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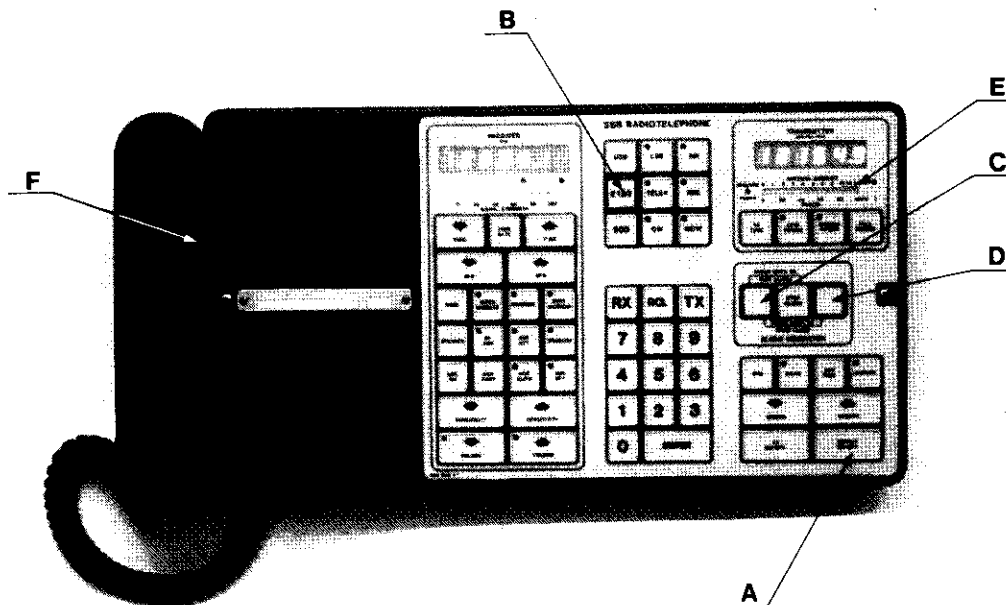
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1. DISTRESS OPERATION ON 2182 kHz



1.1 Transmission of two-tone alarm signal

1. Press "SUPPLY ON/OFF" key (A) to turn equipment on.
2. Press "2182" key (B).
3. Press ALARM GENERATOR keys (C) and (D) simultaneously.

Transmission starts immediately after the automatically initiated tuning sequence and the alarm signal is now transmitted for 45 seconds. The antenna current is displayed on the ANTENNA CURRENT meter (E) and the alarm signal is heard in the loudspeaker.

To repeat the alarm signal transmission just press the ALARM GENERATOR keys (C) and (D) again simultaneously.

An alarm signal transmission may be interrupted at any time by pressing the "STOP ALARM" key.

1.2 Transmission of distress message

When the alarm signal ceases press handset key (F), and transmit your distress message by speaking into the handset microphone with a clear and calm voice.

Release handset key and wait for reply.

Repeat the distress message at intervals until a reply is received.

Transceiver Unit (TU)



Antenna Tuning Unit (ATU)

Control Unit (CU)

Fig 2.1

2. INTRODUCTION

The TRP 8750 D SERIES is general purpose HF SSB transmitting receiving equipment covering the frequency range 1.6 to 30MHz designed for marine as well as point-to-point applications.

The standard version offers duplex, simplex and semiduplex radiotelephone communication in the maritime mobile bands and is intended for installation in voluntarily or compulsorily fitted vessels.

A selection of optional facilities permits configuring equipment fulfilling various needs, including transmission and reception of LSB, J3E signals, transmission and reception of radiotelex, transmission and reception of CW and MCW morse telegraphy. The equipment is fully transistorized and extensive use is made of the latest microprocessor technology.

The TRP 8750 D consists of a Control Unit, a fully remote controlled Transceiver Unit and an automatic Antenna Tuning Unit. The units can be placed up to 100 m apart using standard 16 x 0.5 mm sq. screened cable. An AC Power Supply Unit is used when the equipment is supplied from AC MAINS.

The Control Unit contains all receiver and transmitter operating controls. It is fully push-button controlled by means of a rugged membrane keyboard, insensitive to dust and water. Separate LED-displays show receive and transmit frequencies, and two bar-graph displays show receiver signal strength and transmitter output power respectively. When the transmitter is switched-off, time of day is displayed from a built-in realtime clock, which can also be used to switch-on the equipment at a predetermined time.

The keyboard permits the operator to program up to 76 receive and transmit frequency pairs and to recall or scan the frequencies with a few key operations.

When the equipment is switched-off the real-time clock and the memory are supplied from a built-in lithium primary cell having a lifetime of several years. The non-volatile memory also stores the current setting of the equipment when switching-off and restores it when switching-on again.

Where required by the authorities transmitter frequencies can be preprogrammed into a PROM having a capacity of 1017 frequencies. Transmitter keying can then only take place on the authorized frequencies. The keyboard permits recall of all the preprogrammed frequencies. The receiver can be tuned in 10 Hz, 100 Hz or 1 kHz steps at the choice of the operator. 5 W audio output is available to the built-in loudspeaker or to external speakers. A squelch circuit is optionally available.

The standard equipment contains the two-tone radiotelephone alarm signal generator and single key selection of 2182 kHz.

The Control Unit provides connection facilities for handset, headphones,

extension speaker, morse-key and telex-equipment. 600 ohms AF input and output terminals are provided with Line Transformers as optional extras.

The Control Unit is housed in a Noryl (PPO) cabinet suitable for tabletop or bulkhead mounting. The front panel can be tilted for convenient operation when the unit is mounted vertically as well as horizontally.

The Transceiver Unit contains all receiver and transmitter RF circuitry. The receiver signal path and the exciter signal path together with two identical fast switching synthesizers are contained in the lower front door of the unit. All frequencies are fully synthesized and derived from a Master Oscillator. The Master Oscillator is available in different stability versions. These boards are contained in screened compartments of the door of the unit. The door itself is made in moulded Noryl (PPO).

The fully protected solid state 750 W power amplifier is cooled by natural convection. It matches a 50 ohms antenna system but is normally used in connection with the Antenna Tuning Unit matching the transmitter to wire or whip antennas.

In the standard version the transmitter covers the marine bands between 1.6 and 30 MHz but PA-filters are available which in addition give coverage of the 500 kHz marine band. Also continuous coverage of the frequency range 1.6 to 30 MHz is available.

A high efficiency switched mode power supply ensures optimum output power at low power consumption and covers a supply voltage range from 21.6 to 41.6 Volts. The nylon-coated steel cabinet can be tabletop or bulkhead mounted by means of rugged nylon-coated cast brackets.

The fast tuning, microprocessor controlled Antenna Tuning Unit is based on high voltage, high current HF reed-relays. It tunes automatically to all antennas between 7 and 30 meters length and requires no presetting at the installation. Tuning is performed in 0.2 to 1.5 sec.

An optionally available Antenna Relay Board contains a simplex relay system, a dummy load and a grounding relay connecting the antenna to ground when the equipment is switched-off. The simplex antenna relay system is fast enough to permit ARQ-telex on one antenna.

The ATU cabinet is made in Lexan (Polycarbonat).

Two versions of the AC Power Supply Unit are available accepting nominal input voltages of 110/120/220/240 V, 50-60 Hz and 3x220/3x380/3x440 V, 50-60 Hz, respectively. A built-in switch permits manual switch-over to battery operation.

2.1 BASIC VERSIONS

- In common : 750 Watt P.E.P. Power Amplifier.
Simplex/Semi-duplex/Full-duplex operation 1.6-30 MHz.
- TRP 8750 D : Marine SSB Radiotelephone.
1017 preprogrammable frequencies in Marine Bands.
Automatic reduction of power below 4 MHz to 400 Watt P.E.P.
- TRP 8753 D : Marine SSB Radiotelephone.
Free frequency selection all bands.
Automatic reduction of power below 4 MHz to 400 Watt P.E.P.
- TRP 8754 D : General Purpose SSB Radiotelephone.
Free frequency selection all bands.
- TRP 8755 D : General Purpose SSB Radiotelephone.
Free frequency selection all bands.
CW and MCW facilities.
- TRP 8757 D : Marine SSB Radiotelephone.
Free frequency selection all bands.
CW and MCW facilities.
Automatic reduction of power below 4 MHz to 400 Watt P.E.P.



3. TECHNICAL DATA

Versions complying with the SOLAS 74 convention and the ITU Radio Regulations are available, meeting one or more of the specifications: CEPT, MPT, DOC and FTZ.

3.1 GENERAL

Frequency Generation: True digital frequency synthesis.

Frequency Selection: By common keyboard.
Single key selection of 2182 kHz.
76 user-programmable frequency pairs.
Scanning facilities (may be disabled).
Remote control (optional).

Frequency Presentation: Separate LED displays for receive and transmit frequencies.

Frequency Stability: 1.5 ppm
0.8 ppm (optional)
0.4 ppm (optional)

Operating modes: Duplex, semiduplex and simplex.

USB: J3E upper sideband, suppressed carrier.
R3E: Upper sideband, reduced carrier.
AM: H3E upper sideband, full carrier.
LSB: J3E lower sideband, suppressed carrier (optional).
CW: A1A morse telegraphy.
MCW: H2A modulated morse telegraphy
TELEX: F1B with center audio frequency selectable between 1500 and 2500 Hz in 100 Hz steps (optional).

Operating Temperature Range: -20 deg. C to +55 deg. C

Full Performance Temperature Range: 0 deg. C to +40 deg. C

3.2 RECEIVER CHARACTERISTICS

Frequency Range: 100 kHz to 30 MHz
(10 kHz to 100 kHz with reduced performance)

Frequency resolution: 100 Hz by numerical frequency keyboard entry. A search/fine tuning facility is provided with selectable increment steps of 10 Hz, 100 Hz or 1 kHz. In addition a user-programmed step size may be selected.

Antenna Impedance: Below 4 MHz: 10 ohm in series with 250 pF or 50 ohm (std.) internally selectable.
4 MHz to 30 MHz: 50 ohm

Input Protection: 30 V RMS (EMF) for up to 15 min.

IF Selectivity: SSB: 350 Hz to 2.7 kHz

AM: +/- 2.7 kHz or
+/- 4 kHz (optional)

CW/MCW:

Wide: +/- 2.7 kHz or
+/- 4 kHz (optional)

Inter: +/- 1.2 kHz or
+/- 2.7 kHz (optional)

Narrow: +/- 250 Hz or
+/- 500 Hz (optional)

Very
Narrow: As Telex or disabled

TELEX (optional):
+/- 150 Hz or
+/- 250 Hz or
+/- 400 Hz or
+/- 1200 Hz

Sensitivity: Max. antenna input for 10 dB SINAD, 50 ohm antenna.

SSB:
1.6 - 30 MHz: 0.8 uV

AM:
100 kHz - 400 kHz: 7 uV
400 kHz - 30 MHz: 5 uV

CW (+/- 500 Hz):
100 kHz - 30 MHz: 0.6 uV

When RF-AMP is selected, the sensitivity is increased by 6 dB.

Intermodulation: (out-of-band) 100 dB uV per signal more than 30 kHz offset from receiver frequency produces less than an equivalent input signal of 30 dB uV.

Third order intercept point: +22 dBm.

Cross modulation: Unwanted signal of 118 dB uV/30 % - 400 Hz more than 20 kHz offset from receiver frequency, produces cross modulation less than -30 dB relative to a wanted signal of 60 dB uV/SSB.

Duplex Operation: Less than -30 dB cross modulation for Transmitter/Receiver isolation greater than 30 dB and frequency offset more than 1.5 %.

Blocking: More than 80 dB to cause a 3 dB change in output power when wanted signal gives 20 dB SINAD, and the unwanted signal is offset by more than 20 kHz from the receiver frequency.

Image Rejection: Greater than 80 dB

IF Rejection: Greater than 90 dB

Spurious Response Rejection: Greater than 80 dB below 4 MHz
Greater than 70 dB above 4 MHz

Internally generated spurious signals: Less than 5 dB SINAD (SSB)

Spurious Emission: Less than 25 pW/50 ohm at antenna connector.

RF-Amplifier: 0 dB or 10 dB

RF-Attenuator: 0 dB or 20 dB

Automatic Gain Control: Less than 5 dB change in output for 100 dB input signal variation from 20 dB sensitivity level (SSB).

BFO Range: +/- 3 kHz synthesized in 100 Hz steps

Line output: Internally adjustable up to +10 dBm/600 ohm.
Balanced 600 ohms output (optional).

In-band
Intermodulation: Less than -50 dB

Audio Output Power: 5 W in 8 ohm to internal and/or external loudspeaker.
Audio Squelch (optional): Speech operated.

3.3 TRANSMITTER CHARACTERISTICS

Output Power: 750 W PEP +0/-1.4 dB from Transceiver Unit into 50 ohms.
Power Reduction:
Full Medium: approx. 260 W PEP
Medium: approx. 90 W PEP
Low Medium: approx. 30 W PEP
Low: approx. 10 W PEP
Single-tone max. Power:
750 W PEP for keying duty-cycle less than 55% and modulation rates greater than 3 baud.
3 dB power reduction when continuously keyed during 1 min. Automatic power recovery when muted during 2 min.

Transmitter
Frequencies: TRP 8750 D:
Up to 1017 programmable channels, freely distributed in the ranges:
1606.5 to 4800 kHz
6200 to 8950 kHz
12230 to 17650 kHz
18780 to 27100 kHz

TRP 8753 D/8754 D/8755 D/8757 D:
Free or programmable frequency selection in the range:
1606.5 kHz to 30 MHz.

Spurious Emissions: Less than -60 dB/PEP

Alarm Generator: A two-tone alarm generator is incorporated (TRP 8750 D/8753 D/8757 D).

Audio Input Level: Telex: 0 dBm +10/-16 dB
Input impedance: 600 ohm
Aux: 0 dBm +10/-16 dB
Input impedance: 600 ohm
Mic: 20 mV to 2.5 V internally adjustable.
Input impedance: 100 kohm//6.8 nF.
Recommended source impedance: Less than 2.5 kohm.

3.4 ANTENNA TUNING UNIT

Frequency Range: 1.6 - 30 MHz
Antenna Requirements: 7 - 30 m wire and/or whip.
Antenna Tuning: Fully automatic
Tuning time: 0.2 - 1.5 sec
Input Impedance after tuning: 50 ohm. SWR \leq 1.4
Manual setting possible for 2182 kHz
Power Handling Capability: 750 W PEP
375 W Average

3.5 POWER REQUIREMENTS

Supply Voltage: 24-32 V DC (-10/+30%)
(no presetting)
Connection will not earth Supply Battery.
110/120/220/240 V AC (optional external Power Supply Unit, type P 8750).
3x380/3x220/3x440 V AC (optional external Power Supply Unit, type P 8751).

Power Consumption (approx.):

	750 W PEP	400 W PEP
Receive only:	50 W	50 W
J3E unmodulated:	300 W	300 W
H3E unmodulated:	1100 W	760 W
H3E alarm:	1300 W	950 W
CW keyed:	2000 W	1440 W
MCW keyed:	1300 W	950 W
ARQ-telex:	1000 W	760 W

3.6 DIMENSIONS AND WEIGHTS

Control Unit: Width: 372 mm
Height: 87 mm
Depth: 203 mm
Weight: 4 kg, approx.

4. OPERATION

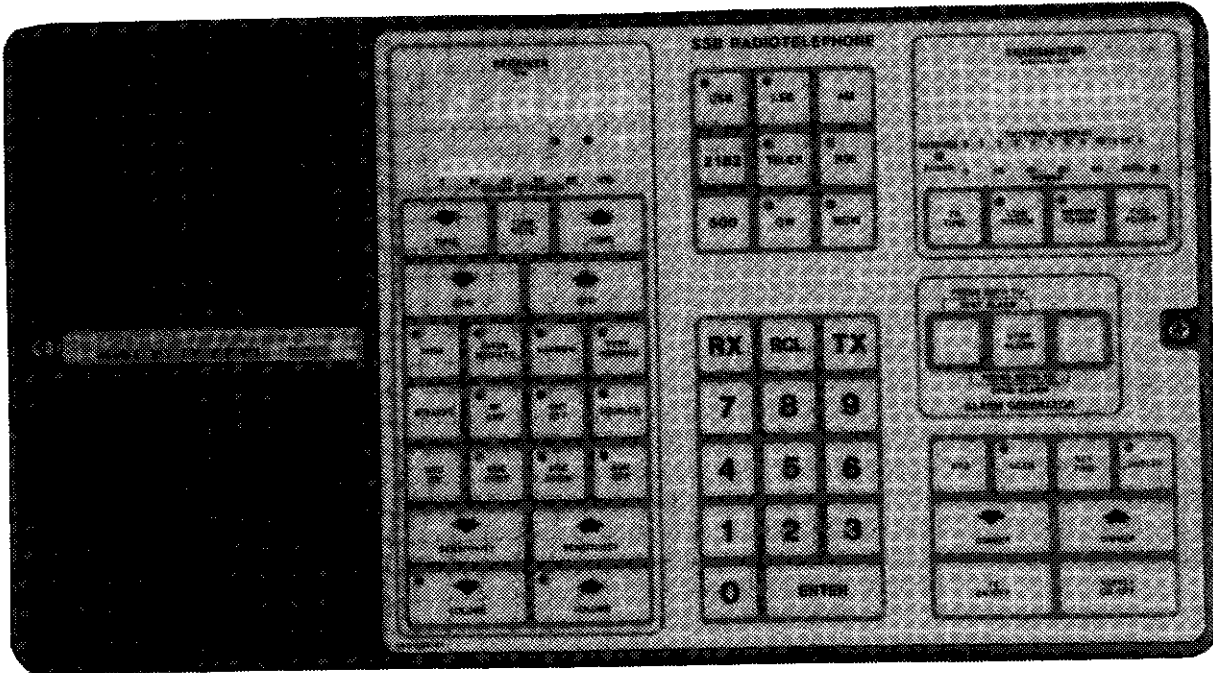
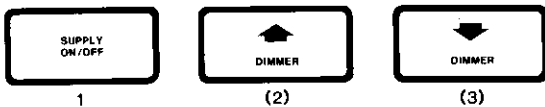


Fig. 4.1

The equipment is operated from the Control Unit (fig. 3.1) and is 100% keyboard controlled. For quick reference section 4.1 gives the operating instructions as pictures of keying sequences, followed by a short description of the action caused by each key. Parentheses around key-numbers indicate that the corresponding keys should only be pressed under the conditions described below. A description of all the keyboard operating controls is found in section 4.2.

4.1 OPERATING INSTRUCTIONS

4.1.1 SWITCH ON



1 Press "SUPPLY ON/OFF"
The equipment will now enter the state it was in before being switched OFF, as indicated by the displays and annunciators.

(2) Increase light intensity of displays and annunciators if too low.

(3) Decrease light intensity of displays and annunciators if too high.

4.1.2 TRANSMITTER ON



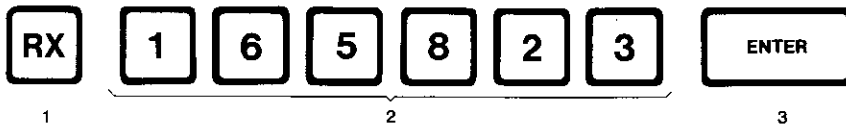
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- 1 Press "TX ON/OFF" if the transmitter is OFF.
The transmitter display will then show the transmitter frequency.

If the transmitter display is showing the time of day, as indicated by the flashing time cursor (3rd digit), the equipment is in the "Receive only" state with all transmitter functions switched OFF.

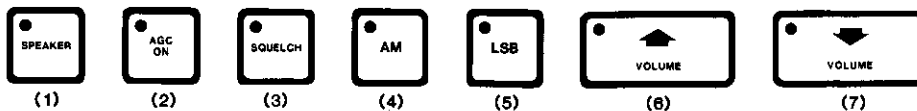
4.1.3 RECEIVING

4.1.3.1 CHANGE RECEIVER FREQUENCY (16582.3 kHz)



- 1 Press "RX"
The receiver display is blanked and its decimal point starts flashing.
- 2 Enter desired frequency in the receiver display via the numeric keys. The last digit is always interpreted as the "100 Hz" digit.
- 3 Press "ENTER"
The decimal point stops flashing if the frequency is valid. The whole display starts flashing if the frequency is invalid.

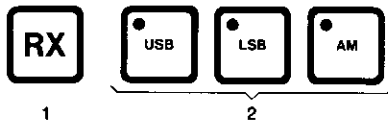
4.1.3.2 SET RECEIVER (MODE)



- (1) Press "SPEAKER" if the loudspeaker is OFF.
Annunciator indicates loudspeaker ON.
- (2) Press "AGC ON" if the AGC is OFF.
Annunciator indicates AGC ON.
- (3) Press "SQUELCH" if the Squelch is OFF.
Annunciator indicates Squelch ON.
- (4) Press "AM" if the received signal is an AM (A3E) signal.

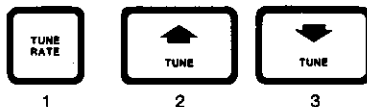
- (5) Press "USB" if the received signal is an SSB (J3E) signal.
Annunciators indicate the mode selected.
- (6) Increase volume if sound level is too low.
- (7) Decrease volume if sound level is too high.

4.1.3.3 SELECT SEPARATE RECEIVER MODE



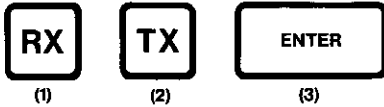
- 1 Press "RX"
The receiver display is blanked and its decimal point starts flashing.
- 2 Press "USB", "LSB" or "AM"
If the TX-mode is either USB, LSB, AM, or R3E then the RX-mode is accepted and the receiver display restored. If the TX-mode is neither USB, LSB, AM nor R3E then nothing will happen until either a valid mode-key, a receiver frequency or "ENTER" is pressed.
If the RX-mode is different from the TX-mode then the mode annunciators indicate the mode according to keyline. E.g. if the unit is not keyed then the RX-mode annunciator is turned ON constantly while the TX-mode annunciator is flashing very fast.

4.1.3.4 RECEIVER TUNING



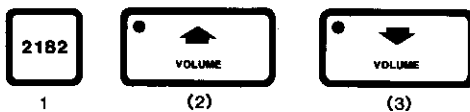
- 1 Press "TUNE RATE" to change frequency step.
An annunciator below one of the three right hand digits of the receiver display indicates the frequency step selected. 10 Hz, 100 Hz and 1000 Hz steps are possible.
- 2 Increase receiver frequency in steps selected.
- 3 Decrease receiver frequency in steps selected.
If "TUNE" is pressed shortly the receiver frequency is changed one step up or down. Holding "TUNE" pressed for more than 0.5 sec. changes the receiver frequency continuously up or down with 10 steps/sec.

4.1.6 COPYING RX FREQUENCY TO TX FOR SIMPLEX OPERATION



- 1 Press "RX"
The receiver display will be blanked.
- 2 Press "TX"
The transmitter display will be blanked.
- 3 Press "ENTER"
The receiver frequency will be copied to the transmitter display, and the 10 Hz digit on the receiver display will be cleared.

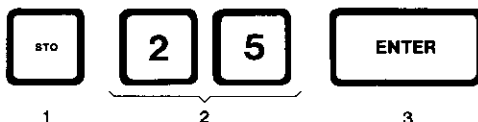
4.1.7 FAST SET-UP FOR 2182 kHz



- 1 Press "2182"
This instantly changes receiver and transmitter frequency to 2182 kHz, selects AM (H3E) mode, selects FULL POWER and enables transmitter function (TX ON). The loudspeaker and AGC are automatically switched ON and RF-AMP, ANT ATT and SQUELCH switched OFF. Antenna current is displayed when transmitting, unless PRESET bit 6 is set (see Second Functions).
- (2) Increase volume if sound level is too low.
- (3) Decrease volume if sound level is too high.
Press handset key, wait a couple of seconds for the automatic tuning, and you are ready to transmit.

4.1.8 STORING AND RECALLING FREQUENCY CHANNELS

4.1.8.1 STORING RECEIVER/TRANSMITTER FREQUENCY PAIRS AND MODE

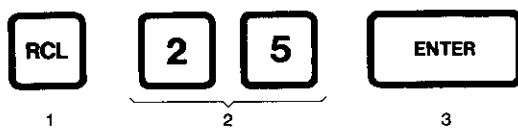


(Channel no. 25)

- 1 Press "STO"
The receiver and transmitter displays are blanked and their decimal points start flashing. If "STO" is pressed by mistake, just press "ENTER" to escape store mode.

- 2 Enter the channel-number in the receiver display via the numeric keys. Channels 0-75 are available.
- 3 Press "ENTER"
If the channel-number is valid the receiver and transmitter displays show the stored frequency-pair. If the channelnumber is invalid the receiver display starts flashing.

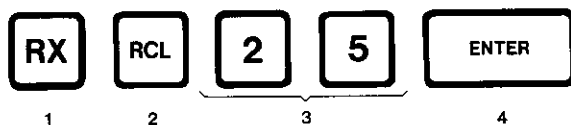
4.1.8.2 RECALLING RECEIVER/TRANSMITTER FREQUENCY PAIRS AND MODE



(Channel no. 25)

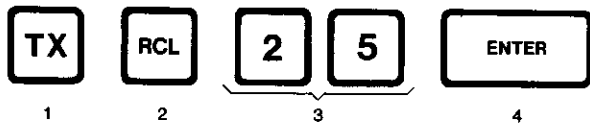
- 1 Press "RCL"
The receiver and transmitter displays are blanked and their decimal points start flashing.
- 2 Enter the channel-number in the receiver display via the numeric keys. Channels 0-75 are available.
- 3 Press "ENTER"
If the channel-number is valid the receiver and transmitter displays show the recalled frequency-pair, an annunciator shows the recalled mode and the AGC is switched ON. If the channel-number is invalid the receiver display starts flashing.

4.1.8.3 RECALLING RECEIVER FREQUENCY



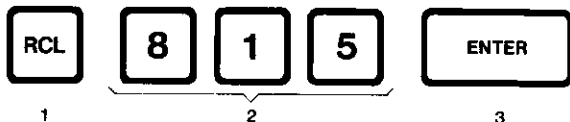
- 1 Press "RX"
The receiver display is blanked and its decimal point starts flashing.
- 2 Press "RCL"
- 3 Enter the channel-number in the receiver display via the numeric keys. Channels 0-75 are available.
- 4 Press "ENTER"
If the channel-number or frequency is invalid the receiver display starts flashing. If both channel-number and frequency is valid the receiver display shows the recalled frequency.

4.1.8.4 RECALLING TRANSMITTER FREQUENCY



- 1 Press "TX"
The transmitter display is blanked and its decimal point starts flashing.
- 2 Press "RCL"
- 3 Enter the channel-number in the transmitter display via the numeric keys. Channels 0-75 are available.
- 4 Press "ENTER"
If the channel-number or frequency and/or mode is invalid the transmitter display starts flashing. If both channelnumber, frequency and mode is valid the transmitter display shows the recalled frequency if TX is ON, and the time of day if TX is OFF.

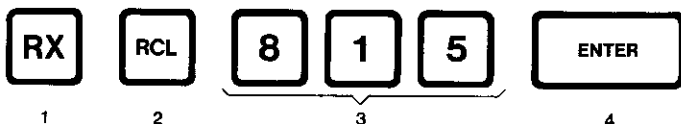
4.1.8.5 RECALLING ITU CHANNEL FREQUENCY PAIRS FROM PROM



(ITU channel no. 815)

- 1 Press "RCL"
The receiver and transmitter displays are blanked and their decimal points start flashing.
- 2 Enter the channel-number in the receiver display via the numeric keys.
- 3 Press "ENTER"
If the channel-number is invalid the receiver display starts flashing. If the channel-number (according to mode) is valid the receiver display shows the ITU receiver frequency and the transmitter display shows the ITU transmitter frequency if TX is ON, and the time-of-day if TX is OFF.

4.1.8.6 RECALLING ITU CHANNEL RECEIVER FREQUENCY FROM PROM

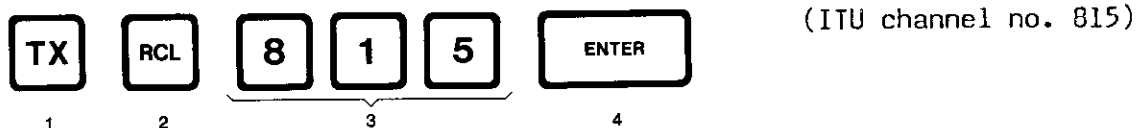


(ITU channel no. 815)

- 1 Press "RX"
The receiver display is blanked and its decimal point starts flashing.
- 2 Press "RCL"

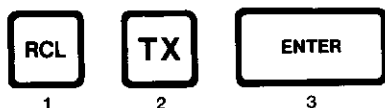
- 3 Enter the channel-number in the receiver display via the numeric keys.
- 4 Press "ENTER"
If the channel-number is invalid the receiver display starts flashing. If the channel-number (according to mode) is valid the receiver display shows the ITU receiver frequency.

4.1.8.7 RECALLING ITU CHANNEL TRANSMITTER FREQUENCY FROM PROM



- 1 Press "TX"
The transmitter display is blanked and its decimal point starts flashing.
- 2 Press "RCL"
- 3 Enter the channel-number in the transmitter display via the numeric keys.
- 4 Press "ENTER"
If the channel-number is invalid the transmitter display starts flashing. If the channel-number (according to mode) is valid the transmitter display shows the ITU transmitter frequency if TX is ON, and the time-of-day if TX is OFF.

4.1.8.8 RECALLING TRANSMITTER FREQUENCY FROM PROM



- 1 Press "RCL"
The receiver and transmitter displays are blanked and their decimal points start flashing.
- 2 Press "TX"
The receiver is reactivated and the first TX PROM frequency is shown in the transmitter display. Repeating "TX" will transfer the next TX PROM frequency to the transmitter display if the PROM location is programmed.
- 3 Press "ENTER"
If TX is ON then the decimal point stops flashing if both frequency and mode are valid, and the whole display starts flashing if frequency and/or mode is invalid.

If TX is OFF the transmitter display will show the time-of-day.