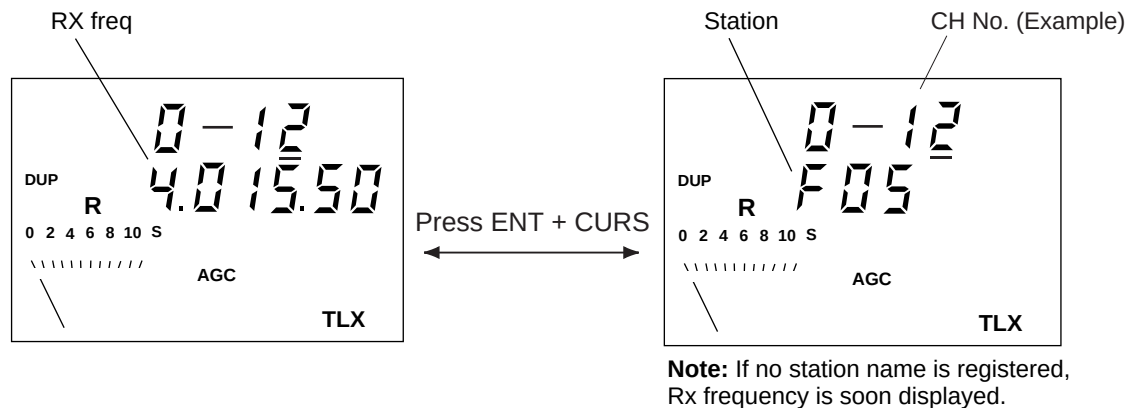


Figure 1-8 How to display Rx frequency and station name alternately

## 1.10 Transmitting

After selecting class of emission and frequency, you can transmit by pressing the PTT (press-to-talk) switch on the microphone (handset). ("T" appears when the PTT switch is pressed. Output power can be evaluated on the operation display. **Do not transmit any signal other than emergency during the silence period, 00 to 03 min, and 30 to 33 min of every hour.**

### Tuning the antenna

Maximum transmission power is achieved only when the antenna impedance and transmitter impedance match each other. Because the antenna impedance changes with frequency a means must be provided to match (tune) the antenna impedance with the transmitter impedance. This is done with the antenna coupler. The antenna coupler automatically tunes the transmitter to a wide range of different antenna length (6 – 15 m). To initiate the automatic tuning, do the following:

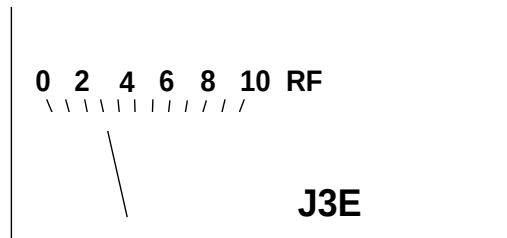
1. Press the PTT switch on the microphone (handset), or the [TUNE/7] key.
2. "TUNE" appears on the display.
3. Tuning will be completed within 2 to 15 seconds for a newly selected frequency, or less than 0.5 seconds for a once tuned frequency. (A built-in memory remembers coil and capacitor settings.)
4. When the tuning process is successfully completed "OK" appears.

## Using the microphone

Hold the microphone close to your mouth, press the PTT switch and speak clearly.

## Monitoring transceiver output power

The meter shows TX filter output level.



*Figure 1-9 Meter*

## Reducing transmitter power

To conserve energy and to minimize possible interference to other stations, reduce the transmission power. This should be done when using the transceiver in a harbor, near the shore or close to communication partner (other ship). Each pressing of the [H/L /8] key selects high or low output power. “LOW” appears on the display when low output power is selected. The output power on 2182 kHz (distress and calling) is the rated maximum regardless of the position of the [H/L /8] key.

## 1.11 Distress Call on 2182 kHz

The frequency 2182 kHz is an International radiotelephony distress, urgency and safety frequency for ship stations, public and private coast stations, and survival craft stations. It is also used for call and reply by ship stations on a primary basis and by public coast stations on a secondary basis.

Distress or emergency call is generally initiated by a radiotelephone alarm signal on 2182 kHz. Watch keeping receivers on other parties will hear your call.

1. Press the [2182] key. 2182 kHz and the class of emission H3E is automatically selected (J3E may be selected depending on system setting).

When the [2182] key is pressed, the following parameters are set automatically:

|               |         |
|---------------|---------|
| AGC:          | ON      |
| Output power: | Maximum |
| Loudspeaker:  | ON      |
| Squelch:      | OFF     |



2. While pressing and holding down the [ALM] key, press the [ENT] key. The alarm signal, modulated at 1300 Hz and 2200 Hz tones alternately, is emitted at full power for 45 sec.

The alarm can be monitored from the loudspeaker. The alarm may be canceled at any time by pressing the [ENT] key for immediate speech transmission.

### 3. Distress calls and Distress message

- (1) Speak slowly and distinctly, “MAYDAY, MAYDAY, MAYDAY, pronounced as the French expression “m’aider”.
- (2) This is;
- (3) The name of your vessel and call sign three times.

Then, continue with the distress message, which consists of:

- (1) The distress signal MAYDAY;
- (2) The name of the mobile station in distress;
- (3) Particulars of its position (in latitude and longitude)
- (4) The nature of the distress;
- (5) The kind of assistance desired;
- (6) Any other information which might facilitate rescue, for length, color, and type of vessels, number of persons on board.

4. Indicate the end of message by saying “Over.”

5. When you receive no answer to a distress message, repeat at intervals over again the radio-telephone alarm signal, the distress call and the distress message.

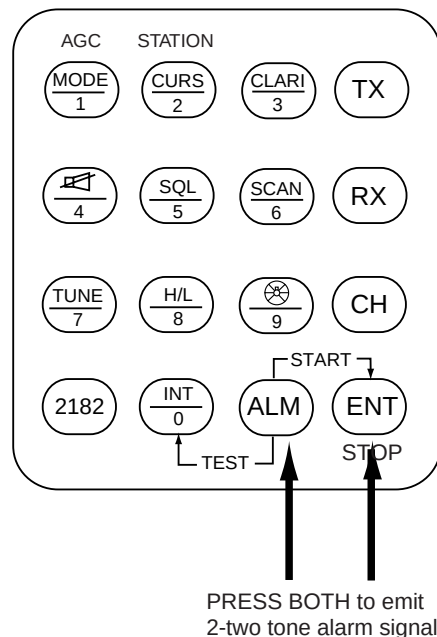


Figure 1-10 Keyboard

## Distress frequencies

All distress frequencies including 2182 kHz are shown below:

| Telephony SSB (kHz, Carrier) | DSC (kHz, Center) | Telex (kHz, Center) |
|------------------------------|-------------------|---------------------|
| 2 182                        | 2 187.5           | 2 174.5             |
| 4 125 <ITU 421>              | 4 207.5           | 4 177.5             |
| 6 215 <ITU 606>              | 6 312             | 6 268               |
| 8 291 <ITU 833>              | 8 414.5           | 8 376.5             |
| 12 290 <ITU 1221>            | 12 577            | 12 520              |
| 16 420 <ITU 1621>            | 16 804.5          | 16 695              |

For other Telex frequencies, refer to APPENDIX.

## 1.12 Receiving

You can select a receiving frequency by one of the following methods:

- Direct frequency entry, or
- Channel number entry

### Adjusting RF gain

In normal use the [RF GAIN] control should be set for maximum. If the audio on the received channel is unclear or interfered with other signals, adjust (usually reduce) the control to improve clarity.

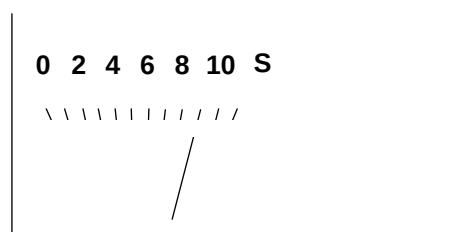
### Clarifier adjustment

If reception is unclear, try to clarify the signal as follows. For manual entry of frequency, simply turn the [FREQ/CH] control for fine tuning.

1. Press the [CLARI/3] key. (If a frequency is selected by CH No., the cursor which was located at the channel number, moves under the 10 Hz place and “CLAR” appears on the display.)
2. Turn the [FREQ/CH] control to fine tune the receiver on the wanted frequency.
3. To terminate this operation, press the [CLARI/3] key again. The cursor returns to the channel number.

### S-meter

During reception, the meter works as a Sensitivity Meter indicating the relative signal strength coming into the receiver front end. While in transmission, it indicates output level at the transmitter.



*Figure 1-11 S-meter*

**Note:** S-meter will not work with AGC off.

### Monitoring traffic on intended transmit frequency

When a semi-duplex (two-frequency simplex) channel is selected, it is recommended to monitor it if there is no existing traffic on the frequency you are going to use. To do this, press the [RX] key followed by the [ENT] key. The transceiver unit monitors traffic on the selected frequency for three sec. If you want to monitor continuously, press the [TX] key followed by the [ENT] key.

## Receiving AM broadcasting stations

1. Press the [MODE/1] key repeatedly to select H3E.
2. To tune in a 15,260 kHz shortwave station, for instance, press as below:  
[RX], [1], [5], [2], [6], [0], [0], [ENT]. **Be sure to enter the last zero.**

## Squelch control

Squelch is used to mute the receiver audio output when the receiver input is less than a preset value or dominant noise is higher than a preset (1000 Hz) frequency. To switch the squelch function ON, press the [SQL/5] key. Make sure the label “SQ” appears on the display. To pick up a weak signal at high audio frequencies, you should remove the squelch function notwithstanding a possible increase of background noise. To do this, press the [SQL/5] key again. Make sure the label “SQ” goes off.

## Noise blanker (NB)

The noise blanker clips inputs of noise resulting from an engine ignition or motor brush sparks. It can be enabled or disabled through the system settings.

## 1.13 Frequency Scan

### Channel scan

Scan is the function where the receiver watches 10/group user or ITU channels in succession at predetermined intervals. The scan-stop signal level and scan-stop time can be changed on system codes 9951 and 9952, respectively. AGC is automatically turned on when scanning is activated.

1. Recall user or ITU channel.

### User channels

User channels are divided into 20 groups in the scan mode as below.

| Scan Group | User Channel No. |
|------------|------------------|
| 1          | 0-01 to 0-09     |
| 2          | 0-10 to 0-19     |
| 3          | 0-20 to 0-29     |
| 4          | 0-30 to 0-39     |
| 5          | 0-40 to 0-49     |
| 6          | 0-50 to 0-59     |
| 7          | 0-60 to 0-69     |
| 8          | 0-70 to 0-79     |
| 9          | 0-80 to 0-89     |
| 10         | 0-90 to 0-99     |
| 11         | 1-00 to 1-09     |
| 12         | 1-10 to 1-19     |
| 13         | 1-20 to 1-29     |
| 14         | 1-30 to 1-39     |
| 15         | 1-40 to 1-49     |
| 16         | 1-50 to 1-59     |
| 17         | 1-60 to 1-69     |
| 18         | 1-70 to 1-79     |
| 19         | 1-80 to 1-89     |
| 20         | 1-90 to 1-99     |

*Figure 1-12 Scan groups*

## ITU channels

To select the scan group (band or channel, including user channels), shift the cursor to either the position of the band or channel number by pressing the [CURS/2] key. (Band scan is useful to watch frequencies on the same channel in different bands.)

2. Press the [SCAN/6] key, and “SCAN” appears. The receiver starts scanning, stopping at a channel where the signal is stronger than the scan-stop level. The receiver will restart scanning when the traffic goes out of that channel or designated time elapses, depending on system setting 9952.

For example, the scan group is “channel” and scan starts at ITU 1203, as shown in Figure 1-12.

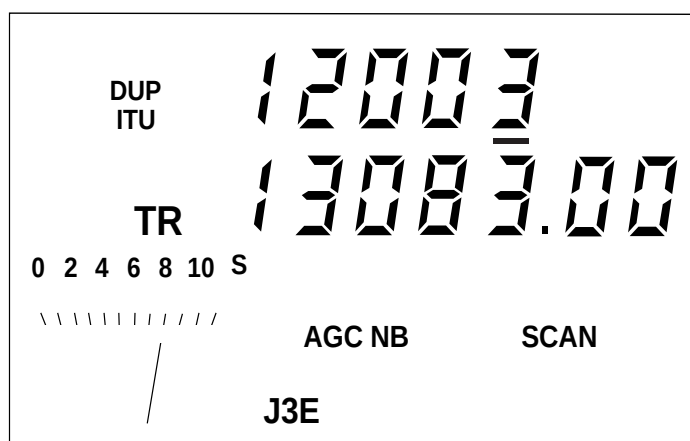


Figure 1-12 Sample “scan” screen

3. To stop scanning, press the [SCAN/6] key. “SCAN” disappears from the operation display.

## 1.14 Frequency Sweep

Sweep is the function where the receiver searches for a signal within a selected frequency coverage. AGC is automatically turned on in frequency sweep.

The defaults of respective parameters are as follows:

|                          |         |
|--------------------------|---------|
| Sweep stop signal level: | 3       |
| Sweep stop time:         | 2 sec   |
| Sweep width:             | 100 kHz |
| Step frequency:          | 1 kHz   |

These can be adjusted on system codes 9951 through 9954.

**Note:** Sweep width is the frequency width to sweep on both sides of the selected frequency. Sweep step is the frequency interval at which the receiver sweeps the sweep width.

### Procedure

1. Select the sweep center by key operation.
2. Press the [SCAN/6] key. "SWEEP" appears and the receiver starts sweeping. To stop sweeping, press the [SCAN/6] key.

## 1.15 MIF Commands

The FS-1503 can be remotely controlled by the FURUNO external device, for example, NBDP Terminal, DSC Terminal, Remote Station, with MIF commands. The table below shows the applicable MIF commands.

*Table 1-1 MIF commands applicable to the FS-1503*

| Command   | Operation                                                                                              |
|-----------|--------------------------------------------------------------------------------------------------------|
| DRS       | Locks keyboard. This command has priority over 1503's 2182 kHz.                                        |
| DRR       | Unlocks keyboard.                                                                                      |
| FZS       | Locks keyboard. FS-1503's 2182 kHz setting has priority.                                               |
| FZR       | Unlocks keyboard.                                                                                      |
| EMx       | Class of emission. x=Single digit denoting class of emission (0: LSB, 1: J3E, 2: H3E, 5: TLX, 6: FAX). |
| FTxxxxxxx | Tx frequency. x=7-digit frequency from 10 MHz to 10 Hz.                                                |
| FRxxxxxxx | Rx frequency. x=7-digit frequency from 10 MHz to 10 Hz.                                                |
| STxxxx    | Registers set class of emission and Rx/Tx frequency as user channel. x=4-digit user channel.           |
| CHxxxx    | Sets user channel. x=4-digit band and channel.                                                         |
| RCxxxx    | Same as above.                                                                                         |
| CHIxxxxx  | Sets ITU channel x=5-digit band and channel number composed of 2-digit band and 3-digit channel.       |
| RCIxxxxx  | Same as above.                                                                                         |
| AGS       | Activates AGC.                                                                                         |
| AGR       | Deactivates AGC.                                                                                       |
| RFxx      | Sets RF GAIN. x=FF: RF GAIN MAX., 00: RF GAIN MIN.                                                     |
| SQS       | Activates squelch.                                                                                     |
| SQR       | Deactivates squelch.                                                                                   |
| SCS       | Starts scanning.                                                                                       |
| SCR       | Stops scanning.                                                                                        |
| POx       | Sets output power. x=0, 1, 2: LOW, 3: HIGH                                                             |
| TU        | Tunes antenna coupler. *: tuning successful, ?: tuning error.                                          |
| ICxS      | Calls on intercom. x=Calling number.                                                                   |
| ICxR      | Stops call on intercom. x=Calling number.                                                              |
| CAID      | Confirms equipment name. #IDFS1503 is returned.                                                        |
| CAEM      | Confirms class of emission. #EM is returned.                                                           |
| CAFT      | Confirms Tx frequency. #FTxxxxxxx is returned.                                                         |
| CAFR      | Confirms Rx frequency. #FRxxxxxxx is returned.                                                         |
| CACH      | Confirms channel. #CHxxxx, #CHIxxxxx is returned.                                                      |
| CARC      | Confirms channel. #RCxxxx, #RCIxxxxx is returned.                                                      |
| CAAG      | Confirms AGC state. #AGS: ON, #AGR: OFF                                                                |
| CARF      | Confirms RF GAIN state. #RFxx (xx = 00-FF) is returned.                                                |
| CASL      | Confirms signal level. #SLxx (xx = 00-FF) is returned.                                                 |
| CASQ      | Confirms squelch state. #SQS: ON, #SQR: OFF                                                            |
| CAPO      | Confirms Tx output power. #POx is returned.                                                            |

## 2. OPERATION OF OPTIONAL EQUIPMENT

### 2.1 Telex Communication

Telex communication is performed with a Narrow-band direct-printing (NBDP) Terminal connected with an SSB transceiver. The recommended terminal for the FS-1503 is the FURUNO DP-5/DP-6. Other makes can also be connected with the FS-1503, provided they comply with the interfacing requirements. Telex operation requires the REMOTE-A Board (option). Note that an Rx narrow filter (option) is also available.

#### FURUNO NBDP Terminal DP-5/DP-6

No special operation is required; class of emission and frequencies are automatically set on the DP-5/DP-6.

Other makes of NBDP Terminal:

1. Select “TLX” with the [MODE/1] key.
2. Select a desired frequency.
3. Tune the antenna coupler by pressing the [TUNE/7] key.

Distress frequencies for telephony and telegraphy are as below. For other traffic frequencies, refer to APPENDIX.

| <b>Telephony SSB<br/>(kHz, Carrier)</b> | <b>DSC<br/>(kHz, Center)</b> | <b>Telex<br/>(kHz, Center)</b> |
|-----------------------------------------|------------------------------|--------------------------------|
| 2182                                    | 2187.5                       | 2174.5                         |
| 4125                                    | 4207.5                       | 4177.5                         |
| 6215                                    | 6312.0                       | 6268.0                         |
| 8291                                    | 8414.5                       | 8376.5                         |
| 12290                                   | 12577.0                      | 12520.0                        |
| 16420                                   | 16804.5                      | 16695.0                        |



## **2.2 Remote Station RB-500 (requires optional Remote-B Board)**

### **Priority**

The Remote Station RB-500 usually has higher priority than the FS-1503. This means that operation of the FS-1503 is disabled when the handset of the RB-500 is picked up. The indication “REM” appears on the FS-1503 display when the remote station is in operation and the PTT switch on the microphone of the FS-1503 is inoperative.

### **Communication on 2182 kHz**

When 2182 kHz is selected on the FS-1503, the FS-1503 takes priority.

## **2.3 Intercom**

The intercom provides communications between the FS-1503 and the RB-500 Remote Station (option). They must be wire-connected. When intercom mode is in use, there is no radio transmission.

### **Calling RB-500**

1. Press the [INT/0] key. “COM” appears on the FS-1503 display panel.
2. Press [1]\*, [ENT] keys. Calling beeps sound at the FS-1503. The buzzer stops when the handset of the RB-500 is picked up. \* Designated number of the RB-500 if more than one is installed.
3. Press the PTT switch to talk. Release the switch to listen.

### **Call from RB-500**

When the FS-1503 is called from the RB-500, the FS-1503 releases a buzzer. Press the [INT/0] key to silence the buzzer. Press the PTT switch to talk. Release the switch to listen. Note that the loudspeaker on the FS-1503 is automatically turned on when a call from the RB-500 is received, regardless of setting.

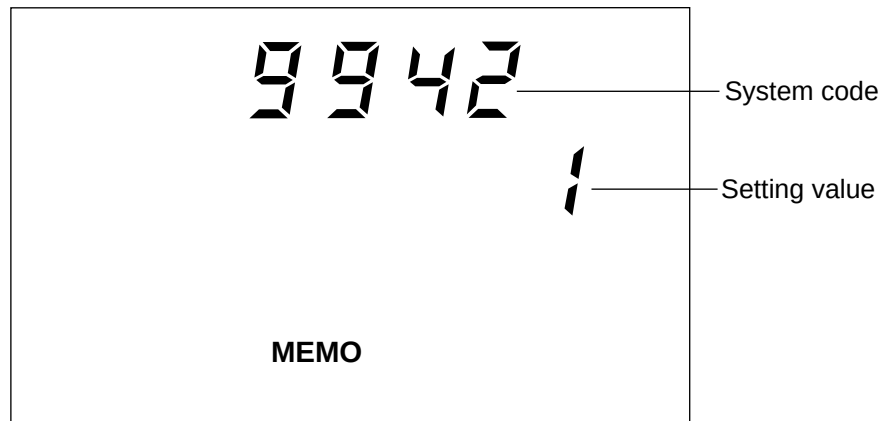
### **Terminating the intercom**

Press the [INT/0] key to terminate the intercom function. “COM” disappears.

## 3. CHANGING SYSTEM SETTINGS

### 3.1 System Setup

1. While pressing and holding down the [CH] key, turn on the power. Release the [CH] key when “MEMO” appears on the display.



*Figure 3-1 System setting selection screen*

2. Turn the [FREQ/CH] control to select a desired code number.
3. Press the [CH] key, enter desired setting by a numeric key, then press the [ENT] key.
4. To change setting for another code, repeat steps 2 and 3.
5. Reset the power.

### 3.2 Customizing by User

The operator can customize several system settings. The table below shows the system codes and their function, setting range and factory setting.

**Note:** FURUNO Electric Company will assume no responsibility for the inconvenience or disturbance to communications due to inadequate or unlawful presetting of this equipment.

| <u>Code</u> | <u>Function, Setting</u>                                                                                                               |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 9942        | Key beep ON/OFF<br>A beep sounds when a keying sequence is correctly executed. You may turn the beep on or off.<br>Factory setting: ON |
| 9943        | Noise blanker ON/OFF<br>The noise blanker cancels unwanted noise.<br>Factory setting: ON                                               |

- 9951 Scan/sweep-stop signal level  
When the receiver detects a signal whose level is stronger than the preset level it stops scanning and receives the signal. The setting on system code 9955 is available only when “0” (SQ working condition) is selected here.  
Setting range: 0 (Squelch working condition is effective as set on code 9955), 1-10 (S-meter level); Factory setting: 3
- 9952 Scan/sweep-stop time  
When a signal is detected, the receiver stops scanning/sweeping and dwells on this channel frequency. When “0” (RX) is selected, the receiver keeps receiving until the traffic goes out of this channel frequency. Define the dwell time between 1 and 99 sec.  
Setting range: 0 (RX), 1-99 sec; Factory setting: 2
- 9953 Sweep width setting range: 0.01-30000.00 kHz; Factory setting: 100.0
- 9954 Sweep step frequency  
Setting range: 0.01-30000.00 kHz; Factory setting: 1.00
- 9955 Squelch activation  
“Squelch activation” is the method by which the squelch is activated.  
Setting range: 0, 1, 2, 3; Factory setting: 3
- 0: Voice  
The squelch is opened by signal frequency less than 1000 Hz (factory setting). This frequency can be changed between 500 – 2000 Hz on system code 9958. The loudspeaker reproduces a sound when the signal is lower than the preset frequency.
- Squelch OPEN:  
Audio signal is detected and a sound is reproduced through the loudspeaker.
- Squelch CLOSED:  
No input signal but only noise is coming into the receiver. The receiver is muted.
- 1: Level  
The squelch is activated depending on “signal strength”. The factory setting is “5”. You can change the level between 0 - 10 on system code 9956.
- 2: And  
The squelch opens when both “voice” and “signal strength” meet the setting.
- 3: Or  
The squelch opens by either “voice” or “signal strength”, whichever meets the setting.
- 9956 Squelch level. Setting range: 0-10; Factory setting: 5

- 9957 Squelch delay - a delay until the squelch mutes (closes) the receiver after the signal has gone.  
(Ex) 9957: 1000 ms  
Squelch closes 1000 ms after the signal has gone.  
Setting range: 500-4000 ms; Factory setting: 1000 ms
- 9958 Squelch activating frequency  
Setting range: 500-2000 Hz; Factory setting: 1000 Hz

### 3.3 Writing User Channels

The user channels may write user Tx channels. (Rx channels may also be written where permitted.)

1. Turn on the power while pressing the [CH] key. Release the key when MEMO appears.
2. Rotate the [FREQ/CH] control clockwise to display desired channel no. "R" appears (Rx frequency writing mode).
4. Press the [MODE/1] key to select class of emission.
5. Press the [CH] key. Key in Rx frequency with the numeric keys (0-9) and press the [ENT] key. If you are only writing Rx frequency go to step 8.
6. Rotate the [FREQ/CH] control clockwise. "T" appears (Tx frequency writing mode).
7. Enter Tx frequency like you entered Rx frequency.
8. Rotate the [FREQ/CH] control clockwise. If no station name have been written you will see seven dashes. If station name cannot be entered for a particular station, the next channel number appears.
9. Press the [CH] key to enter station name or write over existing name. The cursor appears. A station name may consist of seven characters, hyphens, alphabet, numerics and spaces are available.
10. Operate the [FREQ/CH] control to display character desired and press the [ENT] key. To enter a space or shift the cursor press the [ENT] key. To erase station name, press [CH], [0] and [ENT]. When seven characters are entered, the cursor disappears.
11. Turn off the power to register channels.

## 4. MAINTENANCE



### WARNING

**Do not open the equipment.**

Improper handling can result in electrical shock. Only qualified personnel should work inside the equipment.

**Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

### 4.1 Weekly Checks

Check the radiotelephone at appropriate intervals as required by Administration.

#### Aural testing

1. Press the [ALM] key to generate the alarm. Confirm that the two-tone alarm is released for more than 30 seconds. You will hear the audio from the loudspeaker. This process helps to verify that the radiotelephone alarm generator is in the working condition without transmitting an actual radio signal.
2. To terminate test, press the [ALM] key again or [ENT] (STOP) key.

#### Testing the transmitter with a dummy antenna

This requires the optional dummy load (in the antenna coupler).

1. While pressing and holding down the [ALM] key, press the [INT/0] key. The dummy antenna in the antenna coupler is connected to the FS-1503 instead of the antenna. “DUMMY” appears and the test signal at test frequency (for example, 2191 kHz), modulated by two tones (1300 Hz and 2200 Hz), is generated across the dummy load for 45 seconds.
2. To stop the emission, press the [ALM] key. The dummy load is disconnected and the transceiver restores the previous frequency setting.

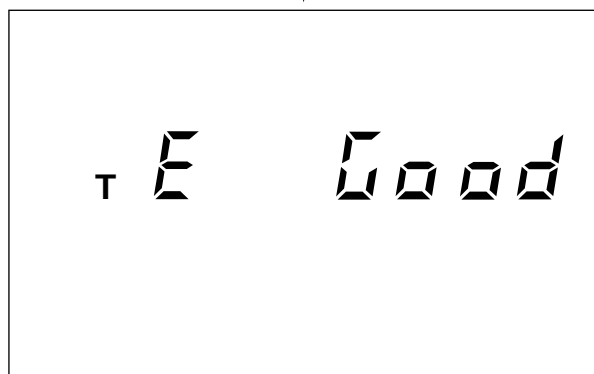
## 4.2 Diagnostic Test

This test checks the transceiver for proper operation. It should be conducted regularly to ensure proper operation. If a DSC or NBDP terminal is connected, the test should be conducted together with them. Before starting the test, set the RF GAIN control to maximum (fully clockwise).

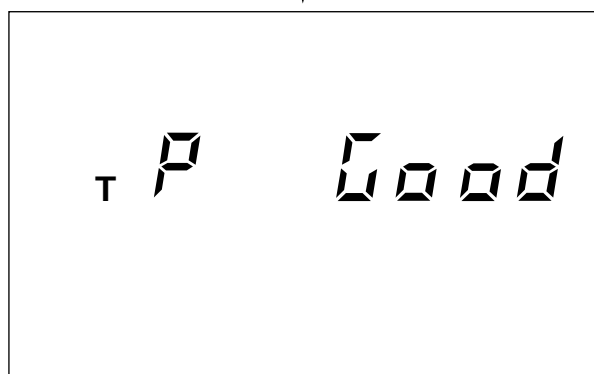
1. While pressing and holding down the [TX] key, turn on the power. All LCD segments appear.
2. Release the [TX] key. The FS-1503 starts diagnostics and the following indications appear:



Receiver section tested successfully.



Transmitter Exciter stage is tested successfully.



Transmitter Power Amplifier stage and Antenna Coupler are tested successfully. Test available with dummy load and by setting system setting 9917 to 1.

*Figure 4-1 Sequence of diagnostic test*

If a fault is detected, “no Good” appears instead of “Good” and the associated indication blinks after completion of this test.

3. Turn off the transceiver on completion of tests. Turn it on again for normal operation.

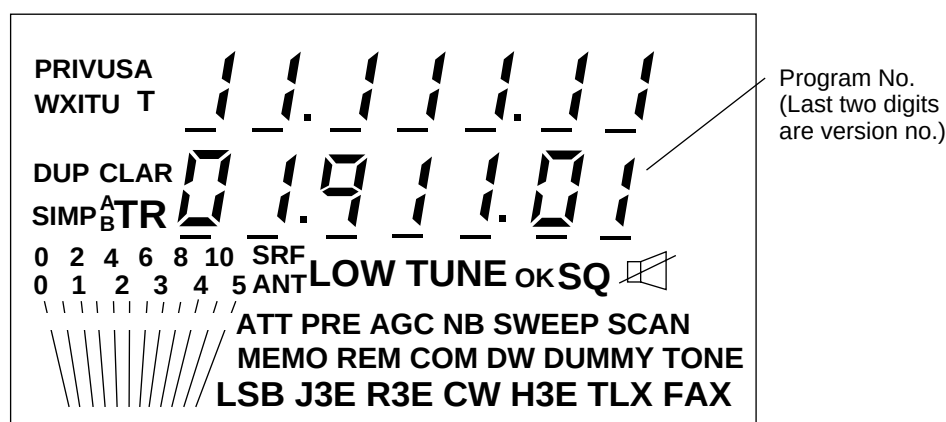
## 4.3 LCD/Keyboard Test & ROM Version No. Confirmation

1. While pressing and holding down the [ENT] key, turn on the power. All LCD segments appear.
2. Release the [ENT] key.
3. Press keys one by one. Check if the indication on the operation display is correct as shown below:

*Table 4-1 Key and corresponding indication*

| Key        | MODE/1 | CURS/2 | CLARI/3 | TX  |
|------------|--------|--------|---------|-----|
| Indication | 0      | 1      | 2       | 3   |
| Key        | 4      | SQL/5  | SCAN/6  | RX  |
| Indication | 4      | 5      | 6       | 7   |
| Key        | TUNE/7 | H/L /8 | 9       | CH  |
| Indication | 8      | 9      | A       | b   |
| Key        | 2182   | INT/0  | ALM     | ENT |
| Indication | C      | d      | E       | F   |

Example: The [CURS/2] key is pressed. The following appears. In a few seconds, 7 characters x 2 lines readout changes to all 8.



*Figure 4-2 LCD segments*

3. Turn off the transceiver on completion of tests. Turn it on again for normal operation.

## 4.4 Maintenance

This radiotelephone equipment is designed and manufactured to provide years of intended performance. For this, a regular maintenance program should be established and should at least include the items listed in the table below:

Table 4-2 Maintenance

| Item                                | Check Point                                                                                                                                                                                                                                                  | Remedy/Remarks                                                                                                                                                                         |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Whip antenna                        | Check for physical damage, corrosion and water leakage.                                                                                                                                                                                                      | Replace damaged parts.                                                                                                                                                                 |
| Wire antenna                        | Check that antenna is properly spanned and separated sufficiently apart from metallic structures.                                                                                                                                                            | If necessary, re-span the antenna.                                                                                                                                                     |
| Insulators for antenna installation | Check for salt water accumulation on insulators.<br><br>Check that connection at lead-in insulator is tight and rust-free.                                                                                                                                   | Replace damaged insulators. Remove salt water deposits. Clean with fresh water, then dry. Remove rust, then tighten bolts and lock nuts. Cover metallic surface with sealing compound. |
| Antenna coupler                     | Check contact at<br>* Antenna terminal<br>* Ground connection<br>* Coaxial cable<br>* Control cable (terminal board)<br><br>Check that coupler lid and cable glands are firmly secured.<br><br>Check for physical damage, corrosion and salt water deposits. | Tighten loosened connections.<br><br><br><br><br>Fasten lid firmly and evenly to prevent water leakage.<br><br>Replace if damaged.                                                     |
| Transceiver                         | Check contact at<br>* Antenna cable<br>* Ground connection<br>* Power cable<br>* Control cable<br><br>Confirm that there are no objects on the top of the cabinet.                                                                                           | Tighten loosened connections; remove foreign material from connectors.<br><br><br><br><br>Remove objects to prevent overheating.                                                       |
| Power supply                        | Check that supply voltage at transmission is within the rated range. (10.8-15.6 VDC at the power connector)                                                                                                                                                  | If not within the range, call for service. Low voltage may cause erratic operation.                                                                                                    |

(Continued on next page)



Table 4-2 Maintenance (con't)

| <b>Item</b>                        | <b>Check Point</b>                                            | <b>Remedy/Remarks</b>                            |
|------------------------------------|---------------------------------------------------------------|--------------------------------------------------|
| Power cable                        | Check for loosened or corroded connection at power terminals. | Clean and tighten.                               |
| Battery                            | Check that the battery is fully charged.                      | If discharged, charge.                           |
| Feeder (coax cable, control cable) | Check for physical damage.                                    | Replace if damaged.                              |
| PCB connection                     | Check that jumper cables between boards are firmly connected. | Reconnect loosened connections of jumper cables. |
| Microphone                         | Check that jumper cables between boards are firmly connected. | Fasten if loosened.                              |

## 5. TROUBLESHOOTING



### WARNING

**Do not open the equipment.**

Improper handling can result in electrical shock. Only qualified personnel should work inside the equipment.

**Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

### 5.1 Troubleshooting List

The troubleshooting list below gives common symptoms of equipment malfunction and means to restore normal operation. If you cannot restore normal operation, please do not check inside any unit. Any repair is best left to a qualified radiotelephone technician. Improper handling or adjustment may cause more serious damage.

*Table 5-1 Troubleshooting list*

| Trouble                                       | Probable Cause                                                 | Remedy                                                |
|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|
| Power cannot be turned on.                    | The mains switchboard may be off.                              | Turn on the mains switch.                             |
|                                               | DC overvoltage input.                                          | Check supply voltage. It should be less than 15 V.    |
|                                               | The battery may have discharged, or poor contact at terminals. | Recharge battery and tighten terminal connections.    |
| Frequency readout appears but no lamps light. | The [⊗/9] key may be off.                                      | Operate the [⊗/9] key.                                |
| Power is on but no sound from loudspeaker.    | The [🔊/4] key is off.                                          | Press the [🔊/4] key.                                  |
|                                               | Volume may be too low.                                         | Adjust the [VOLUME] control.                          |
|                                               | Squelch is on.                                                 | Press the [SQL/5] key if "SQ" appears on the display. |
|                                               | Reduced RF Gain.                                               | Turn the [RF GAIN] control clockwise.                 |

*(Continued on next page)*

*Table 5-1 Troubleshooting list (con't)*

| <b>Trouble</b>                                           | <b>Probable Cause</b>                                                                                                                                                                                                  | <b>Remedy</b>                                                                                                                                                                                                                                     |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Poor articulation                                        | Wrong class of emission may be in use. (For example, receiving signal in H3E mode. H3E should be used only on 2182 kHz.)<br><br>Receiver detuned.                                                                      | Select class of emission same as that of incoming signal.<br><br>In Custom or ITU channel mode, press the [CLARI/3] key then fine tune frequency by the FREQ/CH control.                                                                          |
| Output power is reduced to low ("LOW" indication blinks) | Power is automatically reduced to protect against overheating due to continuous transmission.                                                                                                                          | Wait until the unit returns to normal condition. Check if fan is working properly.                                                                                                                                                                |
| Key input is not accepted.                               | FS-1503 is under control of external equipment.                                                                                                                                                                        | "REM" appears when controlled by external equipment. Suspend operation of external operation.                                                                                                                                                     |
| Antenna coupler can't tune antenna.                      | Antenna may be disconnected or shorted to ground.<br><br>Antenna is out of tunable length.<br><br>Poor grounding of the coupler.<br><br>Connection cable loosened or disconnected.                                     | Check antenna connection.<br><br>Recommended length is 6 to 15 meters.<br><br>Check coupler ground.<br><br>Check cable.                                                                                                                           |
| Can not tune in a broadcast station.                     | Missing last numeral at the digit of 1 when trying to tune in the station.<br><br>Wrong setting of MODE<br><br>The station is off air.<br><br>Frequency is less than 1.6 MHz, however ANT FIL is set to 1.6 to 38 MHz. | To tune in 9640 kHz for instance, press [RX], [9], [6], [4], [0], [0], [ENT]. Do not miss the last [0]; otherwise you will set 964.0 kHz.<br><br>Select H3E.<br><br>Select another frequency.<br><br>Set ANT FIL to 0.1 to 30 MHz(Set in PA/FIL). |

## 5.2 Errow Indication

When the FS-1503 detects a fault in the synthesizer unit (frequency unlocked), the frequency or channel number blinks.

## 5.3 Replacing Fuses

To protect the unit from overcurrent and equipment fault, two 30 A are provided in snap-in holders on the power cable. If a fuse blows, find out the cause before replacing it. If it blows again after replacement, request service.



### **WARNING**

**Use the proper fuse.**

Fuse rating is shown on the equipment.  
Use of a wrong fuse can cause equipment damage and void the warranty.

# SPECIFICATIONS

## GENERAL

|                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Communication System                  | Simplex, semi-duplex                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Frequency Range                       | 1.6 to 27.5 MHz (transmit),<br>0.1 to 29.9 MHz (receive)                                                                                                                                                                                                                                                                                                                                                                                      |
| Frequency Resolution                  | Transmit: 100 Hz    Receive: 10 Hz                                                                                                                                                                                                                                                                                                                                                                                                            |
| Class of Emission                     | J3E SSB, suppressed carrier, signal channel containing analogue information<br>H3E SSB, full carrier, signal channel containing analogue information, telephony; when 2182 kHz is first selected, H3E is set.<br>J2B for DSC, NBDP; SSB, suppressed carrier, signal channel containing quantized or digital information with the use of a modulating sub-carrier, telegraphy for automatic reception<br>F3C weather facsimile, reception only |
| Frequency Error                       | ±10 Hz (Both Transmitter and Receiver)                                                                                                                                                                                                                                                                                                                                                                                                        |
| Number of Channels                    | Custom channels: 199 max. Programmed by FURUNO authorized service representatives (user may program Rx channels).<br>ITU SSB/TELEX Channels as listed in the APPENDIX.<br><br>2182 kHz (single action)                                                                                                                                                                                                                                        |
| Environmental                         | Transceiver unit: -20°C to +55°C<br>Antenna coupler: -30°C to +70°C<br>Relative humidity 93% at 40°C                                                                                                                                                                                                                                                                                                                                          |
| Power Supply                          | 13.6 VDC (+15%, -15%)<br>Receive: 1.5 A<br>Transmit (max.): 30 A                                                                                                                                                                                                                                                                                                                                                                              |
| Radiotelephone Alarm Signal Generator | Two tones of 2200 Hz and 1300 Hz transmitted alternately.                                                                                                                                                                                                                                                                                                                                                                                     |

## TRANSMITTER

|                  |                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------|
| Output Impedance | 50 ohms                                                                                                            |
| Output Power     | J3E/H3E: 1.6 to 23 MHz, 150 W pep, 23 to 27.5 MHz, 75 W pep<br>J2B: 1.6 to 23 MHz, 100 W; 23 to 27.5 MHz, 50 W pep |
| Tune             | 10 W approx.                                                                                                       |
| Power Reduction  | 60 W approx.                                                                                                       |
| Controls         | Output HI/LOW, test (option)/send of two-tone alarm generator                                                      |

## **ANTENNA COUPLER**

|                     |                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------|
| Power Capability    | 150 W pep                                                                                 |
| Tuning System       | CPU controlled fully automatic tuning system                                              |
| Frequency Range     | 1.6 to 27.5 MHz                                                                           |
| Input Impedance     | 50 ohms (viewed from transceiver)                                                         |
| Antenna Required    | 6 to 15 meters wire or whip                                                               |
| Tuning Power        | 10 to 20 W pep                                                                            |
| VSWR                | Less than 1.5                                                                             |
| Tuning Time         | Within 2 to 15 seconds, Within 0.5 seconds for an ever tuned frequency                    |
| Dummy Load (option) | 10 ohms + 250 pF for check of Two-tone alarm generator at 2191 kHz (frequency changeable) |
| Power Requirement   | 12.0 VDC, 0.6 A (supplied from transceiver)                                               |
| Construction        | Waterproof plastic cabinet, stainless steel mount                                         |

## **RECEIVER**

|                  |                                                                                                                                                   |                                            |                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-------------------------------------------------|
| Receiving System | Double-conversion superheterodyne<br>IF: 54.455 MHz and 455 kHz.                                                                                  |                                            |                                                 |
| Sensitivity      | Input level to produce SINAD 20 dB                                                                                                                |                                            |                                                 |
|                  |                                                                                                                                                   | J3E                                        | J2B                                             |
|                  | 1.6 - 4 MHz                                                                                                                                       | Below +16 dB $\mu$ V                       | Below +6 dB $\mu$ V across 10 $\Omega$ + 250 pF |
|                  | 4-27.5 MHz                                                                                                                                        | Below +3 dB $\mu$ V                        | Below -7 dB $\mu$ V across 50 $\Omega$          |
| Pass Band        | 350 - 2700 Hz   -6 dB                                                                                                                             |                                            |                                                 |
| Cross Modulation | Unwanted signal +90 dB $\mu$ V $\pm$ 20 kHz from +60 dB $\mu$ V wanted signal                                                                     |                                            |                                                 |
| Audio Output     | 1 W (8 $\Omega$ internal loudspeaker), 3.5 W (4 $\Omega$ optional external loudspeaker)<br>0 dBm/600 $\Omega$ line output (for NBDP, DSC, RB-500) |                                            |                                                 |
| Other Features   | RF Gain:                                                                                                                                          | Adjustable                                 |                                                 |
|                  | Squelch:                                                                                                                                          | ON/OFF, Activated by voice/signal strength |                                                 |
|                  | Dimmer:                                                                                                                                           | OFF/Low/Medium/High                        |                                                 |
|                  | Loudspeaker:                                                                                                                                      | ON/OFF (Handset always alive)              |                                                 |
|                  | AGC:                                                                                                                                              | ON/OFF                                     |                                                 |
|                  | Noise blanker:                                                                                                                                    | ON/OFF (thru system setting)               |                                                 |

# APPENDIX

## CUSTOM CHANNELS/FREQUENCIES

Where permitted user may program both Tx and Rx frequencies or Rx frequencies; Tx frequencies to be programmed by FURUNO dealer.

[illegible]

## MF band working carrier frequencies - ref. US CFR 47 Part 80.371

| Region     | Ship Receive<br>(kHz) | Ship Transmit<br>(kHz) | Region                   | Ship Receive<br>(kHz) | Ship Transmit<br>(kHz) |
|------------|-----------------------|------------------------|--------------------------|-----------------------|------------------------|
| East Coast | 2490.0                | 2031.5                 | Gulf Coast               | 2466.0                | 2009.0                 |
|            | 2514.0                | 2118.0                 |                          | 2530.0                | 2134.0                 |
|            | 2522.0                | 2126.0                 |                          | 2538.0                | 2142.0                 |
|            | 2538.0                | 2142.0                 |                          | 2550.0                | 2158.0 <sup>1</sup>    |
|            | 2558.0                | 2166.0                 |                          | 2558.0                | 2166.0                 |
|            | 2590.0                | 2198.0                 |                          | 2598.0                | 2206.0                 |
|            | 2450.0                | 2366.0                 |                          | 2450.0                | 2366.0                 |
|            | 2482.0                | 2382.0                 |                          | 2482.0                | 2382.0                 |
|            | 2566.0                | 2390.0                 |                          | 2572.0                | 2430.0                 |
|            | 2400.0                | 2400.0                 |                          | 2506.0                | 2458.0                 |
|            | 2506.0                | 2406.0                 | Great Lakes <sup>2</sup> | 2514.0                | 2118.0                 |
| West Coast | 2450.0                | 2003.0                 |                          | 2550.0                | 2158.0                 |
|            | 2442.0                | 2009.0                 |                          | 2582.0                | 2206.0                 |
|            | 2566.0                | 2009.0                 | Alaska                   | 2309.0                | 2131.0                 |
|            | 2566.0                | 2031.5                 |                          | 2312.0                | 2134.0                 |
|            | 2522.0                | 2126.0                 |                          | 2400.0                | 2240.0                 |
|            | 2598.0                | 2206.0                 | Hawaii                   | 2530.0                | 2134.0                 |
|            | 2466.0                | 2382.0                 | Caribbean                | 2506.0                | 2009.0                 |
|            | 2482.0                | 2430.0                 |                          | 2585.0                | 2086.0 <sup>3</sup>    |
|            |                       |                        |                          | 2530.0                | 2134.0                 |
|            |                       |                        | Guam                     | 2506.0                | 2009.0                 |

**Above is not factory programmed, should be programmed by Furuno representatives.**

1 Unlimited use December 15 to April 1

2 2206 kHz for distress only.

3 Limited to pep of 150 W.

**NOTE:** <sup>1</sup> to <sup>3</sup> indicate the outline only. Refer to the relative documentation for full detail. For other coast stations, consult with your dealers.



## MF band SSB working carrier frequencies

| CH NO | Ship Receive (kHz) | Ship Transmit (kHz) | CH NO | Ship Receive (kHz) | Ship Transmit (kHz) |
|-------|--------------------|---------------------|-------|--------------------|---------------------|
| 241   | 1635               | 2060                | 271   | 1725               | 2069                |
| 242   | 1638               | 2063                | 272   | 1728               | 2072                |
| 243   | 1641               | 2066                | 273   | 1731               | 2075                |
| 244   | 1644               | 2069                | 274   | 1734               | 2078                |
| 245   | 1647               | 2072                | 275   | 1737               | 2081                |
| 246   | 1650               | 2075                | 276   | 1740               | 2084                |
| 247   | 1653               | 2078                | 277   | 1743               | 2087                |
| 248   | 1656               | 2081                | 278   | 1746               | 2090                |
| 249   | 1659               | 2084                | 279   | 1749               | 2093                |
| 250   | 1662               | 2087                | 280   | 1752               | 2096                |
| 251   | 1665               | 2090                | 281   | 1755               | 2099                |
| 252   | 1668               | 2093                | 282   | 1758               | 2102                |
| 253   | 1671               | 2096                | 283   | 1761               | 2105                |
| 254   | 1674               | 2099                | 284   | 1764               | 2108                |
| 255   | 1677               | 2102                | 285   | 1767               | 2111                |
| 256   | 1680               | 2105                | 286   | 1770               | 2114                |
| 257   | 1683               | 2108                | 287   | 1773               | 2117                |
| 258   | 1686               | 2111                | 288   | 1776               | 2120                |
| 259   | 1689               | 2114                | 289   | 1779               | 2123                |
| 260   | 1692               | 2117                | 290   | 1782               | 2126                |
| 261   | 1695               | 2120                | 291   | 1785               | 2129                |
| 262   | 1698               | 2123                | 292   | 1788               | 2132                |
| 263   | 1701               | 2126                | 293   | 1791               | 2135                |
| 264   | 1704               | 2129                | 294   | 1794               | 2138                |
| 265   | 1707               | 2132                | 295   | 1797               | 2060                |
| 266   | 1710               | 2135                |       |                    |                     |
| 267   | 1713               | 2138                |       |                    |                     |
| 268   | 1716               | 2060                |       |                    |                     |
| 269   | 1719               | 2063                |       |                    |                     |
| 270   | 1722               | 2066                |       |                    |                     |

Change of system setting required to use above channels. Ask a FURUNO dealer. Above is factory programmed. A channel can be recalled by hitting the keys [CH], [2], [4], [1], [ENT] for channel 241 as an example. The channel number and Rx frequencies appear on the display. The channel number is displayed in 4 digits, such as 2041. (Additional zero is inserted automatically.) The Tx frequency and Rx frequency are checked by pressing the [ENT] key.

## 4/6 MHz ITU SSB carrier frequencies (ITU RR APPENDIX 16)

The following frequencies are factory programmed.

| 4 MHz SSB (J3E) |         |         |
|-----------------|---------|---------|
| ITU CH NO       | Ship RX | Ship TX |
| 401             | 4357    | 4065    |
| 402             | 4360    | 4068    |
| 403             | 4363    | 4071    |
| 404             | 4366    | 4074    |
| 405             | 4369    | 4077    |
| 406             | 4372    | 4080    |
| 407             | 4375    | 4083    |
| 408             | 4378    | 4086    |
| 409             | 4381    | 4089    |
| 410             | 4384    | 4092    |
| 411             | 4387    | 4095    |
| 412             | 4390    | 4098    |
| 413             | 4393    | 4101    |
| 414             | 4396    | 4104    |
| 415             | 4399    | 4107    |
| 416             | 4402    | 4110    |
| 417             | 4405    | 4113    |
| 418             | 4408    | 4116    |
| 419             | 4411    | 4119    |
| 420             | 4414    | 4122    |
| 421             | 4417    | 4125    |
| 422             | 4420    | 4128    |
| 423             | 4423    | 4131    |
| 424             | 4426    | 4134    |
| 425             | 4429    | 4137    |
| 426             | 4432    | 4140    |
| 427             | 4435    | 4143    |
| 428             | 4351    | 4351    |
| 429             | 4354    | 4354    |
| 430             | 4146    | 4146    |
| 431             | 4149    | 4149    |
| 432 (01)        | 4000    | 4000    |
| 433 (02)        | 4003    | 4003    |
| 434 (03)        | 4006    | 4006    |
| 435 (04)        | 4009    | 4009    |
| 436 (05)        | 4012    | 4012    |
| 437 (06)        | 4015    | 4015    |
| 438 (07)        | 4018    | 4018    |
| 439 (08)        | 4021    | 4021    |
| 440 (09)        | 4024    | 4024    |
| 441 (10)        | 4027    | 4027    |
| 442 (11)        | 4030    | 4030    |
| 443 (12)        | 4033    | 4033    |
| 444 (13)        | 4036    | 4036    |
| 445 (14)        | 4039    | 4039    |
| 446 (15)        | 4042    | 4042    |
| 447 (16)        | 4045    | 4045    |
| 448 (17)        | 4048    | 4048    |
| 449 (18)        | 4051    | 4051    |
| 450 (19)        | 4054    | 4054    |
| 451 (20)        | 4057    | 4057    |
| 452 (21)        | 4060    | 4060    |

| 6 MHz SSB (J3E) |         |         |
|-----------------|---------|---------|
| ITU CH NO       | Ship RX | Ship TX |
| 601             | 6501    | 6200    |
| 602             | 6504    | 6203    |
| 603             | 6507    | 6206    |
| 604             | 6510    | 6209    |
| 605             | 6513    | 6212    |
| 606             | 6516    | 6215    |
| 607             | 6519    | 6218    |
| 608             | 6522    | 6221    |
| 609             | 6224    | 6224    |
| 610             | 6227    | 6227    |
| 611             | 6230    | 6230    |

A channel can be recalled by hitting the keys [CH], [4], [0], [1], [ENT] for CH 401 as an example.

Channel number and Rx frequency appear on the display. The CH NO is displayed in 4 digits such as 4001. To see Tx frequency and Rx frequency, press [ENT].

CH NOs in ( ) are ITU NOs (RR Section C-1). Use 3-digit FURUNO's designators for selections.

## 8 MHz ITU SSB carrier frequencies (ITU RR APPENDIX 16)

The following frequencies are factory programmed.

| 8 MHz SSB (J3E) |         |         |
|-----------------|---------|---------|
| ITU CH NO       | Ship RX | Ship TX |
| 801             | 8719    | 8195    |
| 802             | 8722    | 8198    |
| 803             | 8725    | 8201    |
| 804             | 8728    | 8204    |
| 805             | 8731    | 8207    |
| 806             | 8734    | 8210    |
| 807             | 8737    | 8213    |
| 808             | 8740    | 8216    |
| 809             | 8743    | 8219    |
| 810             | 8746    | 8222    |
| 811             | 8749    | 8225    |
| 812             | 8752    | 8228    |
| 813             | 8755    | 8231    |
| 814             | 8758    | 8234    |
| 815             | 8761    | 8237    |
| 816             | 8764    | 8240    |
| 817             | 8767    | 8243    |
| 818             | 8770    | 8246    |
| 819             | 8773    | 8249    |
| 820             | 8776    | 8252    |
| 821             | 8779    | 8255    |
| 822             | 8782    | 8258    |
| 823             | 8785    | 8261    |
| 824             | 8788    | 8264    |
| 825             | 8791    | 8267    |
| 826             | 8794    | 8270    |
| 827             | 8797    | 8273    |
| 828             | 8800    | 8276    |
| 829             | 8803    | 8279    |
| 830             | 8806    | 8282    |
| 831             | 8809    | 8285    |
| 832             | 8812    | 8288    |
| 833             | 8291    | 8291    |
| 834             | 8707    | 8707    |
| 835             | 8710    | 8710    |
| 836             | 8713    | 8713    |
| 837             | 8716    | 8716    |
| 838             | 8294    | 8294    |
| 839             | 8297    | 8297    |

| 8 MHz SSB (J3E)                                                                                                          |         |         |
|--------------------------------------------------------------------------------------------------------------------------|---------|---------|
| (ITU CH NO)                                                                                                              | Ship RX | Ship TX |
| 840 (01)                                                                                                                 | 8101    | 8101    |
| 841 (02)                                                                                                                 | 8104    | 8104    |
| 842 (03)                                                                                                                 | 8107    | 8107    |
| 843 (04)                                                                                                                 | 8110    | 8110    |
| 844 (05)                                                                                                                 | 8113    | 8113    |
| 845 (06)                                                                                                                 | 8116    | 8116    |
| 846 (07)                                                                                                                 | 8119    | 8119    |
| 847 (08)                                                                                                                 | 8122    | 8122    |
| 848 (09)                                                                                                                 | 8125    | 8125    |
| 849 (10)                                                                                                                 | 8128    | 8128    |
| 850 (11)                                                                                                                 | 8131    | 8131    |
| 851 (12)                                                                                                                 | 8134    | 8134    |
| 852 (13)                                                                                                                 | 8137    | 8137    |
| 853 (14)                                                                                                                 | 8140    | 8140    |
| 854 (15)                                                                                                                 | 8143    | 8143    |
| 855 (16)                                                                                                                 | 8146    | 8146    |
| 856 (17)                                                                                                                 | 8149    | 8149    |
| 857 (18)                                                                                                                 | 8152    | 8152    |
| 858 (19)                                                                                                                 | 8155    | 8155    |
| 859 (20)                                                                                                                 | 8158    | 8158    |
| 860 (21)                                                                                                                 | 8161    | 8161    |
| CH NOs in ( ) are ITU NOs (RR Section C-1).<br>Use 3-digit Furuno's designators for<br>selection in this radiotelephone. |         |         |

A channel can be recalled by hitting the keys [CH], [8], [0], [1], [ENT] for channel 801 as an example. CH NO and Rx frequency appear on the display. The channel number is displayed in 4 digits, such as 8001. (Additional zero is inserted automatically.) The Tx frequency and Rx frequency are checked by pressing the [ENT] key.

## 12/16 MHz ITU SSB carrier frequencies (ITU RR APPENDIX 16)

| 12 MHz SSB (J3E) |         |         | 16 MHz SSB (J3E) |         |         | 16 MHz SSB (J3E) |         |         |
|------------------|---------|---------|------------------|---------|---------|------------------|---------|---------|
| CH NO.           | SHIP RX | SHIP TX | CH NO.           | SHIP RX | SHIP TX | CH NO.           | SHIP RX | SHIP TX |
| 1201             | 13077   | 12230   | 1601             | 17242   | 16360   | 1651             | 17392   | 16510   |
| 1202             | 13080   | 12233   | 1602             | 17245   | 16363   | 1652             | 17395   | 16513   |
| 1203             | 13083   | 12236   | 1603             | 17248   | 16366   | 1653             | 17398   | 16516   |
| 1204             | 13086   | 12239   | 1604             | 17251   | 16369   | 1654             | 17401   | 16519   |
| 1205             | 13089   | 12242   | 1605             | 17254   | 16372   | 1655             | 17404   | 16522   |
| 1206             | 13092   | 12245   | 1606             | 17257   | 16375   | 1656             | 17407   | 16525   |
| 1207             | 13095   | 12248   | 1607             | 17260   | 16378   | 1657             | 16528   | 16528   |
| 1208             | 13098   | 12251   | 1608             | 17263   | 16381   | 1658             | 16531   | 16531   |
| 1209             | 13101   | 12254   | 1609             | 17266   | 16384   | 1659             | 16534   | 16534   |
| 1210             | 13104   | 12257   | 1610             | 17269   | 16387   | 1660             | 16537   | 16537   |
| 1211             | 13107   | 12260   | 1611             | 17272   | 16390   | 1661             | 16540   | 16540   |
| 1212             | 13110   | 12263   | 1612             | 17275   | 16393   | 1662             | 16543   | 16543   |
| 1213             | 13113   | 12266   | 1613             | 17278   | 16396   | 1663             | 16546   | 16546   |
| 1214             | 13116   | 12269   | 1614             | 17281   | 16399   |                  |         |         |
| 1215             | 13119   | 12272   | 1615             | 17284   | 16402   |                  |         |         |
| 1216             | 13122   | 12275   | 1616             | 17287   | 16405   |                  |         |         |
| 1217             | 13125   | 12278   | 1617             | 17290   | 16408   |                  |         |         |
| 1218             | 13128   | 12281   | 1618             | 17293   | 16411   |                  |         |         |
| 1219             | 13131   | 12284   | 1619             | 17296   | 16414   |                  |         |         |
| 1220             | 13134   | 12287   | 1620             | 17299   | 16417   |                  |         |         |
| 1221             | 13137   | 12290   | 1621             | 17302   | 16420   |                  |         |         |
| 1222             | 13140   | 12293   | 1622             | 17305   | 16423   |                  |         |         |
| 1223             | 13143   | 12296   | 1623             | 17308   | 16426   |                  |         |         |
| 1224             | 13146   | 12299   | 1624             | 17311   | 16429   |                  |         |         |
| 1225             | 13149   | 12302   | 1625             | 17314   | 16432   |                  |         |         |
| 1226             | 13152   | 12305   | 1626             | 17317   | 16435   |                  |         |         |
| 1227             | 13155   | 12308   | 1627             | 17320   | 16438   |                  |         |         |
| 1228             | 13158   | 12311   | 1628             | 17323   | 16441   |                  |         |         |
| 1229             | 13161   | 12314   | 1629             | 17326   | 16444   |                  |         |         |
| 1230             | 13164   | 12317   | 1630             | 17329   | 16447   |                  |         |         |
| 1231             | 13167   | 12320   | 1631             | 17332   | 16450   |                  |         |         |
| 1232             | 13170   | 12323   | 1632             | 17335   | 16453   |                  |         |         |
| 1233             | 13173   | 12326   | 1633             | 17338   | 16456   |                  |         |         |
| 1234             | 13176   | 12329   | 1634             | 17341   | 16459   |                  |         |         |
| 1235             | 13179   | 12332   | 1635             | 17344   | 16462   |                  |         |         |
| 1236             | 13182   | 12335   | 1636             | 17347   | 16465   |                  |         |         |
| 1237             | 13185   | 12338   | 1637             | 17350   | 16468   |                  |         |         |
| 1238             | 13188   | 12341   | 1638             | 17353   | 16471   |                  |         |         |
| 1239             | 13191   | 12344   | 1639             | 17356   | 16474   |                  |         |         |
| 1240             | 13194   | 12347   | 1640             | 17359   | 16477   |                  |         |         |
| 1241             | 13197   | 12350   | 1641             | 17362   | 16480   |                  |         |         |
| 1242             | 12353   | 12353   | 1642             | 17365   | 16483   |                  |         |         |
| 1243             | 12356   | 12356   | 1643             | 17368   | 16486   |                  |         |         |
| 1244             | 12359   | 12359   | 1644             | 17371   | 16489   |                  |         |         |
| 1245             | 12362   | 12362   | 1645             | 17374   | 16492   |                  |         |         |
| 1246             | 12365   | 12365   | 1646             | 17377   | 16495   |                  |         |         |
|                  |         |         | 1647             | 17380   | 16498   |                  |         |         |
|                  |         |         | 1648             | 17383   | 16501   |                  |         |         |
|                  |         |         | 1649             | 17386   | 16504   |                  |         |         |
|                  |         |         | 1650             | 17389   | 16507   |                  |         |         |

Above is factory programmed.

A channel can be recalled by hitting the keys [CH], [1], [2], [0], [1], [ENT] for channel 1201 as an example. CH NO and Rx frequency appear on the display. The CH NO is displayed in 5 digits, such as 12001. (Additional zero is inserted automatically.)

The Tx and Rx frequencies are checked by pressing the [ENT] key.

## 18/19, 22, 25/26 MHz ITU SSB carrier frequencies (ITU RR APPENDIX 16)

The following frequencies are factory programmed.

| 18/19 MHz SSB (J3E) |         |         |
|---------------------|---------|---------|
| CH NO.              | SHIP RX | SHIP TX |
| 1801                | 19755   | 18780   |
| 1802                | 19758   | 18783   |
| 1803                | 19761   | 18786   |
| 1804                | 19764   | 18789   |
| 1805                | 19767   | 18792   |
| 1806                | 19770   | 18795   |
| 1807                | 19773   | 18798   |
| 1808                | 19776   | 18801   |
| 1809                | 19779   | 18804   |
| 1810                | 19782   | 18807   |
| 1811                | 19785   | 18810   |
| 1812                | 19788   | 18813   |
| 1813                | 19791   | 18816   |
| 1814                | 19794   | 18819   |
| 1815                | 19797   | 18822   |
| 1816                | 18825   | 18825   |
| 1817                | 18828   | 18828   |
| 1818                | 18831   | 18831   |
| 1819                | 18834   | 18834   |
| 1820                | 18837   | 18837   |
| 1821                | 18840   | 18840   |
| 1822                | 18843   | 18843   |

A channel can be recalled by hitting the keys [CH], [1], [8], [0], [1], [ENT] for channel 1801 as an example. CH NO and Rx frequency appear on the display. The CH NO displayed in 5 digits, such as 18001. (Additional zero is inserted automatically.)

The Tx and Rx frequencies are checked by pressing the [ENT] key.

| 22 MHz SSB (J3E) |         |         |
|------------------|---------|---------|
| CH NO.           | SHIP RX | SHIP TX |
| 2201             | 22696   | 22000   |
| 2202             | 22699   | 22003   |
| 2203             | 22702   | 22006   |
| 2204             | 22705   | 22009   |
| 2205             | 22708   | 22012   |
| 2206             | 22711   | 22015   |
| 2207             | 22714   | 22018   |
| 2208             | 22717   | 22021   |
| 2209             | 22720   | 22024   |
| 2210             | 22723   | 22027   |
| 2211             | 22726   | 22030   |
| 2212             | 22729   | 22033   |
| 2213             | 22732   | 22036   |
| 2214             | 22735   | 22039   |
| 2215             | 22738   | 22042   |
| 2216             | 22741   | 22045   |
| 2217             | 22744   | 22048   |
| 2218             | 22747   | 22051   |
| 2219             | 22750   | 22054   |
| 2220             | 22753   | 22057   |
| 2221             | 22756   | 22060   |
| 2222             | 22759   | 22063   |
| 2223             | 22762   | 22066   |
| 2224             | 22765   | 22069   |
| 2225             | 22768   | 22072   |
| 2226             | 22771   | 22075   |
| 2227             | 22774   | 22078   |
| 2228             | 22777   | 22081   |
| 2229             | 22780   | 22084   |
| 2230             | 22783   | 22087   |
| 2231             | 22786   | 22090   |
| 2232             | 22789   | 22093   |
| 2233             | 22792   | 22096   |
| 2234             | 22795   | 22099   |
| 2235             | 22798   | 22102   |
| 2236             | 22801   | 22105   |
| 2237             | 22804   | 22108   |
| 2238             | 22807   | 22111   |
| 2239             | 22810   | 22114   |
| 2240             | 22813   | 22117   |
| 2241             | 22816   | 22120   |
| 2242             | 22819   | 22123   |
| 2243             | 22822   | 22126   |
| 2244             | 22825   | 22129   |
| 2245             | 22828   | 22132   |
| 2246             | 22831   | 22135   |
| 2247             | 22834   | 22138   |
| 2248             | 22837   | 22141   |
| 2249             | 22840   | 22144   |
| 2250             | 22843   | 22147   |

| 22 MHz SSB (J3E) |         |         |
|------------------|---------|---------|
| CH NO.           | SHIP RX | SHIP TX |
| 2251             | 22846   | 22150   |
| 2252             | 22849   | 22153   |
| 2253             | 22852   | 22156   |
| 2254             | 22159   | 22159   |
| 2255             | 22162   | 22162   |
| 2256             | 22165   | 22165   |
| 2257             | 22168   | 22168   |
| 2258             | 22171   | 22171   |
| 2259             | 22174   | 22174   |
| 2260             | 22177   | 22177   |

| 25/26 MHz SSB (J3E) |         |         |
|---------------------|---------|---------|
| CH NO               | Ship RX | Ship TX |
| 2501                | 26145   | 25070   |
| 2502                | 26148   | 25073   |
| 2503                | 26151   | 25076   |
| 2504                | 26154   | 25079   |
| 2505                | 26157   | 25082   |
| 2506                | 26160   | 25085   |
| 2507                | 26163   | 25088   |
| 2508                | 26166   | 25091   |
| 2509                | 26169   | 25094   |
| 2510                | 26172   | 25097   |
| 2511                | 25100   | 25100   |
| 2512                | 25103   | 25103   |
| 2513                | 25106   | 25106   |
| 2514                | 25109   | 25109   |
| 2515                | 25112   | 25112   |
| 2516                | 25115   | 25115   |
| 2517                | 25118   | 25118   |

# TELEX CHANNELS

## MF BAND Telex FREQUENCY TABLE

The following frequencies are factory programmed.

| CH NO. | Ship Receive<br>(NBDP, DSC) | Ship Transmit<br>(NBDP, DSC) |          |
|--------|-----------------------------|------------------------------|----------|
| 201    | 2142.0                      | 1607.0                       | NBDP/DSC |
| 202    | 2142.5                      | 1607.5                       |          |
| 203    | 2143.0                      | 1608.0                       |          |
| 204    | 2143.5                      | 1608.5                       |          |
| 205    | 2144.0                      | 1609.0                       |          |
|        |                             |                              |          |
| 206    | 2144.5                      | 1609.5                       |          |
| 207    | 2145.0                      | 1610.0                       |          |
| 208    | 2145.5                      | 1610.5                       |          |
| 209    | 2146.0                      | 1611.0                       |          |
| 210    | 2146.5                      | 1611.5                       |          |
|        |                             |                              |          |
| 211    | 2147.0                      | 1612.0                       |          |
| 212    | 2147.5                      | 1612.5                       |          |
| 213    | 2148.0                      | 1613.0                       |          |
| 214    | 2148.5                      | 1613.5                       |          |
| 215    | 2149.0                      | 1614.0                       |          |
|        |                             |                              |          |
| 216    | 2149.5                      | 1614.5                       |          |
| 217    | 2150.0                      | 1615.0                       |          |
| 218    | 2150.5                      | 1615.5                       |          |
| 219    | 2151.0                      | 1616.0                       |          |
| 220    | 2151.5                      | 1616.5                       |          |
|        |                             |                              |          |
| 221    | 2152.0                      | 1617.0                       |          |
| 222    | 2152.5                      | 1617.5                       |          |
| 223    | 2153.0                      | 1618.0                       |          |
| 224    | 2153.5                      | 1618.5                       |          |
| 225    | 2154.0                      | 1619.0                       |          |
|        |                             |                              | DSC      |
| 226    | 2154.5                      | 1619.5                       |          |
| 227    | 2155.0                      | 1620.0                       |          |
| 228    | 2155.5                      | 1620.5                       |          |
| 229    | 2156.0                      | 1621.0                       |          |
| 230    | 2156.5                      | 1621.5                       |          |
|        |                             |                              |          |
| 231    | 2157.0                      | 1622.0                       |          |
| 232    | 2157.5                      | 1622.5                       |          |
| 233    | 2158.0                      | 1623.0                       |          |
| 234    | 2158.5                      | 1623.5                       |          |
| 235    | 2159.0                      | 1624.0                       |          |
|        |                             |                              |          |
| 236    | 2159.5                      | 1624.5                       |          |

For Europe MF frequencies selection of ITU+MF on system setting necessary. A channel can be recalled by hitting the keys [CH], [2], [0], [1], [ENT] for channel 201 as an example. CH NO and Rx frequency appear on the display. The channel number is displayed in 4 digits, such as 2001. (Additional zero is inserted automatically.) The Rx and Tx frequencies are checked by pressing the [ENT] key.

**4/6 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE**  
(ITU RR APPENDIX 32)

| 4 MHz TELEX |         |         | 6 MHz TELEX |         |         | 6 MHz TELEX |         |         |
|-------------|---------|---------|-------------|---------|---------|-------------|---------|---------|
| CH NO.      | SHIP RX | SHIP TX | CH NO.      | SHIP RX | SHIP TX | CH NO.      | SHIP RX | SHIP TX |
| 4001        | 4210.5  | 4172.5  | 6001        | 6314.5  | 6263.0  | 6041        | 6303.5  | 6303.5  |
| 4002        | 4211.0  | 4173.0  | 6002        | 6315.0  | 6263.5  | 6042        | 6304.0  | 6304.0  |
| 4003        | 4211.5  | 4173.5  | 6003        | 6315.5  | 6264.0  | 6043        | 6304.5  | 6304.5  |
| 4004        | 4212.0  | 4174.0  | 6004        | 6316.0  | 6264.5  | 6044        | 6305.0  | 6305.0  |
| 4005        | 4212.5  | 4174.5  | 6005        | 6316.5  | 6265.0  | 6045        | 6305.5  | 6305.5  |
| 4006        | 4213.0  | 4175.0  | 6006        | 6317.0  | 6265.5  | 6046        | 6306.0  | 6306.0  |
| 4007        | 4213.5  | 4175.5  | 6007        | 6317.5  | 6266.0  | 6047        | 6306.5  | 6306.5  |
| 4008        | 4214.0  | 4176.0  | 6008        | 6318.0  | 6266.5  | 6048        | 6307.0  | 6307.0  |
| 4009        | 4214.5  | 4176.5  | 6009        | 6318.5  | 6267.0  | 6049        | 6307.5  | 6307.5  |
| 4010        | 4215.0  | 4177.0  | 6010        | 6319.0  | 6267.5  | 6050        | 6308.0  | 6308.0  |
| 4011        | 4177.5  | 4177.5  | 6011        | 6268.0  | 6268.0  | 6051        | 6308.5  | 6308.5  |
| 4012        | 4215.5  | 4178.0  | 6012        | 6319.5  | 6268.5  | 6052        | 6309.0  | 6309.0  |
| 4013        | 4216.0  | 4178.5  | 6013        | 6320.0  | 6269.0  | 6053        | 6309.5  | 6309.5  |
| 4014        | 4216.5  | 4179.0  | 6014        | 6320.5  | 6269.5  | 6054        | 6310.0  | 6310.0  |
| 4015        | 4217.0  | 4179.5  | 6015        | 6321.0  | 6270.0  | 6055        | 6310.5  | 6310.5  |
| 4016        | 4217.5  | 4180.0  | 6016        | 6321.5  | 6270.5  | 6056        | 6311.0  | 6311.0  |
| 4017        | 4218.0  | 4180.5  | 6017        | 6322.0  | 6271.0  | 6057        | 6311.5  | 6311.5  |
| 4018        | 4218.5  | 4181.0  | 6018        | 6322.5  | 6271.5  | 6058        | 6312.0  | 6312.0  |
| 4019        | 4219.0  | 4181.5  | 6019        | 6323.0  | 6272.0  | 6059        | 6331.0  | 6312.5  |
| 4020        | 4202.5  | 4202.5  | 6020        | 6323.5  | 6272.5  | 6060        | 6331.5  | 6313.0  |
| 4021        | 4203.0  | 4203.0  | 6021        | 6324.0  | 6273.0  | 6061        | 6332.0  | 6313.5  |
| 4022        | 4203.5  | 4203.5  | 6022        | 6324.5  | 6273.5  |             |         |         |
| 4023        | 4204.0  | 4204.0  | 6023        | 6325.0  | 6274.0  |             |         |         |
| 4024        | 4204.5  | 4204.5  | 6024        | 6325.5  | 6274.5  |             |         |         |
| 4025        | 4205.0  | 4205.0  | 6025        | 6326.0  | 6275.0  |             |         |         |
| 4026        | 4205.5  | 4205.5  | 6026        | 6326.5  | 6275.5  |             |         |         |
| 4027        | 4206.0  | 4206.0  | 6027        | 6327.0  | 6281.0  |             |         |         |
| 4028        | 4206.5  | 4206.5  | 6028        | 6327.5  | 6281.5  |             |         |         |
| 4029        | 4207.0  | 4207.0  | 6029        | 6328.0  | 6282.0  |             |         |         |
| 4030        | 4207.5  | 4207.5  | 6030        | 6328.5  | 6282.5  |             |         |         |
| 4031        | 4219.5  | 4208.0  | 6031        | 6329.0  | 6283.0  |             |         |         |
| 4032        | 4220.0  | 4208.5  | 6032        | 6329.5  | 6283.5  |             |         |         |
| 4033        | 4220.5  | 4209.0  | 6033        | 6330.0  | 6284.0  |             |         |         |
|             |         |         | 6034        | 6330.5  | 6284.5  |             |         |         |
|             |         |         | 6035        | 6300.5  | 6300.5  |             |         |         |
|             |         |         | 6036        | 6301.0  | 6301.0  |             |         |         |
|             |         |         | 6037        | 6301.5  | 6301.5  |             |         |         |
|             |         |         | 6038        | 6302.0  | 6302.0  |             |         |         |
|             |         |         | 6039        | 6302.5  | 6302.5  |             |         |         |
|             |         |         | 6040        | 6303.0  | 6303.0  |             |         |         |

Above is factory programmed.

# 8 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

(ITU RR APPENDIX 32)

| 8 MHz TELEX |         |         | 8 MHz TELEX |         |         |
|-------------|---------|---------|-------------|---------|---------|
| CH NO.      | SHIP RX | SHIP TX | CH NO.      | SHIP RX | SHIP TX |
| 8001        | 8376.5  | 8376.5  | 8046        | 8399.0  | 8399.0  |
| 8002        | 8417.0  | 8377.0  | 8047        | 8399.5  | 8399.5  |
| 8003        | 8417.5  | 8377.5  | 8048        | 8400.0  | 8400.0  |
| 8004        | 8418.0  | 8378.0  | 8049        | 8400.5  | 8400.5  |
| 8005        | 8418.5  | 8378.5  | 8050        | 8401.0  | 8401.0  |
| 8006        | 8419.0  | 8379.0  | 8051        | 8401.5  | 8401.5  |
| 8007        | 8419.5  | 8379.5  | 8052        | 8402.0  | 8402.0  |
| 8008        | 8420.0  | 8380.0  | 8053        | 8402.5  | 8402.5  |
| 8009        | 8420.5  | 8380.5  | 8054        | 8403.0  | 8403.0  |
| 8010        | 8421.0  | 8381.0  | 8055        | 8403.5  | 8403.5  |
| 8011        | 8421.5  | 8381.5  | 8056        | 8404.0  | 8404.0  |
| 8012        | 8422.0  | 8382.0  | 8057        | 8404.5  | 8404.5  |
| 8013        | 8422.5  | 8382.5  | 8058        | 8405.0  | 8405.0  |
| 8014        | 8423.0  | 8383.0  | 8059        | 8405.5  | 8405.5  |
| 8015        | 8423.5  | 8383.5  | 8060        | 8406.0  | 8406.0  |
| 8016        | 8424.0  | 8384.0  | 8061        | 8406.5  | 8406.5  |
| 8017        | 8424.5  | 8384.5  | 8062        | 8407.0  | 8407.0  |
| 8018        | 8425.0  | 8385.0  | 8063        | 8407.5  | 8407.5  |
| 8019        | 8425.5  | 8385.5  | 8064        | 8408.0  | 8408.0  |
| 8020        | 8426.0  | 8386.0  | 8065        | 8408.5  | 8408.5  |
| 8021        | 8426.5  | 8386.5  | 8066        | 8409.0  | 8409.0  |
| 8022        | 8427.0  | 8387.0  | 8067        | 8409.5  | 8409.5  |
| 8023        | 8427.5  | 8387.5  | 8068        | 8410.0  | 8410.0  |
| 8024        | 8428.0  | 8388.0  | 8069        | 8410.5  | 8410.5  |
| 8025        | 8428.5  | 8388.5  | 8070        | 8411.0  | 8411.0  |
| 8026        | 8429.0  | 8389.0  | 8071        | 8411.5  | 8411.5  |
| 8027        | 8429.5  | 8389.5  | 8072        | 8412.0  | 8412.0  |
| 8028        | 8430.0  | 8390.0  | 8073        | 8412.5  | 8412.5  |
| 8029        | 8430.5  | 8390.5  | 8074        | 8413.0  | 8413.0  |
| 8030        | 8431.0  | 8391.0  | 8075        | 8413.5  | 8413.5  |
| 8031        | 8431.5  | 8391.5  | 8076        | 8414.0  | 8414.0  |
| 8032        | 8432.0  | 8392.0  | 8077        | 8414.5  | 8414.5  |
| 8033        | 8432.5  | 8392.5  | 8078        | 8436.5  | 8415.0  |
| 8034        | 8433.0  | 8393.0  | 8079        | 8437.0  | 8415.5  |
| 8035        | 8433.5  | 8393.5  | 8080        | 8437.5  | 8416.0  |
| 8036        | 8434.0  | 8394.0  |             |         |         |
| 8037        | 8434.5  | 8394.5  |             |         |         |
| 8038        | 8435.0  | 8395.0  |             |         |         |
| 8039        | 8435.5  | 8395.5  |             |         |         |
| 8040        | 8436.0  | 8396.0  |             |         |         |
| 8041        | 8396.5  | 8396.5  |             |         |         |
| 8042        | 8397.0  | 8397.0  |             |         |         |
| 8043        | 8397.5  | 8397.5  |             |         |         |
| 8044        | 8398.0  | 8398.0  |             |         |         |
| 8045        | 8398.5  | 8398.5  |             |         |         |

Above is factory programmed.



## 12 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 12 MHz TELEX |         |         | 12 MHz TELEX |         |         | 12 MHz TELEX |         |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX |
| 12001        | 12579.5 | 12477.0 | 12056        | 12607.0 | 12504.5 | 12111        | 12634.0 | 12532.0 |
| 12002        | 12580.0 | 12477.5 | 12057        | 12607.5 | 12505.0 | 12112        | 12634.5 | 12532.5 |
| 12003        | 12580.5 | 12478.0 | 12058        | 12608.0 | 12505.5 | 12113        | 12635.0 | 12533.0 |
| 12004        | 12581.0 | 12478.5 | 12059        | 12608.5 | 12506.0 | 12114        | 12635.5 | 12533.5 |
| 12005        | 12581.5 | 12479.0 | 12060        | 12609.0 | 12506.5 | 12115        | 12636.0 | 12534.0 |
| 12006        | 12582.0 | 12479.5 | 12061        | 12609.5 | 12507.0 | 12116        | 12636.5 | 12534.5 |
| 12007        | 12582.5 | 12480.0 | 12062        | 12610.0 | 12507.5 | 12117        | 12637.0 | 12535.0 |
| 12008        | 12583.0 | 12480.5 | 12063        | 12610.5 | 12508.0 | 12118        | 12637.5 | 12535.5 |
| 12009        | 12583.5 | 12481.0 | 12064        | 12611.0 | 12508.5 | 12119        | 12638.0 | 12536.0 |
| 12010        | 12584.0 | 12481.5 | 12065        | 12611.5 | 12509.0 | 12120        | 12638.5 | 12536.5 |
| 12011        | 12584.5 | 12482.0 | 12066        | 12612.0 | 12509.5 | 12121        | 12639.0 | 12537.0 |
| 12012        | 12585.0 | 12482.5 | 12067        | 12612.5 | 12510.0 | 12122        | 12639.5 | 12537.5 |
| 12013        | 12585.5 | 12483.0 | 12068        | 12613.0 | 12510.5 | 12123        | 12640.0 | 12538.0 |
| 12014        | 12586.0 | 12483.5 | 12069        | 12613.5 | 12511.0 | 12124        | 12640.5 | 12538.5 |
| 12015        | 12586.5 | 12484.0 | 12070        | 12614.0 | 12511.5 | 12125        | 12641.0 | 12539.0 |
| 12016        | 12587.0 | 12484.5 | 12071        | 12614.5 | 12512.0 | 12126        | 12641.5 | 12539.5 |
| 12017        | 12587.5 | 12485.0 | 12072        | 12615.0 | 12512.5 | 12127        | 12642.0 | 12540.0 |
| 12018        | 12588.0 | 12485.5 | 12073        | 12615.5 | 12513.0 | 12128        | 12642.5 | 12540.5 |
| 12019        | 12588.5 | 12486.0 | 12074        | 12616.0 | 12513.5 | 12129        | 12643.0 | 12541.0 |
| 12020        | 12589.0 | 12486.5 | 12075        | 12616.5 | 12514.0 | 12130        | 12643.5 | 12541.5 |
| 12021        | 12589.5 | 12487.0 | 12076        | 12617.0 | 12514.5 | 12131        | 12644.0 | 12542.0 |
| 12022        | 12590.0 | 12487.5 | 12077        | 12617.5 | 12515.0 | 12132        | 12644.5 | 12542.5 |
| 12023        | 12590.5 | 12488.0 | 12078        | 12618.0 | 12515.5 | 12133        | 12645.0 | 12543.0 |
| 12024        | 12591.0 | 12488.5 | 12079        | 12618.5 | 12516.0 | 12134        | 12645.5 | 12543.5 |
| 12025        | 12591.5 | 12489.0 | 12080        | 12619.0 | 12516.5 | 12135        | 12646.0 | 12544.0 |
| 12026        | 12592.0 | 12489.5 | 12081        | 12619.5 | 12517.0 | 12136        | 12646.5 | 12544.5 |
| 12027        | 12592.5 | 12490.0 | 12082        | 12620.0 | 12517.5 | 12137        | 12647.0 | 12545.0 |
| 12028        | 12593.0 | 12490.5 | 12083        | 12620.5 | 12518.0 | 12138        | 12647.5 | 12545.5 |
| 12029        | 12593.5 | 12491.0 | 12084        | 12621.0 | 12518.5 | 12139        | 12648.0 | 12546.0 |
| 12030        | 12594.0 | 12491.5 | 12085        | 12621.5 | 12519.0 | 12140        | 12648.5 | 12546.5 |
| 12031        | 12594.5 | 12492.0 | 12086        | 12622.0 | 12519.5 | 12141        | 12649.0 | 12547.0 |
| 12032        | 12595.0 | 12492.5 | 12087        | 12622.5 | 12520.0 | 12142        | 12649.5 | 12547.5 |
| 12033        | 12595.5 | 12493.0 | 12088        | 12623.0 | 12520.5 | 12143        | 12650.0 | 12548.0 |
| 12034        | 12596.0 | 12493.5 | 12089        | 12623.5 | 12521.0 | 12144        | 12650.5 | 12548.5 |
| 12035        | 12596.5 | 12494.0 | 12090        | 12624.0 | 12521.5 | 12145        | 12651.0 | 12549.0 |
| 12036        | 12597.0 | 12494.5 | 12091        | 12624.5 | 12522.0 | 12146        | 12651.5 | 12549.5 |
| 12037        | 12597.5 | 12495.0 | 12092        | 12625.0 | 12522.5 | 12147        | 12652.0 | 12550.0 |
| 12038        | 12598.0 | 12495.5 | 12093        | 12625.5 | 12523.0 | 12148        | 12652.5 | 12550.5 |
| 12039        | 12598.5 | 12496.0 | 12094        | 12626.0 | 12523.5 | 12149        | 12653.0 | 12551.0 |
| 12040        | 12599.0 | 12496.5 | 12095        | 12626.5 | 12524.0 | 12150        | 12653.5 | 12551.5 |
| 12041        | 12599.5 | 12497.0 | 12096        | 12627.0 | 12524.5 | 12151        | 12654.0 | 12552.0 |
| 12042        | 12600.0 | 12497.5 | 12097        | 12627.5 | 12525.0 | 12152        | 12654.5 | 12552.5 |
| 12043        | 12600.5 | 12498.0 | 12098        | 12628.0 | 12525.5 | 12153        | 12655.0 | 12553.0 |
| 12044        | 12601.0 | 12498.5 | 12099        | 12628.5 | 12526.0 | 12154        | 12655.5 | 12553.5 |
| 12045        | 12601.5 | 12499.0 | 12100        | 12629.0 | 12526.5 | 12155        | 12656.0 | 12554.0 |
| 12046        | 12602.0 | 12499.5 | 12101        | 12629.5 | 12527.0 | 12156        | 12656.5 | 12554.5 |
| 12047        | 12602.5 | 12500.0 | 12102        | 12630.0 | 12527.5 | 12157        | 12657.0 | 12555.0 |
| 12048        | 12603.0 | 12500.5 | 12103        | 12630.5 | 12528.0 | 12158        | 12657.5 | 12555.5 |
| 12049        | 12603.5 | 12501.0 | 12104        | 12631.0 | 12528.5 | 12159        | 12658.0 | 12556.0 |
| 12050        | 12604.0 | 12501.5 | 12105        | 12631.5 | 12529.0 | 12160        | 12658.5 | 12556.5 |
| 12051        | 12604.5 | 12502.0 | 12106        | 12632.0 | 12529.5 | 12161        | 12659.0 | 12557.0 |
| 12052        | 12605.0 | 12502.5 | 12107        | 12632.5 | 12530.0 | 12162        | 12659.5 | 12557.5 |
| 12053        | 12605.5 | 12503.0 | 12108        | 12633.0 | 12530.5 | 12163        | 12660.0 | 12558.0 |
| 12054        | 12606.0 | 12503.5 | 12109        | 12633.5 | 12531.0 | 12164        | 12660.5 | 12558.5 |
| 12055        | 12606.5 | 12504.0 | 12110        | 12634.0 | 12531.5 | 12165        | 12661.0 | 12559.0 |

## 12/16 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 12 MHz TELEX |         |         | 16 MHz TELEX |         |         | 16 MHz TELEX |         |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX |
| 12166        | 12564.5 | 12564.5 | 16001        | 16807.0 | 16683.5 | 16056        | 16834.0 | 16711.0 |
| 12167        | 12565.0 | 12565.0 | 16002        | 16807.5 | 16684.0 | 16057        | 16834.5 | 16711.5 |
| 12168        | 12565.5 | 12565.5 | 16003        | 16808.0 | 16684.5 | 16058        | 16835.0 | 16712.0 |
| 12169        | 12566.0 | 12566.0 | 16004        | 16808.5 | 16685.0 | 16059        | 16835.5 | 16712.5 |
| 12170        | 12566.5 | 12566.5 | 16005        | 16809.0 | 16685.5 | 16060        | 16836.0 | 16713.0 |
| 12171        | 12567.0 | 12567.0 | 16006        | 16809.5 | 16686.0 | 16061        | 16836.5 | 16713.5 |
| 12172        | 12567.5 | 12567.5 | 16007        | 16810.0 | 16686.5 | 16062        | 16837.0 | 16714.0 |
| 12173        | 12568.0 | 12568.0 | 16008        | 16810.5 | 16687.0 | 16063        | 16837.5 | 16714.5 |
| 12174        | 12568.5 | 12568.5 | 16009        | 16811.0 | 16687.5 | 16064        | 16838.0 | 16715.0 |
| 12175        | 12569.0 | 12569.0 | 16010        | 16811.5 | 16688.0 | 16065        | 16838.5 | 16715.5 |
| 12176        | 12569.5 | 12569.5 | 16011        | 16812.0 | 16688.5 | 16066        | 16839.0 | 16716.0 |
| 12177        | 12570.0 | 12570.0 | 16012        | 16812.5 | 16689.0 | 16067        | 16839.5 | 16716.5 |
| 12178        | 12570.5 | 12570.5 | 16013        | 16813.0 | 16689.5 | 16068        | 16840.0 | 16717.0 |
| 12179        | 12571.0 | 12571.0 | 16014        | 16813.5 | 16690.0 | 16069        | 16840.5 | 16717.5 |
| 12180        | 12571.5 | 12571.5 | 16015        | 16814.0 | 16690.5 | 16070        | 16841.0 | 16718.0 |
| 12181        | 12572.0 | 12572.0 | 16016        | 16814.5 | 16691.0 | 16071        | 16841.5 | 16718.5 |
| 12182        | 12572.5 | 12572.5 | 16017        | 16815.0 | 16691.5 | 16072        | 16842.0 | 16719.0 |
| 12183        | 12573.0 | 12573.0 | 16018        | 16815.5 | 16692.0 | 16073        | 16842.5 | 16719.5 |
| 12184        | 12573.5 | 12573.5 | 16019        | 16816.0 | 16692.5 | 16074        | 16843.0 | 16720.0 |
| 12185        | 12574.0 | 12574.0 | 16020        | 16816.5 | 16693.0 | 16075        | 16843.5 | 16720.5 |
| 12186        | 12574.5 | 12574.5 | 16021        | 16817.0 | 16693.5 | 16076        | 16844.0 | 16721.0 |
| 12187        | 12575.0 | 12575.0 | 16022        | 16817.5 | 16694.0 | 16077        | 16844.5 | 16721.5 |
| 12188        | 12575.5 | 12575.5 | 16023        | 16818.0 | 16694.5 | 16078        | 16845.0 | 16722.0 |
| 12189        | 12576.0 | 12576.0 | 16024        | 16695.0 | 16695.0 | 16079        | 16845.5 | 16722.5 |
| 12190        | 12576.5 | 12576.5 | 16025        | 16818.5 | 16695.5 | 16080        | 16846.0 | 16723.0 |
| 12191        | 12577.0 | 12577.0 | 16026        | 16819.0 | 16696.0 | 16081        | 16846.5 | 16723.5 |
| 12192        | 12577.5 | 12577.5 | 16027        | 16819.5 | 16696.5 | 16082        | 16847.0 | 16724.0 |
| 12193        | 12578.0 | 12578.0 | 16028        | 16820.0 | 16697.0 | 16083        | 16847.5 | 16724.5 |
| 12194        | 12578.5 | 12578.5 | 16029        | 16820.5 | 16697.5 | 16084        | 16848.0 | 16725.0 |
|              |         |         | 16030        | 16821.0 | 16698.0 | 16085        | 16848.5 | 16725.5 |
|              |         |         | 16031        | 16821.5 | 16698.5 | 16086        | 16849.0 | 16726.0 |
|              |         |         | 16032        | 16822.0 | 16699.0 | 16087        | 16849.5 | 16726.5 |
|              |         |         | 16033        | 16822.5 | 16699.5 | 16088        | 16850.0 | 16727.0 |
|              |         |         | 16034        | 16823.0 | 16700.0 | 16089        | 16850.5 | 16727.5 |
|              |         |         | 16035        | 16823.5 | 16700.5 | 16090        | 16851.0 | 16728.0 |
|              |         |         | 16036        | 16824.0 | 16701.0 | 16091        | 16851.5 | 16728.5 |
|              |         |         | 16037        | 16824.5 | 16701.5 | 16092        | 16852.0 | 16729.0 |
|              |         |         | 16038        | 16825.0 | 16702.0 | 16093        | 16852.5 | 16729.5 |
|              |         |         | 16039        | 16825.5 | 16702.5 | 16094        | 16853.0 | 16730.0 |
|              |         |         | 16040        | 16826.0 | 16703.0 | 16095        | 16853.5 | 16730.5 |
|              |         |         | 16041        | 16826.5 | 16703.5 | 16096        | 16854.0 | 16731.0 |
|              |         |         | 16042        | 16827.0 | 16704.0 | 16097        | 16854.5 | 16731.5 |
|              |         |         | 16043        | 16827.5 | 16704.5 | 16098        | 16855.0 | 16732.0 |
|              |         |         | 16044        | 16828.0 | 16705.0 | 16099        | 16855.5 | 16732.5 |
|              |         |         | 16045        | 16828.5 | 16705.5 | 16100        | 16856.0 | 16733.0 |
|              |         |         | 16046        | 16829.0 | 16706.0 | 16101        | 16856.5 | 16733.5 |
|              |         |         | 16047        | 16829.5 | 16706.5 | 16102        | 16857.0 | 16739.0 |
|              |         |         | 16048        | 16830.0 | 16707.0 | 16103        | 16857.5 | 16739.5 |
|              |         |         | 16049        | 16830.5 | 16707.5 | 16104        | 16858.0 | 16740.0 |
|              |         |         | 16050        | 16831.0 | 16708.0 | 16105        | 16858.5 | 16740.5 |
|              |         |         | 16051        | 16831.5 | 16708.5 | 16106        | 16859.0 | 16741.0 |
|              |         |         | 16052        | 16832.0 | 16709.0 | 16107        | 16859.5 | 16741.5 |
|              |         |         | 16053        | 16832.5 | 16709.5 | 16108        | 16860.0 | 16742.0 |
|              |         |         | 16054        | 16833.0 | 16710.0 | 16109        | 16860.5 | 16742.5 |
|              |         |         | 16055        | 16833.5 | 16710.5 | 16110        | 16861.0 | 16743.0 |

## 16 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 16 MHz TELEX |         |         | 16 MHz TELEX |         |         | 16 MHz TELEX |         |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX |
| 16111        | 16861.5 | 16743.5 | 16166        | 16889.0 | 16771.0 | 16221        | 16798.5 | 16798.5 |
| 16112        | 16862.0 | 16744.0 | 16167        | 16889.5 | 16771.5 | 16222        | 16799.0 | 16799.0 |
| 16113        | 16862.5 | 16744.5 | 16168        | 16890.0 | 16772.0 | 16223        | 16799.5 | 16799.5 |
| 16114        | 16863.0 | 16745.0 | 16169        | 16890.5 | 16772.5 | 16224        | 16800.0 | 16800.0 |
| 16115        | 16863.5 | 16745.5 | 16170        | 16891.0 | 16773.0 | 16225        | 16800.5 | 16800.5 |
| 16116        | 16864.0 | 16746.0 | 16171        | 16891.5 | 16773.5 | 16226        | 16801.0 | 16801.0 |
| 16117        | 16864.5 | 16746.5 | 16172        | 16892.0 | 16774.0 | 16227        | 16801.5 | 16801.5 |
| 16118        | 16865.0 | 16747.0 | 16173        | 16892.5 | 16774.5 | 16228        | 16802.0 | 16802.0 |
| 16119        | 16865.5 | 16747.5 | 16174        | 16893.0 | 16775.0 | 16229        | 16802.5 | 16802.5 |
| 16120        | 16866.0 | 16748.0 | 16175        | 16893.5 | 16775.5 | 16230        | 16803.0 | 16803.0 |
| 16121        | 16866.5 | 16748.5 | 16176        | 16894.0 | 16776.0 | 16231        | 16803.5 | 16803.5 |
| 16122        | 16867.0 | 16749.0 | 16177        | 16894.5 | 16776.5 | 16232        | 16804.0 | 16804.0 |
| 16123        | 16867.5 | 16749.5 | 16178        | 16895.0 | 16777.0 | 16233        | 16804.5 | 16804.5 |
| 16124        | 16868.0 | 16750.0 | 16179        | 16895.5 | 16777.5 | 16234        | 16805.0 | 16805.0 |
| 16125        | 16868.5 | 16750.5 | 16180        | 16896.0 | 16778.0 | 16235        | 16805.5 | 16805.5 |
| 16126        | 16869.0 | 16751.0 | 16181        | 16896.5 | 16778.5 | 16236        | 16806.0 | 16806.0 |
| 16127        | 16869.5 | 16751.5 | 16182        | 16897.0 | 16779.0 |              |         |         |
| 16128        | 16870.0 | 16752.0 | 16183        | 16897.5 | 16779.5 |              |         |         |
| 16129        | 16870.5 | 16752.5 | 16184        | 16898.0 | 16780.0 |              |         |         |
| 16130        | 16871.0 | 16753.0 | 16185        | 16898.5 | 16780.5 |              |         |         |
| 16131        | 16871.5 | 16753.5 | 16186        | 16899.0 | 16781.0 |              |         |         |
| 16132        | 16872.0 | 16754.0 | 16187        | 16899.5 | 16781.5 |              |         |         |
| 16133        | 16872.5 | 16754.5 | 16188        | 16900.0 | 16782.0 |              |         |         |
| 16134        | 16873.0 | 16755.0 | 16189        | 16900.5 | 16782.5 |              |         |         |
| 16135        | 16873.5 | 16755.5 | 16190        | 16901.0 | 16783.0 |              |         |         |
| 16136        | 16874.0 | 16756.0 | 16191        | 16901.5 | 16783.5 |              |         |         |
| 16137        | 16874.5 | 16756.5 | 16192        | 16902.0 | 16784.0 |              |         |         |
| 16138        | 16875.0 | 16757.0 | 16193        | 16902.5 | 16784.5 |              |         |         |
| 16139        | 16875.5 | 16757.5 | 16194        | 16785.0 | 16785.0 |              |         |         |
| 16140        | 16876.0 | 16758.0 | 16195        | 16785.5 | 16785.5 |              |         |         |
| 16141        | 16876.5 | 16758.5 | 16196        | 16786.0 | 16786.0 |              |         |         |
| 16142        | 16877.0 | 16759.0 | 16197        | 16786.5 | 16786.5 |              |         |         |
| 16143        | 16877.5 | 16759.5 | 16198        | 16787.0 | 16787.0 |              |         |         |
| 16144        | 16878.0 | 16760.0 | 16199        | 16787.5 | 16787.5 |              |         |         |
| 16145        | 16878.5 | 16760.5 | 16200        | 16788.0 | 16788.0 |              |         |         |
| 16146        | 16879.0 | 16761.0 | 16201        | 16788.5 | 16788.5 |              |         |         |
| 16147        | 16879.5 | 16761.5 | 16202        | 16789.0 | 16789.0 |              |         |         |
| 16148        | 16880.0 | 16762.0 | 16203        | 16789.5 | 16789.5 |              |         |         |
| 16149        | 16880.5 | 16762.5 | 16204        | 16790.0 | 16790.0 |              |         |         |
| 16150        | 16881.0 | 16763.0 | 16205        | 16790.5 | 16790.5 |              |         |         |
| 16151        | 16881.5 | 16763.5 | 16206        | 16791.0 | 16791.0 |              |         |         |
| 16152        | 16882.0 | 16764.0 | 16207        | 16791.5 | 16791.5 |              |         |         |
| 16153        | 16882.5 | 16764.5 | 16208        | 16792.0 | 16792.0 |              |         |         |
| 16154        | 16883.0 | 16765.0 | 16209        | 16792.5 | 16792.5 |              |         |         |
| 16155        | 16883.5 | 16765.5 | 16210        | 16793.0 | 16793.0 |              |         |         |
| 16156        | 16884.0 | 16766.0 | 16211        | 16793.5 | 16793.5 |              |         |         |
| 16157        | 16884.5 | 16766.5 | 16212        | 16794.0 | 16794.0 |              |         |         |
| 16158        | 16885.0 | 16767.0 | 16213        | 16794.5 | 16794.5 |              |         |         |
| 16159        | 16885.5 | 16767.5 | 16214        | 16795.0 | 16795.0 |              |         |         |
| 16160        | 16886.0 | 16768.0 | 16215        | 16795.5 | 16795.5 |              |         |         |
| 16161        | 16886.5 | 16768.5 | 16216        | 16796.0 | 16796.0 |              |         |         |
| 16162        | 16887.0 | 16769.0 | 16217        | 16796.5 | 16796.5 |              |         |         |
| 16163        | 16887.5 | 16769.5 | 16218        | 16797.0 | 16797.0 |              |         |         |
| 16164        | 16888.0 | 16770.0 | 16219        | 16797.5 | 16797.5 |              |         |         |
| 16165        | 16888.5 | 16770.5 | 16220        | 16798.0 | 16798.0 |              |         |         |

## 18/19 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 18/19 MHz TELEX |         |         | 18/19 MHz TELEX |         |         |
|-----------------|---------|---------|-----------------|---------|---------|
| CH NO.          | SHIP RX | SHIP TX | CH NO.          | SHIP RX | SHIP TX |
| 18001           | 19681.0 | 18870.5 | 18051           | 18895.5 | 18895.5 |
| 18002           | 19681.5 | 18871.0 | 18052           | 18896.0 | 18896.0 |
| 18003           | 19682.0 | 18871.5 | 18053           | 18896.5 | 18896.5 |
| 18004           | 19682.5 | 18872.0 | 18054           | 18897.0 | 18897.0 |
| 18005           | 19683.0 | 18872.5 | 18055           | 18897.5 | 18897.5 |
| 18006           | 19683.5 | 18873.0 | 18056           | 18898.0 | 18898.0 |
| 18007           | 19684.0 | 18873.5 | 18057           | 18898.5 | 18898.5 |
| 18008           | 19684.5 | 18874.0 | 18058           | 18899.0 | 18899.0 |
| 18009           | 19685.0 | 18874.5 | 18059           | 18899.5 | 18899.5 |
| 18010           | 19685.5 | 18875.0 |                 |         |         |
| 18011           | 19686.0 | 18875.5 |                 |         |         |
| 18012           | 19686.5 | 18876.0 |                 |         |         |
| 18013           | 19687.0 | 18876.5 |                 |         |         |
| 18014           | 19687.5 | 18877.0 |                 |         |         |
| 18015           | 19688.0 | 18877.5 |                 |         |         |
| 18016           | 19688.5 | 18878.0 |                 |         |         |
| 18017           | 19689.0 | 18878.5 |                 |         |         |
| 18018           | 19689.5 | 18879.0 |                 |         |         |
| 18019           | 19690.0 | 18879.5 |                 |         |         |
| 18020           | 19690.5 | 18880.0 |                 |         |         |
| 18021           | 19691.0 | 18880.5 |                 |         |         |
| 18022           | 19691.5 | 18881.0 |                 |         |         |
| 18023           | 19692.0 | 18881.5 |                 |         |         |
| 18024           | 19692.5 | 18882.0 |                 |         |         |
| 18025           | 19693.0 | 18882.5 |                 |         |         |
| 18026           | 19693.5 | 18883.0 |                 |         |         |
| 18027           | 19694.0 | 18883.5 |                 |         |         |
| 18028           | 19694.5 | 18884.0 |                 |         |         |
| 18029           | 19695.0 | 18884.5 |                 |         |         |
| 18030           | 19695.5 | 18885.0 |                 |         |         |
| 18031           | 19696.0 | 18885.5 |                 |         |         |
| 18032           | 19696.5 | 18886.0 |                 |         |         |
| 18033           | 19697.0 | 18886.5 |                 |         |         |
| 18034           | 19697.5 | 18887.0 |                 |         |         |
| 18035           | 19698.0 | 18887.5 |                 |         |         |
| 18036           | 19698.5 | 18888.0 |                 |         |         |
| 18037           | 19699.0 | 18888.5 |                 |         |         |
| 18038           | 19699.5 | 18889.0 |                 |         |         |
| 18039           | 19700.0 | 18889.5 |                 |         |         |
| 18040           | 19700.5 | 18890.0 |                 |         |         |
| 18041           | 19701.0 | 18890.5 |                 |         |         |
| 18042           | 19701.5 | 18891.0 |                 |         |         |
| 18043           | 19702.0 | 18891.5 |                 |         |         |
| 18044           | 19702.5 | 18892.0 |                 |         |         |
| 18045           | 19703.0 | 18892.5 |                 |         |         |
| 18046           | 18893.0 | 18893.0 |                 |         |         |
| 18047           | 18893.5 | 18893.5 |                 |         |         |
| 18048           | 18894.0 | 18894.0 |                 |         |         |
| 18049           | 18894.5 | 18894.5 |                 |         |         |
| 18050           | 18895.0 | 18895.0 |                 |         |         |

## 22 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 22 MHz TELEX |         |         | 22 MHz TELEX |         |         | 22 MHz TELEX |         |         |
|--------------|---------|---------|--------------|---------|---------|--------------|---------|---------|
| CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX | CH NO.       | SHIP RX | SHIP TX |
| 22001        | 22376.5 | 22284.5 | 22051        | 22401.5 | 22309.5 | 22101        | 22426.5 | 22334.5 |
| 22002        | 22377.0 | 22285.0 | 22052        | 22402.0 | 22310.0 | 22102        | 22427.0 | 22335.0 |
| 22003        | 22377.5 | 22285.5 | 22053        | 22402.5 | 22310.5 | 22103        | 22427.5 | 22335.5 |
| 22004        | 22378.0 | 22286.0 | 22054        | 22403.0 | 22311.0 | 22104        | 22428.0 | 22336.0 |
| 22005        | 22378.5 | 22286.5 | 22055        | 22403.5 | 22311.5 | 22105        | 22428.5 | 22336.5 |
| 22006        | 22379.0 | 22287.0 | 22056        | 22404.0 | 22312.0 | 22106        | 22429.0 | 22337.0 |
| 22007        | 22379.5 | 22287.5 | 22057        | 22404.5 | 22312.5 | 22107        | 22429.5 | 22337.5 |
| 22008        | 22380.0 | 22288.0 | 22058        | 22405.0 | 22313.0 | 22108        | 22430.0 | 22338.0 |
| 22009        | 22380.5 | 22288.5 | 22059        | 22405.5 | 22313.5 | 22109        | 22430.5 | 22338.5 |
| 22010        | 22381.0 | 22289.0 | 22060        | 22406.0 | 22314.0 | 22110        | 22431.0 | 22339.0 |
| 22011        | 22381.5 | 22289.5 | 22061        | 22406.5 | 22314.5 | 22111        | 22431.5 | 22339.5 |
| 22012        | 22382.0 | 22290.0 | 22062        | 22407.0 | 22315.0 | 22112        | 22432.0 | 22340.0 |
| 22013        | 22382.5 | 22290.5 | 22063        | 22407.5 | 22315.5 | 22113        | 22432.5 | 22340.5 |
| 22014        | 22383.0 | 22291.0 | 22064        | 22408.0 | 22316.0 | 22114        | 22433.0 | 22341.0 |
| 22015        | 22383.5 | 22291.5 | 22065        | 22408.5 | 22316.5 | 22115        | 22433.5 | 22341.5 |
| 22016        | 22384.0 | 22292.0 | 22066        | 22409.0 | 22317.0 | 22116        | 22434.0 | 22342.0 |
| 22017        | 22384.5 | 22292.5 | 22067        | 22409.5 | 22317.5 | 22117        | 22434.5 | 22342.5 |
| 22018        | 22385.0 | 22293.0 | 22068        | 22410.0 | 22318.0 | 22118        | 22435.0 | 22343.0 |
| 22019        | 22385.5 | 22293.5 | 22069        | 22410.5 | 22318.5 | 22119        | 22435.5 | 22343.5 |
| 22020        | 22386.0 | 22294.0 | 22070        | 22411.0 | 22319.0 | 22120        | 22436.0 | 22344.0 |
| 22021        | 22386.5 | 22294.5 | 22071        | 22411.5 | 22319.5 | 22121        | 22436.5 | 22344.5 |
| 22022        | 22387.0 | 22295.0 | 22072        | 22412.0 | 22320.0 | 22122        | 22437.0 | 22345.0 |
| 22023        | 22387.5 | 22295.5 | 22073        | 22412.5 | 22320.5 | 22123        | 22437.5 | 22345.5 |
| 22024        | 22388.0 | 22296.0 | 22074        | 22413.0 | 22321.0 | 22124        | 22438.0 | 22346.0 |
| 22025        | 22388.5 | 22296.5 | 22075        | 22413.5 | 22321.5 | 22125        | 22438.5 | 22346.5 |
| 22026        | 22389.0 | 22297.0 | 22076        | 22414.0 | 22322.0 | 22126        | 22439.0 | 22347.0 |
| 22027        | 22389.5 | 22297.5 | 22077        | 22414.5 | 22322.5 | 22127        | 22439.5 | 22347.5 |
| 22028        | 22390.0 | 22298.0 | 22078        | 22415.0 | 22323.0 | 22128        | 22440.0 | 22348.0 |
| 22029        | 22390.5 | 22298.5 | 22079        | 22415.5 | 22323.5 | 22129        | 22440.5 | 22348.5 |
| 22030        | 22391.0 | 22299.0 | 22080        | 22416.0 | 22324.0 | 22130        | 22441.0 | 22349.0 |
| 22031        | 22391.5 | 22299.5 | 22081        | 22416.5 | 22324.5 | 22131        | 22441.5 | 22349.5 |
| 22032        | 22392.0 | 22300.0 | 22082        | 22417.0 | 22325.0 | 22132        | 22442.0 | 22350.0 |
| 22033        | 22392.5 | 22300.5 | 22083        | 22417.5 | 22325.5 | 22133        | 22442.5 | 22350.5 |
| 22034        | 22393.0 | 22301.0 | 22084        | 22418.0 | 22326.0 | 22134        | 22443.0 | 22351.0 |
| 22035        | 22393.5 | 22301.5 | 22085        | 22418.5 | 22326.5 | 22135        | 22443.5 | 22351.5 |
| 22036        | 22394.0 | 22302.0 | 22086        | 22419.0 | 22327.0 | 22136        | 22352.0 | 22352.0 |
| 22037        | 22394.5 | 22302.5 | 22087        | 22419.5 | 22327.5 | 22137        | 22352.5 | 22352.5 |
| 22038        | 22395.0 | 22303.0 | 22088        | 22420.0 | 22328.0 | 22138        | 22353.0 | 22353.0 |
| 22039        | 22395.5 | 22303.5 | 22089        | 22420.5 | 22328.5 | 22139        | 22353.5 | 22353.5 |
| 22040        | 22396.0 | 22304.0 | 22090        | 22421.0 | 22329.0 | 22140        | 22354.0 | 22354.0 |
| 22041        | 22396.5 | 22304.5 | 22091        | 22421.5 | 22329.5 | 22141        | 22354.5 | 22354.5 |
| 22042        | 22397.0 | 22305.0 | 22092        | 22422.0 | 22330.0 | 22142        | 22355.0 | 22355.0 |
| 22043        | 22397.5 | 22305.5 | 22093        | 22422.5 | 22330.5 | 22143        | 22355.5 | 22355.5 |
| 22044        | 22398.0 | 22306.0 | 22094        | 22423.0 | 22331.0 | 22144        | 22356.0 | 22356.0 |
| 22045        | 22398.5 | 22306.5 | 22095        | 22423.5 | 22331.5 | 22145        | 22356.5 | 22356.5 |
| 22046        | 22399.0 | 22307.0 | 22096        | 22424.0 | 22332.0 | 22146        | 22357.0 | 22357.0 |
| 22047        | 22399.5 | 22307.5 | 22097        | 22424.5 | 22332.5 | 22147        | 22357.5 | 22357.5 |
| 22048        | 22400.0 | 22308.0 | 22098        | 22425.0 | 22333.0 | 22148        | 22358.0 | 22358.0 |
| 22049        | 22400.5 | 22308.5 | 22099        | 22425.5 | 22333.5 | 22149        | 22358.5 | 22358.5 |
| 22050        | 22401.0 | 22309.0 | 22100        | 22426.0 | 22334.0 | 22150        | 22359.0 | 22359.0 |

## 22, 25/26 MHz BAND ITU NBDP (Telex) FREQUENCY TABLE

The following frequencies are factory programmed.

| 22 MHz TELEX |         |         | 25/26 MHz TELEX |         |         | 25/26 MHz TELEX |         |         |
|--------------|---------|---------|-----------------|---------|---------|-----------------|---------|---------|
| CH NO.       | SHIP RX | SHIP TX | CH NO.          | SHIP RX | SHIP TX | CH NO.          | SHIP RX | SHIP TX |
| 22151        | 22359.5 | 22359.5 | 25001           | 26101.0 | 25173.0 | 25051           | 25198.0 | 25198.0 |
| 22152        | 22360.0 | 22360.0 | 25002           | 26101.5 | 25173.5 | 25052           | 25198.5 | 25198.5 |
| 22153        | 22360.5 | 22360.5 | 25003           | 26102.0 | 25174.0 | 25053           | 25199.0 | 25199.0 |
| 22154        | 22361.0 | 22361.0 | 25004           | 26102.5 | 25174.5 | 25054           | 25199.5 | 25199.5 |
| 22155        | 22361.5 | 22361.5 | 25005           | 26103.0 | 25175.0 | 25055           | 25200.0 | 25200.0 |
| 22156        | 22362.0 | 22362.0 | 25006           | 26103.5 | 25175.5 | 25056           | 25200.5 | 25200.5 |
| 22157        | 22362.5 | 22362.5 | 25007           | 26104.0 | 25176.0 | 25057           | 25201.0 | 25201.0 |
| 22158        | 22363.0 | 22363.0 | 25008           | 26104.5 | 25176.5 | 25058           | 25201.5 | 25201.5 |
| 22159        | 22363.5 | 22363.5 | 25009           | 26105.0 | 25177.0 | 25059           | 25202.0 | 25202.0 |
| 22160        | 22364.0 | 22364.0 | 25010           | 26105.5 | 25177.5 | 25060           | 25202.5 | 25202.5 |
| 22161        | 22364.5 | 22364.5 | 25011           | 26106.0 | 25178.0 | 25061           | 25203.0 | 25203.0 |
| 22162        | 22365.0 | 22365.0 | 25012           | 26106.5 | 25178.5 | 25062           | 25203.5 | 25203.5 |
| 22163        | 22365.5 | 22365.5 | 25013           | 26107.0 | 25179.0 | 25063           | 25204.0 | 25204.0 |
| 22164        | 22366.0 | 22366.0 | 25014           | 26107.5 | 25179.5 | 25064           | 25204.5 | 25204.5 |
| 22165        | 22366.5 | 22366.5 | 25015           | 26108.0 | 25180.0 | 25065           | 25205.0 | 25205.0 |
| 22166        | 22367.0 | 22367.0 | 25016           | 26108.5 | 25180.5 | 25066           | 25205.5 | 25205.5 |
| 22167        | 22367.5 | 22367.5 | 25017           | 26109.0 | 25181.0 | 25067           | 25206.0 | 25206.0 |
| 22168        | 22368.0 | 22368.0 | 25018           | 26109.5 | 25181.5 | 25068           | 25206.5 | 25206.5 |
| 22169        | 22368.5 | 22368.5 | 25019           | 26110.0 | 25182.0 | 25069           | 25207.0 | 25207.0 |
| 22170        | 22369.0 | 22369.0 | 25020           | 26110.5 | 25182.5 | 25070           | 25207.5 | 25207.5 |
| 22171        | 22369.5 | 22369.5 | 25021           | 26111.0 | 25183.0 | 25071           | 25208.0 | 25208.0 |
| 22172        | 22370.0 | 22370.0 | 25022           | 26111.5 | 25183.5 | 25072           | 26121.0 | 25208.5 |
| 22173        | 22370.5 | 22370.5 | 25023           | 26112.0 | 25184.0 | 25073           | 26121.5 | 25209.0 |
| 22174        | 22371.0 | 22371.0 | 25024           | 26112.5 | 25184.5 | 25074           | 26122.0 | 25209.5 |
| 22175        | 22371.5 | 22371.5 | 25025           | 26113.0 | 25185.0 |                 |         |         |
| 22176        | 22372.0 | 22372.0 | 25026           | 26113.5 | 25185.5 |                 |         |         |
| 22177        | 22372.5 | 22372.5 | 25027           | 26114.0 | 25186.0 |                 |         |         |
| 22178        | 22373.0 | 22373.0 | 25028           | 26114.5 | 25186.5 |                 |         |         |
| 22179        | 22373.5 | 22373.5 | 25029           | 26115.0 | 25187.0 |                 |         |         |
| 22180        | 22374.0 | 22374.0 | 25030           | 26115.5 | 25187.5 |                 |         |         |
| 22181        | 22374.5 | 22374.5 | 25031           | 26116.0 | 25188.0 |                 |         |         |
| 22182        | 22375.0 | 22375.0 | 25032           | 26116.5 | 25188.5 |                 |         |         |
| 22183        | 22375.5 | 22375.5 | 25033           | 26117.0 | 25189.0 |                 |         |         |
|              |         |         | 25034           | 26117.5 | 25189.5 |                 |         |         |
|              |         |         | 25035           | 26118.0 | 25190.0 |                 |         |         |
|              |         |         | 25036           | 26118.5 | 25190.5 |                 |         |         |
|              |         |         | 25037           | 26119.0 | 25191.0 |                 |         |         |
|              |         |         | 25038           | 26119.5 | 25191.5 |                 |         |         |
|              |         |         | 25039           | 26120.0 | 25192.0 |                 |         |         |
|              |         |         | 25040           | 26120.5 | 25192.5 |                 |         |         |
|              |         |         | 25041           | 25193.0 | 25193.0 |                 |         |         |
|              |         |         | 25042           | 25193.5 | 25193.5 |                 |         |         |
|              |         |         | 25043           | 25194.0 | 25194.0 |                 |         |         |
|              |         |         | 25044           | 25194.5 | 25194.5 |                 |         |         |
|              |         |         | 25045           | 25195.0 | 25195.0 |                 |         |         |
|              |         |         | 25046           | 25195.5 | 25195.5 |                 |         |         |
|              |         |         | 25047           | 25196.0 | 25196.0 |                 |         |         |
|              |         |         | 25048           | 25196.5 | 25196.5 |                 |         |         |
|              |         |         | 25049           | 25197.0 | 25197.0 |                 |         |         |
|              |         |         | 25050           | 25197.5 | 25197.5 |                 |         |         |

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