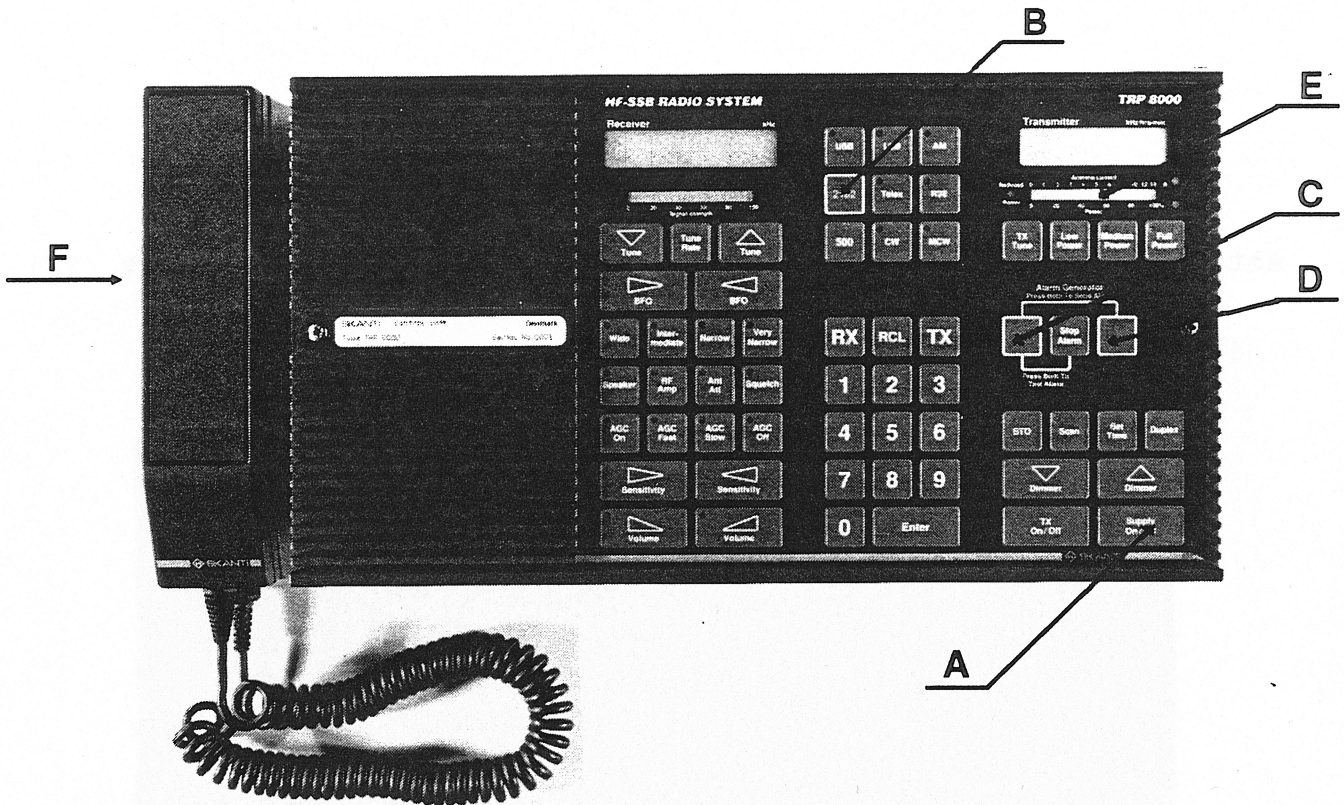


1. DISTRESS OPERATION ON 2182 KHZ



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.

Antenna Tuning Unit (ATU)

Transceiver Unit (TU)



Control Unit (CU)

Fig. 1.1

2. INTRODUCTION

The TRP 8250 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 8250 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 bargraph 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 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 250 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 or give continuous coverage of the frequency range 1.6 to 30 MHz.

A high efficiency switched mode power supply ensures optimum output power at low power consumption and covers a supply voltage range from 10.8 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).

The AC Power Supply Unit accepts nominal input voltages of 110/120/220/240 V, 50-60 Hz. A built-in switch permits manual switch-over to battery operation.

2.1 BASIC VERSIONS

In common : 250 Watt P.E.P. Power Amplifier.
Simplex/Semi-duplex/Full-duplex operation 1.6-30 MHz.

TRP 8250 D : Marine SSB Radiotelephone.
1017 preprogrammable frequencies in Marine Bands.

TRP 8251 D : Marine SSB Radiotelephone.
Free frequency selection Marine Bands.

TRP 8252 D : Marine SSB Radiotelephone.
Free frequency selection Marine Bands.
CW and MCW facilities.

TRP 8253 D : Marine SSB Radiotelephone.
Free frequency selection all bands.

TRP 8254 D : General Purpose SSB Radiotelephone.
Free frequency selection all bands.

TRP 8255 D : General Purpose SSB Radiotelephone.
Free frequency selection all bands.
CW and MCW facilities.

TRP 8256 D : General Purpose SSB Radiotelephone.
Free frequency selection all bands.
As type TRP 8254 D, but simplified keyboard.

TRP 8257 D : Marine SSB Radiotelephone.
Free frequency selection all bands.
CW and MCW facilities.

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 μ V

AM:
100 kHz - 400 kHz: 7 μ V
400 kHz - 30 MHz: 5 μ V

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: 250 W PEP +0/-1.4 dB from Transceiver Unit into 50 ohms.
Power Reduction:
Medium: approx. 60 W PEP
Low: approx. 10 W PEP
Single-tone max. Power:
250 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 8250 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 8253 D/8254 D/8255 D/8257 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 8250 D/8253 D/8257 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: 250 W PEP
125 W Average

3.5 POWER REQUIREMENTS

Supply Voltage: 12-24-32 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 8250).

Power Consumption (approx.)	Receive only:	50 W
	J3E unmodulated:	100 W
	H3E unmodulated:	360 W
	H3E alarm:	420 W
	CW keyed:	640 W
	MCW keyed:	420 W
	ARQ-telex:	330 W

3.6 DIMENSIONS AND WEIGHTS

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

Transceiver Unit:	Width:	422 mm (500 mm incl mounting brackets).
	Height:	368 mm
	Depth:	280 mm
	Weight:	28.4 kg, approx.
Antenna Tuning Unit:	Width:	330 mm
	Height:	440 mm (535 mm incl antenna horn).
	Depth:	130 mm
	Weight:	5.7 kg, approx.
AC Power Supply Unit (optional):	Width:	241 mm
	Height:	367 mm (440 mm incl attachment rails).
	Depth:	101 mm
	Weight:	17 kg, approx.