4. TROUBLE SHOOTING AND SERVICE

4.1. Malfunction

If the equipment is not functioning correctly a check should be made that is being operated properly; see chapter 2.

4.2. Replacement of FUSES

The TRANSCEIVER UNIT contains two replaceable fuses located at the front of the Switched Mode Power Supply. The fuses become accessible when the front door is opened. Spare fuses are placed on the Switched Mode Power Supply.

The AC POWER SUPPLY UNIT contains a fuse located at the front of the unit. Spare fuses are located behind the cover.

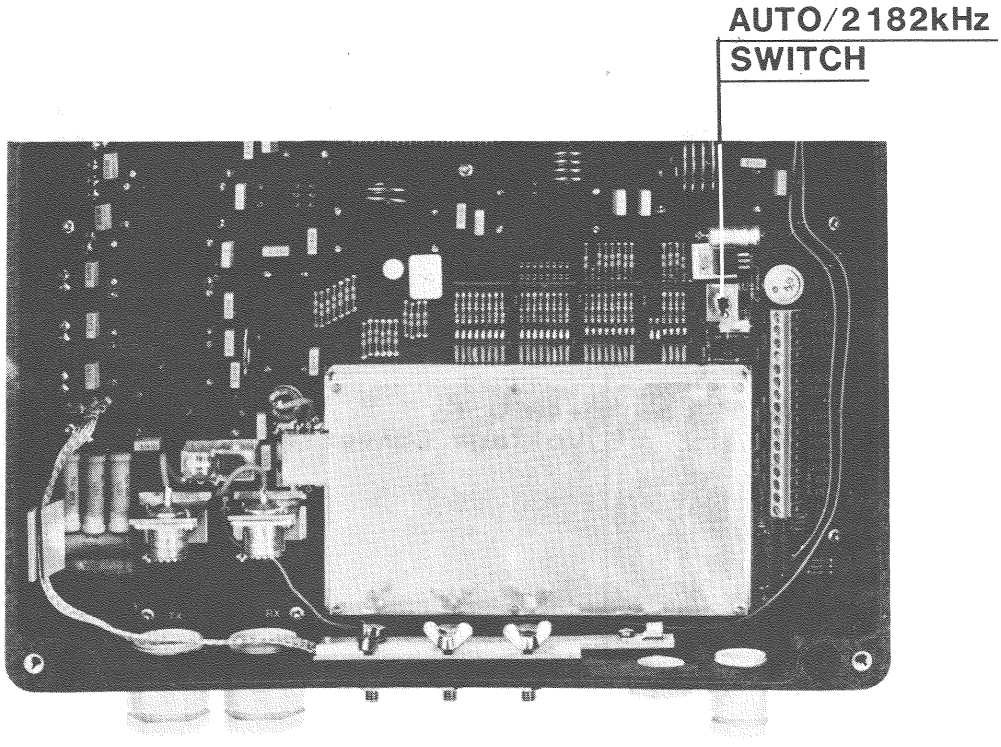
Fuse ratings are given in table 4.1 below. Fuses with marked ratings within 5 percent of the ratings must be used. Note that fast or slow blowing fuses must be used as specified.

Location	Fuse Rating	Function	Sympton if fuse is blown
TRANSCEIVER UNIT	4 A fast	+48 V to Voltage Converter	Equipment dead, but Main Relay operates when Supply switch is activated. Voltage-indicator lamp in Switched Mode Power Supply is lit when power is on.
	15 A fast	48 V to Power Amplifier	No RF output power
AC POWER SUPPLY UNIT	110/120 V: 12.5 A slow 220/240 V: 6.3 A slow	Mains input	No light in DC OUTPUT LAMP with mains switch position MAINS ON

Table 4.1

4.3 HOW TO MANUALLY TUNE THE ANTENNA TUNING UNIT TO 2182 kHz IN CASE OF FAILURE IN THE AUTOMATIC TUNING SYSTEM.

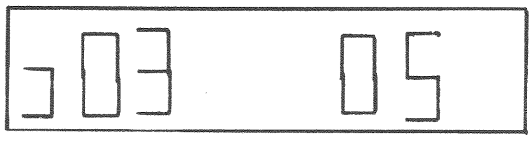
1. Switch SUPPLY OFF on Control Unit.
2. Remove cover from Antenna Tuning Unit.
3. Locate AUTO/2182 kHz toggle switch and switch it to 2182 kHz (downwards).
4. Refit the cover.
5. The radiotelephone is now ready for operation on 2182 kHz only.



1

4.4 DESCRIPTION OF SELFTEST FUNCTIONS

Selftest can be done in two different modes, auto mode and step mode. Auto mode is intended for a quick verification of all functions, it will execute all tests in sequence and stop if a malfunction is detected. Step mode is intended for service purposes, it allows step by step testing and gives the operator the possibility to make measurements during the tests and to repeat tests. Thus it can be used as a built-in signal generator for many purposes.
The results of the tests are displayed on the RX display at the Control Unit. The result consists of a test number, indicating which test has been performed, and an error code indicating if the test was OK.

RX display 

test number — error code

The error codes are to be interpreted as follows:

Error-code	Meaning
00	The test has passed.
01 02 - - 97	A malfunction has been detected, refer to specific test description for precise information.
98	Communication error The test failed due to communication error between CU and TU.
99	The test can not be executed due to missing options (special IF filters etc.)

EXECUTION OF SELFTEST IN AUTO-MODE

The selftest is executed by pressing:

00 - no faults

The test will take several seconds, during which various sounds may be heard. The test will stop when all tests have been executed, or the first time an error is detected. When the test stops, a test number and an error-code will be displayed. If the error-code is 00 no faults has been detected. If the error-code is different from 00, an error has been detected, refer to description of specific tests for information on the fault and for appropriate actions. The test-result will be displayed for 10 seconds, thereafter the Transceiver will return to normal operation.

EXECUTION OF SELFTEST IN STEP MODE

The selftest is executed by pressing:

The test will start by executing test number 1 and displaying the test-number and the error-code.
The test setup will remain until the operator presses "DIMMER UP", then it will proceed to the next test.
The last test can be repeated by pressing "DIMMER DOWN".
If the operator presses any key but "DIMMER UP" or "DIMMER DOWN", the Transceiver will return to normal operation.
The Transceiver will return to normal operation when the last test has been executed.

Dimmer UP ↑

TEST 1

Test 1 will test Audio Processing Board [601], reception signal path.

Microprocessor tone generator is set to no tone, AF switch is set to microprocessor tone generator, and speaker is set ON.

AF AMP is checked for silence.

The test is OK if CHECK 1 = "1"

Error-code	Meaning
00	The test was OK
01	Error. CHECK 1 was "0" Possible cause: Fault on [601] Audio Processing Board or [600] Control Board or cable connecting [600] and [601]

#27 - 99
#28 - 99
#29 - 99
30 - 99
40 - 99
41 - 99

TEST 2

Test 2 will test Audio Processing Board [601] , reception signal path.

Microprocessor tone generator is set to 800 Hz, AF switch is set to microprocessor tone generator, and speaker is set ON.

AF AMP is checked for tone.

The test is OK if $\overline{\text{CHECK 1}}$ = "0"

A clear tone is heard during the test.

Error-code	Meaning
00	The test was OK
01	Error. Check 1 was "1" Possible cause: Fault on [601] Audio Processing Board or [600] Control Board or cable connecting [600] and [601] or loudspeaker shortcircuited

TEST 3

Test 3 will test Audio Processing Board [601] , transmission signal path.

The input selector is grounded, the compressor is checked for silence.
The execution of this test takes 5 seconds.

The test is OK if CHECK 2 = "0"

Error-code	Meaning
00	The test was OK
01	Error. CHECK 2 was "1" Possible cause: Fault on [601] Audio Processing Board or [600] Control Board or cable connecting [600] and [601]

TEST 4

Test 4 will test Audio Processing Board [601] , transmission signal path.

The microprocessor tone generator is set to 800 Hz, input selector is set to microprocessor tone, the compressor is checked for compression.

The test is OK if CHECK 2 = "1"

Error-code	Meaning
00	The test was OK
01	Error. CHECK 2 was "0" Possible cause: Fault on [601] Audio Processing Board or [600] Control Board or cable connecting [600] and [601]

TEST 5

Display test.

This test will turn all displays, annunciators and bar-graph's ON for 10 seconds.

The microprocessor can not test the displays, the operator must inspect the displays visually.

Error-code	Meaning
00	The test was OK, the microprocessor can not detect any faults in this test

If some displays, annunciators or bar-graph's do not turn ON, exchange or repair [600] Control Board.

TEST 6

Test 6 will test Master Oscillator and reference dividers on board [612] , [613] or [614] .

Test 6 will test that M.O.CHECK = "1"

Error-code	Meaning
00	The test was OK
01	Error. M.O.CHECK was "0" Fault on: [612] , [613] or [614] Master Oscillator or cable connecting [611] and [612] or [611] Synthesizer Board or cable connecting [611] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 7

Test 7 will test Synthesizer Board 611.
It will set all synthesizers mid-range and test for lock.

1.LO is set to 50 MHz range = 45-52.5 MHz
2.LO is set to 43.6 MHz
3.LO is set to 1.4 MHz

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error. SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 8

Test 8 will test Synthesizer Board 611.
It will bring 1.LO out of lock to check that it can be controlled by the microprocessor.

The test is OK if SYNCHECK 0 = "0"

Error-code	Meaning
00	The test was OK
01	Error. SYNCHECK 0 was "1" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 9

Test 9 will test Synthesizer Board 611.
It will set 1.LO to 45 MHz to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error. SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 10

Test 10 will test Synthesizer Board 611.
It will set 1.LO to 52.5 MHz, using the 45-52.5 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 11

Test 11 will test Synthesizer Board 611.
It will set 1.LO to 52.5 MHz, using the 52.5-60 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

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TEST 12

Test 12 will test Synthesizer Board 611.
It will set 1.LO to 60 MHz, using the 52.5-60 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 13

Test 13 will test Synthesizer Board 611.
It will set 1.LO to 60 MHz, using the 60-67.5 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 14

Test 14 will test Synthesizer Board 611.
It will set 1.LO to 67.5 MHz, using the 60-67.5 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 15

Test 15 will test Synthesizer Board [611].
It will set 1.LO to 67.5 MHz, using the 67.5-75 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: [611] Synthesizer Board or cable connecting [611] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 16

Test 16 will test Synthesizer Board [611].
It will set 1.LO to 75 MHz, using the 67.5-75 MHz band, to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: [611] Synthesizer Board or cable connecting [611] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 17

Test 17 will test Synthesizer Board [611].
It will set 2.LO to 43.597 MHz to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: [611] Synthesizer Board or cable connecting [611] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 18

Test 18 will test Synthesizer Board 611.
It will set 2.LO to 43.603 MHz to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 19

Test 19 will test Synthesizer Board 611.
It will set 3.LO out of lock to check if it can be controlled by the microprocessor.

The test is OK if SYNCHECK 0 = "0"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "1" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 20

Test 20 will test Synthesizer Board 611.
It will set 3.LO to 1.3955 MHz to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: 611 Synthesizer Board or cable connecting 611 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

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TEST 21

Test 20 will test Synthesizer Board [611].
It will set 3.LO to 1.403 MHz to check if it can lock.

The test is OK if SYNCHECK 0 = "1"

Error-code	Meaning
00	The test was OK
01	Error, SYNCHECK 0 was "0" Fault on: [611] Synthesizer Board or cable connecting [611] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 22

Test 22 will test RX/EX Signal path [610].
It will set [610] to J3E reception and test that EX OUT CHECK and EX AF CHECK is LOW, this will prove that the signal path is controlled by the microprocessor.

The test is OK if EX AF CHECK = "0"
and EX OUT CHECK = "0"

Error-code	Meaning
00	The test was OK
01	Error, EX AF CHECK was "1" Fault on: [610] RX/EX signal path or cable connecting [610] and [624] or [624] Transceiver Control Board
02	Error, EX OUT CHECK was "1" Fault on: [610] RX/EX Signal path or cable connecting [610] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 23

Test 23 will test RX/EX Signal path 610.
It will set 610 to A1 (CW) transmission and test EX OUT CHECK, this will prove that the transmission signal path is OK for A1 mode. The frequency is 14.250 MHz.

The test is OK if EX OUT CHECK = "1"

Error-code	Meaning
00	The test was OK
01	Error, EX OUT CHECK was "0", Exciter generates no RF. Fault on: 610 Exciter or cable connecting 610 and 611 or 611 Synthesizer Board or cable connecting 610 and 624 or 624 Transceiver Control Board
98	Error, no response from TU Fault on: 624 Transceiver Control Board

TEST 24

Test 24 will test RX/EX Signal path [610] .
It will set [610] to J3E (USB) transmission and test EX OUT CHECK and EX AF CHECK, this will prove that the signal path is OK for J3E mode, the CU will generate a 800 Hz tone to modulate the exciter. The carrier frequency is 14.250 MHz.

The test is OK if EX AF CHECK and EX OUT CHECK is "1"

Error-code	Meaning
00	The test was OK
01	Error, EX AF CHECK was "0" no AF modulation is detected Fault on: cable connecting CU and TU or [601] Audio Processing Board or [610] RX/EX Signal path or cable connecting [610] and [624] or [624] Transceiver Control Board
02	Error, EX OUT CHECK was "0" no RF is generated on [610] Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or [611] Synthesizer Board or cable connecting [610] and [624] or [624] Transceiver Control Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 25

Test 25 will test RX/EX Signal path [610].
It will set [610] to J3E (USB) reception and set the synthesizer to make a 1 kHz beat frequency, AGC voltage and AF signal level will be tested by the CU unit.
The synthesizer frequencies are: 1.LO = 45.0 MHz, 2.LO = 43.601 MHz, 3.LO = 1.4 MHz.
A clear 1 kHz tone will be heard during this test.

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "0"
and CHECK 1 ([601]) = "0"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "1" no AF signal on [601] Audio processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "1" no AF signal on loudspeaker Fault on: [601] Audio Processing Board
99	The test can not be executed because either: filter X5 is not installed or this is not a standard version
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 26

Test 26 will test RX/EX Signal path [610].
It will set [610] to H3E (AM) reception and set the synthesizer to generate an unmodulated carrier. The CU will test AGC voltage and that no AF signal is detected.
The synthesizer frequencies are: 1.LO = 45 MHz, 2.LO = 43.6 MHz, 3.LO = 1.4 MHz

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "1"
and CHECK 1 ([601]) = "1"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "0" AF was detected on [601] Audio Processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "0" AF was detected on loudspeaker Fault on: [601] Audio Processing Board
98	Error, no response from TU Fault on: [624] Transceiver Control Board
99	The test can not be executed because this is a special version

TEST 27

Test 27 will test RX/EX Signal path [610].
It will set [610] to telex reception and set the synthesizer to generate a 1500 Hz tone. The CU will check AGC voltage and AF signal.
The synthesizer frequencies are: 1.LO = 45.0005 MHz, 2.LO = 43.002 MHz and 3.LO = 1.4 MHz.

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "0"
and CHECK 1 ([601]) = "0"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "1" no AF signal on [601] Audio processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "1" no AF signal on loudspeaker Fault on: [601] Audio Processing Board
99	The test can not be executed because either filter X4 is not installed or this is not a standard version
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 28

Test 28 will test RX/EX Signal path [610].
It will set [610] to CW reception and set the synthesizer to generate a 1 kHz tone. The CU will check AGC voltage and AF signals. A clear 1 kHz tone will be heard during this test. The synthesizer frequencies are: 1.LO = 45 MHz, 2.LO = 43.601 MHz, 3.LO = 1.4 MHz.

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "0"
and CHECK 1 ([601]) = "1"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "1" no AF signal on [601] Audio processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "1" no AF signal on loudspeaker Fault on: [601] Audio Processing Board
99	The test can not be executed because either filter X2 is not installed or this is a special version.
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 29

Test 29 will test RX/EX Signal path [610].
It will set [610] to CW reception, narrow bandwidth, and set the synthesizer to generate a 1 kHz tone. The CU will check AGC voltage and AF signals. A clear 1 kHz tone will be heard during this test.
The synthesizer frequencies are 1.LO = 45 MHz, 2.LO = 43.6 MHz, 3.LO = 1.4 MHz.

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "0"
and CHECK 1 ([601]) = "0"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "1" no AF signal on [601] Audio processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "1" no AF signal on loudspeaker Fault on: [601] Audio Processing Board
99	The test can not be executed because either filter X3 is not installed or X3 has a center frequency of 1.3985 MHz or this is a special version
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 30

Test 30 will test RX/EX Signal path [610].
It will set [610] to CW reception, narrow bandwidth, and set the synthesizer to generate a 1.5 kHz tone. The CU will check AGC voltage and AF signals. A clear 1.5 kHz tone will be heard during the test.
The synthesizer frequencies are: 1.LO = 45.0005 MHz, 2. LO = 43.602 MHz, 3.LO = 1.4 MHz.

The test is OK if RX RATE ([624]) < 9.1 kHz
and CHECK 0 ([601]) = "0"
and CHECK 1 ([601]) = "0"

Error-code	Meaning
00	The test was OK
01	Error, RX RATE > 9.1 kHz AGC voltage is too low Fault on: [610] RX/EX Signal path or [624] Transceiver Control Board or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [600] Control Board
02	Error, CHECK 0 was "1" no AF signal on [601] Audio processing Board Fault on: [610] RX/EX Signal path or cable connecting [610] and [611] or cable connecting [611] and [624] or cable connecting CU and TU or [601] Audio Processing Board or [600] Control Board
03	Error, CHECK 1 was "1" no AF signal on loudspeaker Fault on: [601] Audio Processing Board
99	The test can not be executed because filter X3 is not installed or has a center frequency of 1.4 MHz or this is a special version
98	Error, no response from TU Fault on: [624] Transceiver Control Board

TEST 31

Test 31 is a listening test at 2.0 MHz. The purpose of this test is not to test anything. The operator should listen to this frequency before proceeding with the transmitter tests. The transmitter tests will transmit at this frequency, therefore the operator must listen to ensure that this frequency is not occupied by others.
If the frequency is free proceed to next test by pressing "DIMMER UP".
If the frequency is occupied, wait until it becomes free or abort the test by pressing any key but "DIMMER UP" or "DIMMER DOWN".

NOTE: This test can be executed in step mode only.

Error-code	Meaning
00	Is always returned

TEST 32

Test 32 will test Power Amplifier 626 , PA-filters and Antenna Tuning Unit.
It will transmit at 2 MHz CW mode and test that ALCCHECK is OK, SWROK is OK, Power is OK and that IANT (antenna current) is OK. The 1.6-2.3 MHz filter is used in this test.

NOTE: This test can be executed in step mode only.

The test is OK if ALCCHECK = "1"
and SWROK (640) = "0"
and Power >= 90 %
and IANT >= 1A

Error-code	Meaning
00	The test was OK
01	Error, ALCCHECK was "0" Fault on: 624 Transceiver Control Board or cable connecting 624 and 626 or 626 Power Amplifier
02	Power was < 90 % Fault on: 624 Power Amplifier or 627 , 628 , 629 PA-filter or cable connecting 610 and 624 or cable connecting 626 and 627 628 629
03	Error, SWROK was "1" SWR was > 3 Fault on: 640 Antenna Tuning Unit or antenna
04	Error, IANT was < 1 A Fault on: 640 Antenna Tuning Unit or antenna

TEST 33

Test 33 will test PA-filters 627 , 628 or 629 .
It will select the 2.31-3.33 MHz filter and transmit at 2 MHz.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was < 90 % Fault on: 627 , 628 , 629 PA-filters

TEST 34

Test 34 will test PA-filters 627 , 628 , 629 .
It will select the 3.3-4.8 MHz filters at continuous coverage transceiver, and transmit at 2 MHz. Marine bands transceivers can not execute this test.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was < 90 % Fault on: 629 PA-filters
99	This is a marine bands transceiver, this unit can not execute the test

TEST 35

Test 35 will test PA-filters 627 , 628 , 629 .
It will select the 4.8-6.9 MHz filter for continuous coverage transceivers or the 3.3-4.8 MHz filter for marine bands transceivers.

NOTE: This test can be executed in step mode only.

The test was OK if Power > 90 %

Error-code	Meaning
00	The test was OK
01	Error, Power was < 90 % Fault on: 627 , 628 , 629 PA-filters

TEST 36

Test 36 will test PA-filters 627 , 628 , 629 .
It will select the 6.9-10 MHz filter for continuous coverage transceivers or the 6.2-8.45 MHz filter for marine bands transceivers. It will transmit at 2 MHz.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was > 90 % Fault on: 627 , 628 , 629 PA-filters

TEST 37

Test 37 will test PA-filters 627 , 628 , 629 .
It will select the 10-14.4 MHz filter for continuous coverage transceivers or the 12-17 MHz filter for marine bands transceivers. It will transmit at 2 MHz.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was > 90 % Fault on: 627 , 628 , 629 PA-filters

TEST 38

Test 38 will test PA-filters 627 , 628 , 629 .
It will select the 14-20 MHz filters at continuous coverage transceiver, and transmit at 2 MHz. Marine bands transceivers can not execute this test.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was < 90 % Fault on: 629 PA-filters
99	This is a marine bands transceiver, this unit can not execute the test

TEST 39

Test 39 will test PA-filters [627] , [628] , [629] .
It will select the 20-30 MHz filter for continuous coverage transceivers or the 14-27 MHz filter for marine bands transceivers. It will transmit at 2 MHz.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was > 90 % Fault on: [627] , [628] , [629] PA-filters

TEST 40

Test 40 is a listening test at 491 kHz. The purpose of this test is not to test anything, but the operator should listen at this frequency before proceeding to the transmitter test. Test 41 will transmit at this frequency, therefore the operator must listen to ensure that this frequency is not occupied by others.
If the frequency is free proceed to test 41 by pressing "DIMMER UP".
If the frequency is occupied, wait until it becomes free, or abort the test by pressing any key but "DIMMER UP" or "DIMMER DOWN".

NOTE: This test can be executed in step mode only.

Error-code	Meaning
00	The listening test is executing
99	This transceiver is not a marine bands version with 400-525 kHz filter, this test can not be executed

TEST 41

Test 41 will test PA-filters [628] .
It will select 400-525 kHz filter and transmit at 491 kHz.

NOTE: This test can be executed in step mode only.

The test is OK if Power > 90 %.

Error-code	Meaning
00	The test was OK
01	Error, Power was < 90 % Fault on: [628] PA-filters
99	This is not a marine bands version with 400-525 kHz filter, the test can not be executed

LIST OF TESTS

TEST#	TESTS	REMARKS
01	Audio Processing Board [601]	receiver signal path
02	Audio Processing Board [601]	receiver signal path
03	Audio Processing Board [601]	transmitter signal path
04	Audio Processing Board [601]	transmitter signal path
05	Display test	
06	Master Oscillator [612]	
07	Synthesizer [611]	all synthesizers mid range
08	Synthesizer [611]	1.LO out of lock
09	Synthesizer [611]	1.LO = 45 MHz 45-52.5 MHz range
10	Synthesizer [611]	1.LO = 52.5 MHz 45-52.5 MHz range
11	Synthesizer [611]	1.LO = 52.5 MHz 52.5-60 MHz range
12	Synthesizer [611]	1.LO = 60 MHz 52.5-60 MHz range
13	Synthesizer [611]	1.LO = 60 MHz 60-67.5 MHz range
14	Synthesizer [611]	1.LO = 67.5 MHz 60-67.5 MHz range
15	Synthesizer [611]	1.LO = 67.5 MHz 67.5-75 MHz range
16	Synthesizer [611]	1.LO = 75 MHz 67.5-75 MHz range
17	Synthesizer [611]	2.LO = 43.597 MHz
18	Synthesizer [611]	2.LO = 43.603 MHz
19	Synthesizer [611]	3.LO out of lock
20	Synthesizer [611]	3.LO = 1.3955 MHz
21	Synthesizer [611]	3.LO = 1.403 MHz
22	Signal path [610]	no signal
23	Signal path [610]	Exciter, A1 mode
24	Signal path [610]	Exciter, J3E mode
25	Signal path [610]	Receiver, J3E mode
26	Signal path [610]	Receiver, AM mode
27	Signal path [610]	Receiver, F1B mode

LIST OF TESTS - continued

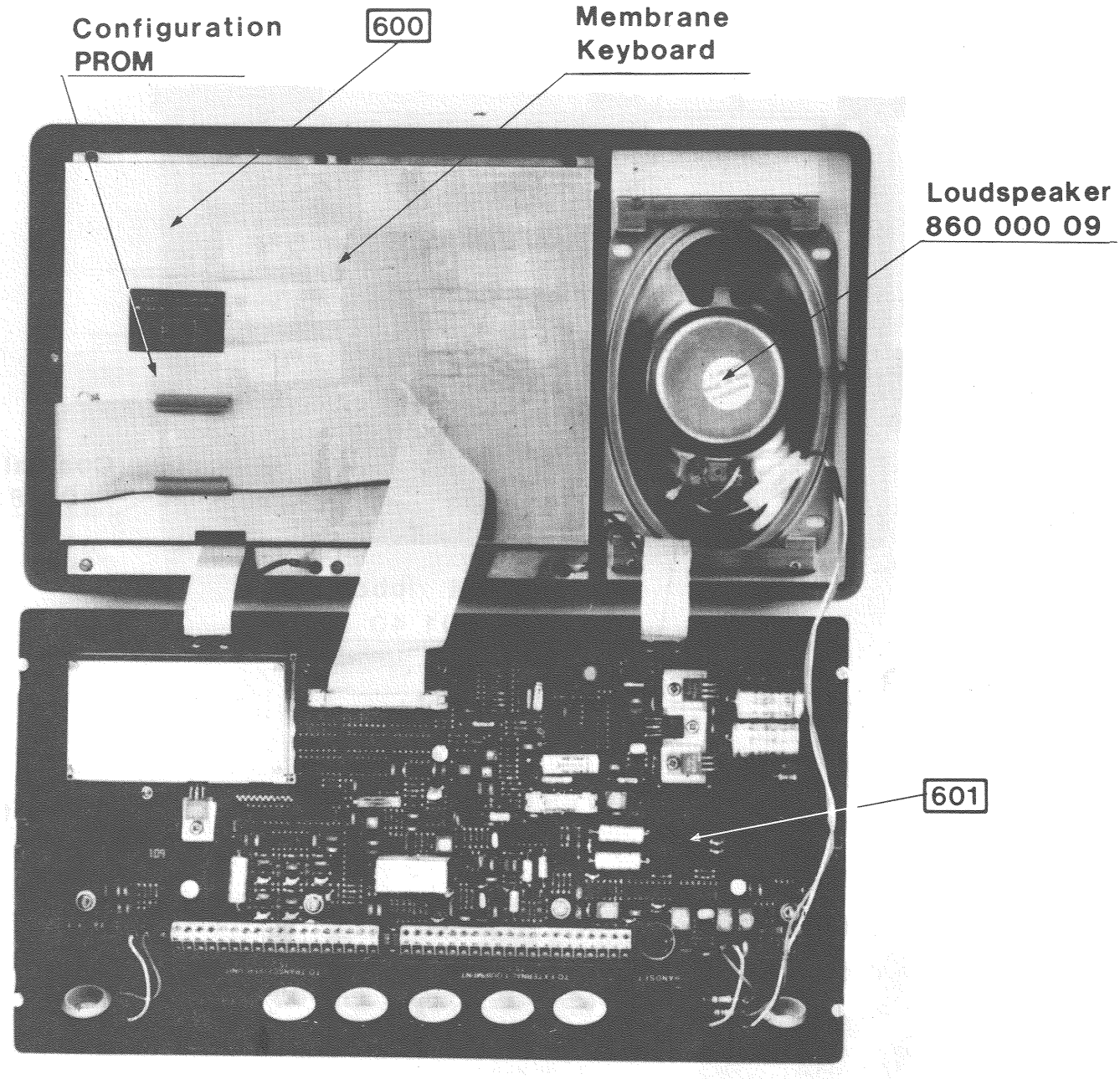
TEST#	TESTS	REMARKS	
28	Signal path 610	Receiver, CW inter	
29	Signal path 610	Receiver, CW narrow	
30	Signal path 610	Receiver, CW narrow	
31	Listening test (2 MHz)	Marine-band	Continuous
32	PA-filters, ATU	1.6-2.3 MHz	1.6-2.3 MHz
33	PA-filters	2.3-3.3 MHz	2.3-3.3 MHz
34	- -	- -	3.3-4.8 MHz
35	- -	3.3-4.8 MHz	4.8-6.9 MHz
36	- -	6.2-8.9 MHz	6.9-10 MHz
37	- -	12-17 MHz	10-14 MHz
38	- -	- -	14-20 MHz
39	- -	19-27 MHz	20-30 MHz
40	Listening test (491 kHz)		
41	PA-filters	400-525 kHz	

4.5 SPARE PARTS LISI, IRP 8250S SERIES

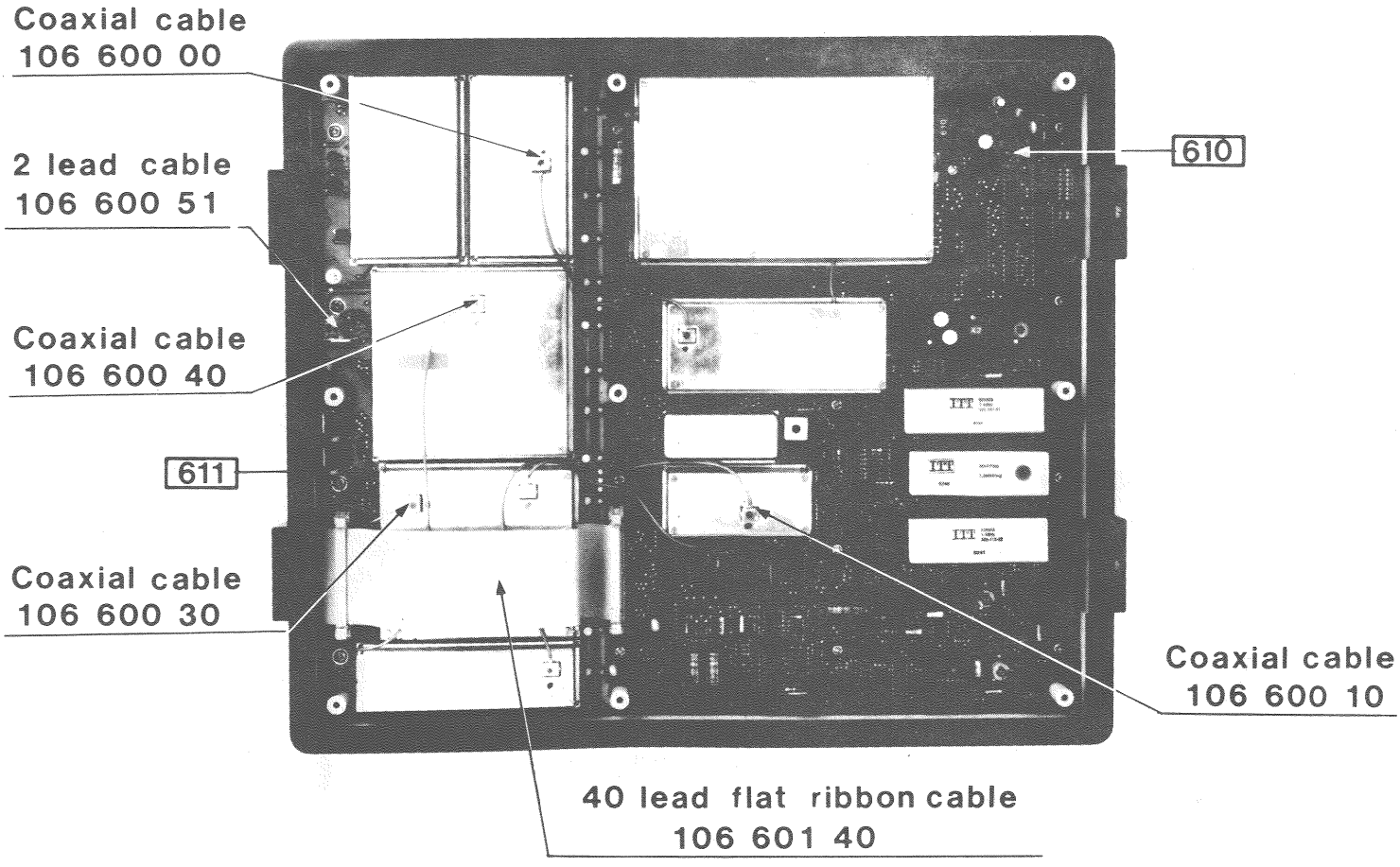
Standard Shipborne Spares	Part No.
1 fuse 4 A fast 6.3 x 32 mm	720 340 00
1 fuse 15 A fast 6.3 x 32 mm	720 415 01
1 fuse 12.5 A slow 6.3 x 32 mm (110/120 VAC)	720 412 50
1 fuse 6.3 A slow 6.3 x 32 mm (220/240 VAC)	720 363 00
Depot Spares	
CONTROL UNIT:	
[600] Control Board (configuration Prom not included)	107 560 01
[601] Audio Processing	107 560 11
[602] Squelch Board (optional)	107 560 21
[603] Line Transformer Board (optional)	107 560 31
Membrane Keyboard (Part no. of graphics overlay must be specified)	
Loudspeaker	860 600 00
HANDSET:	
Complete	107 400 60
TRANSCEIVER UNIT:	
[610] RX/EX Signal Path	107 561 01
+/- 150 Hz Telex/Very Narrow filter (optional)	385 247 63
+/- 250 Hz Telex/Narrow filter (optional)	383 582 31
+/- 400 Hz Telex filter (optional)	385 201 71
+/- 500 Hz Narrow filter (optional)	385 201 01
+/- 2.7 kHz Intermediate filter (optional)	385 111 91
+/- 4 kHz AM/Wide filter (optional)	383 582 41
[611] Synthesizer Board	107 561 11
[612] Master Oscillator, 1.5 ppm	107 561 21
[613] Master Oscillator, 0.8 ppm (optional)	107 561 31
[614] Master Oscillator, 0.4 ppm (optional)	107 561 41

(Transceiver Unit, cont.)

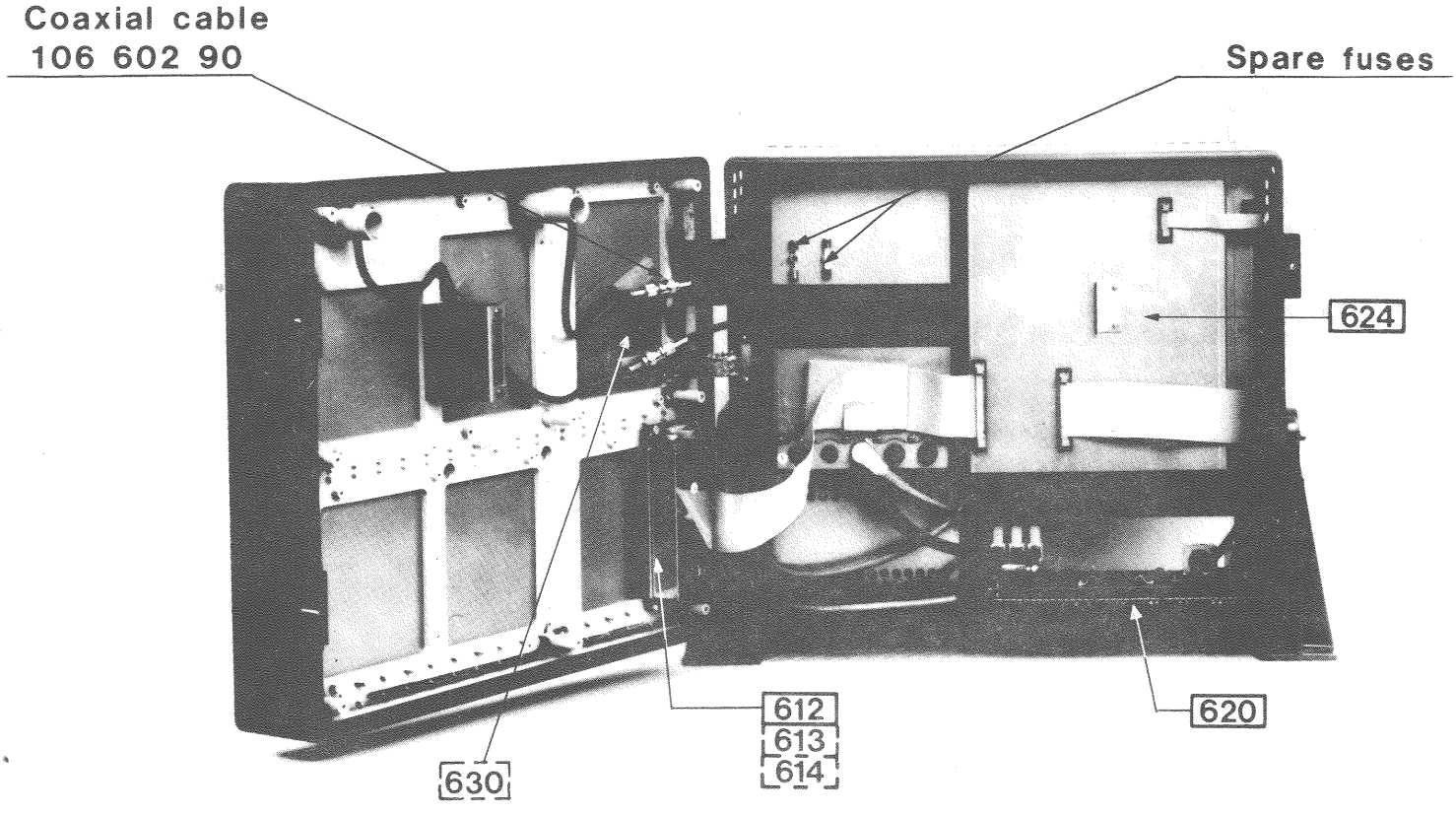
40 Lead Flat Ribbon Cable	373 590 21
2 Lead Cable	106 600 50
Coaxial Cable	106 600 00
Coaxial Cable	106 600 10
Coaxial Cable	106 600 30
Coaxial Cable	106 600 40
Coaxial Cable	106 602 90
620 Interconnection Board	107 562 01
Voltage Converter Assembly	107 600 90
Switched Mode Power Supply	107 600 20
624 Transceiver Control Board	107 562 41
Power Amplifier Assembly	107 600 10
P.A. Filter Assembly, Marine Bands (TRP 8250S/8251S/8252S)	107 601 70
P.A. Filter Assembly, Continuous Coverage (TRP 8253S/8254S/8255S)	107 601 80
P.A. Filter Assembly, Marine Bands incl. 500 kHz (optional)	107 601 90
630 50 ohms Antenna Relay (optional)	107 563 01
ANTENNA TUNING UNIT:	
640 ATU Board	107 564 01
641 Antenna Relay Board	107 564 11
AC POWER SUPPLY UNIT:	
Transformer	383 597 31
Electrolytic capacitor 10000 uF/63 V	652 910 51
Lamp 24 V	754 000 04
Diode PH70	831 007 00



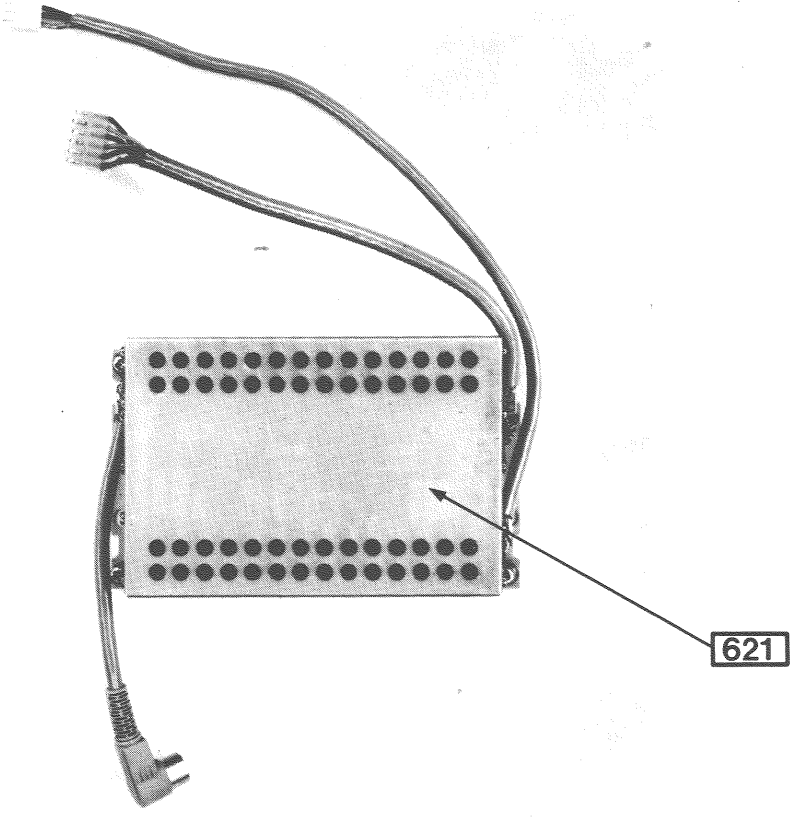
Control Unit



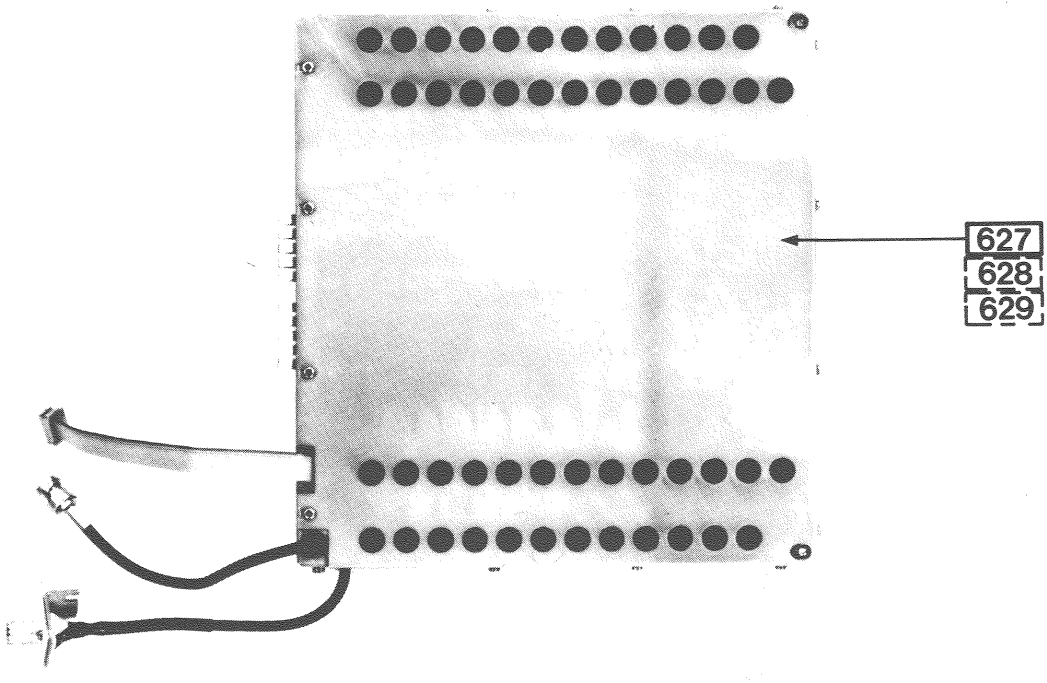
RX / EX Assembly



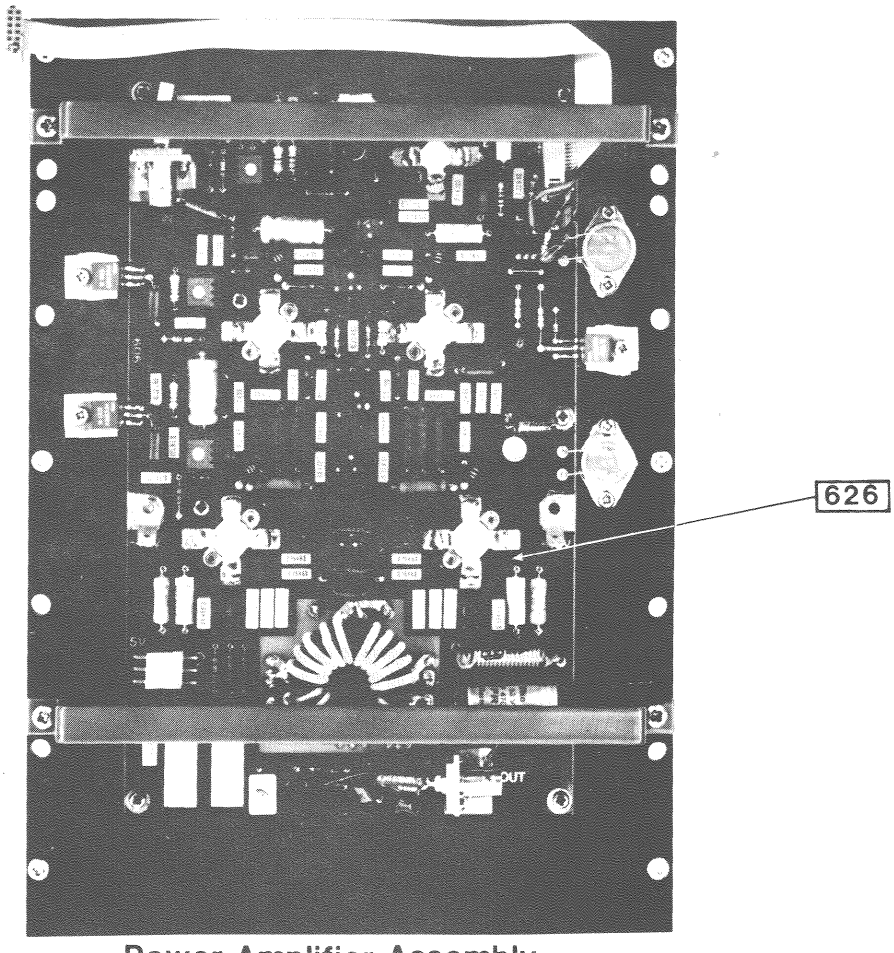
Transceiver Unit



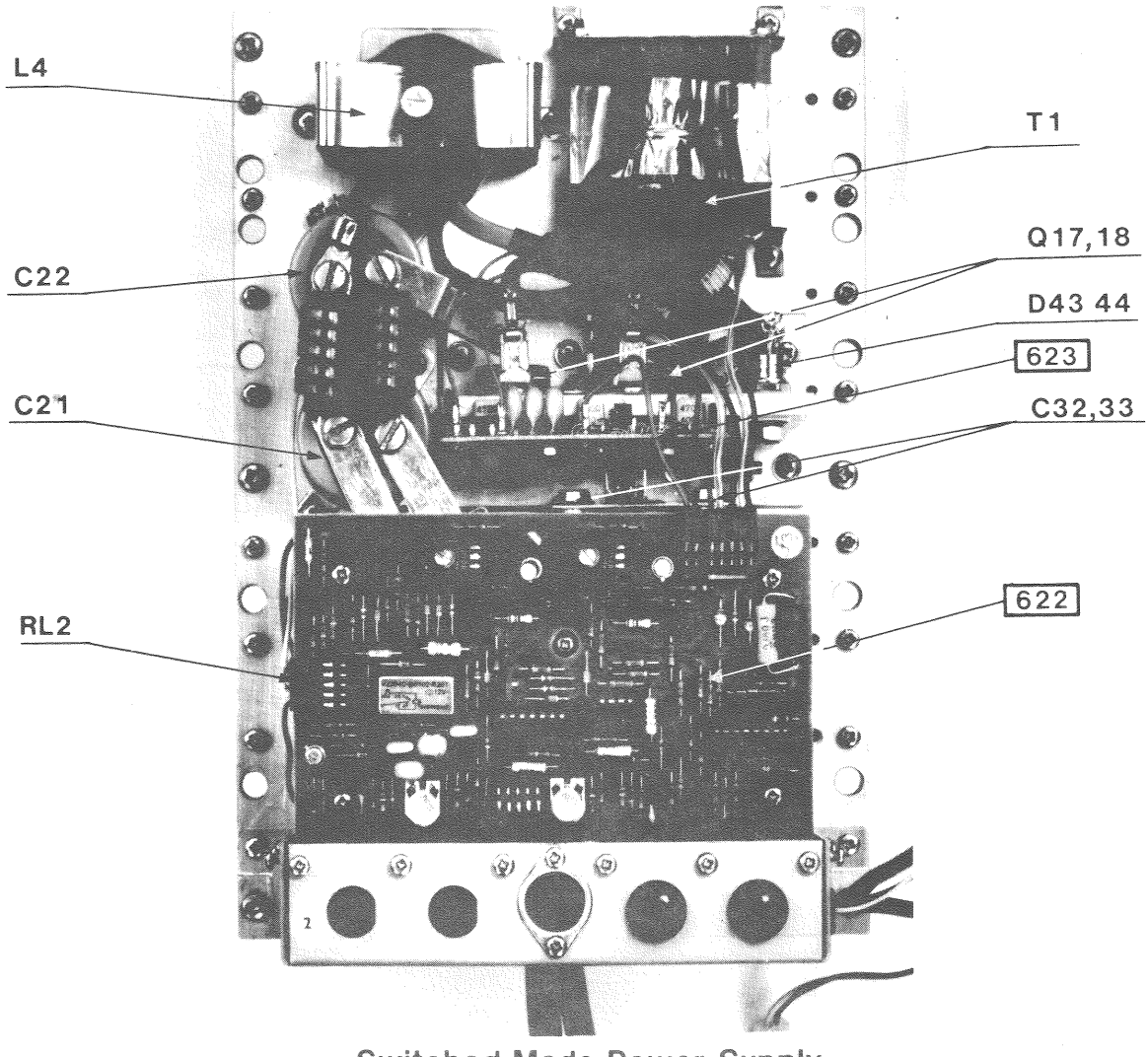
Voltage Converter Assembly



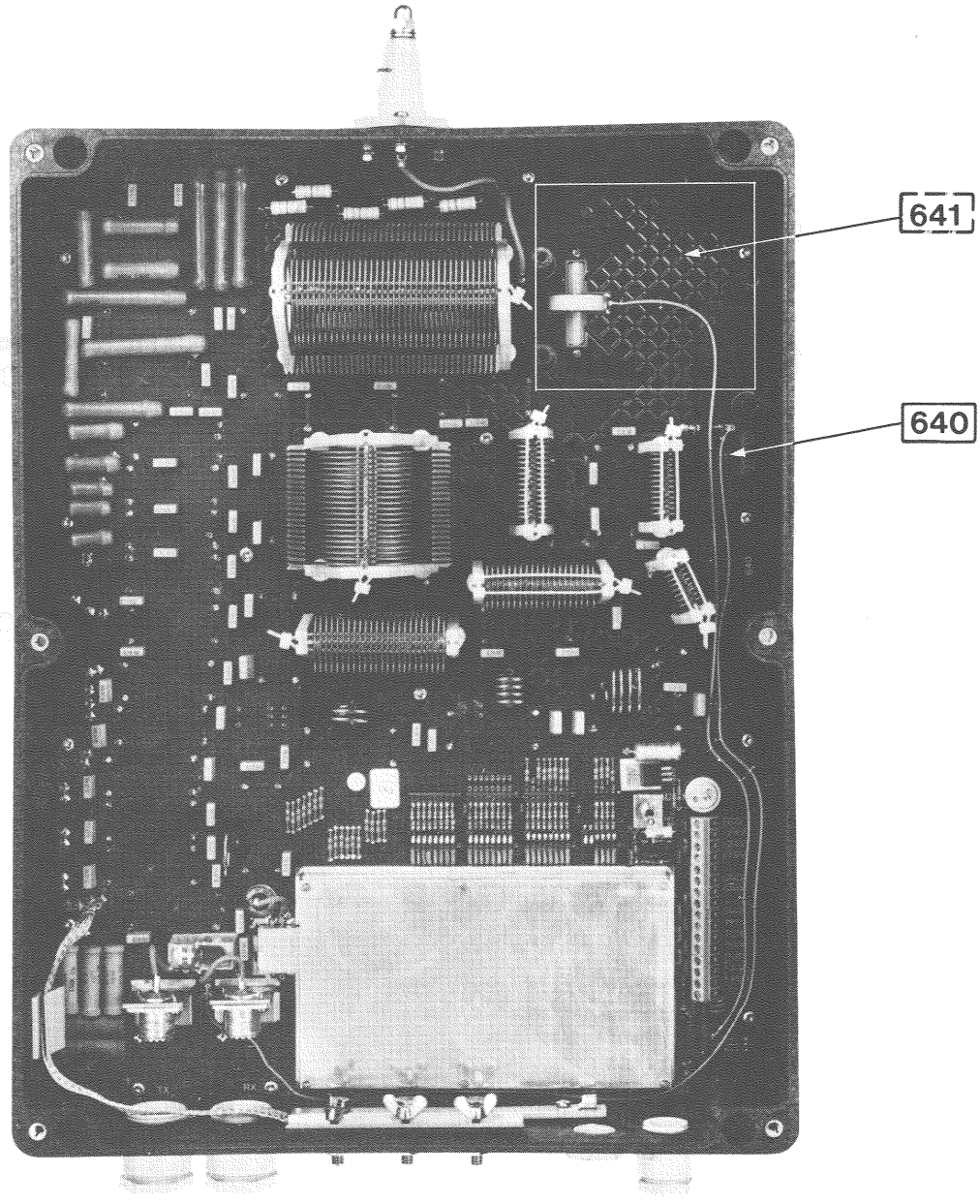
P.A. Filter Assembly



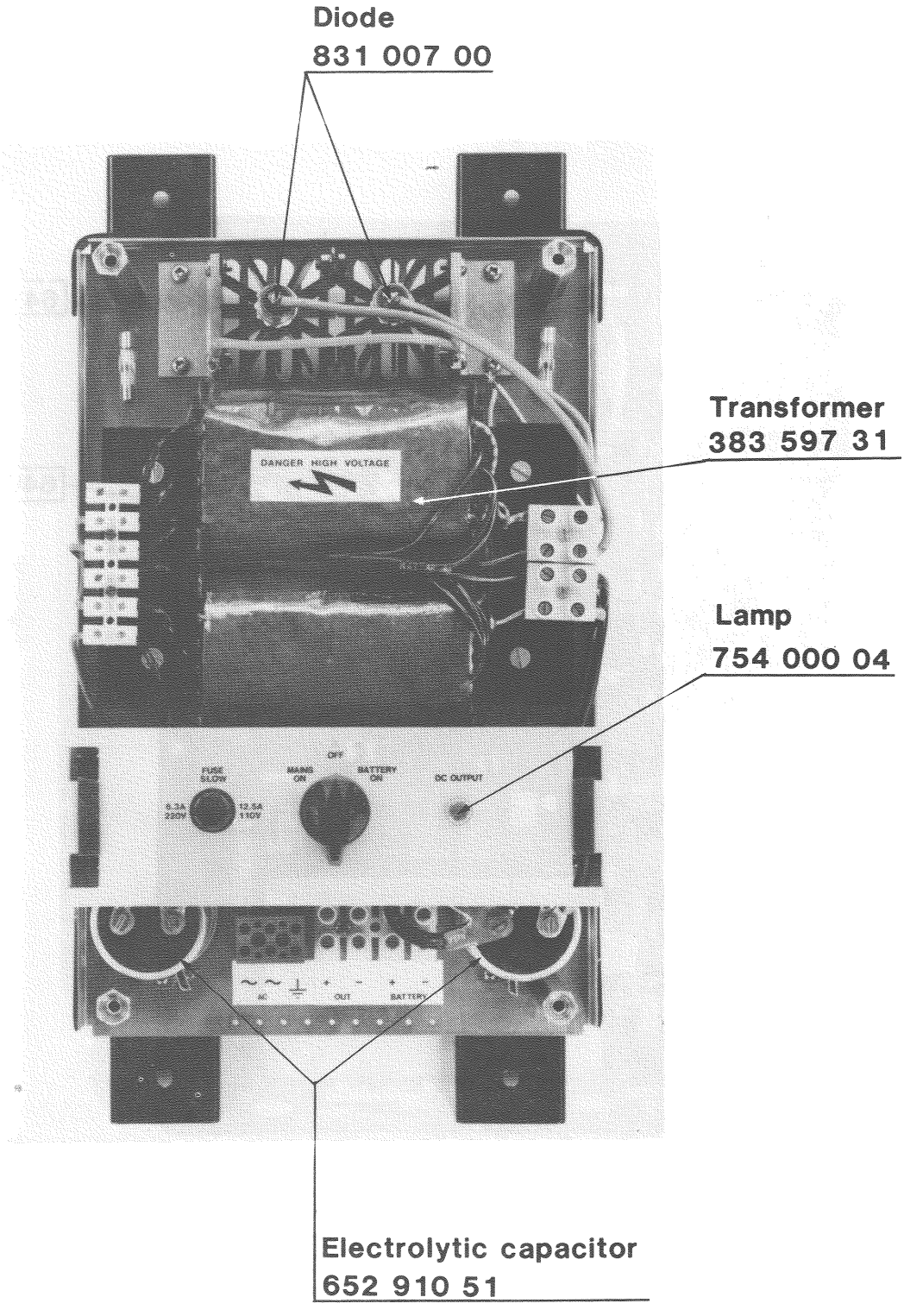
Power Amplifier Assembly



Switched Mode Power Supply



ANTENNA TUNING UNIT



AC Power Supply Unit