EX-2144  FIELD PROGRAMMING SOFTWARE
                        For the IC-M710RT

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        **                                              **
        **  This program is designed to perform cloning for the  **
        **  IC-M710RT MF/HF MARINE TRANSCEIVER only.     **
        **  Before using the program, make a backup copy of the  **
        **  original disk.                               **
        **                                              **


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--------------------------------------------------------------------------------
1. PROGRAM START UP AND SHUT DOWN
--------------------------------------------------------------------------------

1) Boot up DOS. (Microsoft(R) Windows(R) 3.1/95 are not supported.)
2) Insert the EX-2144 backup disk.
   Please quit any applications which are using the RS-232C port(s).
3) Type the start command:
        **                                              **
        **   EX2144 /(option) /(version) [Enter]    **
        **                                              **
     1. #01, #02, #03, #06, #11, #12 can be used as "(version)".
         #01: U.S.A. General version
         #02: U.S.A. Marine version
         #03: U.S.A. GMDSS version
         #06: KOR version
         #11: Europe Marine version
         #12: Europe GMDSS version
     2. When the version is specified, the corresponding
        default settings are read.

3. When no version is specified, data is read from the
           710RT#01.INI (for U.S.A. General-1 version) file.
        4. When "expert" is used as "(option)," several settings are available
           for programming additional items.
        5. When a file name is used instead of "/(version)," the specified file
           is loaded at start up.

4) The COMMON screen appears.
        **                                                              **
        **   The loaded file name appears in the bottom left corner of   **
        **   the screen.  "NONAME.ICF" appears when no data file is      **
        **   loaded.                                                      **
        **                                                              **

5) When programming is completed:
   push [Esc] (indicates the TOP menu)
      then [F] (selects file SUB menu)
      then [S] (saves the set data; if not necessary skip this operation.)
      then [Q] (quits the program)

-------------------------------------------------------------------------------
2. OPERATION
-------------------------------------------------------------------------------

The EX-2144 has a TOP menu and 6 screens for programming.  All screens or
operations can be accessed from the TOP menu.  A SUB menu appears under the
TOP menu when an item in the top menu is selected with an [Arrow] key and
[Enter].  The TOP menu appears when the [Esc] key is pushed.

1) After the program starts up, push the [Esc] key to indicate the top menu.

2) Push a highlighted character; or an [Arrow] key and the [Enter] key to
   select the desired item.
     - A SUB menu appears under the selected item.

3) Push a highlighted character; or an [Arrow] key and the [Enter] key to
   select the desired screen.
     - The desired screen appears.

4) Select the desired item with an [Arrow] key, then push [Space] or the
   digit keys to set the item.
     - See descriptions of each screen for details.

--------------------------------------------------------------------------------
3. SCREEN DESCRIPTIONS
--------------------------------------------------------------------------------


////// COMMON SCREEN //////

The COMMON screen automatically appears after starting up this program.
This screen allows you to set conditions common to all channels.

```
+[Common]---------+-----------++-----------------+-----------+
| ITEM            |           || ITEM            |           |
+-----------------+-----------++-----------------+-----------+
| Tx meter        | RF        || Indication type | COMMENT   |
| Tx power select | low,mid,hi || Narrow filter   | OFF       |
| Mode sel on 2182| ENABLE    || FSK shift [Hz]  | 170       |
| Max user ch No. |       160 || FSK polarity    | NORMAL    |
| ITU FSK ch      | USABLE    || Cw break-in     | FULL      |
| ITU direction   | NORMAL    || ACC mod. input  | ACC SEND  |
| Antenna tuner   | AT-130/E  || Mic audio input | PTT       |
| Auto tuning use | OFF       || Mic Key         | DISABLE   |
| Auto tuning type| PTT       || Mic Key function| NONE      |
| ALM timer [sec] |        50 || NMEA ID         |        03 |
| 2182 sel at ALM | AUTOMATIC || NMEA input jack | RS-232C   |
| Scan type       | CHANNEL   |+-----------------+-----------+
| Scan ref.[msec] |       130 || Cross ch oper.  | DISABLE   |
| Scan speed[step]|         4 || ITU ch use      | ENABLE    |
| Busy timer[sec] |         5 || Freq. program   | RX ONLY   |
+ ----------------+-----------++-----------------+-----------+
```


SCREEN SELECTION

1) Push the [Esc] key once or twice to indicate the TOP menu.

2) Select "Screen" with the [S] key, or an [Arrow] and [Enter] keys.
     - A sub menu appears under the TOP menu.

3) Select "Common" with the [C] key, or an [Arrow] and [Enter] keys.
     - The COMMON screen appears.

TX METER (Tx meter)
    The bar-indicator on the display can be used as an RF meter or antenna
    current meter.  European regulations require an antenna current meter.
    For the antenna current meter to function properly, the AT-130E HF
    AUTOMATIC ANTENNA TUNER must be connected to the IC-M710RT.
         Selectable value:    RF ...... RF meter
                              ANT C ... Antenna current meter
         Selection method:    Push [Space] key to toggle the selection.

TX POWER SELECTION (Tx power select)
    The IC-M710RT has 3 output powers available.  However, some countries do not
    allow low power.  In such cases output power should be restricted using
    this item.
            Selectable value:      low,mid,hi .... 20, 60, 150 W
                                   mid,high ...... 60, 150 W
                                   high .......... 150 W only
                                   (GMDSS version is 125W only)
            Selection method:    Push [Space] or [Backspace] for selection.


MODE SELECTION ON THE EMERGENCY CHANNEL (Mode sel on 2182)
    When pushing the [2182KHz] switch, the 2182 kHz emergency frequency can be
    selected instantly as channel 0.  When selecting the emergency channel,
    the operating mode selection can be inhibited, if desired.
            Selectable value:      ENABLE or DISABLE
            Selection method:    Push [Space] to toggle the selection.


MAXIMUM USER CHANNEL NUMBER (Max user ch No.)
    The maximum number of user channels for the IC-M710RT is 160.   However,
    this number can be reduced for easier operation.
            Selectable value:    1 to 160
            Selection method:    Enter the desired number, then push [Enter],
                                 or push [Space] to select 160.


ITU FSK CHANNEL (ITU FSK ch)
    ITU FSK channels appear as a group between the ITU 25 MHz band and user
    channels.  This FSK channel group can be hidden for voice communication use
    only.  This setting can be modified in the transceiver's set mode.
            Selectable value:      USABLE or INHIBIT
            Selection method:    Push [Space] to toggle the selection.

ITU DIRECTION (ITU direction)
    The IC-M710RT is designed for ship-to-shore operation when ITU channels are
    in use.  When using the transceiver as a coastal station, the duplex
    direction must be reversed for shore-to-ship operation.
            Selectable value:      NORMAL ..... For vessel use
                                   REVERSE .... For coastal use
            Selection method:    Push [Space] to toggle the selection.


ANTENNA TUNER SELECTION (Antenna tuner)
    Selects the connected antenna tuner name.
            Selectable tuner:    AT-130/E, AT-120 or AH-3
            Selection method:    Push [Space] to toggle the selection.


AUTOMATIC TUNING CONDITION (Auto tuning use)
    When the optional AT-130 or AT-130E AUTOMATIC ANTENNA TUNER is connected,
    tuning can be started automatically without the [TUNE] switch for instant
    operation.  This setting can be modified in the transceiver's set mode.
            Selectable value:    ON or OFF
            Selection method:    Push [Space] or [Backspace] for selection.


TUNING START METHOD (Auto tuning type)
    When the automatic tuning condition is set to ON, the start trigger is
    selected in this item.  "PTT" tunes the antenna when pushing the PTT on the
    new frequency.  "FREQUENCY" tunes the antenna 2.5 sec. after a new

frequency is selected.
```
        Selectable value:    PTT, FREQUENCY
        Selection method:    Push [Space] to toggle the selection.
```


ALARM TIMER (ALM timer [sec])
    During on distress a 2-tone emergency signal should be transmitted for at
    least 30 sec. before the emergency call.  The transceiver has a timer which
    automatically stops the 2-tone alarm after a specified time.  This item
    sets the timer period.
```
        Selectable value:    1 to 99 (sec.)
        Selection method:    Enter the desired period, then push [Enter]
                             or push [Space] to select "50".
```

AUTOMATIC 2182 kHz SELECTION AT ALARM TRANSMISSION (2182 sel at ALM)
    To transmit the 2-tone alarm signal, 2182 kHz must be selected in advance.
    However, automatic 2182 kHz selection is available when pushing and
    holding [ALARM] and [TX FREQ].
```
        Selectable value:    MANUAL ...... 2182 kHz must be selected manually
                             AUTOMATIC ... 2182 kHz is selected automatically
        Selection method:    Push [Space] to toggle the selection.
        ** NOTE: When selecting "AUTOMATIC" in this item, testing alarm **
        **       transmission on a different frequency is not possible. **
```


SCAN TYPE (Scan type)
    This item selects one of the scan functions.
    Channel scan and channel resume scan search the 5 channels around the
    selected channel when a user channel is selected or search all ITU channels
    in the band when an ITU channel is selected.
    Channel scan is canceled when transmitting and channel resume scan pauses
    for 30 sec. when transmitting.
    Programmed scan searches for signals over the frequency range at high
    speed while squelch is closed and at low speed while squelch is open. The
    frequency range of programmed scan is between user channels maximum number
    and maximum number minus 1 (e.g. 159 and 160).
```
        Selectable value:    CHANNEL, CH RESUME, PROGRAM, or OFF(scan inhibit)
        Selection method:    Push [Space] or [Backspace] for selection.
          **                                                         **
          ** NOTE: When the "Freq. program" item is selected as "INHIBIT", **
          **       "PROGRAM" does not appear as selectable values.    **
          **                                                         **
```


SCAN SPEED REFERENCE [msec./ch] (Scan ref.[msec])
    Scan speed can be selected in the next item and in the transceiver's set
    mode.  The reference value of the selection can be set in this item.  The
    reference value is the time paused on a channel and is used for the fastest
    scan speed.  This selection AFFECTS CHANNEL SCAN ONLY.
```
        Selectable value:    100 to 200 in 10 msec increments.
                             (100 is the fastest speed)
        Selection method:    Enter the desired period, then push [Enter]
                             or push [space] to select "130".
```

SCAN SPEED (Scan speed[step])
  Scan speed is selectable from one of 10 steps.  Scan speed "1" is the
  fastest speed.  This setting can be modified in the transceiver's set mode.

```
+----------------------+--------+------+------+------+--------+---------+
|Selection [step]      |   1    |  2   |  3   |  4   | 5....9 |   10    |
+----------------------+--------+------+------+------+--------+---------+
|Channel scan [msec/ch]| 1 x ref|2 x ref|4 X ref|8 x ref| ...... |512 x ref|
+----------------------+--------+------+------+------+--------+---------+
                  (ref stands for the value of "scan speed reference"
                   on the above item.)
+--------------------------+---+---+---+---+---+---+---+---+---+---+
|Selection [step]          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10|
+--------------------------+---+---+---+---+---+---+---+---+---+---+
|Channel resume scan [sec/ch]| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10|
+--------------------------+---+---+---+---+---+---+---+---+---+---+
|Programmed scan* [msec/ch] | 10| 20| 40| 60| 90|140|210|320|480|720|
+--------------------------+---+---+---+---+---+---+---+---+---+---+
```
    *value shows while squelch open; fixed 10 msec/ch while squelch closed.

        Selectable value:    1 to 10
        Selection method:    Enter the desired number, then push [Enter].
                             or push [Space] to select "4".


  BUSY TIMER (Busy timer[sec])
     When 2 or more controllers(such as the PC control software) are connected
     to the transceiver, only one controller can be operated at a time.
     The busy timer sets the inhibit time after operation of one controller
     before operation on another controller can begin.
        Selectable value:    0 to 180
        Selection method:    Enter the desired number, then push [Enter].
                             or push [Space] to select "5".


INDICATION TYPE (Indication type)
    The display indication type can be toggled with the [CH/FREQ] key.  This
    item sets which display types are toggled.  This setting can be modified in
    the transceiver's set mode (except "FREQ ONLY" setting).
        Selectable value:
            COMMENT ...... Channel number/comment and Rx/Tx frequencies
            FREQ ONLY .... Channel number/frequency and Rx/Tx frequencies
                           (Comment cannot be selected on the transceiver's
                           set mode.)
            FREQUENCY .... Channel number/frequency and Rx/Tx frequencies
                           (Comment can be selected on the transceiver's set
                           mode.)
        Selection method:    Push [Space] or [Backspace] for selection.
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NARROW FILTER (Narrow filter)
    This item selects the passband width when selecting A1A(CW), FSK or J2B
    mode.  These narrow widths are available for the GMDSS versions and an
    optional filter is required for the Marine/General versions.
    This setting can be modified in the transceiver's set mode.
        Selectable value:    OFF ..... 2.3 kHz/-6 dB
                             ON ...... 350 Hz/-6 dB (GMDSS versions)
                                       500 Hz/-6 dB (optional for
                                                     Marine/General versions)
        Selection method:    Push the [Space] key to toggle the selection.
         **                                                          **
         ** NOTE: When "ON" is set without an optional filter        **
         **       installation for the General/Marine versions,      **
         **       the transceiver's transmit/receive circuitry do    **
         **       not function.                                      **
         **                                                          **


FSK SHIFT FREQUENCY (FSK shift [Hz])

For FSK operation, two audio frequencies, mark and space, are used to send
data.  The shift frequency is the difference between these frequencies.
This setting can be modified in the transceiver's set mode.
          Selectable value:    170, 425, 850
          Selection method:    Push [Space] or [Backspace] for selection.
                               or, enter a number above via the keyboard, then
                               push [Enter].


FSK POLARITY (FSK polarity)
    Normal and reverse polarity are available for FSK operation.  This setting
    can be modified in the transceiver's set mode.
          Selectable value:    NORMAL ...... key open: mark,   key close: space
                               REVERSE ..... key open: space,  key close: mark
          Selection method:    Push the [Space] key to toggle the selection.


CW BREAK-IN (CW break-in)
    The CW break-in function (in A1A mode) toggles transmit and receive with CW
    keying.  Full break-in allows you to receive signals between transmitted
    keying pulses during CW transmission.  Semi break-in allows you to mute
    receiving until keying stops with some delay time.  This setting can be
    modified in the transceiver's set mode.
          Selectable value:    FULL, SEMI, OFF
          Selection method:    Push [Space] or [Backspace] for selection.

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ACC MODULATION INPUT ACCEPT (ACC mod. input)
    Modulation input from the ACC(1) socket, pin 4, is usually acceptable only
    when the "SEND" line (ACC(1) pin 3) is grounded.  However, this item can be
    used to allow modulation input when the PTT switch is pushed.
          Selectable value:    ACC SEND ...... at ACC SEND only
                               PTT/ACC ....... at both ACC SEND and PTT
          Selection method:    Push the [Space] key to toggle the selection.


MICROPHONE AUDIO INPUT ACCEPT (Mic audio input)
    Microphone audio is usually acceptable only when the PTT switch is pushed
    and held.  However, this item can be used to accept audio when the "SEND"
    line (ACC(1) pin 3) is grounded.
          Selectable value:    PTT ........... at PTT switch only
                               PTT/ACC ...... at Both ACC SEND and PTT
          Selection method:    Push the [Space] key to toggle the selection.


MICROPHONE KEY (Mic key)
    When using the attached HM-120 SMART MICROPHONE, you can use the channel
    [UP/ DOWN] key and the programmable key on the microphone.
          Selectable value:    DISABLE........No function available
                               ENABLE.........[UP/DOWN] and programmable key
                                              function available
          Selection method:    Push the [Space] key to toggle the selection.


MICROPHONE KEY FUNCTION (Mic key function)
    One of following functions can be assigned the microphone programmable key.
          Function:   NONE, MODE, SQL, AGC, NB, TUNE
          Selection method:    Push the [Space] key to toggle the selection.


ID NUMBER FOR REMOTE CONTROL (NMEA ID)
    When connecting an external controller such as a personal computer, 2-digit
    ID codes are required to access the transceiver.  The IC-M710RT adopts
    NMEA0183 format and uses a "proprietary sentence" for remote control.  This
    setting can be modified in the transceiver's set mode.

```
          Selectable value:    01 to 99
          Selection method:    Push digit keys, then [Enter] for ID code entry
                               or push [Space] to select "03".
       **                                                            **
       ** NOTE: A different NMEA ID code must be used for remote      **
       **       control.  For example, avoid "90" which is the       **
       **       default setting of the GM-110DSC DSC TERMINAL         **
       **       UNIT's ID code.                                       **
       **                                                            **
                              - 10 -
NMEA CONTROL DATA INPUT JACK (NMEA input jack)
   Remote control signals can usually be input via the [RS-232C] socket only.
   However, this item can be used to also set the [CLONE] jack as acceptable
   in parallel with the [RS-232C] socket.
   This setting can be modified in the transceiver's set mode.
          Selectable value:    RS-232C,  CLONE
          Selection method:    Push [Space] to toggle the selection.



CROSS CHANNEL OPERATION (Cross ch oper.)
   ("/EXPERT" is necessary in the start up command to edit this item)
   Cross channel operation is available for European countries to operate
   different channels for receiving and transmitting.  The U.S.A. versions
   must be set to "DISABLE" in this setting.
          Selectable value:    DISABLE,   ENABLE
          Selection method:    Push [Space] to toggle the selection.



ITU CHANNEL USE (ITU ch use)
   ("/EXPERT" is necessary in the start up command to edit this item)
   The IC-M710RT has all ITU channels.  However, customers of some versions
   such as the General version, may not need the ITU channels.  In such cases,
   the ITU channels can be hidden for easier operation.
          Selectable value:    DISABLE,   ENABLE
          Selection method:    Push [Space] to toggle the selection.



FREQUENCY PROGRAMMING CAPABILITY (Freq. program)
   ("/EXPERT" is necessary in the start up command to edit this item)
   Both Rx and Tx frequencies can be programmed via the IC-M710RT's keypad.
   However, this capability can be restricted to suit regulations, operation
   methods, etc.
          Selectable value:    RX/TX,  RX ONLY,  INHIBIT
          Selection method:    Push [Space] or [Backspace] for selection.
       **                                                            **
       **  NOTE: If "Scan type" is selected as "PROGRAM" and this item **
       **        sets to "INHIBIT", the scan type becomes "CHANNEL"    **
       **        automatically.                                        **
       **                                                            **
```

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////// USER CHANNEL SCREEN //////

The USER CH screen allows you to set all user channel and [2182KHz] emergency
channel contents.  These contents can be overwritten from the transceiver's
front panel (except ch 0) when the "Freq. program" item in the COMMON screen
is set as "RX/TX" (or "RX ONLY).

```
+[USER ch]-------+-----------+------+---------+
|CH  | Rx FREQ.  | Tx FREQ.  | MODE | COMMENT |
```

```
| No.|      [kHz] |      [kHz] |       |           |
+----+-----------+-----------+------+---------+
|  0 |    2182.0 |    2182.0 | H3E  | EMERGEN |
|  1 |    5000.0 |           | H3E  | WWV     |
|  2 |   10000.0 |           | H3E  | WWV     |
|  3 |   15000.0 |           | H3E  | WWV     |
|  4 |    2182.0 |    2182.0 | H3E  | EMERGEN |
|  5 |    4125.0 |    4125.0 | J3E  | DISTRES |
|  6 |    6215.0 |    6125.0 | J3E  | DISTRES |
|  7 |    8291.0 |    8291.0 | J3E  | DISTRES |
|  8 |   12290.0 |   12290.0 | J3E  | DISTRES |
|  9 |   16420.0 |   16420.0 | J3E  | DISTRES |
| 10 |    2450.0 |    2003.0 | J3E  | KMI     |
| 11 |    2506.0 |    2406.0 | J3E  | KMI     |
| 12 |    4357.0 |    4065.0 | J3E  | KMI     |
| 13 |    4402.0 |    4110.0 | J3E  | KMI     |
~    ~           ~           ~      ~           ~
~    ~           ~           ~      ~           ~
|160 |           |           |      |           |
+----+-----------+-----------+---------------+
```

SCREEN SELECTION

1) Push the [Esc] key once or twice to indicate the TOP menu.

2) Select "Screen" with the [S] key, or an [Arrow] and [Enter] keys.
   - A sub menu appears under the TOP menu.

3) Select "User" with the [U] key, or an [Arrow] and [Enter] keys.
   - The USER CH screen appears.

RX FREQ./TX FREQ.
The programmed frequencies are used when user channels are selected.

1) Select the desired channel in the "Rx FREQ." or "Tx FREQ." column with a
   [PageUp], [PageDown] or [Arrow] key.

2) Enter the desired frequency in kHz (incl. 1 decimal place),
   then push [Enter]; or,
   push [Space] then [Enter] to set the channel as a blank channel.
   - The acceptable frequency range is determined by the setting in the FREQ
     RANGE screen.
   - Blank setting on the Rx freq. erases mode and comment simultaneously.
     Blank setting on the Tx freq. produces the transmit inhibit channel.
   **                                                                    **
   **   NOTE: If "?" appears at the end of the frequency, (1) the        **
   **         acceptable frequency range has been changed (decreased)    **
   **         in the FREQ RANGE  screen; or (2) the usable mode is       **
   **         restricted in the MODE screen.  Check both screens,        **
   **         otherwise cloning will not be successful.                  **
   **                                                                    **

MODE
Programmed modes are used when user channels are selected.  This column shows
the same contents as the display indication, such as J3E or USB.  The usable
mode and mode indication are set in the MODE screen.

1) Select the desired channel in the "MODE" column with a [PageUp], [PageDown]
   or [Arrow] key.

2) Push [Space] or [Backspace] to select the desired operating mode.
   Or, enter the desired mode via the keyboard directly.
   ** The usable modes are determined by the setting in the MODE screen.


COMMENT
The IC-M710RT shows channel names with up to 7 characters when channel
indication is selected, to conveniently display station names, operating
purposes, etc.  Check that the "Indication type" in the COMMON screen is set
to "COMMENT" to indicate memory names.

1) Select the desired channel in the "NAME" column with a [PageUp], [PageDown]
   or [Arrow] key.

2) Enter the desired channel name via the keyboard.
   - Acceptable characters: 0-9, A-Z, ' ( ) * + - < = > @
   - Capital letters only although small letters can be input.
   - To delete the name, push [Space].
////// ITU SIMP CH SCREEN //////

The ITU SIMP CH screen allows you to set all ITU simplex channel contents.
These contents can be overwritten from the transceiver's front panel when the
"Freq. program" item in the COMMON screen is set to "RX/TX".


```
+[ITUsimp ch]------+------+---------+
| CH   | FREQ.     | MODE | COMMENT |
| No.  |    [kHz]  |      |         |
+------+-----------+------+---------+
| 4-1  |  4125.0   | J3E  | 4A LTD  |
| 4-2  |  4146.0   | J3E  | 4B LTD  |
| 4-3  |  4149.0   | J3E  | 4C LTD  |
| 4-4  |  4366.0   | J3E  | ALASKA  |
| 4-5  |  4369.0   | J3E  | ALASKA  |
| 4-6  |  4396.0   | J3E  | ALASKA  |
| 4-7  |  4402.0   | J3E  | ALASKA  |
| 4-8  |  4420.0   | J3E  | ALASKA  |
| 4-9  |  4423.0   | J3E  | ALASKA  |
+------+-----------+------+---------+
| 6-1  |  6224.0   | J3E  | 6A LTD  |
| 6-2  |  6227.0   | J3E  | 6B LTD  |
~      ~           ~      ~         ~
~      ~           ~      ~         ~
| 25-8 |           |      |         |
| 25-9 |           |      |         |
+------+-----------+------+---------+
```


SCREEN SELECTION

1) Push the [Esc] key once or twice to indicate the TOP menu.

2) Select "Screen" with the [S] key, or an [Arrow] and [Enter] keys.
   - A sub menu appears under the TOP menu.

3) Select "ITU simp" with the [I] key, or an [Arrow] and [Enter] keys.
   - The ITU SIMP CH screen appears.

FREQ. [kHz]
The programmed frequencies are used when an ITU simplex channel is selected.

1) Select the desired channel in the "FREQ." column with a [PageUp],
   [PageDown] or [Arrow] key.

2) Enter the desired frequency in kHz (incl. 1 decimal place),
   then push [Enter]; or,
   push [Space] then [Enter] to set the channel as a blank channel.
   -  The acceptable frequency range is determined by the setting in the FREQ
      RANGE screen.

```
   **                                                              **
   **  NOTE: If "?" appears at the end of the frequency, (1) the   **
   **        acceptable frequency range has been changed (decreased) **
   **        in the FREQ RANGE screen; or (2) the usable mode is    **
   **        restricted in the MODE screen.  Check both screens,    **
   **        otherwise cloning will not be successful.              **
   **                                                              **
```

MODE
The programmed mode appears when ITU simplex channels are selected.  This
column shows the same contents as the display indication, such as J3E or USB.
The usable mode and mode indication are set in the MODE screen.

1) Select the desired channel in the "MODE" column with a [PageUp], [PageDown]
   or [Arrow] key.

2) Push [Space] or [Backspace] to select the desired operating mode.
   Or, enter the desired mode via the keyboard directly.
   ** The usable modes are determined by the setting in the MODE screen.

COMMENT
The IC-M710RT shows channel names with up to 7 characters when channel
indication is selected, to conveniently display station names, operating
purposes, etc.  Check that the "Indication type" in the COMMON screen is set
to "COMMENT" to indicate memory names.

1) Select the desired channel in the "NAME" column with a [PageUp], [PageDown]
   or [Arrow] key.

2) Enter the desired channel name via the keyboard.
   - Acceptable characters: 0-9, A-Z, ' ( ) * + - < = > @
   - Capital letters only although small letters can be input.
   - To delete the name, push [Space].

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////// FREQ RANGE SCREEN //////

The FREQ RANGE screen allows you to change (restrict) the frequency coverage.
The receiver is a general coverage receiver, therefore only one range is
available.  The transmitter frequency range is separated by 11 to fit the
allowed range.  In addition, the frequency ranges for the ITU simplex channels
are also available for operating convenience.

```
   **                                                              **
   ** NOTE: The FREQ RANGE screen can be selected without any special **
   **       operation.  However, setting is possible only when the   **
   **       "expert" command is used during start up.                **
   **                                                              **
```

```
+[Freq. range]--------+----------++---------+----------+----------+
|  ITEM   | lower    | higher   ||  ITEM   | lower    | higher   |
|         | edge[kHz]| edge[kHz]||         | edge[kHz]| edge[kHz]|
+---------+----------+----------++---------+----------+----------+
```

```
|   Rx    |     30.000 | 29999.900 || Tx  1st |   1600.000 |   1999.999 |
+---------+-----------+-----------+| Tx  2nd |   2000.000 |   2999.999 |
+---------+-----------+-----------+| Tx  3rd |   4000.000 |   4999.999 |
| ITU  4M |  4000.000 |  4999.999 || Tx  4th |   6000.000 |   6999.999 |
| ITU  6M |  6000.000 |  6999.999 || Tx  5th |   8000.000 |   8999.999 |
| ITU  8M |  8000.000 |  8999.999 || Tx  6th |  12000.000 |  13999.999 |
| ITU 12M | 12000.000 | 13999.999 || Tx  7th |  16000.000 |  17999.999 |
| ITU 16M | 16000.000 | 17999.999 || Tx  8th |  18000.000 |  19999.999 |
| ITU 18M | 18000.000 | 19999.999 || Tx  9th |  22000.000 |  22999.999 |
| ITU 22M | 22000.000 | 22999.999 || Tx 10th |  25000.000 |  27500.000 |
| ITU 25M | 25000.000 | 27500.000 || Tx 11th |            |            |
+---------+-----------+-----------++---------+-----------+-----------+
```

SCREEN SELECTION

1) Push the [Esc] key once or twice to indicate the TOP menu.

2) Select "Screen" with the [S] key, or an [Arrow] and [Enter] keys.
   - The FREQ RANGE screen appears.
   - Be sure the "expert" command is used at start up if you want to change
     the contents.

RX
This line is used for setting the receiver frequency coverage continuously.
Enter the desired lower and higher edges.
         Selectable range:     30.000 to 29999.900 [kHz]
         Selection method:     Enter the desired frequency directly via the
                               numeral keys.


ITU 4M -- ITU 25M
These lines are used to set the receive/transmit range for ITU simplex
channels.  Enter the desired range for each band.
         Selectable range:     1600.000 to 29999.900 [kHz]
         Selection method:     Enter the desired frequency directly via the
                               numeral keys.


Tx 1st -- Tx 11th
These lines are used to set the transmit range for user channels.  Input the
desired frequency range from the upper lines as there are 11 lines for band
separation.
         Selectable range:     1600.000 to 29999.900 [kHz]
         Selection method:     Enter the desired frequency directly via the
                               numeral keys;
                               or push [Space] then [Enter] to delete the
                               frequency range.
      **                                                               **
      ** NOTE: When a frequency range in an upper line is deleted,     **
      **       the frequency range lines underneath are erased,        **
      **       automatically.                                          **
      **                                                               **

////// MODE SCREEN //////

The IC-M710RT has the following mode capabilities.  However, some modes can be
restricted to suit operating needs.

```
+[Mode]-------+--------+--------+--------+
|  MODE  |INDI- |   Rx    |   Tx    |
|        |CATION|         |         |
+-------|------+--------+--------+
|   J3E  |   J3E  | ENABLE  | ENABLE  |
|   R3E  |   R3E  | ENABLE  | ENABLE  |
|   H3E  |   H3E  | ENABLE  | ENABLE  |
|   LSB  |   LSB  | DISABLE | DISABLE |
|   J2B  |   J2B  | DISABLE | DISABLE |
|   FSK  |   FSK  | ENABLE  | ENABLE  |
|   A1A  |   A1A  | DISABLE | DISABLE |
+-------+------+--------+--------+
```

SCREEN SELECTION

1) Push the [Esc] key once or twice to indicate the TOP menu.

2) Select "Screen" with the [S] key, or an [Arrow] and [Enter] keys.
     - A SUB menu appears under the TOP menu.

3) Select "MODE" with the [M] key, or an [Arrow] and [Enter] keys.
     - The MODE screen appears.

INDICATION
    The programmed indication appears on the transceiver's display when the
    mode is selected.  The following indications are available for [Space]
    selection, however, other indications up to 3 characters can be input via
    the keyboard.
          Selectable value:      J3E ...... J3E,  USB  or other
                                 R3E ...... R3E        or other
                                 H3E ...... H3E,  AM   or other
                                 LSB ...... LSB        or other
                                 J2B ...... J2B,  AFS  or other

```
                              FSK ...... FSK,  DFS  or other
                              A1A ...... A1A,  CW   or other
            Selection method:  Push [Space] to toggle the selection,
                              or enter the desired name directly from the
                              keyboard.



  RX / TX
     These columns select usable modes for operation.  When "DISABLE" is
     selected in the Rx column, the mode cannot be selected via the
     transceiver's front panel.  When "DISABLE" is selected in the Tx column,
     transmission is inhibited when the mode is selected even if a transmit
     frequency is programmed.
            Selectable value:   ENABLE,  DISABLE
                               (ENABLE cannot be selected in the Tx column when
                                the Rx column is set as DISABLE.)
            Selection method:   Push [Space] to toggle the selection.

        **                                                            **
        ** NOTE: J3E cannot be set to "DISABLE" in the both RX and   **
        **       TX columns.                                         **
        **                                                            **
```

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--------------------------------------------------------------------------------
4. CLONING OPERATION
--------------------------------------------------------------------------------

Programmed data can be cloned to an IC-M710RT instantly.  All data is clone
sent (PC -> TR) or clone read (PC <- TR).  A cloning cable, OPC-552 is
necessary to connect a PC's RS-232C port and the transceiver.

For convenience, when changing a small portion of the programmed contents,
clone read the data from the transceiver, modify the data, then clone send
it back to the transceiver.


CLONE SEND (PC->TR)
The programmed data in the PC is copied to the transceiver.

1) Connect the OPC-552 between the PC's RS-232C terminal and transceiver's
   [CLONE] jack.

2) Turn the PC and transceiver power ON.

3) Start up this program.

4) Select "Clone" in the TOP menu with the [C] key, or an [Arrow] and
   [Enter] keys.
     - Clone sub menu appears.

5) Select "PC->TR" in the SUB menu with the [P] key, or [Arrow] and
   [Enter] keys.

- "Sending oooooo" appears in the bottom left of corner of the screen.
          - "CLONE" appears and counting starts from E000 to EFF0 on the
            transceiver.
          - When cloning is finished and all data send correctly, "Good" appears on
            the transceiver display.
                **                                                              **
                **  NOTE: - when "CLONE error" appears, check the "RS-232C  **
                **          port" setting.                                    **
                **        - when "Illegal data in" and screen name appears  **
                **          "?" may be appears on the illegal data in the    **
                **          screen.  Re-program them, or check the freq.     **
                **          range screen.                                    **
                **                                                              **

6) Turn the transceiver OFF and ON again.
     - Clone send is now complete.

CLONE READ (PC<-TR)
The pre-set data in the transceiver is copied to the PC.

1) Connect the OPC-552 between the PC's RS-232C terminal and transceiver's
   [CLONE] jack.

2) Turn the PC and transceiver power ON.

3) Start up this program.

4) Select "Clone" in the TOP menu with the [C] key, or [Arrow] and
   [Enter] keys.
     - Clone sub menu appears.

5) Select "PC<-TR" in the sub menu with the [T] key, or [Arrow] and
   [Enter] keys.
     - "CLONE" appears and counting starts from E000 to EFF0 on the
       transceiver.
     - when cloning is finished, the transceiver's display returns to
       the previous indication.
     - Clone read is now complete.




RS-232C
When the connected PC has 2 or more RS-232C ports, the desired port can be
selected with this program.  When the PC has only 1 port, "PORT #1" must be
selected, otherwise, the cloning operation cannot be performed.


1) Select "Clone" in the TOP menu with the [C] key, or an [Arrow] and
   [Enter] keys.
     - Clone sub menu appears.

2) Select "RS-232C" in the SUB menu with the [R] key, or an [Arrow] and
   [Enter] keys.
     - RS-232C port selection block appears.

3) Select the desired port number to connect the cloning cable with an
   [Arrow] and [Enter] keys.
     - Selected number is the same as the PC port number assignment.

```
--------------------------------------------------------------------------------
5. FILE SAVING and LOADING
--------------------------------------------------------------------------------


FILE SAVING OPERATION

1) Push the [Esc] to indicate the TOP menu.

2) Select "File" in the TOP menu with the [F] key, or an [Arrow] and
   [Enter] keys.
      - File sub menu appears.

3) Select "Save" in the sub menu with the [S] key, or [Arrow] and
   [Enter] keys.
      - A file name box appears and shows "FILE: noname.icf".

4) Type the desired file name to be saved.
      - ICF is recommended as a file extension for loading convenience.
      - When no file extension is used, ".ICF" is automatically added to the
        file name.
      - The TOP menu and the file name disappear and the previous menu appears.

**                                                                          **
**   SAVING NOTE:                                                           **
**                                                                          **
**   When starting up the program and no file name has been loaded,         **
**   "noname.icf" appears in the file name box.  In this case, direct       **
**   file name entry is possible ("noname" disappears automatically).       **
**   However, once a file is loaded or saved, file name entry does not      **
**   change the file name. ([Del] or [Ins] key must be used to change the   **
**   file name.)                                                            **
**                                                                          **
**   To indicate the previously saved file name, "*" (wild card) may be     **
**   helpful to check the file name.                                        **
**                                                                          **
```

```
FILE LOADING OPERATION

1) Push the [Esc] to indicate the TOP menu.

2) Select "File" in the TOP menu with the [F] key, or an [Arrow] and
   [Enter] keys.
      - File sub menu appears.

3) Select "Load" in the SUB menu with the [L] key, or [Arrow] and
   [Enter] keys.
      - A file name box appears and shows "FILE: FILE: *.ICF".

4) Type the desired file name, then push [Enter].
   Or, push [Enter] to indicate the pre-programmed file name, select the
   desired file name with an [Arrow] key, then push the [Enter] key twice.
      - The typed or selected file is loaded, then the file name box
        disappears.
      - The loaded file name appears in the bottom left corner of the screen.
```

DOS COMMAND
 In the "File" sub menu, a "Dos" item appears.  This command pauses the
 program so that a DOS command can be used.  When you want to return to
 normal operation of the program, type "EXIT", then push [Enter]

------------------------------------------------------------------------
6. PRINTOUT
------------------------------------------------------------------------

The set data can be printed out for convenience and reference for subsequent
programming.  Only the currently displayed screen is printed out, therefore,
the printout operation must be performed for each screen desired.

1) Push the [Esc] to indicate the TOP menu.

2) Select "Print" in the TOP menu with the [P] key, or an [Arrow] and
   [Enter] keys.
     - Print sub menu appears and shows "Current".

3) Push [Enter] again to print out the currently displayed data.

4) After printing is complete, the TOP and SUB menus disappear.