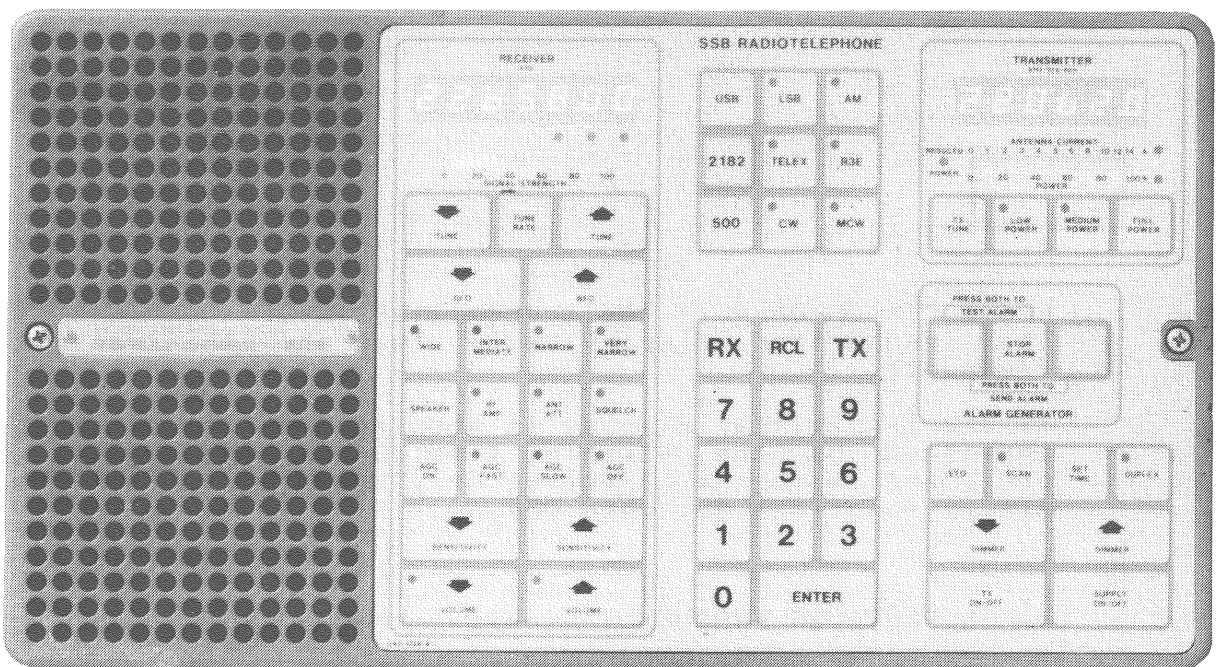# 2. OPERATION

Fig. 2.1

The equipment is operated from the CONTROL UNIT (fig. 2.1) and
is 100% keyboard controlled. For quick reference section 2.1
gives the operating instructions as pictures of keying sequen-
ces, followed by a short description of the action caused by
each key. Parentheses around key-numbers indicates that the
corresponding keys should only be pressed under the conditions
described below. A more detailed description of all the keybo-
ard operating controls is found in section 2.2.

2.1. OPERATING INSTRUCTIONS

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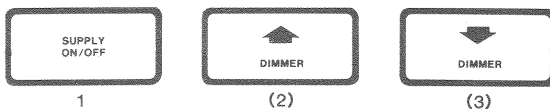
1   Press "SUPPLY ON/OFF"
     The equipment will now enter the state it was in before
     being switched OFF, as indicated by the displays and an-
     nunciators.

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

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

TRANSMITTER ON

```
┌─────────┐
│   TX    │
│ ON/OFF  │
└─────────┘
     1
```
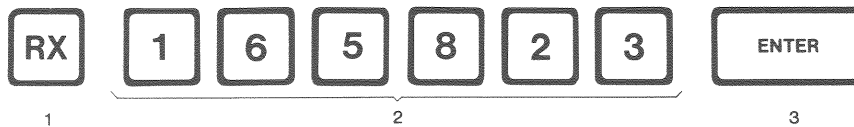
1   Press "TX ON/OFF" if the transmitter is OFF.
    The transmitter display will then show the transmitter
    frequency.

    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 trans-
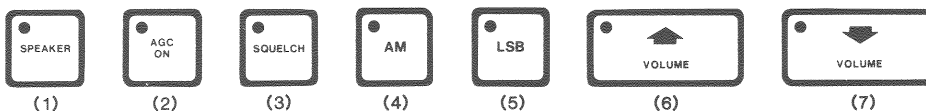   mitter functions switched OFF.

RECEIVING

A. CHANGE RECEIVER FREQUENCY (16582.3 kHz)

```
┌────┐ ┌────┐┌────┐┌────┐┌────┐┌────┐┌────┐  ┌─────────┐
│ RX │ │ 1  ││ 6  ││ 5  ││ 8  ││ 2  ││ 3  │  │  ENTER  │
└────┘ └────┘└────┘└────┘└────┘└────┘└────┘  └─────────┘
  1              2                                3
```

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.

B. SET RECEIVER (MODE)

```
┌─────────┐┌─────────┐┌─────────┐┌─────────┐┌─────────┐┌─────────┐┌─────────┐
│●        ││●  AGC   ││●        ││●   AM   ││●  LSB   ││●    ▲    ││●    ▼    │
│ SPEAKER ││   ON    ││ SQUELCH ││         ││         ││ VOLUME  ││ VOLUME  │
└─────────┘└─────────┘└─────────┘└─────────┘└─────────┘└─────────┘└─────────┘
   (1)        (2)        (3)        (4)        (5)        (6)        (7)
```

(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.

C. SELECT SEPARATE RECEIVER MODE
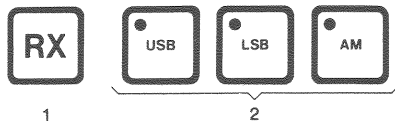
1
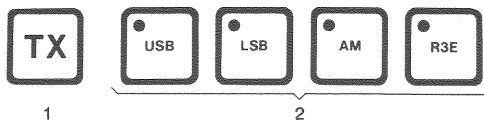   2

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.

3

TRANSMITTING

A. CHANGE TRANSMITTING FREQUENCY (16473.8 kHz)

| TX | | 1 | | 6 | | 4 | | 7 | | 3 | | 8 | | ENTER |
| 1 | | | | | 2 | | | | | | | 3 |

1   Press "TX"
     The transmitter display is blanked and its decimal point
     starts flashing.

2   Enter desired frequency in the transmitter display via the
     numeric keys. The last digit is always interpreted as the
     "100-Hz" digit.

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.

B. SET TRANSMITTER (Mode-Power-Tune)

| TX ON/OFF | | USB | | LOW POWER | | MEDIUM POWER | | FULL POWER | | TX TUNE |
| (1) | | (2) | | (3) | | (4) | | (5) | | (6) |

(1) Press "TX ON/OFF" if the transmitter is OFF.
    The transmitter display will then show the transmitter
    frequency, flashing if frequency and/or mode is invalid.

(2) Press "USB" to transmit an SSB (J3E) signal.
    Annunciators indicate the mode selected, and the trans-
    mitter display starts flashing if the mode is invalid.

(3) Press "LOW POWER"   ⎫
                               ⎬
(4) Press "MEDIUM POWER"   ⎬   according to desired power level.
                               ⎬
(5) Press "FULL POWER"   ⎭

2-4

4

Annunciators indicate the power level selected.
If the transmitter frequency has been changed the Antenna
Tuning Unit will automatically tune its input impedance on
the new frequency in less than 1.5 sec when the handset
key is pressed, and you are then ready to transmit.

(6) Press "TX TUNE" if the power meter annunciator starts
flashing during transmission. This indicates that the
Antenna Tuning Unit input SWR is greater than 1:3, and may
happen if the antenna impedance has changed due to exter-
nal circumstances.

C. SELECT SEPARATE TRANSMITTER MODE
----

1   Press "TX"
The transmitter display is blanked and its decimal point
starts flashing.

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

FAST SET-UP FOR SIMPLEX OPERATION (8295.6 kHz)

RX	TX	8	2	9	5	6	ENTER
1	2			3			4
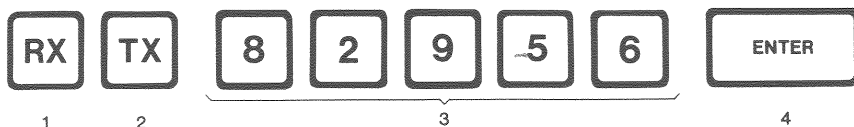
1   Press "RX"

2   Press "TX"
    The receiver and transmitter displays are blanked, and the-
    ir decimal points start flashing.

3   Enter the desired frequency in the receiver and transmitter
    displays via the numeric keys.

4   Press "ENTER"
    If frequency and mode are valid the decimal points stop
    flashing. Set receiver and transmitter as described previo-
    usly.

FAST SET-UP FOR 2182 kHz

| 2182	▲ VOLUME	▼ VOLUME
1	(2)	(3)
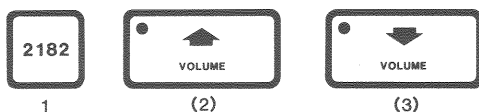
1   Press "2182"
    This instantly changes receiver and transmitter frequency
    to 2182 kHz, selects AM (H3E) mode, selects FULL POWER and
    enables transmitter function (TX ON). The loudspeaker and
    AGC are automatically switched ON and RF-AMP, ANT ATT and
    SQUELCH switched OFF. Antenna current is displayed when
    transmitting.

(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 automa-
    tic tuning, and you are ready to transmit.

RECEIVER TUNING
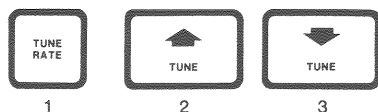
1   Press "TUNE RATE" to change frequency step.
   An annunciator below one of the three right hand digits of
   the receiver display indicates the frequency step selected.
   10 Hz, 100 Hz and 1000 Hz steps are possible.

2   Increase receiver frequency in steps selected.

3   Decrease receiver frequency in steps selected.
   If "TUNE" is pressed shortly the receiver frequency is cha-
   nged one step up or down. Holding "TUNE" pressed for more
   than 0.5 sec. changes the receiver frequency continuously
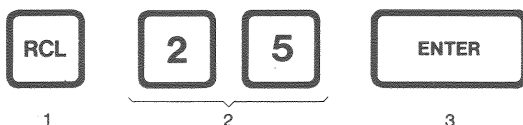   up or down with 10 steps/sec.

STORING RECEIVER/TRANSMITTER FREQUENCY PAIRS AND MODE
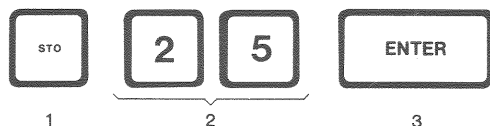
(Channel no. 25)

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

2   Enter the channel-number (0-75) in the receiver display via
   the numeric keys.

3   Press "ENTER"
   If the channel-number is valid the receiver and transmitter
   displays show the stored frequency-pair. If the channel-
   number is invalid the receiver display starts flashing.

RECALLING RECEIVER/TRANSMITTER FREQUENCY PAIRS AND MODE
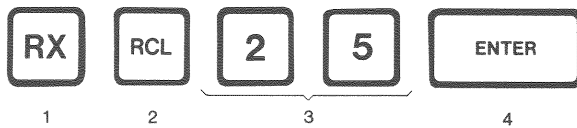

(Channel no. 25)

1   Press "RCL"
   The receiver and transmitter displays are blanked and their
   decimal points start flashing.

2   Enter the channel-number (0-75) in the receiver display via
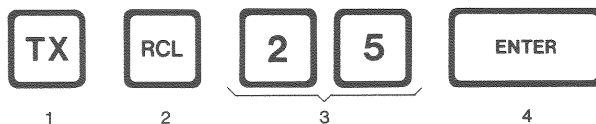   the numeric keys.

2-7

7

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 flas-
   hing.

RECALLING RECEIVER FREQUENCY

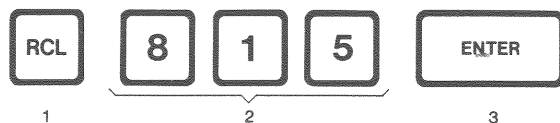| RX | RCL | 2 | 5 | ENTER |

  1   2   3   4

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

2 Press "RCL"

3 Enter the channel-number (0-75) in the receiver display via
   the numeric keys.

4 Press "ENTER"
   If the channel-number or frequency is invalid the receiver
   display starts flashing. If both channel-number and freque-
   ncy is valid the receiver display shows the recalled frequ-
   ency.

RECALLING TRANSMITTER FREQUENCY

| TX | RCL | 2 | 5 | ENTER |

  1   2   3   4

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 or frequency and/or mode is invalid
   the transmitter display starts flashing. If both channel-
   number, 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.

RECALLING ITU CHANNEL FREQUENCY PAIRS FROM PROM

| RCL | 8 | 1 | 5 | ENTER | (ITU channel no. 815)

  1   2   3

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 fre-
    quency and the transmitter display shows the ITU transmit-
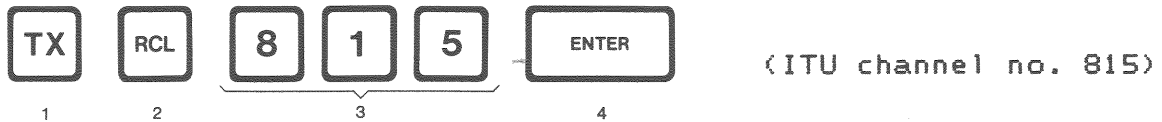   ter frequency if TX is ON, and the time-of-day if TX is
    OFF.

RECALLING ITU CHANNEL RECEIVER FREQUENCY FROM PROM
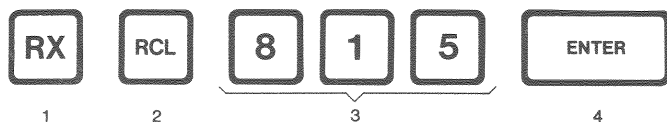
| RX | RCL | 8 | 1 | 5 | ENTER | (ITU channel no. 815)

  1   2   3   4
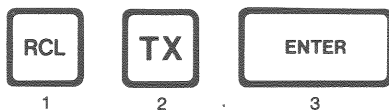
1   Press "RX"
    The receiver display is blanked and its decimal point
    starts flashing.

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 frequ-
    ency.

9

RECALLING ITU CHANNEL TRANSMITTER FREQUENCY FROM PROM

| TX | RCL | 8 | 1 | 5 | _ | ENTER | (ITU channel no. 815)

  1   2   3   4

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.

RECALLING TRANSMITTER FREQUENCY FROM PROM

```
┌─────┐   ┌─────┐   ┌───────────┐
│ RCL │   │ TX  │   │   ENTER   │        ─
└─────┘   └─────┘   └───────────┘
   1         2            3
```
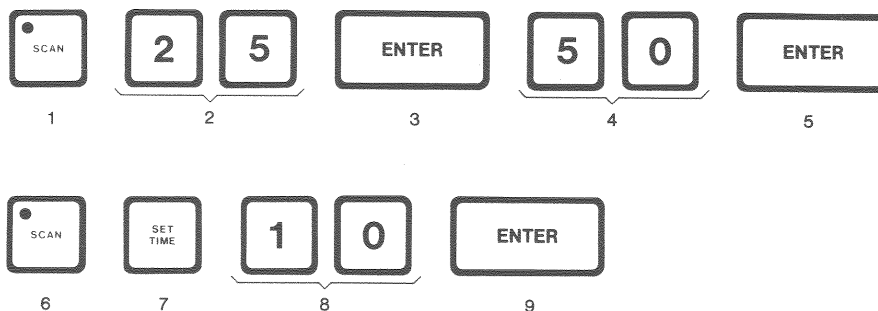
1   Press "RCL"
    The receiver and transmitter displays are blanked and their
    decimal points start flashing.

2   Press "TX"
    The receiver is reactivated and the first TX PROM frequency
    is shown in the transmitter display. Repressing "TX" will
    transfer the next TX PROM frequency to the transmitter dis-
    play 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.

SCANNING STORED RECEIVER/TRANSMITTER FREQUENCY PAIRS

A. SET SCANNING PARAMETERS   (Channel 25-50, time 1.0 sec.)

```
┌─────┐  ┌───┐ ┌───┐ ┌─────────┐  ┌───┐ ┌───┐ ┌─────────┐
│•    │  │ 2 │ │ 5 │ │  ENTER  │  │ 5 │ │ 0 │ │  ENTER  │
│ SCAN│  └───┘ └───┘ └─────────┘  └───┘ └───┘ └─────────┘
└─────┘   └────┬────┘              └────┬────┘
   1         2         3             4         5
```

```
┌─────┐  ┌─────┐ ┌───┐ ┌───┐ ┌─────────┐
│•    │  │ SET │ │ 1 │ │ 0 │ │  ENTER  │
│ SCAN│  │TIME │ └───┘ └───┘ └─────────┘
└─────┘  └─────┘  └────┬────┘
   6        7         8          9
```

1   Press "SCAN"
    The receiver and transmitter displays are blanked and their
    decimal points start flashing.

2   Enter the start channel-number in the receiver display via
    the numeric keys.

3   Press "ENTER"
    If the channel-number is valid the receiver display is bla-
    nked. If not, it starts flashing and you must repeat steps
   1,2 and 3.

4   Enter the stop channel-number (greater than the start chan-
    nel-number) in the receiver display via the numeric keys.

5   Press "ENTER"
    If the channel-number is valid the receiver and transmitter
    displays are reset to their initial states. If not, the
    receiver display starts flashing and you must press "SCAN",
    enter a valid stop channel-number and press "ENTER" again.

6   Press "SCAN"
    The receiver and transmitter displays are blanked and their
    decimal points start flashing.

7   Press "SET TIME"

8   Enter the dwell time (0.1-9.9 sec.) in the receiver display
    via the numeric keys.

9   Press "ENTER"
    The receiver and transmitter displays are reset to their
    initial states.

B. RECALL SCANNING PARAMETERS AND RESET SCAN POINTER
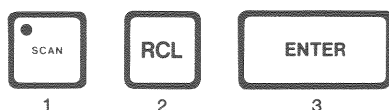
```
[● SCAN]   [RCL]   [ ENTER ]
   1         2         3
```

1   Press "SCAN"
    The receiver and transmitter displays are blanked and their
    decimal points start flashing.

2   Press "RCL"
    The start and stop channel-number are shown in the receiver
    display and the dwell time in the transmitter display. The
    scan pointer is reset to the start channel-number.

3   Press "ENTER"
    The receiver and transmitter displays are reset to their
   initial states.

C. START/STOP AUTOMATIC SCANNING
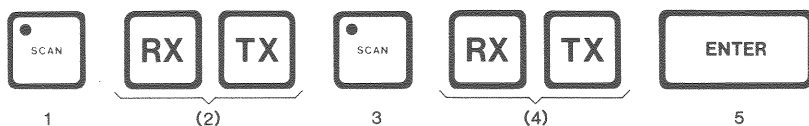
```
[● SCAN]  [RX][TX]  [● SCAN]  [RX][TX]  [ ENTER ]
   1        (2)        3        (4)         5
```

1   Press "SCAN"
    The receiver and transmitter displays are blanked and their
    decimal points starts flashing.

(2) Control external scan port. Press "RX" to open port. Press
    "TX" to close port. If the port is open the scan s/s signal
    can be used to start automatic scanning. The port is initi-
    ally closed.

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3 Press "SCAN"
   The scanning annunciator starts flashing indicating that
   the equipment is in automatic scanning mode. The receiver/
   transmitter frequency pairs stored in each channel between
   start and stop will be shown in the receiver and transmit-
   ter displays for the dwell time set. This is repeated until
   "ENTER" is pressed. If the scanning parameters has been
   changed, some time may pass before the start channel frequ-
   encies appear in the displays.

(4) Control external scan port. Press "RX" to open port. Press
    "TX" to close port. If the port is open the scan s/s signal
    can be used to stop automatic scanning. If neither keys are
    operated the port-state is as specified in (2).

5 Press "ENTER"
   The scanning annunciator stops flashing and the receiver
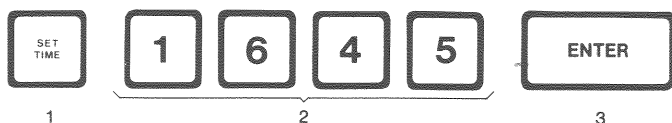   and transmitter are set to the frequencies indicated by the
   displays.

D. MANUAL SCANNING
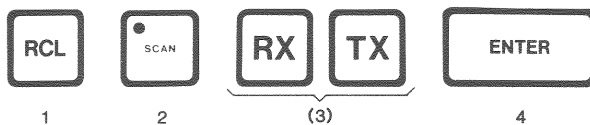
| RCL | SCAN | RX | TX | ENTER |

1   2   (3)   4

1 Press "RCL"
   The receiver and transmitter displays are blanked and their
   decimal points start flashing.

2 Press "SCAN"
   The scanning annunciator is turned constantly ON indicating
   that the equipment is in manual scanning mode. The start
   or next channel-number frequency pair is recalled and shown
   in the receiver and transmitter displays until "SCAN" is
   repressed, which will recall the next pair.

(3) Control external scan port. Press "RX" to open port. Press
    "TX" to close port. If the port is open the scan s/s signal
    can be used to step manual scanning to next frequency pair.
    The port is initially closed.

4 Press "ENTER"
   Manual scan is terminated, leaving the displayed frequency
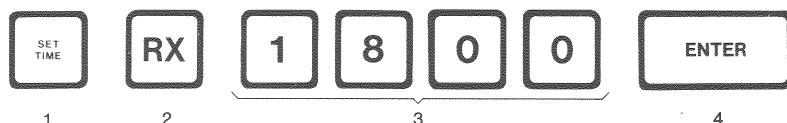   pair unchanged.

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SET TIME OF DAY   (16 hrs. 45 min.)

```
┌──────┐  ┌───┐ ┌───┐ ┌───┐ ┌───┐  ┌──────────┐
│ SET  │  │ 1 │ │ 6 │ │ 4 │ │ 5 │  │  ENTER   │
│ TIME │  │   │ │   │ │   │ │   │  │          │
└──────┘  └───┘ └───┘ └───┘ └───┘  └──────────┘
   1        └─────────┬─────────┘        3
                      2
```

1 Press "SET TIME"
   The transmitter display is blanked and the time cursor set
   (3rd digit).

2 Enter the time of day in the transmitter display via the
   numeric keys. The first two digits are interpreted as hours
   and the last two digits as minutes.

3 Press "ENTER"
   The transmitter display shows the time of day if TX is OFF
   and the transmitter frequency if TX is ON. If you set time
   according to a time signal you must press "ENTER" exactly
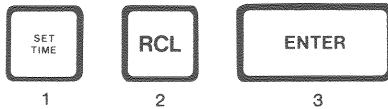   when the signal is given as this synchronizes the clock.
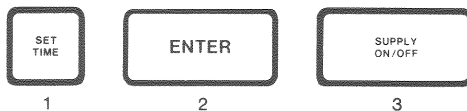
SET WAKE-UP TIME   (18 hrs. 00 min.)

```
┌──────┐  ┌────┐ ┌───┐ ┌───┐ ┌───┐ ┌───┐  ┌──────────┐
│ SET  │  │ RX │ │ 1 │ │ 8 │ │ 0 │ │ 0 │  │  ENTER   │
│ TIME │  │    │ │   │ │   │ │   │ │   │  │          │
└──────┘  └────┘ └───┘ └───┘ └───┘ └───┘  └──────────┘
   1        2    └─────────┬─────────┘         4
                           3
```

1 Press "SET TIME"
   The transmitter display is blanked and the time cursor set
   (3rd digit).

2 Press "RX"

3 Enter the wake-up time in the transmitter display via the
   numeric keys. The first two digits are interpreted as hours
   and the last two digits as minutes.

4 Press "ENTER"
   The transmitter display is reset to its initial state.

RECALL WAKE-UP TIME

```
┌──────┐   ┌──────┐   ┌────────────┐
│ SET  │   │ RCL  │   │   ENTER    │
│ TIME │   │      │   │            │
└──────┘   └──────┘   └────────────┘
   1          2             3
```

1   Press "SET TIME"
    The transmitter display is blanked and the time cursor set
    (3rd digit).

2   Press "RCL"
    The transmitter display shows wake-up time.

3   Press "ENTER"
    The transmitter display is reset to its initial state.

START DORMANT STATE

```
┌──────┐   ┌────────────┐   ┌────────────┐
│ SET  │   │   ENTER    │   │  SUPPLY    │
│ TIME │   │            │   │  ON/OFF    │
└──────┘   └────────────┘   └────────────┘
   1             2                3
```

1   Press "SET TIME"
    The transmitter display is blanked and the time cursor set
    (3rd digit).

2   Press "ENTER"
    The transmitter display is reset to its initial state.

3   Press "SUPPLY ON/OFF"
    The equipment is switched OFF, and will automatically be
    switched ON again at wake-up time recalling the state it
    was in before being switched OFF.

SECOND FUNCTIONS

The second function level provides enhanced system control to
the advanced user without sacrificing simplicity of the pri-
mary keypad functions. The level consists of 10 menues (pages)
each containing a maximum of 10 functions (lines). Operation
on this level will always be identified by the non-standard
display symbol "] " in the left most tab of at least one of
the displays.

SECOND FUNCTION SYNTAX
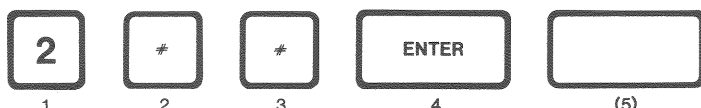
2	#	#	ENTER	
1	2	3	4	(5)

1   Press "2".
    The transmitter display is blanked and the decimal points
    start flashing. The receiver display shows "] " to identify
    a non-standard display and "2". If "2" was pressed by mis-
    take "ENTER" will terminate second function mode.

2   Press a number.
    The number is passed to the receiver display. This number
    identifies the second function page. If the number was
    pressed by mistake "ENTER" will terminate second function
    mode.

3   Press a number.
    The number is passed to the receiver display. This number
    identifies the second function line. If the number was
    pressed by mistake "2" will restart the second function mo-
    de.

4   Press "ENTER".
    If page and line numbers are not valid the receiver dis-
    play starts flashing and the second function mode can be
    either restarted by pressing "2" or terminated by pressing
    "ENTER". If both page and line numbers are valid the respe-
    ctive second function is executed and if no further keys
    are required in the specific function the displays are
    restored to the state prior to second function execution.

(5) Most second functions require additionally keys to be pres-
    sed. Typically "2" will restart second function mode and
    "ENTER" terminate it.
    Some second functions require confirmation via the "STO"
    key. This situation is indicated by a special warning dis-
    play-flash shifting between "]]]]]]]" and the entered num-
    ber. Pressing "STO" will execute the function, "2" will
    restart the second function mode and any other key will
    terminate it.

Second functions requiring confirmation:

250:      Clear RAM
251:      Reset system
278:      Clear "OPTION" register
280-287: Toggle "PRESET" register bit 0-7
298:      Clear "GUARD" register

PAGE 0 (20#).

Self test. For detailed information see selftest description
in chapter 4.

Executable lines:

200: Automatic stepped selftest.
201: Manually stepped selftest.

PAGE 4 (24#).

Miscellaneous functions.

Executable lines:

244: Control BFO frequency. The receiver display shows the
     present BFO frequency. The transmitter display shows the
     stored BFO frequency selected on power-up. Pressing "STO"
     will store the present frequency. Pressing "RCL" will
     recall the stored frequency. Pressing "2" or "ENTER" will
     restart or terminate second function.

245: Read special system parameters in configuration PROM. The
     receiver display shows the PROM address in decimal initi-
     alized to top of PROM = 4095. The transmitter display
     shows the PROM data in decimal. Pressing "RCL" will chan-
     ge the displayed data to hexadecimal, useful when reading
     BCD. Since the display decoder is not designed for let-
     ters the following symbols are displayed for hexadecimals
     greater than 9:

                              A : ⊏
                              B : ⊐
                              C : ⊔
                              D : ⊑
                              E : ⊨
                              F : blank

Pressing "DIMMER DOWN" will show the next lower PROM address.
Pressing "DIMMER UP" will show the next higher PROM address.
Pressing "2" or "ENTER" will restart or terminate second
function.

246: Read CU program release date and version. The receiver
     display shows release date (year/month/day). The trans-
     mitter display shows version number.
     Pressing "2" or "ENTER" will restart or terminate second
     function.

247: Read TU program release date and version. The receiver
     display shows release date (year/month/day). The trans-
     mitter display shows version number.
     Pressing "2" or "ENTER" will restart or terminate second
     function.

248: Adjust beeper sound level. A continuous control beeping
     is started.
     Pressing "VOLUME UP" will increase the sound level.
     Pressing "VOLUME DOWN" will decrease the sound level.
     Pressing "2" or "ENTER" will restart or terminate second
     function preserving the new beeper sound level.

249: Switch antenna OFF. The antenna and transmitter are swit-
     ched OFF. The power annunciators are turned OFF to iden-
     tify antenna OFF and transmitter display shows time of
     day to identify transmitter OFF. Finally second function
     is terminated. When "TX ON/OFF" is then pressed both an-
     tenna and transmitter are switched ON and power annuncia-
     tors and transmitter display restored to normal.

PAGE 5 (25#).

Miscellaneous functions. This page can not be entered when
"GUARD" bit 7 is set (see second function page 9).

Executable lines:

250: Clear RAM. The function requires confirmation as descri-
     bed for the syntax key (5). All stored frequency pairs
     and modes, the "OPTION" register and "GUARD" register
     will be cleared (=0) and second function terminated.

251: Reset system. The function requires confirmation as de-
     scribed for the syntax key (5). 32 msec after releasing
     the "STO" key, both CU and TU processors are reset by
     running the power-up program.

PAGE 7 (27#).

Controls an 8-bit "OPTION" register.

Executable lines:

270: Toggle "OPTION" bit 0
271:    -   -   -   -   1
272:    -   -   -   -   2
273:    -   -   -   -   3
274:    -   -   -   -   4
275:    -   -   -   -   5
276:    -   -   -   -   6
277:    -   -   -   -   7
278: Clear "OPTION" register
279: Display "OPTION" register (bits 0-3 in transmitter dis-
     play, bits 4-7 in receiver display).

All lines will display the resulting "OPTION" register.
Pressing "2" or "ENTER" will restart or terminate second
function.

2-18

18

"OPTION" bit functions:

BIT	LEVEL	FUNCTION			
0	-	Reserved for future use			
1	-	- ~	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	-	-	-	-	-
5	-	-	-	-	-
6	-	-	-	-	-
7	0	Normal			
	1	No time-display "cursor"			

PAGE 8 (28#).

Controls an 8 bit "PRESET" register intended for use in in-
stallation only. Special system parameters which are difficult
to specify before installation can be changed on location by
toggling the respective bit in this non-volatile register. To
protect the "PRESET" register against erroneous changes Page 8
can not be entered when "GUARD" bit 7 is set. Toggling any bit
requires confirmation as described for the syntax key (5).
Further more "PRESET" is excluded from the CLEAR RAM function
(250).

Executable lines:

```
280: Toggle "PRESET" bit 0
281:   -       -      -      - 1
282:   -       -      -      - 2
283:   -       -      -      - 3
284:   -       -      -      - 4
285:   -       -      -      - 5
286:   -       -      -      - 6
287:   -       -      -      - 7
289: Display "PRESET" register (bits 0-3 in transmitter dis-
     play, bit 4-7 in receiver display).
```

All lines will display the resulting "PRESET" register.
Pressing "2" or "ENTER" will restart or terminate second
function.

"PRESET" bit functions:

BIT	LEVEL	FUNCTION			
0	-	Reserved for future use			
1	-	-	-	-	-
2	-	-	-	-	-
3	-	-	-	-	-
4	-	-	-	-	-
5	-	-	-	-	-
6	-	-	-	-	-
7	0	Normal			
	1	Complement external scan transitions			

PAGE 9 (29#).

Controls an 8-bit "GUARD" register.
This page can not be entered when "GUARD" bit 7 is set (see
following explanation).

Executable lines:

290: Toggle "GUARD" bit 0
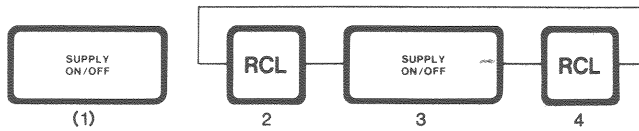291:   -   -   -   -   1
292:   -   -   -   -   2
293:   -   -   -   -   3
294:   -   -   -   -   4
295:   -   -   -   -   5
296:   -   -   -   -   6
297:   -   -   -   -   7
298: Clear "GUARD" register.
299: Display "GUARD" register (bits 0-3 in transmitter
     display, bit 4-7 in receiver display).

All lines will display the resulting "GUARD" register.
Pressing "2" or "ENTER" will restart or terminate second
function.

"GUARD" bit functions:

BIT	LEVEL	FUNCTION
0	0	Normal
	1	Inhibit direct entry of RX frequencies
1	0	Normal
	1	Inhibit "RX" key
2	0	Normal
	1	Inhibit direct entry of TX frequencies
3	0	Normal
	1	Inhibit "TX" key
4	0	Normal
	1	Inhibit store function
5	0	Normal
	1	Inhibit "STO" key
6	0	Normal
	1	Inhibit entry of scan parameters
7	0	Normal
	1	Inhibit certain second function pages

Clear GUARD-bit 7 (PAGE GUARD)

```
┌──────────┐  ┌─────┐  ┌──────────┐  ┌─────┐
│ SUPPLY   │  │ RCL │  │ SUPPLY   │~ │ RCL │
│ ON/OFF   │  │     │  │ ON/OFF   │  │     │
└──────────┘  └─────┘  └──────────┘  └─────┘
    (1)          2          3           4
```

(1) Switch supply OFF.

 2   Press "RCL" and keep it.

 3   Switch supply ON.

 4   Keep "RCL" pressed until the beeper sounds.
     Guard-bit 7 is now cleared and all second function pages
     can be entered.

To prevent unauthorized use this syntax is not described in
the User Manual.

SECOND FUNCTIONS SUMMARY

```
200:      Automatically stepped selftest
201:      Manually stepped selftest

244:      Control BFO frequency
245:      Read special system parameters
246:      Read CU release date and version
247:      Read TU release date and version
248:      Adjust beeper sound level
249:      Turn OFF antenna

250:      Clear RAM
251:      Reset system

270-277:  Toggle "OPTION" register bit 0-7
278:      Clear "OPTION" register
279:      Read "OPTION" register

280-287:  Toggle "PRESET" register bit 0-7
289:      Read "PRESET" register

290-296:  Toggle "GUARD" register bit 0-6
297:      Set "GUARD" register bit 7
298:      Clear "GUARD" register
299:      Read "GUARD" register
```

2.2 DESCRIPTION OF OPERATING CONTROLS

SUPPLY ON/OFF Switches ON/OFF the equipment power supply. When switched ON the equipment enters the state it was in just before being switched OFF.

TX ON/OFF Switches ON/OFF the transmitter functions. The transmitter display shows the transmitter frequency when switched ON, and the time of day when switched OFF.
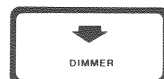
DIMMER ↑ DIMMER ↓ Increases and decreases the light intensity in the displays, meters and annunciators.

STO Storing of receiver/transmitter frequency pairs and mode. When "STO" is pressed the receiver and transmitter displays are blanked and their decimal points start flashing, indicating that a channel-number (0-75) must be entered in the receiver display via the numeric keys.

SCAN Setting/recalling scanning parameters and start/stop scanning of stored receiver/transmitter frequency pairs. The annunciator is flashing in automatic scanning mode and turned constantly ON in manual scanning mode. (for details see section 2.1)

SET TIME Setting time of day, setting/recalling wake-up time, starting dormant state and setting dwell time in scanning. (for details see section 2.1)

**DUPLEX** Pressing "DUPLEX" causes no action in the TRP 8250S

RX a) Primary function: Change of receiver frequency. When "RX" is pressed the receiver display is blanked and its decimal point starts flashing, indicating that a new receiver frequency must be entered into the display via the numeric keys.
b) Secondary function: Setting of wake-up time, when "RX" is pressed immediately after "SET TIME". Opening of the external scan port (see section 2.1)

TX

a) Primary function: Change of transmitter freque-
ncy. When "TX" is pressed the transmitter disp-
lay is blanked and its decimal points starts
flashing, indicating that a new transmitter
frequency must be entered into the display via
the numeric keys.

b) Secondary function: Recalling of transmitter
frequency from PROM. Closing of the external
scan control port (see section 2.1)

RCL

a) Primary function: Recalling stored receiver/
transmitter frequencies. When "RCL" is pressed
the receiver and transmitter displays are blan-
ked and their decimal points start flashing,
indicating that a channel-number (0-75) must be
entered into the receiver display via the nume-
ric keys.

b) Secondary function: Recalling wake-up time,
when "RCL" is pressed immediately after "SET
TIME" and recalling scanning parameters when
"RCL" is pressed immediately after "SCAN" (see
section 2.1)

7	8	9
4	5	6
1	2	3
0		
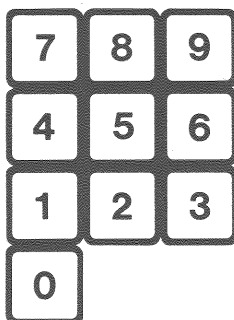
Numeric keys
----

a) Primary functions:
   Entering of receiver/transmitter
   frequencies and channel-numbers.

b) Secondary functions:
   Setting scanning parameters, time
   of day, wake-up time and sound
   level of beeper. Refer to section
   2.1 for further details.

ENTER

Terminating keyboard operation. "ENTER" must be
pressed to terminate all keyboard operations ini-
tiated by the "RX", "TX", "STO", "RCL", "SCAN",
"SET TIME" or numeric keys. Generally the displays
will then be reset to their initial states if the
operating parameters are valid. An exception is
the selfcheck mode (see section 4.4)

VOLUME ▲   **VOLUME ▼**

Adjustment of receiver AF-amplifier
gain. (Sound level of internal speak-
er, handset phone and headphone).
Pressing one of the keys turns on the
corresponding annunciator, which is
turned off again when the key is rel-
eased or when minimum or maximum sou-
nd level is reached.

2-24

[▲ SENSITIVITY]   [▼ SENSITIVITY]   Adjustment of receiver IF-amplifier gain when the AGC is switched OFF.

[AGC ON]   [AGC OFF]   Switches ON/OFF the AGC (Automatic Gain Control). The annunciators indicate whether the AGC is ON or OFF. When the AGC is ON the receiver IF-amplifier gain is automatically adjusted and manual control disabled. When the AGC is switched OFF the receiver IF-amplifier gain is maintained on the level it had just before the AGC was switched OFF and manual control via the "SENSITIVITY" keys is enabled. When selecting a new receiver frequency the AGC should always be ON, to ensure that a suitable start level of IF-amplifier gain is set before the AGC is switched OFF for manual adjustment.

[SPEAKER]   Switches ON/OFF internal and external loudspeaker. Annunciator ON indicates loudspeaker(s) ON. If headphones are connected via the socket on the rear of the Control Unit, the internal loudspeaker is always switched OFF.

[RF AMP]   Increases receiver gain 10 dB by activating the RF-amplifier stage. Annunciator ON indicates RF-amplifier ON. The RF-amplifier may be used when the received signal is weak.

[ANT ATT]   Decreases receiver gain 20 dB by inserting the antenna input attenuator. Annunciator ON indicates attenuator ON. The antenna attenuator may be used if the received signal is disturbed by strong out-of-band signals.

[SQUELCH]   Switches ON/OFF Squelch function. Annunciator ON indicates Squelch ON. If the Squelch is ON a speech signal with a signal to noise ratio greater than a certain value is required to pass the signal through the receiver AF-amplifier. The Squelch is used to eliminate noise when there is no speech signal on the receiver frequency. The Squelch Board is optional. When not installed, pressing the key causes no action.

[TUNE RATE]   Selects frequency step in receiver tuning. 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.

2-25

↑ TUNE / ↓ TUNE Tuning of receiver frequency up or down in frequency steps selected by the "TUNE RATE" key (see section 2.1)

↑ BFO / ↓ BFO Adjustment of the BFO frequency down and up in CW-mode. Receiver display shows BFO frequency when either of the keys are pressed.

WIDE / INTER MEDIATE / NARROW / VERY NARROW Selects respective IF-filters in CW and MCW-mode. Annunciator ON indicates selected filter.

USB Selecting transmission of J3E and reception of J3E and R3E signals in USB (Upper Side Band). Annunciator ON indicates USB-mode selected.

LSB Selecting transmission of J3E and reception of J3E and R3E signals in LSB (Lower Side Band). Annunciator ON indicates LSB-mode selected. If transmission of LSB is illegal and transmitter is ON, the transmitter display is flashing and transmitter function disabled.

AM Selecting transmission of H3E (Upper Side Band) and reception of H3E and A3E signals. Annunciator ON indicates AM-mode selected. If transmission of H3E is illegal and transmitter is ON, the transmitter display is flashing and transmitter function disabled.

R3E Selecting transmission of R3E and reception of R3E and J3E signals (Upper Side Band). Annunciator ON indicates R3E-mode selected.

TELEX Selecting transmission and reception of Telex in F1B-mode. Annunciator ON indicates Telexmode selected. The Telex function is optional.

2182 Fast set-up for 2182 kHz. Pressing this key will instantly change receiver and transmitter frequency to 2182 kHz, select AM (H3E) mode, select FULL POWER, and enable transmitter function (TX ON). The loudspeaker(s) and AGC are automatically switched ON and RF-AMP, ANT ATT and SQUELCH switched OFF. Antenna current is displayed when transmitting.

500

Fast set-up for 500 kHz. Pressing this key will instantly change receiver frequency to 500 kHz and select MCW (H2A) mode. The loudspeaker(s) and AGC are automatically switched ON and RFAMP, ANT ATT and SQUELCH switched OFF. IF FILTER keys are enabled and the intermediate type filter automatically selected.

CW

Selecting transmission and reception of A1A morse telegraphy signals. Annunciator ON indicates CW-mode selected. If transmission of A1A is illegal and transmission is ON, the transmitter display is flashing and transmitter function disabled. IF FILTER keys are enabled and the intermediate type filter automatically selected. BFO is enabled and AGC is switched ON.

MCW

Selecting transmission and reception of H2A modulated morse telegraphy signals. Annunciator ON indicates MCW-mode selected. If transmission of H2A is illegal and transmission is ON, the transmitter display is flashing and transmitter disabled. IF FILTER keys are enabled and the intermediate type filter automatically selected. AGC is switched ON.

TX TUNE

Activating Antenna Tuner. Pressing this key will start the automatic tuning procedure in the ATU (Antenna Tuning Unit). Tuning is performed in less than 1.5 sec. Pressing the handset key for the first time after changing transmitter frequency will also start the tuning procedure, and it is therefore not necessary to press "TX TUNE" in this case. "TX TUNE" is normally used when the frequency has been unchanged for some time and the antenna impedance has changed due to external circumstances (see section 2.1).

LOW POWER

Selecting low transmitter output power (appx. 10 W PEP). Annunciator ON indicates LOW POWER selected.

MEDIUM POWER

Selecting medium transmitter output power (appx. 60 W PEP). Annunciator ON indicates MEDIUM POWER selected.

FULL POWER

Selecting full transmitter output power (appx. 250 W PEP). Annunciator ON indicates FULL POWER selected.

PRESS BOTH TO
TEST ALARM

STOP
ALARM

PRESS BOTH TO
SEND ALARM
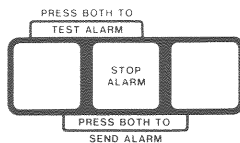
Testing and transmitting the two-tone alarm sig-
nal. Press "STOP ALARM" and the left key simultan-
eously and keep pressed to test alarm. The alarm
signal is heard in the loudspeaker, and transmit-
ter keying is disabled. If the Dummy Load option
is installed the alarm generator and the transmit-
ter is tested on the built-in dummy load of the
Antenna Tuning Unit. The Antenna Current Meter
indicates current into the dummy load. The Output
Power and Antenna Current annunciators are flas-
hing to show that the transmitter is in the test
mode. Test on dummy load cannot be performed on
2182 kHz. Press the left and right keys simultane-
ously to send alarm. The alarm signal is heard in
the loudspeaker and transmitted for 45 sec. on the
selected frequency if the transmitter is ON. The
alarm signal may be interrupted by pressing "STOP
ALARM".

Transmitter Display

In its initial state the transmitter display shows the transm-
itter frequency in kHz if TX is ON or the time of day in hours
and minutes if TX is OFF. Time of day is indicated by a flash-
ing time cursor (3rd digit).

A steady time cursor indicates that entering or recalling of
time has not yet been terminated.

A flashing decimal point indicates that entering, storing or
recalling of a transmitter frequency has not yet been termina-
ted.

Flashing digits indicate that the transmitter frequency and/or
mode is unauthorized, i.e. the frequency is outside the speci-
fied range and/or not contained in the frequency PROM. The
transmitter cannot be keyed if the transmitter display is
flashing.

Receiver Display

In its initial state the receiver display shows the receiver
frequency in kHz.

A flashing decimal point indicates that entering, storing or
recalling of a receiver frequency or channel-number has not
yet been terminated.

Flashing digits indicate that the frequency or channel-number
is outside the specified range.

Signal Strength meter

Gives a relative indication of the signal strength in the
received signal.

2-28

Output power/Antenna current meter

Measures the antenna current during transmission on 2182 kHz, as indicated by the antenna current annunciator.

Gives a relative indication of the transmitter output power during transmission on other frequencies by measuring the output peak voltage/current, as indicated by the output power annunciator.

A flashing meter indicates a fault in the Transceiver Unit – Antenna Tuning Unit communication.

Output power annunciator

Also serves as a mismatch indicator on all frequencies. If the input SWR of the Antenna Tuning Unit exeeds 1:3 the output power annunciator starts flashing, indicating that tuning is required.

Reduced power annunciator

If the temperature of the Power Amplifier heatsink and/or the Antenna Tuning Unit exeeds their maximum levels, the output power is reduced by 5 dB which is indicated by the reduced power annunciator. This may occur due to extreme environmental and/or working conditions.