

2.7.5 15.4.5 Spurious Response Rejection

CHANNEL 70: Fn: 156.525 MHz

Funw (MHz)	SPURIOUS RESPONSE REJECTION RATIO (dB)
*	> 80 dB @ 1.0 % BER
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Measurement uncertainty	+ 2.4 / - 2.9 dB
Limit	≥ 70 dB @ BER < 1%

Funw = unwanted frequency

* : Rejection of all spurious responses is better than 80 dB @ 1 % BER.

- (1) Frequency of the Receiver (f_R): 156.525 MHz
- (2) Local oscillator frequency (f_{LO}): (f_R) + (f_F) MHz
- (3) Intermediate frequency (f_F): RX1: 55.0 MHz

Test equipment used: (Item numbers)	2, 4, 13, 14, 21, 25, 31, 37
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2.7.6 15.4.6 Intermodulation response Rejection

CHANNEL 70:

F_u: 156.525 MHz

TEST CONDITIONS		Intermodulation response rejection ratio (dB)	
Temperature	Voltage	Upper Side	Lower Side
T_{nom} (+20 °C)	V_{nom} (24,0 V)	71 dB at < 0.5 % BER	67 dB at < 0.5 % BER
Measurement uncertainty		+ 2.4 / - 2.8 dB	
Limits		65.0 dB at BER < 1%	

Test equipment used: (Item numbers)	2, 3, 4, 13, 14, 21, 25, 31, 37, 38
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2.7.7 15.4.7 Blocking or Desensitisation

CHANNEL 70: Fn: 156.525 MHz

Unwanted frequency (MHz)	Blocking Ratio (dB @ BER %)
Fn -10	92 dB at < 0.5 % BER
Fn - 5	92 dB at < 0.5 % BER
Fn - 1	92 dB at < 0.5 % BER
Fn + 1	92 dB at < 0.5 % BER
Fn + 5	92 dB at < 0.5 % BER
Fn + 10	92 dB at < 0.5 % BER
Measurement uncertainty	+ 2.3 / - 2.8 dB
Limit	≥ 84 dB @ BER < 1% except at spurious response frequencies

Test equipment used: (Item numbers)	2, 4, 13, 14, 21, 25, 31, 37
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2.8 15.5 Conducted Spurious Emissions conveyed to the antenna

2.8.1 15.5.1 Spurious Emissions from the Receiver

TDMA Receivers and DSC Receiver

$F_n = 156.025, 162.025 \text{ MHz}$ and 156.525 MHz

SPURIOUS EMISSIONS POWER LEVEL	
Spurious frequency (MHz)	Power level (dBm)
*	All emissions more than 10 dB below the limit
*	--
Measurement uncertainty	+ 1.7 / - 1.9 dB
Limit (150 kHz - 2 GHz)	$\leq -57 \text{ dBm}$ (2 nW) for 150 kHz - 1 GHz, $\leq -47 \text{ dBm}$ (20 nW) for 1 GHz - 2 GHz.

Test equipment used: (Item numbers)	1, 9
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Test results module

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2.8.2 15.5.2 Spurious Emissions from the Transmitter

Fn = 156.025 MHz

SPURIOUS EMISSIONS POWER LEVEL	
Spurious frequency (MHz)	Power level (dBm)
312.050	- 47.0
468.075	- 38.7
780.125	- 49.2
*	All other spurious emissions are more than 15dB below the limit
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--	--
Measurement uncertainty	+ 1.7 / - 1.9 dB
Limit (150 kHz - 2 GHz)	$\leq$ - 36 dBm (0.25 μ W) for 150 kHz - 1 GHz, $\leq$ - 30 dBm (1 μ W) for 1 GHz - 2 GHz.

Remark: Test was carried out on high and low power and worst case has been noted

Test equipment used: (Item numbers)	1, 9, 25, 33, 36
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Test results module

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Spurious Emissions from the Transmitter

$F_n = 162.025 \text{ MHz}$

SPURIOUS EMISSIONS POWER LEVEL	
Spurious frequency (MHz)	Power level (dBm)
324.050	- 46.8
486.075	- 38.2
648.100	-53.5
810.125	-50.0
*	All other spurious emissions are more than 15dB below the limit
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Measurement uncertainty	+ 1.7 / - 1.9 dB
Limit (150 kHz - 2 GHz)	$\leq - 36 \text{ dBm}$ (0.25 μW) for 150 kHz - 1 GHz, $\leq - 30 \text{ dBm}$ (1 μW) for 1 GHz - 2 GHz.

Remark: Test was carried out on high and low power and worst case has been noted.

Test equipment used: (Item numbers)	1, 9, 25, 33, 36
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Used test equipment module

This module contains the total list of test equipment used.

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Used test equipment module

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Item	Test equipment	Manufacturer	Type	ident
RF Measurement Equipment				
1	Spectrum Analyzer	HP	8563E	TE 00481
2	Signal Generator	Marconi	2042	TE 00029
3	Signal Generator	Marconi	2042	TE 00020
4	Signal Generator	Marconi	2052	119764/0072
5 *	Signal Generator	Rohde & Schwarz	SMIQ	11097
6 *	Signal Generator	HP	8657A	3134A04210
7 *	Signal Generator	HP	8657A	3025A02280
8 *	Signal Generator	HP	8644A	2933A00819
9 *	Spectrum Analyzer	HP	8560E	3240A00214
10 *	Spectrum Analyzer	Rohde & Schwarz	FSEB	826304/027
11	Modulation Meter	Marconi	TF 2300B	TE00360
12	Frequency counter	Philips	PM6614	TE00378
13	Audio Analyzer	HP	8903A	TE00373
14	Oscilloscope	TEK	442	TE00382
15				
General Measurement Equipment				
21	Digital Multimeter	HP	3438A	TE 00215
22	Digital Thermometer	Fluke	Fluke 51	TE 00388
23	FSK decoder	HM	JOZ-2	KML002
24	Transient detector	HM	JOZ-1	KML001
25	AIS Test software	SWT	--	--
26				
27				
28				
29				
30				
Auxiliaries				
31	Power Supply	Delta	E030-10	TE 00550
32	Climate Chamber	CTS	C-40/350	TE 00741
33	Attenuator 20 dB 100 Watt	Bird	8325	TE00417
34	Step attenuator	HP	8494B	KSR699
35	Step attenuator	HP	8496B	KSR700
36	Band reject filter	KL	FF 227	KSR624
37	Splitter	MCL	ZFSC-2	KSR500
38	Splitter	MCL	ZSC-2-1	KSR357
39				
40				

* : Calibrated measuring equipment used during tests at SWT.

Photographs module

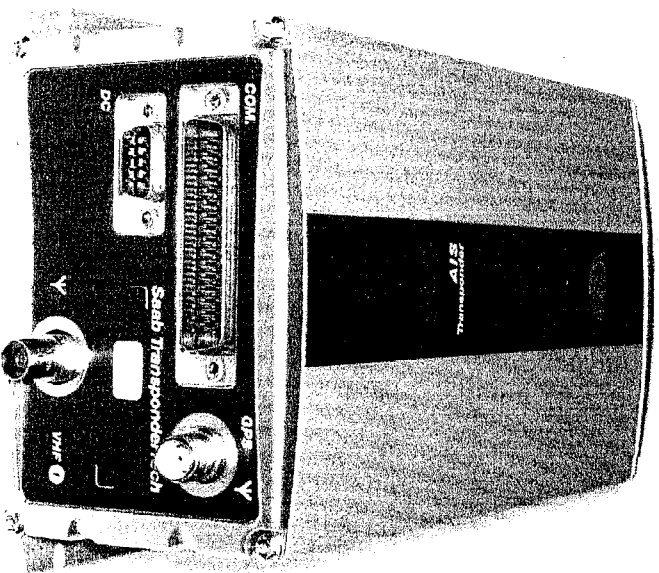
List of Photographs

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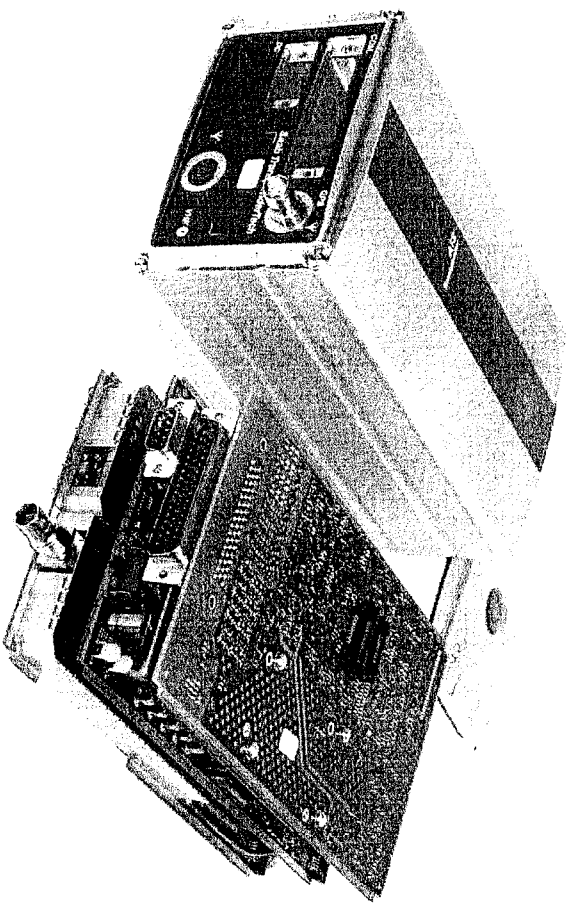
Photographs module

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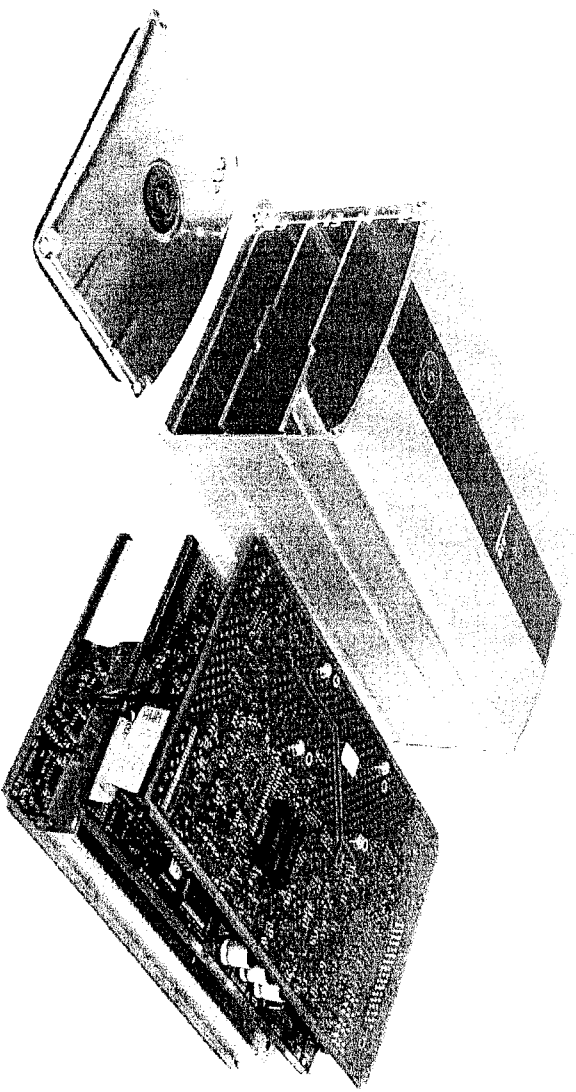
Photograph 1: Assembled view



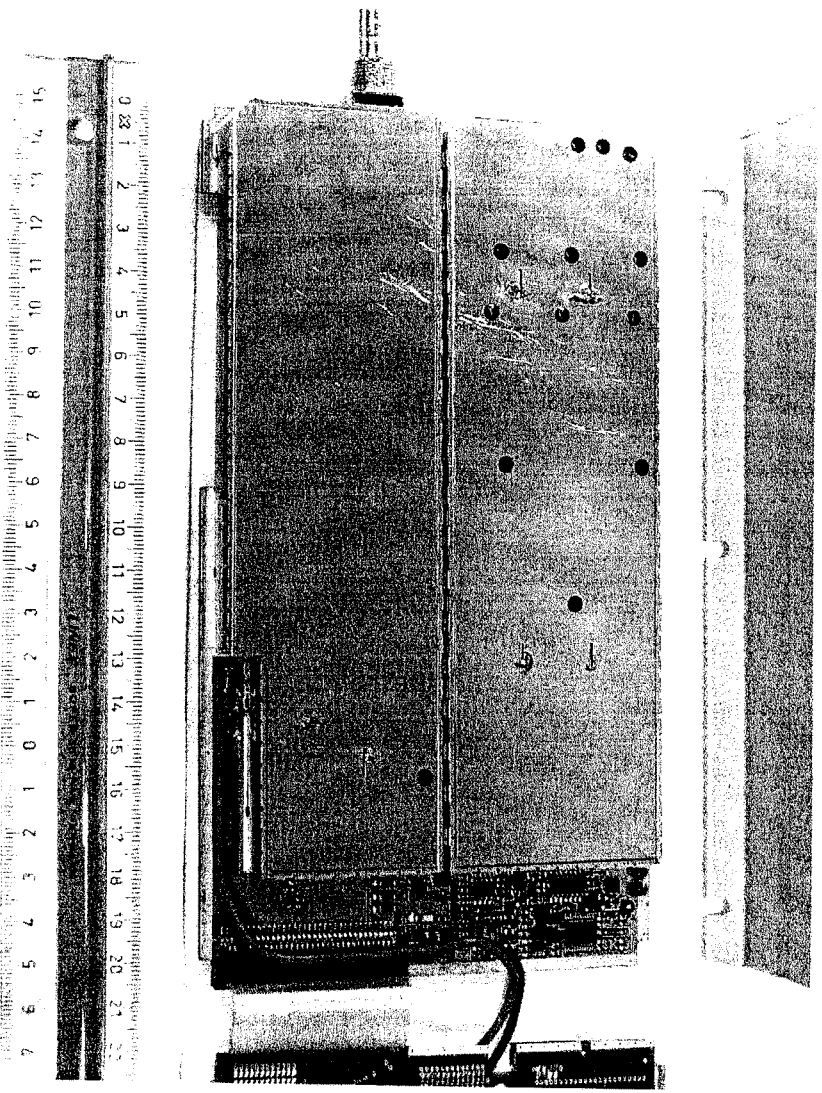
Photograph 2: *Disassembled from view of pc-boards*



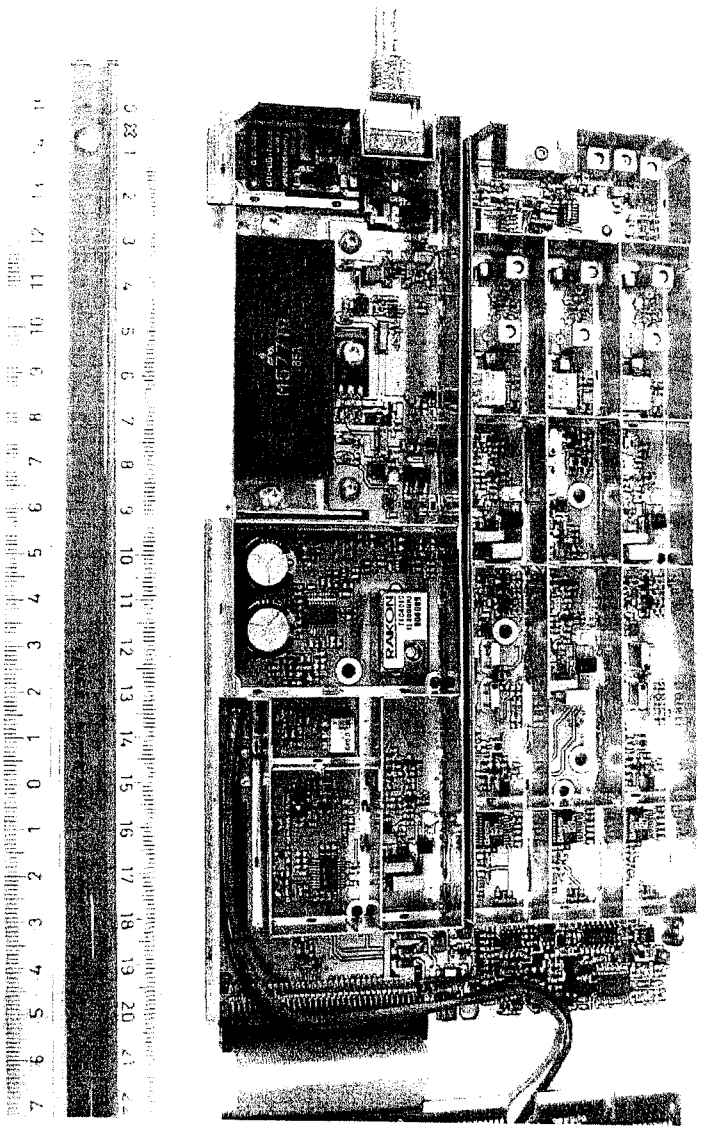
Photograph 3: *Disassembled rear view of pc-boards*



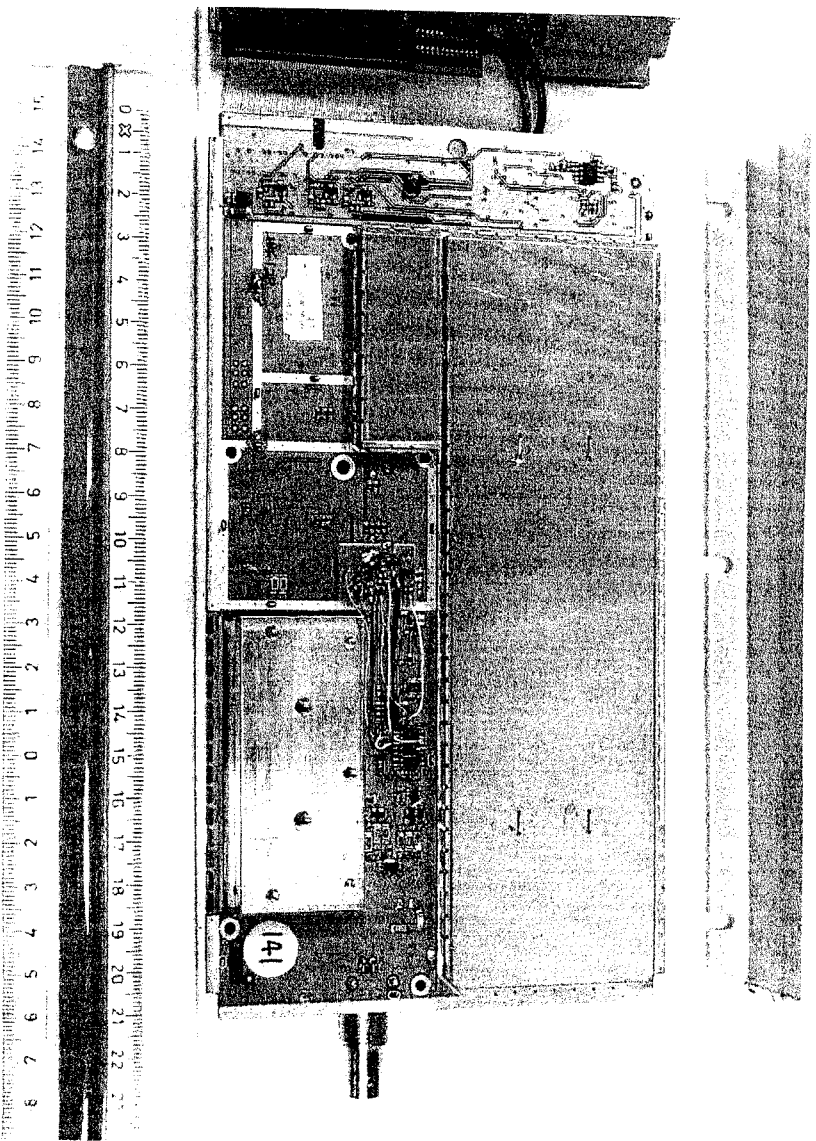
Photograph 4: *RF-board top view*



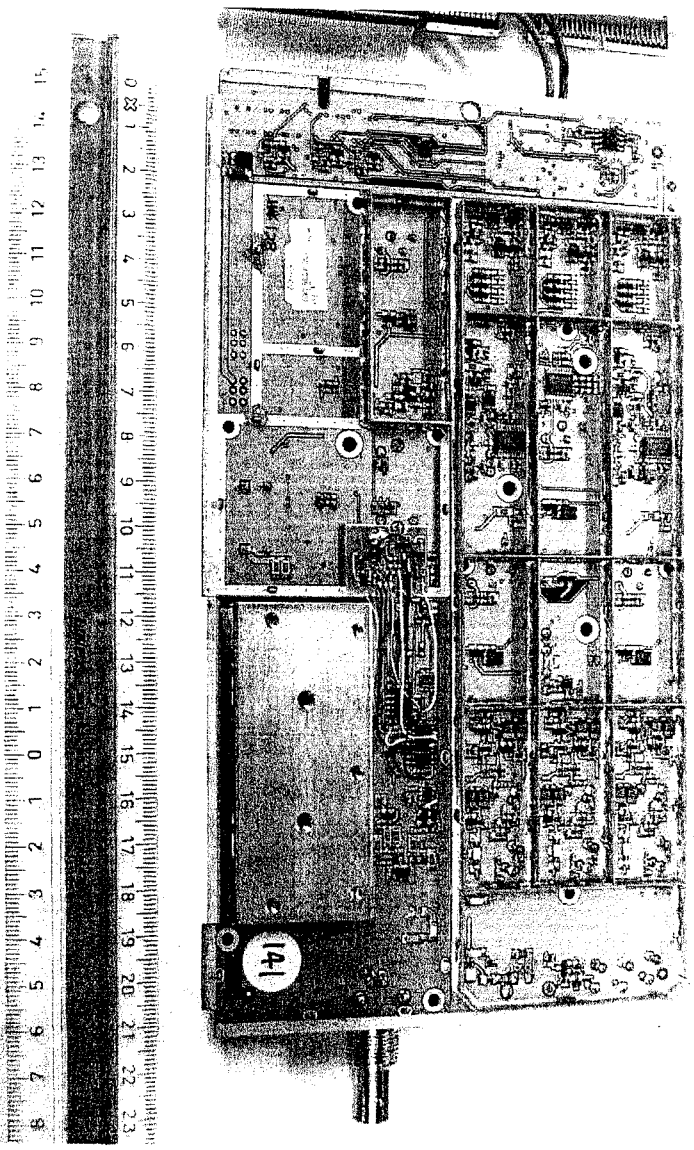
Photograph 5: RF-board top view, screen cover removed



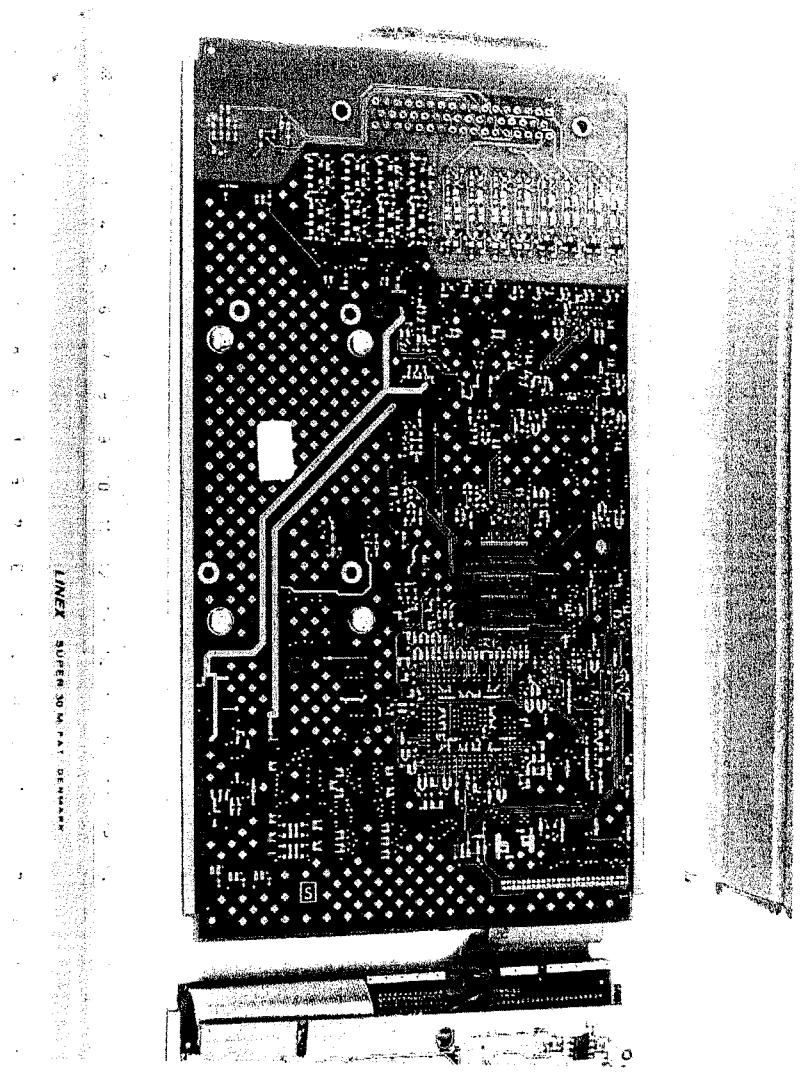
Photograph 6: *RF-board bottom view*



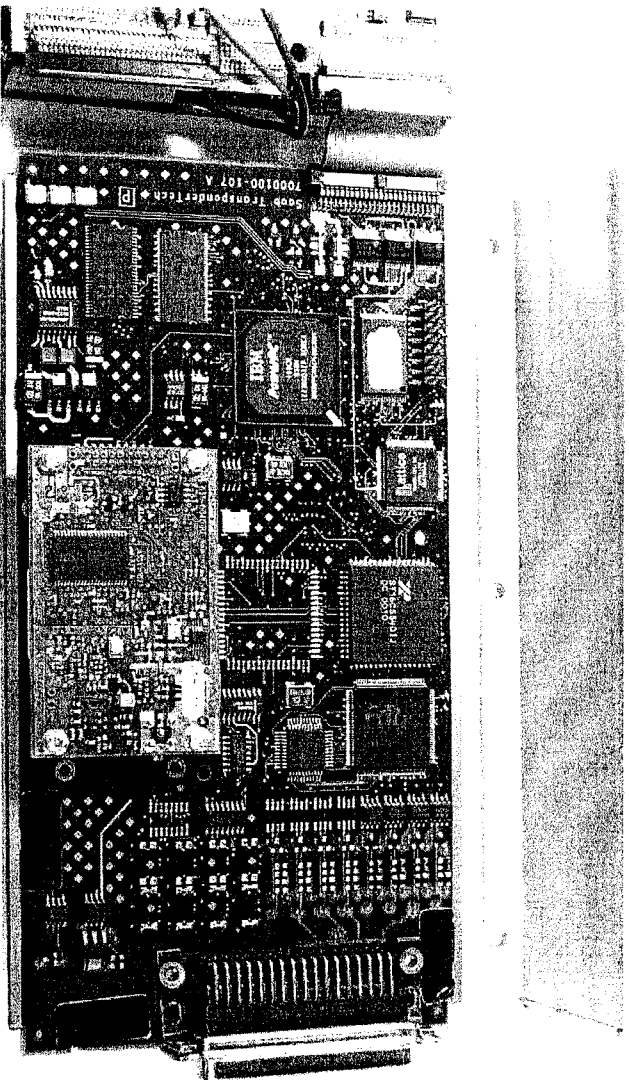
Photograph 7: *RF-board bottom view, screen cover removed*



Photograph 8: CPU-board top view



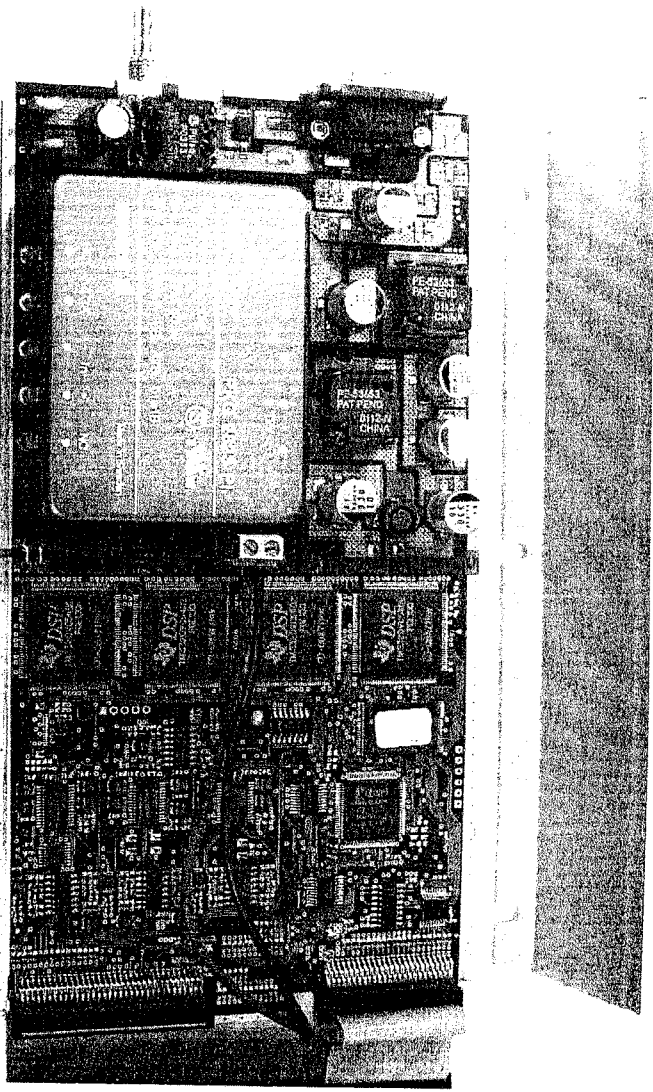
Photograph 9: CPU-board bottom view



Photographs module

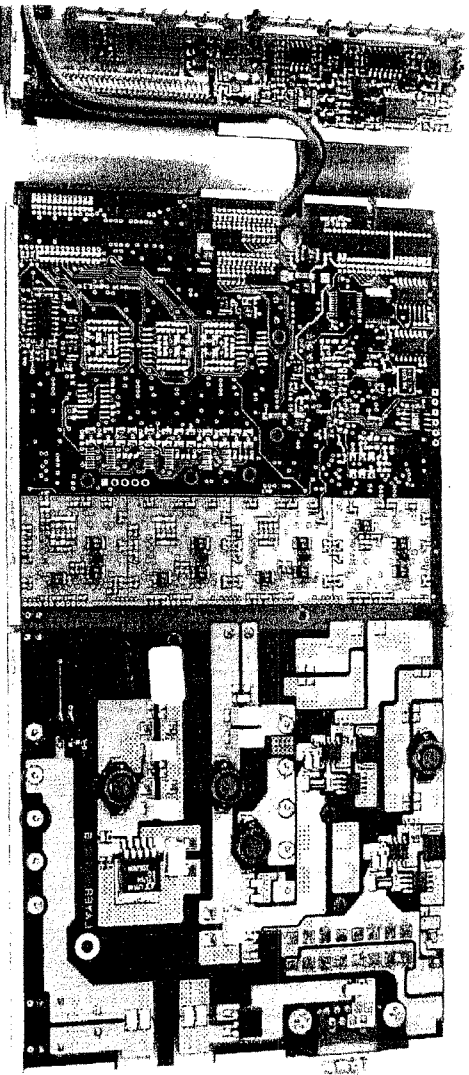
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Photograph 10: Power-supply and DSP-board top view



0 28 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Photograph 11 : *Power supply and DSP-board bottom view*



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Additional information module

No additional information has been provided by the applicant.

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