MODEL NRD-545

SERVICE MANUAL

JRC Japan Radio Co., Ltd.

DSP RECEIVER

Downloaded by
RadioManual.EU

INTRODUCTION

This manual describes the basic operating principles of the NRD-545DSP receiver and items required for its maintenance. Please refer to the User Manual supplied with the equipment for how to operate and handle the NRD-545.

The NRD-545 consists of eight units. Each circuit has been designed to minimize the number of locations that might require adjustment with the passage of time, and so increase operating stability. It is therefore only necessary to service the equipment according to the instructions contained in this manual when a fault becomes apparent.

Please refer to the table of units and be sure to enter the name and type on the form when ordering replacement unit.

Please refer to the parts lists and enter the unit type, part No., type, and code when ordering parts.

CONTENTS

Downloaded by
RadioManual.EU

Downloaded by
RadioManual.EU

1. SPECIFICATIONS

(1) Operating frequency range

With optional board CHE-199 installed:
NRD-545J: 0.1~252.9MHz, 255.1~261.9MHz
266.1~270.9MHz, 275.1~379.9MHz
382.1~411.9MHz, 415.1~809.9MHz
834.1~859.9MHz, 889.1~914.9MHz
960.1~1999.999MHz
NRD-545G: 0.1~1999.999MHz
NRD-545U: 0.1~823.9MHz, 849.1~868.9MHz
894.1~1849.9MHz, 1910.1~1929.9MHz
1990.1~1999.999MHz

(2) Modes of Reception

USB, LSB, CW, RTTY, AM, FM, WFM (with optional board installed)
(Note: USB, LSB, CW, and RTTY modes are available at below 30MHz. WFM mode is available at 30MHz or more.)

(3) Frequency stability

± 10ppm or less after 5 to 60 minutes warm-up period;
± 2ppm per hour or less from then on
± 0.5ppm (with optional TCXO mounted)

(4) Minimum tuning step

1Hz
(10Hz, 100Hz, 1kHz, 5kHz, 6.25kHz, 9kHz, 10kHz, 12.5kHz, 20kHz, 25kHz, 30kHz, 50kHz, 100kHz steps available)

(5) Memory Capacity

1000 channels
(frequency, mode, bandwidth, ATT, AGC, and tuning step)

(6) Receiving system

Triple superheterodyne
1st IF: 70.455MHz
2nd IF: 455kHz
3rd IF: 20.22kHz

(7) Sensitivity

	USB, LSB, CW, RTTY	AM	FM	WFM
0.1~0.499999MHz	14dB μ (5 μV)	24dB μ (15.8 μV)	———	———
0.5~1.599999MHz	6dB μ (2 μV)	16dB μ (6.3 μV)	———	———
1.6~29.999999MHz	-10dB μ (0.32 μV)	6dB μ (2 μV)	-6dB μ (0.5 μV)	———
30~1000MHz	———	10dB μ (3.2 μV)	-2dB μ (0.8 μV)	6dBμ (2 μV)
1260~1300MHz	———	10dB μ (3.2 μV)	-2dB μ (0.8 μV)	———

Bandwidth: USB/LSB/CW/RTTY/AM: 2.4kHz
S/N: 10dB, Modulation: 400Hz, 30% (when measuring AM), 12dB SINAD (when measuring FM and WFM).
Note: The sensitivity of 30MHz or more measured with CHE-199 UNIT installed.

Downloaded by
RadioManual.EU

(8) Selectivity

	Bandwidth	6dB	60dB
WIDE	4.5kHz	4.5kHz or more	8kHz or less
INTER	2.4kHz	2.4kHz or more	5kHz or less
NARROW	1kHz	1kHz or more	4kHz or less
FM	10kHz	10kHz or more	——

The WIDE, INTER, and NARROW are only examples. The bandwidth can be set as desired between 0.01 and 9.99kHz (except for AMS, FM, and WFM).

(9)	Dynamic range	106dB (IF bandwidth: 300Hz)
(10)	Image rejection	70dB or more
(11)	Spurious response	60dB or more
(12)	IF rejection	70dB or more
(13)	PBS variable range	± 2.3kHz (50Hz steps)
(14)	NOTCH attenuation	40dB or more
(15)	NOTCH variable range	± 2.5kHz (10Hz steps)
(16)	NOTCH tracking range	± 10kHz
(17)	Antenna impedance	50 Ω (Lo-Z terminal) 600 Ω (Hi-Z terminal)
(18)	Attenuator	Approx. 20dB
(19)	AGC characteristics	10dB or less variation in audio-frequency output in relation to a change between 3 μV and 100mV antenna input Release time: 40mS to 5.1S (20mS steps)
(20)	Audio frequency output	Speaker output: 1W or more (4 Ω load, 10% distortion) Line output and recording output: 1mW or more (600 Ω load, 10% distortion)
(21)	RS-232C interface	Baud rate: 4800 baud (character structure: 1 start bit, 8 data bits, no-parity bit, 1 stop bit)
(22)	Power requirements	AC 100/120/220/240V ± 10%, 40VA or less DC 12 to 16V (standard 13.8V) 30W or less
(23)	Dimensions	330 (w) × 130 (143) (h) × 285 (327) (d) mm Valus in parentheses include projections.
(24)	Weight	Approx. 7.5kg

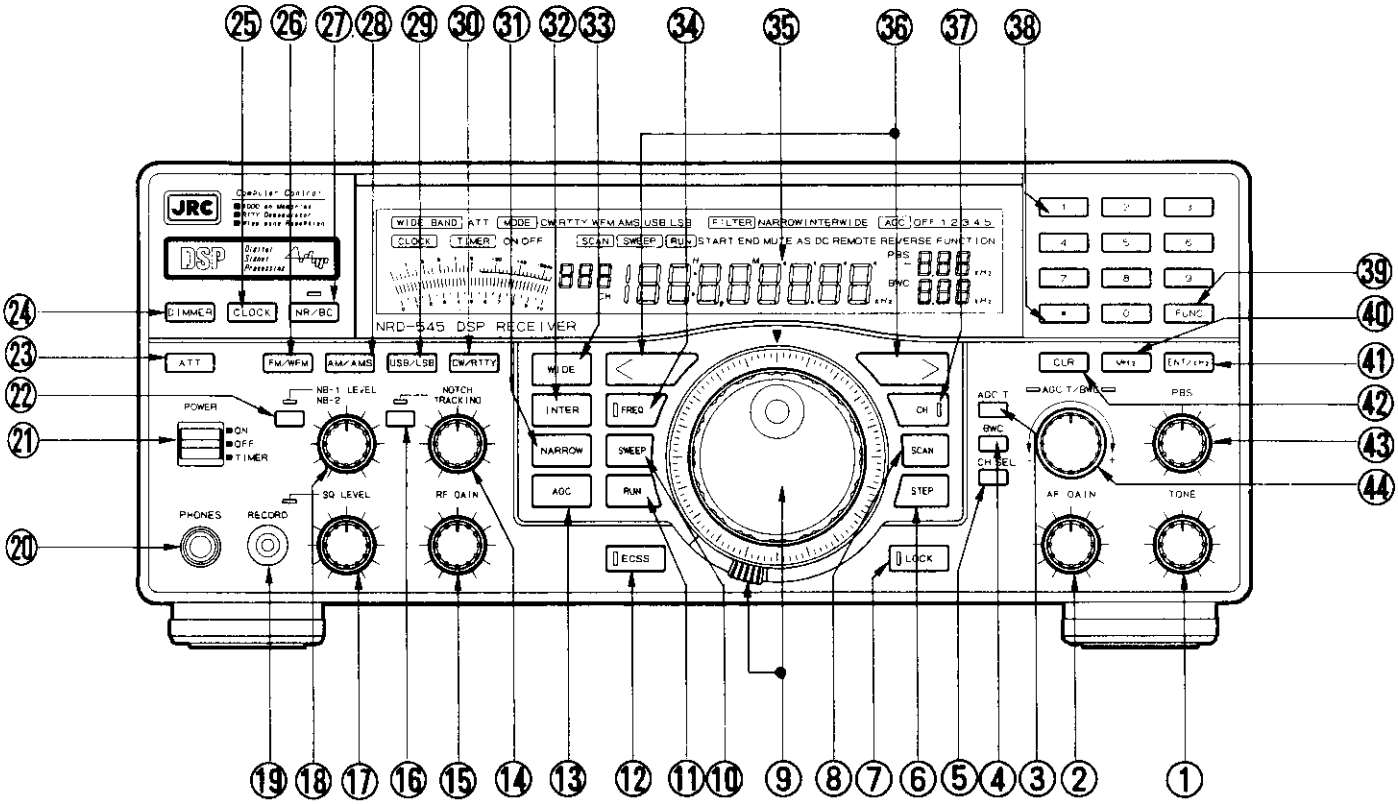
Notes: 1. Specifications and appearance, etc., are subject to change without prior notice.

2. In the event of a mismatch between the manual and operation of the actual equipment, operation of the actual equipment takes precedence.

Downloaded by
RadioManual.EU

2. FRONT PANEL AND REAR PANEL

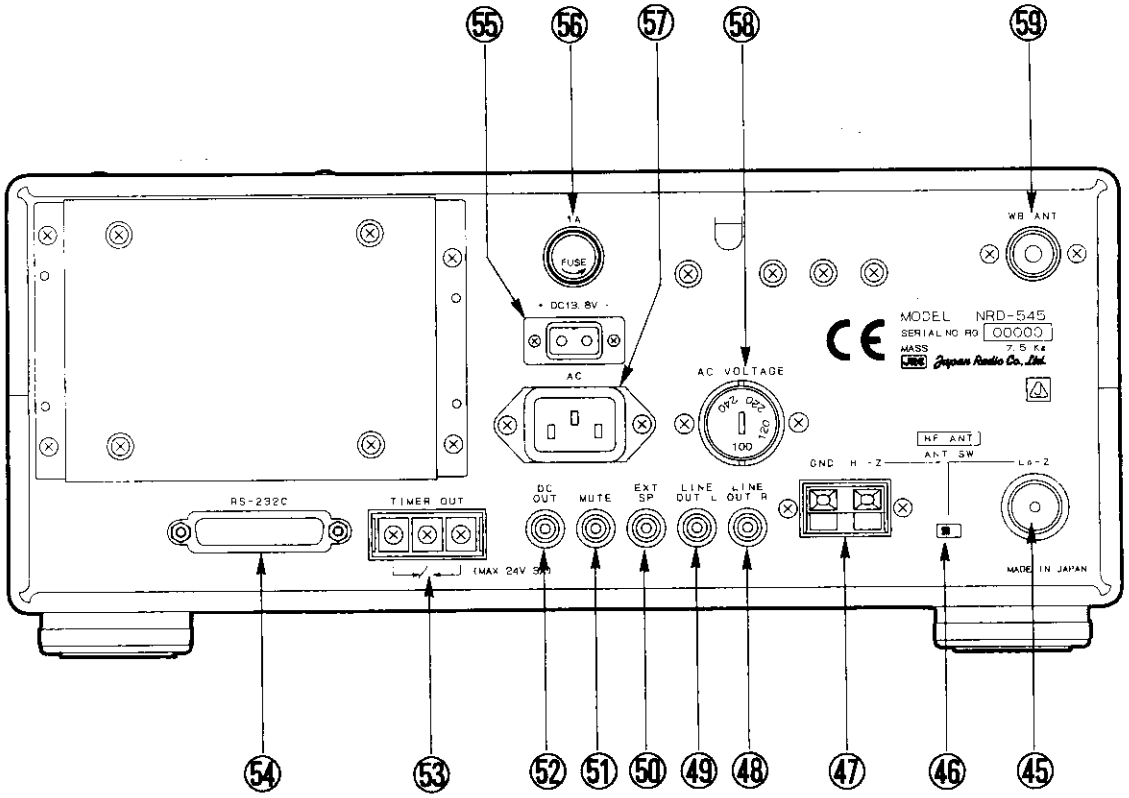
2-1 FRONT PANEL



① TONE control
② AF GAIN control
③ AGC T button
④ BWC (bandwidth control) button
⑤ CH SEL (channel select) button
⑥ STEP button
⑦ LOCK button
⑧ SCAN button
⑨ Tuning control/torque control
⑩ SWEEP button
⑪ RUN button
⑫ ECSS button
⑬ AGC button
⑭ NOTCH control
⑮ RF GAIN control
⑯ NOTCH button
⑰ SQ LEVEL (squelch level) control
⑱ NB LEVEL (noise blanker level) control
⑲ RECORD jack
⑳ PHONES jack
㉑ POWER switch
㉒ NB (noise blanker) button
㉓ ATT (attenuator) button
㉔ DIMMER button
㉕ CLOCK button
㉖ FM/WFM button
㉗ NR/BC (noise reduction/beat canceller) button
㉘ AM/AMS button
㉙ USB/LSB button
㉚ CW/RTTY button
㉛ NARROW button
㉜ INTER button
㉝ WIDE button
㉞ FREQ (frequency) button
㉟ LCD display
㊱ > (UP) and < (DOWN) button
㊲ CH (channel) button
㊳ Numerical keypad
㊴ FUNC (function) button
㊵ MHz button
㊶ ENT/kHz button
㊷ CLR (clear) button
㊸ PBS (passband shift) control
㊹ FINE control

Downloaded by
RadioManual.EU

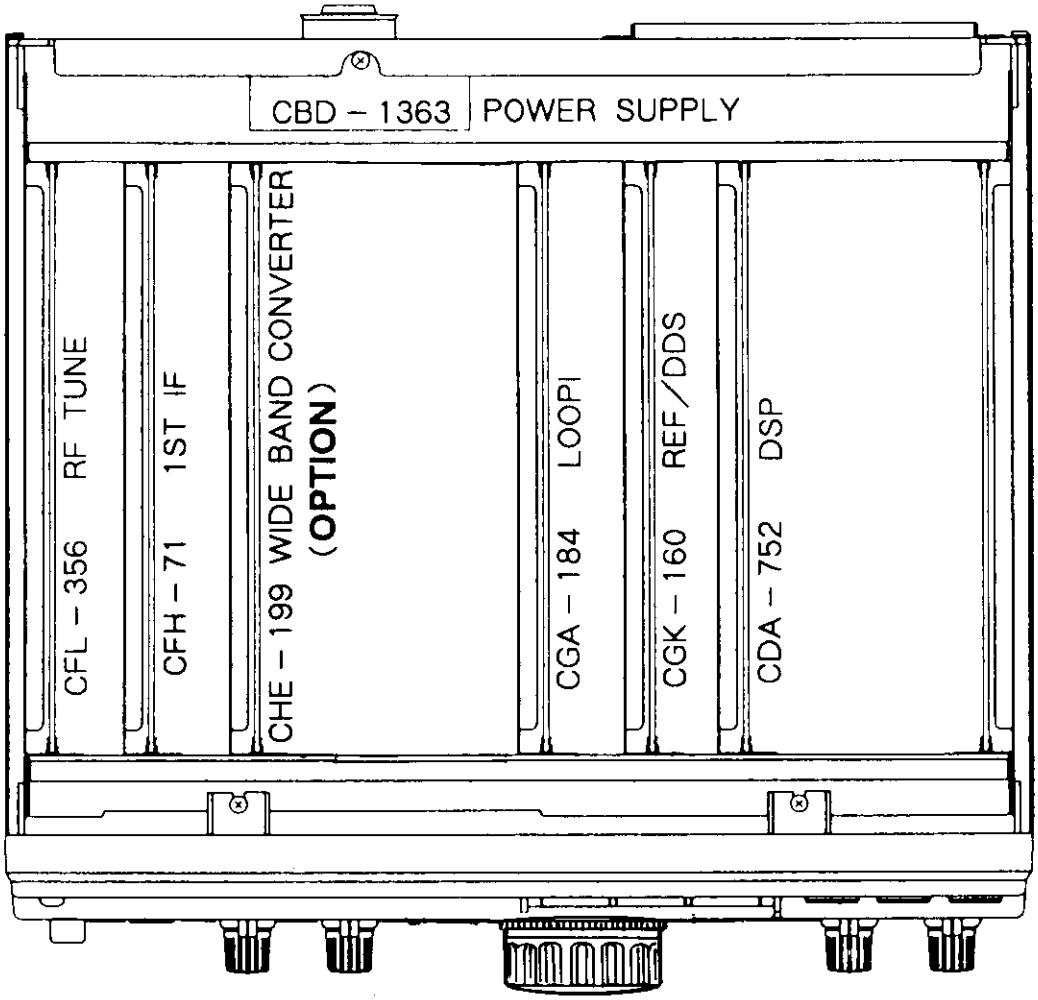
2-2 REAR PANEL



45 ANT Lo-Z (low-impedance) connector
46 ANT SW (antenna switch)
47 ANT Hi-Z (high-impedance) terminal
48 LINE OUT R jack
49 LINE OUT L jack
50 EXT SP (speaker) jack
51 MUTE jack
52 DC OUT (DC output) jack
53 TIMER OUT terminal
54 RS-232C connector
55 DC power connector
56 Fuse holder
57 AC power connector
58 Voltage selector
59 WB ANT (wideband antenna) connector

Downloaded by
RadioManual.EU

3. LAYOOUT OF UNITS



CDE – 860 DISPLAY

Downloaded by
RadioManual.EU

7. ADJUSTMENT

7-1 PREPARATION

(1) Initial settings

Set the respective switches and controls as shown below.

LOCK button	: OFF
RF GAIN	: Fully clockwise
TONE control	: Center position
NOTCH button	: OFF
SQ LEVEL control	: Fully counterclockwise (OFF)
PBS control	: Center position (OFF)
NB button	: OFF
ATT button	: OFF

(2) Required Measuring Instruments

DC (AC) voltmeter	: Digital voltmeter
Frequency counter	: 10kHz to 1500MHz
RF voltmeter	: 455kHz to 150MHz, 0.001 to 3Vrms
VU meter	: 600 Ω , 0 to 35dBm
Level meter	: 600 Ω /10K Ω , -50 to 30dBm
Distortion meter	: 600 Ω /10K Ω , 0.5 to 30%
CR OSC	: 600 Ω , 10Hz to 5kHz
SG	: 50 Ω , -20 to 120dBuV, 90kHz to 2000MHz AM/FM modulation, with external modulation connector Note: The SG output voltage shown above is when output is open. Note that output is terminated with 50 Ω for measuring sensitivity.
Spectrum analyzer	: 100kHz to 2000MHz
Tracking generator	: 50 Ω , 100kHz to 2000MHz
Oscilloscope	: Dual-channel DC to 100MHz
Transformer	: 4: 600 Ω (3W)

(3) Extension Unit : CMH-365

Downloaded by
RadioManual.EU

7-2 CBD-1363 POWER CIRCUIT

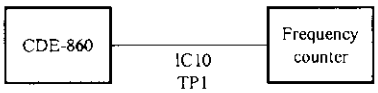
NO.	ITEM	ADJUSTING PROCEDURE		RATING
1	Secondary voltage check of power transformer	① Connect the AC power cable. Set the AC supply voltage as appropriate for the respective model: NRD-545J (Japan): 100VAC NRD-545U (USA): 120VAC NRD-545G (Europe): 220VAC ② Connect the receiver to the appropriate power supply. ③ Turn ON the POWER switch and measure the secondary voltage (BLU-BLK) at rear panel T1.		13~16VAC
2	Input voltage check	① Using a DC voltmeter, check the voltage at W14-9	AC power supply	15~18.5VDC
			DC power supply	13~14VDC
3	10.8VDC adjustment (RV1)	① Connect a DC voltmeter to W14-12. ② Adjust RV1 so that the voltmeter indicates a voltage of 10.8V.		10.8 ± 0.1VDC
4	5V check	① Check that W14-1 is 5VDC. ② Check that W14-4 is 5VDC.		4.8~5.2VDC 4.8~5.2VDC
5	10V check	① Check that W14-7 is 10VDC.		9.8~10.2VDC
6	DC power supply check	① Disconnect the AC power cable and connect a 13.8V ± 0.1V DC power supply. ② Recheck the voltages in NO. 2 to 5.		

Downloaded by
RadioManual.EU

7-3 CDE-860 DISPLAY UNIT

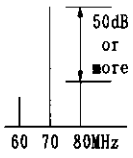
<table>
<tr><th>NO.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>1</td><td>Memory setting</td><td>① Store the following frequencies in the memory channels.
BANDWIDTH: INTER (all channels)
AGC: OFF ATT: OFF
<table>
<tr><th>Channel No.</th><th>Frequency (MHz)</th><th>MODE</th><th>Channel No.</th><th>Frequency (MHz)</th><th>MODE</th></tr>
<tr><td>0</td><td>0.106</td><td>AM</td><td>16</td><td>20.499</td><td>AM</td></tr>
<tr><td>1</td><td>0.399</td><td>AM</td><td>17</td><td>20.5</td><td>AM</td></tr>
<tr><td>2</td><td>0.4</td><td>AM</td><td>18</td><td>21.3</td><td>AM</td></tr>
<tr><td>3</td><td>0.799</td><td>AM</td><td>19</td><td>28.2</td><td>AM</td></tr>
<tr><td>4</td><td>0.8</td><td>AM</td><td>20</td><td>29.99</td><td>AM</td></tr>
<tr><td>5</td><td>1.599</td><td>AM</td><td>21</td><td>30.1</td><td>AM</td></tr>
<tr><td>6</td><td>1.605</td><td>AM</td><td>22</td><td>107.9</td><td>AM</td></tr>
<tr><td>7</td><td>2.649</td><td>AM</td><td>23</td><td>145.04</td><td>FM</td></tr>
<tr><td>8</td><td>2.65</td><td>AM</td><td></td><td></td><td></td></tr>
<tr><td>9</td><td>4.399</td><td>AM</td><td></td><td></td><td></td></tr>
<tr><td>10</td><td>4.4</td><td>AM</td><td>30</td><td>0.999</td><td>AM</td></tr>
<tr><td>11</td><td>7.399</td><td>AM</td><td>⋮</td><td>⋮</td><td>⋮</td></tr>
<tr><td>12</td><td>7.4</td><td>AM</td><td>⋮</td><td>1MHz steps</td><td>⋮</td></tr>
<tr><td>13</td><td>12.299</td><td>AM</td><td>⋮</td><td>⋮</td><td>⋮</td></tr>
<tr><td>14</td><td>12.3</td><td>AM</td><td>59</td><td>29.999</td><td>AM</td></tr>
<tr><td>15</td><td>14.1</td><td>AM</td><td></td><td></td><td></td></tr>
</table></td><td></td></tr>
<tr><td>2</td><td>Memory check</td><td>① Check the stored contents of the memory channels on the LCD display.
② When the set is ON, measure the voltages at the contacts of CD21 and R61.</td><td>Memory contents are as set.
3VDC or more</td></tr>
<tr><td>3</td><td>TUNE voltage adjustment</td><td>① Connect the digital voltmeter to TP3.
② Select memory channel 2 (0.4MHz).
Adjust RV2 so that the voltmeter indicates 5.74VDC.
③ Select memory channel 3 (0.799MHz).
Adjust RV1 so that the voltmeter indicates 20VDC.
④ Repeat steps ② and ③ two or three times to confirm that the ratings are as specified.
⑤ If, in step ②, the voltage cannot be adjusted to 5.74V, adjust R50 and R51.
⑥ Select memory channel 21 (30.1MHz).
Adjust RV10 so that the voltmeter indicates 1.9VDC.
⑦ Select memory channel 22 (107.9MHz).
Check that the voltmeter indicates 10VDC.</td><td>5.74 ± 0.1VDC
20 ± 0.1VDC
1.9 ± 0.1VDC
10 ± 0.1VDC</td></tr>
<tr><td>4</td><td>LCD check</td><td>① Press the DIMMER key to check that the illumination is dimmed.
② Turn ON the set while pressing and holding FUNC + DIMMER. Check that all segments light.</td><td></td></tr>
<tr><td>5</td><td>Switches</td><td>① Firmly operate the switches to check that they move smoothly when being pressed ON or OFF.
② Check that the appropriate LED or LCD display lights when the respective switch is pressed.</td><td></td></tr>
</table>

Downloaded by
RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
6	32.768kHz adjustment (CV1)	① Connect the frequency counter and frequency multiplier as illustrated below.  ② Adjust CV1 until the frequency is 32.768kHz. Be sure to allow at least 30 min. after turning ON the power before adjusting CV1.	32.767621kHz ~32.768379kHz

Downloaded by
RadioManual.EU

7-4 CGK-160 REF/DDS UNIT

NO.	ITEM	ADJUSTING PROCEDURE	RATING
1	20MHz adjustment	① Set P1 to TCXO OFF. ② Connect the frequency counter and RF voltmeter to TP3. ③ Adjust CV1 so that the frequency is 20MHz. ④ Check the output voltage.	20MHz±10Hz 0.12Vrms or more
2	2nd Local adjustment (70MHz)	① Connect the spectrum analyzer to TP5. ② Adjust T1, T2, and T3 so that the 70MHz component is maximum. ③ Check that the 60MHz and 80MHz components are 50dB lower than the 70MHz component. ④ Adjust T4 so that the 70MHz component is maximum. ⑤ Connect the RF voltmeter to TP5. ⑥ Check the output voltage.	 0.16Vrms or more
3	DDS output check	① Set the reception frequency to 1.499MHz. ② Connect the RF voltmeter to TP1 and check the output voltage.	0.015Vrms or more
4	10MHz output check	① Connect the frequency counter to TP12. ② Check that the frequency is 10MHz. ③ Connect the RF voltmeter to TP12. ④ Check the output voltage.	10MHz±15Hz 0.4Vrms or more
5	20MHz output check	① Connect the RF voltmeter to TP2 and TP4. ② Check the output voltages.	TP2: 0.12Vrms or more TP4: 0.17Vrms or more
6	BEEP output adjustment	① Connect the oscilloscope to TP10. ② Adjust RV3 so that, when the beep is output, the output voltage is 0.3Vp-p.	0.3Vp-p ± 0.03V
7	Line out adjustment	① RV1 and RV2 are adjusted in section 7-9.	

Downloaded by
RadioManual.EU

7-5 CGA-184 LOOP1 UNIT

NO.	ITEM	ADJUSTING PROCEDURE		RATING
1	AVR adjustment	① Connect the digital voltmeter (DCV) to TP4. ② Check that the voltage is 9.6V. If the voltage is not 9.6V, adjust it by replacing R52 and R62 with different values.		9.6 ± 0.3VDC
2	60MHz tuning	① Connect the RF voltmeter to TP5. ② Adjust T1 to the maximum output.		0.4Vrms or more
3	57MHz tuning	① Connect the RF voltmeter to TP6. ② Set the reception frequency to 1.250MHz and select AM mode. ③ Adjust T2 to the maximum output. ④ Connect the frequency counter to TP6. ⑤ Check that the output frequency is 57.705MHz.		0.042Vrms or more 57.705MHz ± 100Hz or less
4	VCO adjustment	① Connect the digital voltmeter (DCV) to TP1. ② Switch the receiving frequency according to the following table and adjust the VCO control voltage.		
		Receiving frequency	Adjustment trimmer	Control voltage
		7.499MHz	CV1	7.5V ± 0.1Vdc
		14.499MHz	CV2	7.5V ± 0.1Vdc
		21.499MHz	CV3	7.5V ± 0.1Vdc
		29.999MHz	CV4	7.5V ± 0.1Vdc
		③ Make sure the lock-out does not take place at the receiving frequency ranging from 100kHz to 29.999MHz. ④ Check that CD11 lights when in the unlocked state while switching bands. Make sure that CD11 also turns OFF immediately.		
5	Unit operating level check	① Use the RF voltmeter to check operating levels.	TP3	0.1Vrms or more

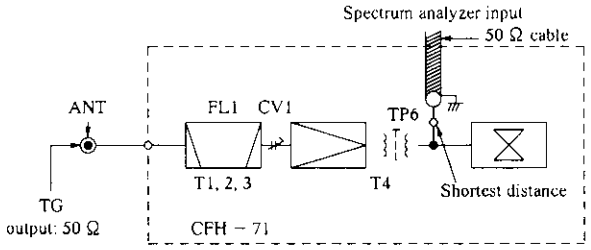
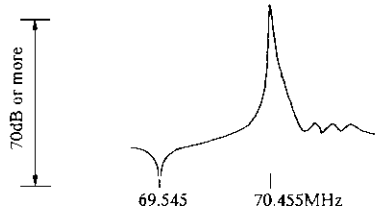
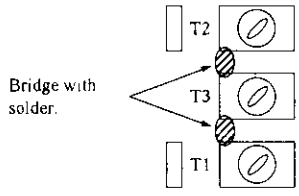
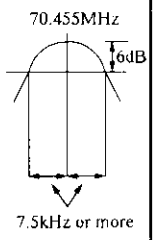
Downloaded by
RadioManual.EU

7-6 CDA-752 DSP UNIT

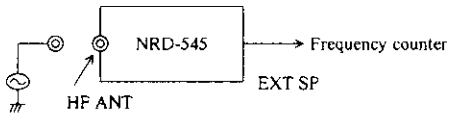
NO.	ITEM	ADJUSTING PROCEDURE	RATING
1	Level adjustment	① Connect the oscilloscope to terminal 21 of P16 and to TP7. Select memory channel 12 and set AGC OFF. ② Input an unmodulated signal to the antenna connector and set the signal so that the voltage at terminal 21 of P16 is 1.1Vp-p. ③ Now adjust RV1 so that the voltage at TP7 is 2.08Vp-p.	2.08Vp-p ± 0.15V
2	AGC voltage check	① Connect the voltmeter to TP6. Select memory channel 12 and measure the voltage when no signal to the antenna connector. ② Connect the voltmeter to TP9. Select memory channel 23 and measure the voltage when no signal to the antenna connector.	AGC1 4.8 ± 0.3V AGC2 0.3 ± 0.2V

Downloaded by
RadioManual.EU

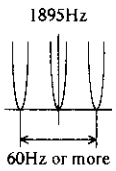
7-7 CFH-71 1ST IF UNIT

NO.	ITEM	ADJUSTING PROCEDURE	RATING
1	70.455MHz BPF adjustment (T1 to T4, and CV1)	① Connect a tracking generator (TG) as illustrated below.  ② Adjust CV1 and T4 so that the 70.455MHz point is maximum. ③ Adjust T1, T2, and T3 so that the 6dB bandwidth is ± 7.5kHz. Adjust T1 and T2 so that it is flat within the band. Adjust T3 to adjust the bandwidth. ④ Repeat step ②. ⑤ Adjust T1 and T2 so that the 69.545MHz point is at maximum attenuation. Now reduce the input ATT of the tracking generator so that attenuation is easier to see at the 69.545MHz point.  Adjust T1 to maximize attenuation at the 69.545MHz point. Adjust T2 so that the maximum point of attenuation is at 69.545MHz. ⑥ Check the 6dB bandwidth and band ripple. Repeat steps ③ to ⑤ if not within ratings. If the dip at the 69.545MHz point is not clear, check the following:  ⓐ Bridge the shield case of T2 and T3 with solder. ⓑ Bridge the shield case of T3 and T1 with solder. ⓒ Bridge the shield case of T2 and T3 and of T3 and T1 with solder.	 Band ripple 2dB or less
2	2nd MIX injection level	① Connect the RF voltmeter to TP7 and adjust T6 to the maximum level.	RF voltmeter: 0.7 to 1.3Vrms
3	Signal system tuning (T4 and T5)	① Connect the RF voltmeter to TP8 of CFH-71. ② Select 7.4MHz, CW mode, INTER bandwidth, and AGC OFF. ③ Set the SG output level to 5dBμ and connect to ANT connector. ④ Set the RF GAIN to maximum and adjust T4 and T5 so that the AF output is maximum ⑤ Check the TP8 voltage when the SG output level is set at 60dBμ .	0.45Vrms ± 0.10Vrms

Downloaded by
RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
4	RTTY demodulator filter adjustment	① Connect the SG and frequency counter as illustrated below.  SG (50 Ω): 7.104MHz 60dBμV CW Reception frequency: 7.104MHz MODE: RTTY BANDWIDTH: WIDE AGC: ON TONE control: Center position ② Set RV1 to the center position and RV2 and RV3 fully clockwise. ③ Connect CH1 of the oscilloscope (dual-channel) to TP4 and CH2 to TP5. ④ Fine tune the SG frequency or reception frequency so that the EXT SP output is 2295Hz. ⑤ Adjust RV4 so that the TP4 output level is maximum. Now, the output level is saturated. Rotate RV1 clockwise so that the output level is not saturated. ⑥ Set the shift width to 170Hz (± 85Hz). ⑦ Fine tune the SG frequency or reception frequency. ⑧ Adjust RV5 so that the TP5 output level is maximum. ⑨ Repeat steps ⑥ , ⑦ , and ⑧ to adjust 1870Hz and 1445Hz space filters. Space filter / Shift width / Adjuster (VR) 1870Hz / 425Hz / RV6 1445Hz / 850Hz / RV7	→Check that the MARK (CD8) LED is ON. →Check that the SPACE (CD9) LED is ON.

Downloaded by RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
	Mark and space filter output level differential adjustment	⑩ Set the shift width to 425Hz. Fine tune the SG frequency or reception frequency so that the EXT SP output frequency is 2295Hz or 1870Hz. Adjust RV2 or RV3 so that the output levels of TP4 and TP5 are identical. Now, make sure RV2 and RV3 are set closer to the fully clockwise position. ⑪ Adjust RV1 so that the output level of TP4 and TP5 is 8Vp-p.	Level differential: 0.5Vp-p or less 8Vp-p ± 0.5V
	Fine tuning check	⑫ With the settings in step ⑩, set the TONE control fully clockwise or counterclockwise and check the shift range of the space filter around 1895Hz.	

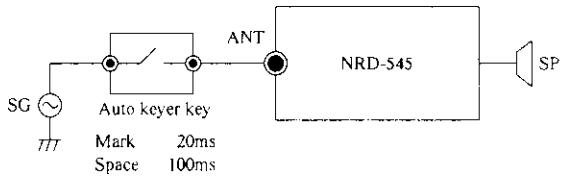
Downloaded by
RadioManual.EU

7-8 CFL-356 RF TUNE UNIT

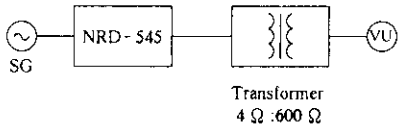
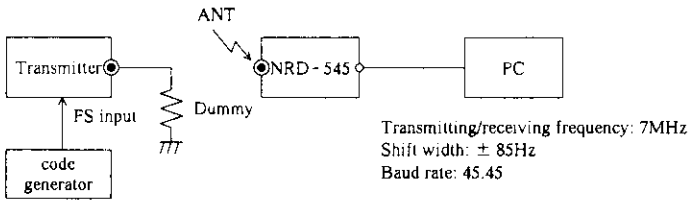
<table>
<tr><th>NO.</th><th>ITEM</th><th colspan="4">ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td rowspan="11">1</td><td rowspan="11">TUNE adjustment</td><td colspan="4">① Connect the tracking scope output to the RX ANT, and the tracking scope input to L14 (MODE: AM).
② Adjust the TUNE as shown below. (Make sure that the CDE-860 TUNE voltage has been adjusted.)</td><td></td></tr>
<tr><td colspan="2">TUNE type</td><td>Reception frequency</td><td>Adjuster</td><td></td></tr>
<tr><td colspan="2">400kHz LPF</td><td>0.4MHz or less</td><td></td><td>300kHz reference attenuation 400kHz 3dB or less
600kHz 30dB or more</td></tr>
<tr><td rowspan="2">0.4~1.6MHz</td><td>SUB
0.8~1.599MHz</td><td>0.8MHz
1.599MHz</td><td>T9, 10
–</td><td rowspan="8">TUNE mismatch: 3dB or less</td></tr>
<tr><td>MAIN
0.4~0.799MHz</td><td>0.799MHz
0.4MHz</td><td>CV5, 6
–</td></tr>
<tr><td rowspan="2">1.6~4.4MHz</td><td>SUB
2.65~4.399MHz</td><td>2.65MHz
4.399MHz</td><td>T7, 8
–</td></tr>
<tr><td>MAIN
1.6~2.649MHz</td><td>2.649MHz
1.6MHz</td><td>CV3, 4
–</td></tr>
<tr><td rowspan="2">4.4~12.3MHz</td><td>SUB
7.4~12.299MHz</td><td>7.4MHz
12.299MHz</td><td>T5, 6
–</td></tr>
<tr><td>MAIN
4.4~7.399MHz</td><td>7.399MHz
4.4MHz</td><td>CV1, 2
–</td></tr>
<tr><td colspan="2">12.3~20.5MHz</td><td>12.3MHz
20.499MHz</td><td>T3, 4
–</td></tr>
<tr><td colspan="2">20.5~30MHz</td><td>20.5MHz
29.999MHz</td><td>T1, 2
–</td></tr>
<tr><td colspan="4">Example: SUB 0.8 to 1.599MHz
(1) Set the reception frequency to 0.8MHz.
(2) Adjust T9 and T10 so that the tuning frequency is 0.8MHz.
(3) Check that, when the reception frequency is set to 1.599MHz, the set tunes to 1.599MHz. If there is any TUNE mismatch, repeat step (2).</td><td></td></tr>
<tr><td>2</td><td>ATT check</td><td colspan="4">① Set the ATT switch ON and check the attenuation.</td><td>15 to 25dB</td></tr>
<tr><td>3</td><td>1st MIX input level</td><td colspan="4">① Connect the RF voltmeter to RT2.
② Switch reception frequency between 100kHz and 29.999MHz (in 1MHz steps) and check the level.</td><td>0.5Vrms or more</td></tr>
<tr><td>4</td><td>Signal system tuning</td><td colspan="4">① Set in 7.4MHz AM sensitivity measuring state.
AGC: OFF, bandwidth: INTER
② Connect the RF voltmeter to TP8 of CFH-71.
③ Set the SG output level to 5dBμ , then adjust T12 to set the AF output to maximum.
④ Set the SG output to 60dBμ and measure the voltage at TP8.</td><td>0.45Vrms
± 0.1Vrms</td></tr>
<tr><td>5</td><td>1st MIX balance</td><td colspan="4">① Connect the RF voltmeter to P25-1, then adjust RV1 so that the voltmeter reading is minimum.</td><td>0.1Vrms or less</td></tr>
</table>

Downloaded by
RadioManual.EU

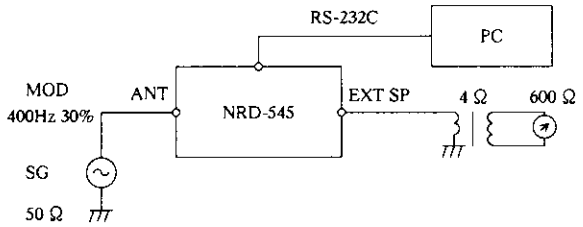
7-9 INTEGRATED ADJUSTMENTS

NO.	ITEM	ADJUSTING PROCEDURE	RATING
1	LINE OUT adjustment	① Set up for 7.4MHz USB sensitivity measuring. (SG output: 7.401MHz) AGC: ON SG output level: 60dBμ ② Connect the level meter (600 Ω) to the LINE OUT R connector on the rear panel. ③ Adjust RV2 on CGK-160 until the level meter indicates -2dBm. ④ Now measure the distortion. ⑤ Connect the level meter (600 Ω) to the LINE OUT L connector on the rear panel. ⑥ Adjust RV1 on CGK-160 until the level meter indicates -2dBm. ⑦ Now measure the distortion.	2% or less 2% or less
2	RECORD output check	① Check that the output level is the same as LINE OUT R.	
3	Total distortion	① Set up for 7.4MHz AM sensitivity measuring. 400Hz, 60% modulation, AGC: ON, AF output: 27dBm ② Measure AF output distortion when the SG output level is 60dBμ and 100dBμ . SG 60dBμ SG 100dBμ	 3% or less 10% or less
4	Squelch check	① AGC: ON, RF GAIN: fully clockwise, ANT connector: Open ② Check for AF output in all modes when the squelch control is fully counterclockwise. ③ Check for AF output in all modes when the squelch control is rotated clockwise three points.	
5	Noise blanker	① Set up for 7.4MHz AM sensitivity measuring. SG output level: 0dBμ to 100dBμ . ② Connect the auto keyer.  ③ Set NB-1 ON and check that the noise is blanked when you rotate the NB LEVEL control clockwise. ④ Check NB-2 in the same manner.	

Downloaded by
RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
6	IF filter check	① Set up for 7.4MHz CW sensitivity measuring. (SG output: 7.4MHz) AGC: OFF, FILTER: WIDE (2.4kHz), SG output level -10dBμ , TONE control: Fully clockwise. ② Connect the level meter to the SP OUT connector on the rear panel. Connect the impedance conversion transformer between the SP OUT connector and level meter.  ③ Adjust the AF control until the level meter indicates 0dBm. ④ 6dB bandwidth measurement Set the SG output level to -4dBμ , detune the SG frequency, and measure the detuning frequency when the level meter indicates 0dBm. Note: Detune from 0.9kHz or more on the lower frequency side. ⑤ 60dB bandwidth measurement Set the SG output level to 50dBμ , detune the SG frequency, and measure the detuning frequency when the level meter indicates 0dBm. Note: Detune from 0.9kHz or more on the lower frequency side.	6dB bandwidth ± 1.2kHz or more 60dB bandwidth ± 2.5kHz or less
7	BWC check	① Check the BWC function.	
8	RTTY check	① Connect a transmitter, code generator , and PC as illustrated below.  ② Check that the PC output maches the transmitted code.	

Downloaded by RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
9	PBS check	① Check the PBS function.	
10	S-meter adjustment and check	① Reception frequency: 0.75MHz, MODE: AM, BW: NARROW (2.4kHz) AGC: ON, NOTCH: OFF, ATT: OFF ② Connect measuring instruments and PC as illustrated below.  ③ Set the SG output level to 34dBμ , the frequency to 0.75MHz, then send remote control commands "SM99" and "SM" from the PC. ④ Set the reception frequency to 1.75MHz and the SG frequency to 1.75MHz, then send remote control command "SM" from the PC. ⑤ Raise the reception frequency and SG frequency by 1MHz, send remote control command "SM", and repeat to 29.75MHz. ⑥ Set the reception frequency to 145MHz and the SG frequency to 145MHz, then send remote control command "SM" from the PC. ⑦ Set the reception frequency to 7.4MHz and SG to 7.4MHz, then measure the AF output change while varying the SG between 10 and 100dBμ . (20dBm standard) ⑧ Check the reading on the S meter in relation to the SG output level. S1 10dBμ ± 3dB S9+20dB 54dBμ ± 5dB S5 22dBμ ± 3dB S9+40dB 74dBμ ± 10dB S9 34dBμ ± 3dB S9+60dB 94dBμ ± 10dB ⑨ Check the AGC release time constant.	S-meter adjustment for < 1MHz S-meter adjustment for < 2MHz WB converter S-meter adjustment 10dB or less
11	RF GAIN check	① Set up for 7.4MHz USB sensitivity measuring. (SG output 7.401MHz) AGC: OFF RF GAIN control: fully clockwise ② Set SG output level to 0dBμ and AF output to 20dBm. ③ Set the RF GAIN control fully counterclockwise. ④ Determine the SG output level at which the AF output is 20dBm.	90dBμ or more
12	NOTCH check	① Set up for 7.4MHz USB sensitivity measuring. (SG output 7.401MHz) AGC: OFF RF GAIN control: fully clockwise ② Set SG output level to 30dBμ and AF output to 20dBm. ③ Set NOTCH ON and adjust control to notch out the signal. ④ Check that the AF output is -20dBm or less. ⑤ Check NOTCH tracking.	

Downloaded by RadioManual.EU

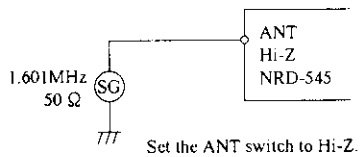
NO.	ITEM	ADJUSTING PROCEDURE	RATING
13	NR/BC check	① The NR/BC function must be ON. ② Output the beat tone and check that the beat is extinguished when the BC is ON.	
14	Sensitivity	① Measure the sensitivity at the following frequencies: USB: S/N=10dB AF output=10dBm Bandwidth: INTER (2.4kHz) AM : S/N=10dB AF output=10dBm Bandwidth: NARROW (2.4kHz) MOD=400Hz 30% FM : 12dB SINAD AF output=10dBm MOD=1kHz DEV= ± 3.5kHz The SG output level when measuring sensitivity is with a 50 Ω load.	

Reception frequency	USB	AM	FM
0.106 MHz	14dBμ or less	24dBμ or less	——
0.399MHz	14dBμ or less	——	——
0.405MHz	14dBμ or less	24dBμ or less	——
0.799MHz	6dBμ or less	16dBμ or less	——
0.8MHz	6dBμ or less	——	——
1.599MHz	6dBμ or less	——	——
1.605MHz	-10dBμ or less	6dBμ or less	——
2.649MHz	-10dBμ or less	——	——
2.65 MHz	-10dBμ or less	——	——
4.399MHz	-10dBμ or less	——	——
4.4MHz	-10dBμ or less	——	——
7.399MHz	-10dBμ or less	6dBμ or less	——
7.4MHz	-10dBμ or less	——	——
10.1MHz	-10dBμ or less	——	——
12.299MHz	-10dBμ or less	——	——
12.3MHz	-10dBμ or less	——	——
14.1MHz	-10dBμ or less	——	——
20.499MHz	-10dBμ or less	——	——
20.5MHz	-10dBμ or less	6dBμ or less	——
21.3MHz	-10dBμ or less	——	——
28.2MHz	-10dBμ or less	——	——
29.99 MHz	-10dBμ or less	——	-6dBμ or less
145.04MHz	——	——	-2dBμ or less

Note: —— indicates measurements not required.

② Set RF TUNE to "PASS", then measure the 4.4MHz USB sensitivity. -10dBμ or less
Reset RF TUNE to its original position after taking the measurements. 3dBμ or less

③ Connect the SG as illustrated below, then measure the 1.6MHz USB sensitivity.

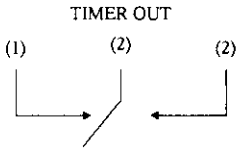


Set the ANT switch to Hi-Z.

Downloaded by
RadioManual.EU

NO.	ITEM	ADJUSTING PROCEDURE	RATING
15	Interference rejection ratio	① Set up for 7.4MHz sensitivity measuring. AGC: OFF, MODE: CW ② Set the SG output level to 0dBμ and AF output to 10dBm.	
	1st image interference ratio	③ Set the SG frequency to 148.31MHz and determine the SG output level at which the AF output is 10dBm.	70dB or more
	2nd image interference ratio	④ Set the SG frequency to 8.31MHz and determine the SG output level at which the AF output is 10dBm.	70dB or more
	1st IF rejection ratio	⑤ Set the SG frequency to 70.455MHz and determine the SG output level at which the AF output is 10dBm.	70dB or more
	2nd IF rejection ratio	⑥ Set the SG frequency to 455kHz and determine the SG output level at which the AF output is 10dBm.	70dB or more
16	PHONES jack check	① Check that, when headphones are connected to the PHONES jack, that the internal speaker and external SP are OFF. Also check that sounds can be heard through the headphones.	
17	Noise level	① ANT: open, RF GAIN: fully counterclockwise, AF GAIN: fully counterclockwise, MODE: USB ② Now measure the AF output level. ③ Plug the headphones into the PHONES jack and check that there is no HAM noise.	-40dBm or more
18	Mute	① Set up for 7.4MHz sensitivity measuring. AGC: ON, MODE: CW ② Set the SG output level to 120dBμ and AF output to 20dBm. ③ Connect the MUTE terminal on the rear panel to ground, then measure the AF output level.	-40dBm or more
19	Tone control	① Set up for 7.4MHz AM sensitivity measuring. AGC: ON, FILTER: WIDE ② Set the SG output level to 40dBμ and modulation frequency to 2kHz 30%. ③ Set the TONE control to the center position. ④ Set the AF output level to 15dBm. ⑤ Measure the output level when the TONE control is fully counterclockwise.	0dBm or more

Downloaded by
RadioManual.EU

<table>
<tr><th>NO.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>20</td><td>DC OUT</td><td>① Connect a 470 Ω resistor between the DC out terminal on the rear panel and ground, then measure the voltage across the resistor.</td><td>10.8 ± 0.3V</td></tr>
<tr><td>21</td><td>EXT SP</td><td>① Insert a pin plug into the EXT SP jack on the rear panel, then check that the internal speaker is switched off.</td><td></td></tr>
<tr><td>22</td><td>Timer output</td><td>① Set the timer ON/OFF times as appropriate.
② Set the POWER/TIMER switch to TIMER.
③ Check the timer output contact on the rear panel, and the 10.8V and 5V voltages.
④ Check that, when the timer is operating, the LCD backlighting is OFF.
 
<table><tr><td>Timer ON</td><td>(2) and (3) connected
10.8V and 5V are ON.</td></tr><tr><td>Timer OFF</td><td>(1) and (2) connected
10.8V and 5V are OFF.</td></tr></table></td><td></td></tr>
<tr><td>23</td><td>Scan and sweep</td><td>① Check that the scan and sweep functions perform correctly.</td><td></td></tr>
<tr><td>24</td><td>Power dissipation</td><td>① Measure the power dissipation with AC and DC power supplies.
AF GAIN: Minimum
<table><tr><td rowspan="2">Power supply</td><td colspan="2">POWER</td></tr><tr><td>OFF</td><td>ON</td></tr><tr><td>AC</td><td>15VA or less</td><td>40VA or less</td></tr><tr><td>DC13.8V</td><td>0.1W or less</td><td>21W or less</td></tr></table>② Check that there is abnormal operation with fluctuation in the supply voltage (rated AC supply ± 10%, or 12V to 16VDC).
③ Check that "DC" is displayed on the panel when using a DC power supply.
④ Check the voltage selector.</td><td></td></tr>
<tr><td>25</td><td>RS-232C interface</td><td>① Connect a PC to the RS-232C connector on the rear panel.
② Check that the NRD-545 can be controlled by the test program.</td><td></td></tr>
<tr><td>26</td><td>Spurious beat</td><td>MODE: CW, FILTER:WIDE, AGC:OFF
Reception frequency Fr=0.1745MHz, =24.317MHz,
=5.2545MHz, =24.9991MHz,
=5.2555MHz, =29.491MHz,
=10MHz, =15.9725MHz,
=20MHz.</td><td>B/N other than at frequencies shown at left are to be 10dB or less</td></tr>
</table>

Downloaded by
RadioManual.EU

<table>
<tr><th>NO.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>27</td><td>Final operation check</td><td>① Check the final operation (as per User Manual).</td><td></td></tr>
<tr><td>28</td><td>Shipping reset</td><td>① Press and hold CLR while turning on the power (to clear the RAM).</td><td></td></tr>
<tr><td>29</td><td>Control settings for shipping</td><td>NB control : Center
POWER switch : Center
NOTCH control : Center
SQ LEVEL control : Fully counterclockwise
RF GAIN control : Fully clockwise
PBS control : Center
AF GAIN control : Fully counterclockwise
TONE control : Center</td><td></td></tr>
<tr><td>30</td><td>NRD-545J, G, U destination settings</td><td>Set the NRD-545J, G, U destination as follows.
Install R24 and R25 (chip resistors) on the CFQ-8350 motherboard, and, using a black marker, mark the destination table printed on the PCB.
① Installation of R24 and R25 (chip resistors).
<table><tr><th></th><th>R24</th><th>R25</th></tr><tr><td>J</td><td>Yes</td><td>Yes</td></tr><tr><td>G</td><td>No</td><td>Yes</td></tr><tr><td>U</td><td>No</td><td>No</td></tr></table>
② Use the black marker to fill the circles as appropriate.
<table><tr><th>J</th><th>G</th><th>U</th></tr><tr><td>○</td><td>○</td><td>○</td></tr></table></td><td>Reception frequency ranges.
NRD-545J:
0.1~252.9MHz
255.1~261.9MHz
266.1~270.9MHz
275.1~379.9MHz
382.1~411.9MHz
415.1~809.9MHz
834.1~859.9MHz
889.1~914.9MHz
960.1~1999.999MHz
NRD-545G:
0.1~1999.999MHz
NRD-545U:
0.1~823.9MHz
849.1~868.9MHz
894.1~1849.9MHz
1910.1~1929.9MHz
1990.1~1999.999MHz</td></tr>
<tr><td>31</td><td>Voltage setting for NRD-545J, G, U destination</td><td>Using the voltage selector S1 on the rear panel, select the appropriate voltage for the NRD-545J, G, U according to destination.
NRD-545J 100V
NRD-545G 220V
NRD-545U 120V</td><td></td></tr>
</table>

Downloaded by
RadioManual.EU

7-10 CHE-199 WIDEBAND CONVERTER UNIT

<table>
<tr><th>No.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>1</td><td>TUNE adjustment and check</td><td>
① Connect the output of a tracking scope to RX ANT and the input of the tracking scope to J2.
Reception mode: FM
Tracking scope output level: -30dBm
Frequency SPAN: Must span full frequency range in each band
② Tune each point at the low and high frequencies of each band shown below.
(Be sure to match the CDE-860 TUNE voltage.)
③ After completing tuning, check that in Bands 1 to 4, the tuning frequency moves with the reception frequency.
④ The results of the checks in step (3), above, must be as specified in the table below. The final decision should be based on the gain check.
<table>
<tr><th>BAND NO.</th><th>Reception frequency</th><th>Adjustment point</th><th>TUNE error, and gain</th></tr>
<tr><td>BAND1</td><td>30.00 ~ 107.99MHz</td><td>RV7, CV9</td><td rowspan="4">Peak TUNE error
Band low: within 3dB
Band high: within 10dB
Gain: +5dB or more</td></tr>
<tr><td>BAND2</td><td>108.00 ~ 279.99MHz</td><td>RV6, CV7</td></tr>
<tr><td>BAND3</td><td>280.00 ~ 567.39MHz</td><td>RV5, CV5</td></tr>
<tr><td>BAND4</td><td>567.40 ~ 1104.79MHz</td><td>RV4, CV3</td></tr>
<tr><td>BAND5</td><td>1104.80 ~ 1239.99MHz</td><td>– – –</td><td rowspan="2">Gain: +10dB or more</td></tr>
<tr><td rowspan="2">BAND6</td><td>1240.00 ~ 1299.99MHz</td><td>– – –</td></tr>
<tr><td>1300.00 ~ 1999.99MHz</td><td>– – –</td><td>Gain: -5dB or more</td></tr>
</table>
Example: Adjusting BAND 1
① Set the reception frequency to 30MHz, then adjust the tuning frequency by adjusting the RVs.
② Set the reception frequency to 107.9MHz, then adjust the tuning frequency by adjusting the CVs.
③ Repeat steps (1) and (2) to complete the adjustment.
</td><td></td></tr>
<tr><td>2</td><td>ATT operation check</td><td>
① Connect the tracking scope as in item 1, above.
Tracking scope output level: -30dBm
NRD-545 reception frequency: 1295.01MHz
② Turn on ATT to measure the attenuation.
</td><td>Attenuation:
15 to 20dB</td></tr>
</table>

Downloaded by
RadioManual.EU

<table>
<tr><th>No.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>3</td><td>1st LOCAL (1LO)
VCO control voltage</td><td>① Connect the digital voltmeter (DCv) to TP10.
② Measure the 1LO VCO control voltage at the low and high end frequencies of each VCO in the table below.
<table>
<tr><th>VCO NO.</th><th>Reception frequency</th><th>Adjustment part</th><th>Control voltage</th></tr>
<tr><td>VCO1</td><td>30.00 ~ 140.39MHz</td><td>C226, C227</td><td rowspan="4">*1
1.0 to 7.0VDC
*2
(With shield case installed.)</td></tr>
<tr><td>VCO2</td><td>140.40 ~ 265.49MHz</td><td>C339, C340</td></tr>
<tr><td>VCO3</td><td>265.50 ~ 407.09MHz</td><td>C211, C212</td></tr>
<tr><td>VCO4</td><td>407.10 ~ 567.39MHz</td><td>C326, C327</td></tr>
</table>
*1 Note that if the above control voltages are not within the specification (rating), replace the above capacitors.

To raise the control voltage: Increase the capacitance. (Note, however, that the operating width of the control voltage is decreased.)
To lower the control voltage: Decrease the capacitance. (Note, however, that the operating width of the control voltage is increased.)

If you alter the capacitance, note that the operating width of the voltage also changes, and it is therefore necessary to check the control voltage at both the low and high end frequencies of the VCO that has been changed.
Note that installing the shield case also changes the control voltage. Make sure that, after installing the shield case, the voltage meets the specification (rating).
(Installing the shield case lowers the control voltage by about 0.1V.)

③ Make sure there is no unlocking in the reception frequency range 30 to 1999.999MHz (be sure to check with the shield case installed).
④ Make sure CD37 (1LO UNLOCK) lights (and immediately turns OFF again) when the VCO is switched.</td><td></td></tr>
<tr><td>4</td><td>1st LOCAL VCO
MIX level</td><td>① Connect a spectrum analyzer to J3.
② Measure the local signal level and spurious signal level at the low and high end frequencies of the VCOs in the following table.
Check the spurious signals at up to two times the local fundamental frequency.
③ After check in step ②, check that the local frequency moves with the movement in the reception frequency.
<table>
<tr><th>VCO NO.</th><th>Reception frequency
(local frequency)</th><th>(With shield case installed)</th></tr>
<tr><td>VCO1</td><td>30.00 ~ 140.39MHz
(836.10 ~ 946.49MHz)</td><td rowspan="4">Local level:
0dBm or more

Spurious level:
-30dB or less</td></tr>
<tr><td>VCO2</td><td>140.40 ~ 265.49MHz
(946.50 ~ 1071.59MHz)</td></tr>
<tr><td>VCO3</td><td>265.50 ~ 407.09MHz
(1071.60 ~ 1213.19MHz)</td></tr>
<tr><td>VCO4</td><td>407.10 ~ 567.39MHz
(1213.20 ~ 1373.49MHz)</td></tr>
</table></td><td></td></tr>
</table>

Downloaded by
RadioManual.EU

<table>
<tr><th>No.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>5</td><td>2nd LOCAL (2LO)
VCO control voltage</td><td>① Connect the digital voltmeter (DCv) to TP7.
② Switch the NRD-545 reception frequency as shown below to check the VCO control voltages.
<table><tr><th>VCO NO.</th><th>Reception frequency</th><th>Control voltage</th></tr><tr><td>VCO H</td><td>567.39MHz</td><td rowspan="2">2.0 to 4.0VDC</td></tr><tr><td>VCO L</td><td>567.40MHz</td></tr></table>*1 Note that installing the shield case also changes the control voltage. Make sure that, after installing the shield case, the voltage meets the specification (rating).
(Installing the shield case lowers the control voltage by about 0.1V.)
③ Make sure there is unlocking in the reception frequency range 30 to 1999.999MHz (be sure to check with the shield case installed).
④ Make sure CD36 (2LO UNLOCK) lights (and immediately turns OFF again) when the frequency is switching.</td><td>*1 (With shield case installed)</td></tr>
<tr><td>6</td><td>2nd LOCAL VCO
MIX level</td><td>① Connect a spectrum analyzer to J4.
② Measure the local signal level at the following frequencies.
<table><tr><th>VCO NO.</th><th>Reception frequency
(local frequency)</th><th>(With shield case installed)</th></tr><tr><td>VCO H</td><td>567.39MHz
(795.49MHz)</td><td rowspan="2">Local level:
+3dBm or more</td></tr><tr><td>VCO L</td><td>567.40MHz
(258.00MHz)</td></tr></table></td><td></td></tr>
<tr><td>7</td><td>AGC 1 adjustment</td><td>① Connect the SG RF OUT at the following settings to J1.
Frequency: 145.01MHz, Level: 34dBμ (emf), Mod: OFF
② Set the NRD-545 reception frequency to 145.01MHz.
Adjust RV1 so that the S-meter indicates 9.
(Set where the S-meter changes from S8 to S9.)
③ After adjusting RV1, set the SG RF output OFF and check that the S-meter is S1 or lower.</td><td></td></tr>
<tr><td>8</td><td>AGC 2 adjustment</td><td>① Connect the SG RF OUT at the following settings to J1.
Frequency: 1104.81MHz, Level: 34dBμ (emf), Mod: OFF
② Set the NRD-545 reception frequency to 1104.81MHz.
Adjust RV2 so that the S-meter indicates 9.
(Set where the S-meter changes from S8 to S9.)
③ After adjusting RV1, set the SG RF output OFF and check that the S-meter is S1 or lower.</td><td></td></tr>
</table>

Downloaded by
RadioManual.EU

No.	ITEM	ADJUSTING PROCEDURE	RATING
9	WFM S-meter adjustment	① Connect the SG RF OUT at the following settings to J1. Frequency: 63.00MHz, Level: 100dBμ (emf), Mod: OFF ② Set the NRD-545 reception frequency to 63.00MHz. Adjust RV3 so that the S-meter indicates full scale. (Set where the S-meter changes from S9 + 60dB to full scale.) ③ After adjusting, check the following operations: -1 At SG FREQ: 63.00MHz, increase the RF input level, then check that the input level is within 21dBμ (emf) ± 5dB when the S meter indication moves from 8 to 9. -2 At SG FREQ: 1295.01MHz, increase the RF input level, then check that the input level is within 31dBμ (emf) ± 5dB when the S meter indication moves from 8 to 9. Note: This adjustment is affected by items 7 and 8, above. - If you have readjusted the AGC1 (Item 7), recheck all adjustments in item 9. - If you have readjusted the AGC2 (Item 8), recheck adjustment ③-2 in item 9.	

Downloaded by
RadioManual.EU

<table>
<tr><th>No.</th><th>ITEM</th><th>ADJUSTING PROCEDURE</th><th>RATING</th></tr>
<tr><td>10</td><td>Sensitivity check</td><td>
① Measure sensitivity at the following frequencies:
AM: S/N = 10dB AF output = 10dBm
Bandwidth = NARROW (2.4kHz) MOD = 400Hz 30%
FM: 12dB SINAD AF output = 10dBm
MOD = 1kHz DEV = ± 3.5kHz
WFM: 12dB SINAD AF output = 10dBm
MOD = 1kHz DEV = ± 75kHz
The SG output level is when it is terminated by 50 Ω while measuring the sensitivity.

Because the center reception frequency may shift as a result of changes in the deviation of the local frequency, adjust the tuning dial to determine the optimum point. (Especially when measuring AM sensitivity)

The asterisk (*) indicates frequencies to be checked also on the final test bench.
<table>
<tr><th></th><th>Reception frequency</th><th>BAND</th><th>AM</th><th>FM</th><th>WFM</th></tr>
<tr><td>*</td><td>30.01 MHz</td><td>1</td><td>——</td><td>0dBμ or less</td><td>——</td></tr>
<tr><td></td><td>50.01 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>83.00 MHz</td><td></td><td>——</td><td>——</td><td>6dBμ or less</td></tr>
<tr><td>*</td><td>107.99 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>108.01 MHz</td><td>2</td><td>10dBμ or less</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td></td><td>145.01 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>279.99 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>280.01 MHz</td><td>3</td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td></td><td>433.01 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>567.39 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>567.41 MHz</td><td>4</td><td>——</td><td>0dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>999.99 MHz</td><td></td><td>——</td><td>0dBμ or less</td><td>——</td></tr>
<tr><td></td><td>1104.79 MHz</td><td></td><td>——</td><td>0dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>1104.81 MHz</td><td>5</td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>1239.99 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>1240.01 MHz</td><td>6</td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>1299.99 MHz</td><td></td><td>——</td><td>− 2dBμ or less</td><td>——</td></tr>
<tr><td>*</td><td>1999.99 MHz</td><td></td><td>——</td><td>12dBμ or less</td><td>——</td></tr>
</table>
Note: − indicates checking not required.
</td><td></td></tr>
<tr><td>11</td><td>Overall distortion check (AM)</td><td>
① Set up for checking AM sensitivity at 145.01MHz.
400Hz 60% modulation, AGC: ON, AF output: 27dBm
② Measure the AF output distortion with the SG level at 60dB μ and 100dB μ .
SG 60dBμ (emf) 5% or less
SG 100dBμ (emf) 10% or less
Because the center reception frequency may shift as a result of changes in the deviation of the local frequency, adjust the tuning dial to determine the optimum point.
</td><td></td></tr>
</table>

Downloaded by
RadioManual.EU

No.	ITEM	ADJUSTING PROCEDURE	RATING
12	Overall distortion check (WFM)	① Set up for measuring WFM sensitivity at 83.00MHz. MOD: 1kHz, Dev: ± 75kHz, AF output: 27dBm ② Measure the AF output distortion with the SG level at 60dB μ (emf).	5% or less
13	Overall level check (WFM)	① Set up for measuring WFM sensitivity at 83.00MHz. SG level: 60dB μ (emf), MOD: 1kHz, Dev: ± 75kHz ② Connect a level meter (600 Ω) to the LINE OUT L and R connectors on the back of the NRD-545 to take the readings.	L and R connectors: -8dBm ± 2dB
14	WFM stereo operation check	① Set up for 83.00MHz WFM stereo reception. SG level: 60dBμ (emf), MOD: EXT, Dev: ± 75kHz Set the external modulation signal as follows: Stereo modulation mode: R= L 1kHz modulation Modulation level: Set to SG input Pilot signal (19kHz): ON (10%) Preemphasis: 50μ Sec Subcarrier frequency: 38kHz ② Set the 19kHz pilot signal for the external modulation stereo composite signal OFF, then make sure that the "S" stereo indicator is blinking and the reception is in monaural mode. ③ Set the 19kHz pilot signal for the external modulation stereo composite signal ON, then make sure that the "S" stereo indicator is ON and the reception is in stereo mode. ④ With reception in stereo mode (as in step (3)), connect a level meter (600 Ω) to the LINE OUT L and R connectors on the back of the NRD-545 to take the readings. ⑤ With the setup as in step (4), measure the stereo separation and level differential. -1 Set to R only, stereo modulation mode, then measure the L and R differential. -2 Set to L only, stereo modulation mode, then measure the L and R differential. -3 In the above tests, measure the differential between the R signal level in the R only test and the L signal level in the L only test. ⑥ On completion, remember to return the set to monaural reception in WFM stereo mode.	Mono: "S" blinks Stereo: "S" ON L and R connectors: -11dBm ± 2dB Stereo separation: L and R both 16dB or more Level differential: Within 2dB
15	Squelch operation check	① Reception frequency 145.01MHz, AGC: ON, RF GAIN: fully clockwise SG modulation: OFF, RF output: OFF ② Rotate the squelch control fully counterclockwise, then check that there is AF output in AM, FM, and WFM modes. ③ Rotate the squelch control 3 steps clockwise, then check that there is no AF output in AM, FM, or WFM mode. ④ Set the SG RF level to +20dBμ , then check that there is AF output in AM, FM, and WFM modes.	Within three steps counterclockwise from squelch muting point. 3 steps from fully counterclockwise +20dB or less

Downloaded by RadioManual.EU

No.	ITEM	ADJUSTING PROCEDURE	RATING
16	Consumption	① Measure the NRD-545 current consumption when operating on DC. Supply voltage: 13.8VDC AF GAIN: Min Measuring frequency: 83.00MHz Measuring mode: WFM	DC supply current: 1.8A or less

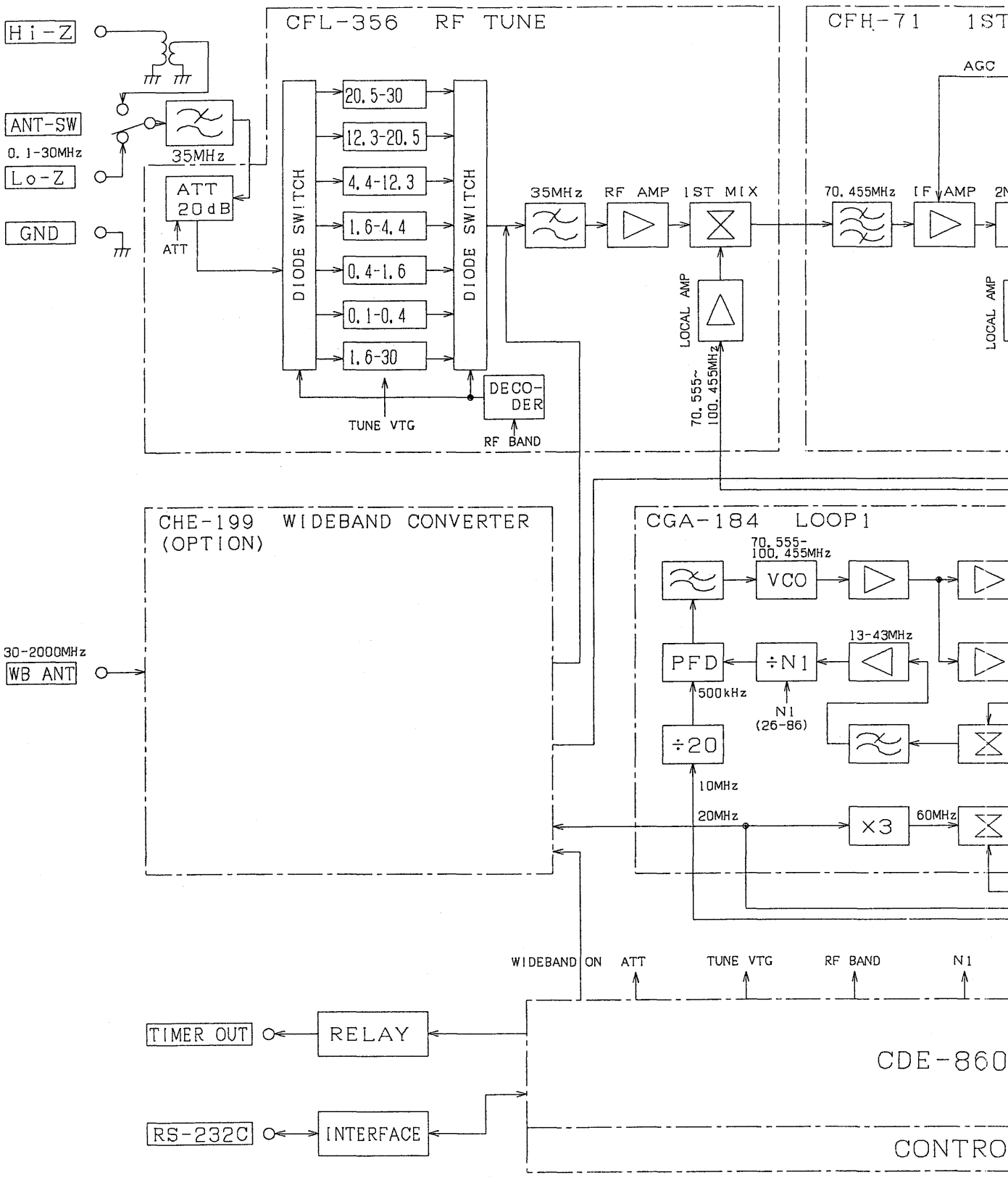
Downloaded by
RadioManual.EU

MODEL NRD-545

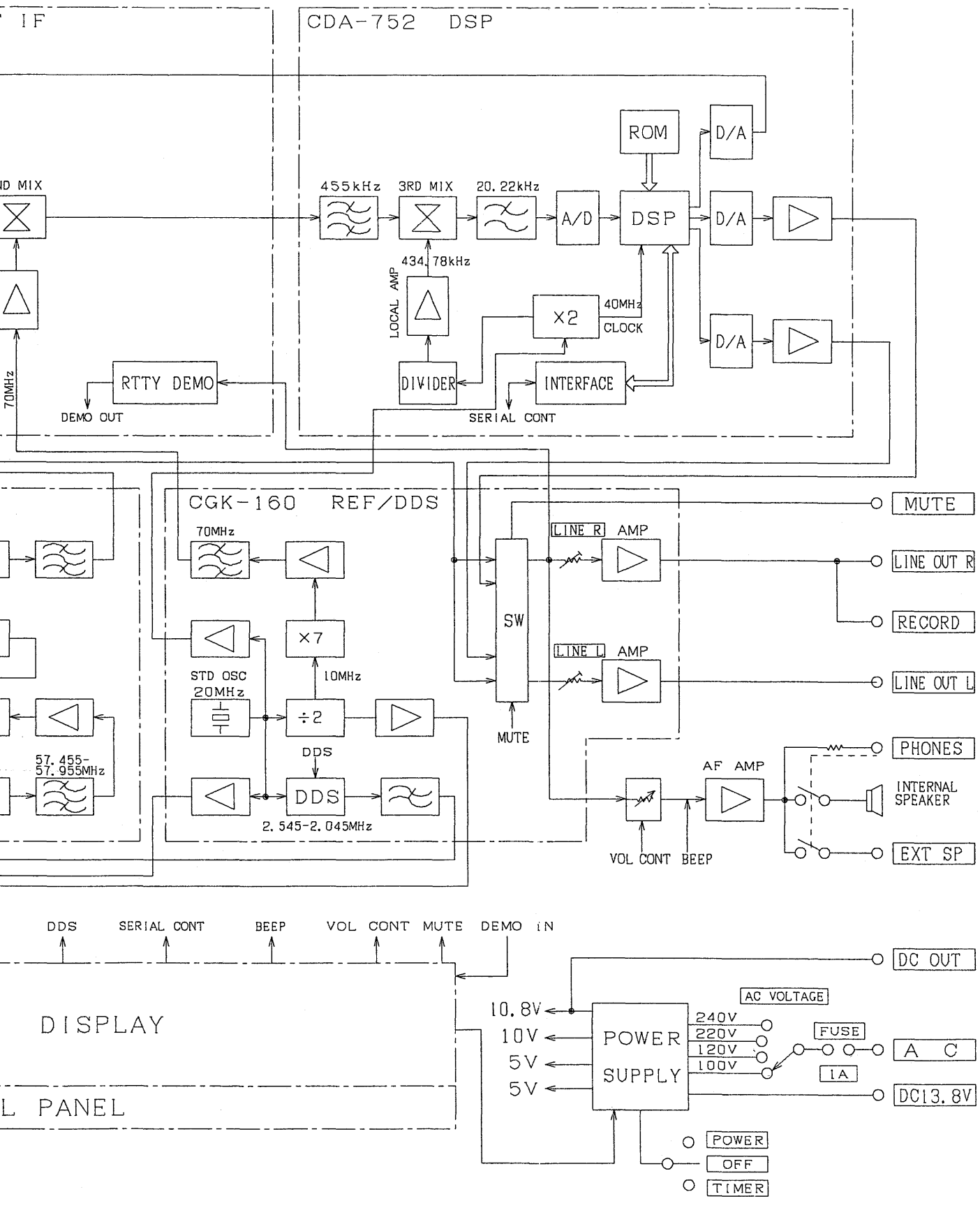
Circuit schema

Downloaded by
RadioManual.EU

5. BLOCK DIAGRAM

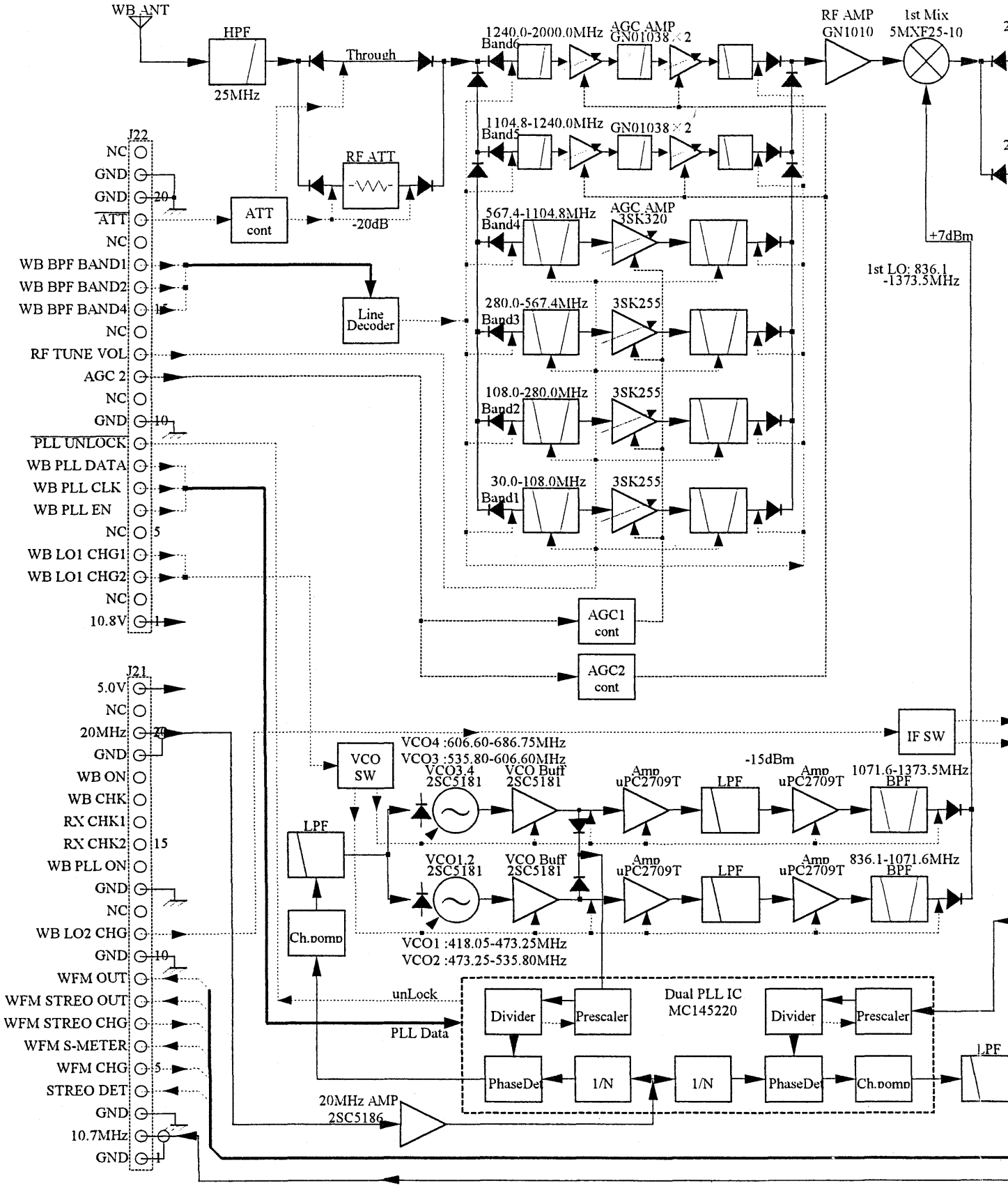


Downloaded by
RadioManual.EU



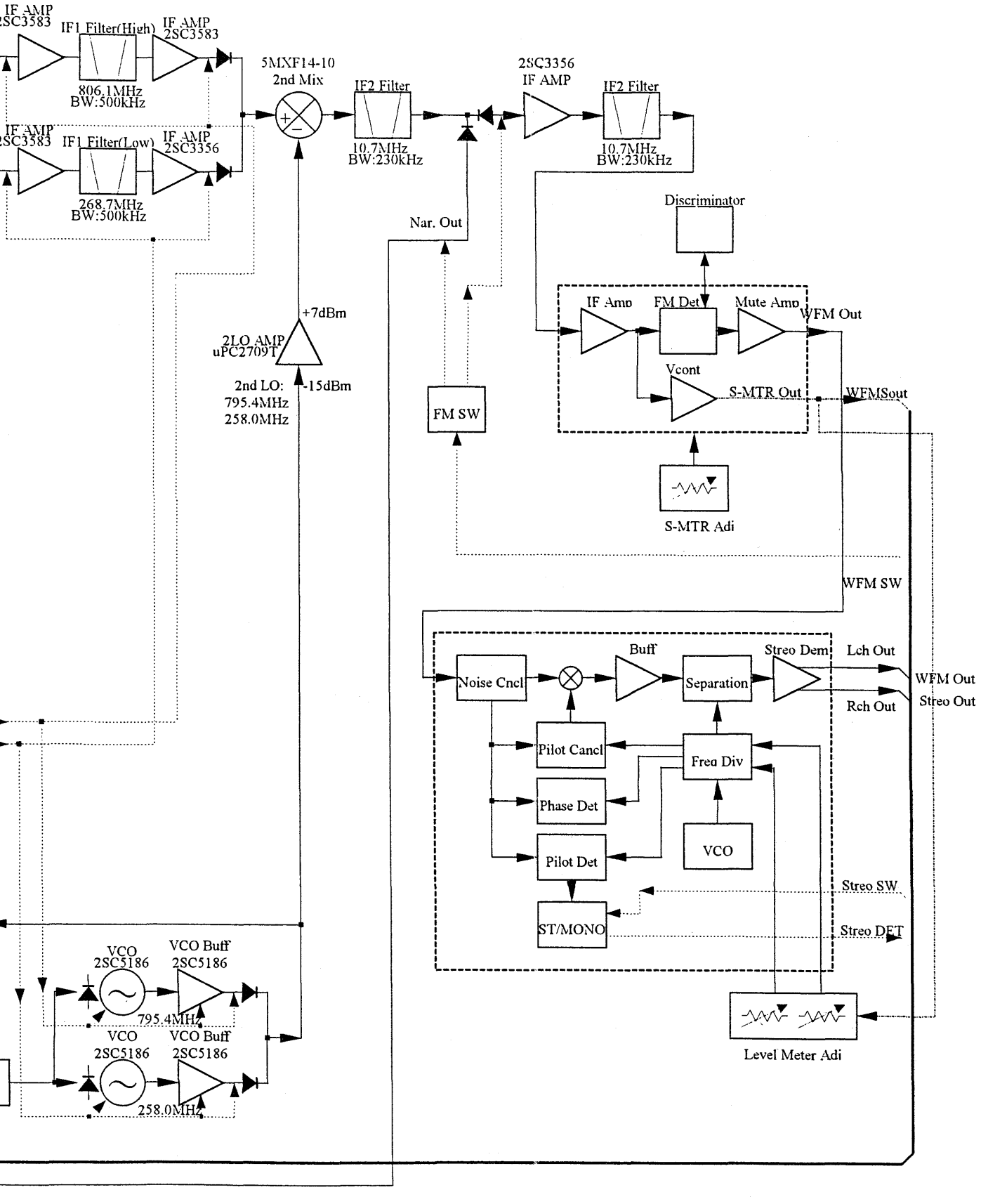
Downloaded by RadioManual.EU

CHE-199 Wideband Conv



Downloaded by
RadioManual.EU

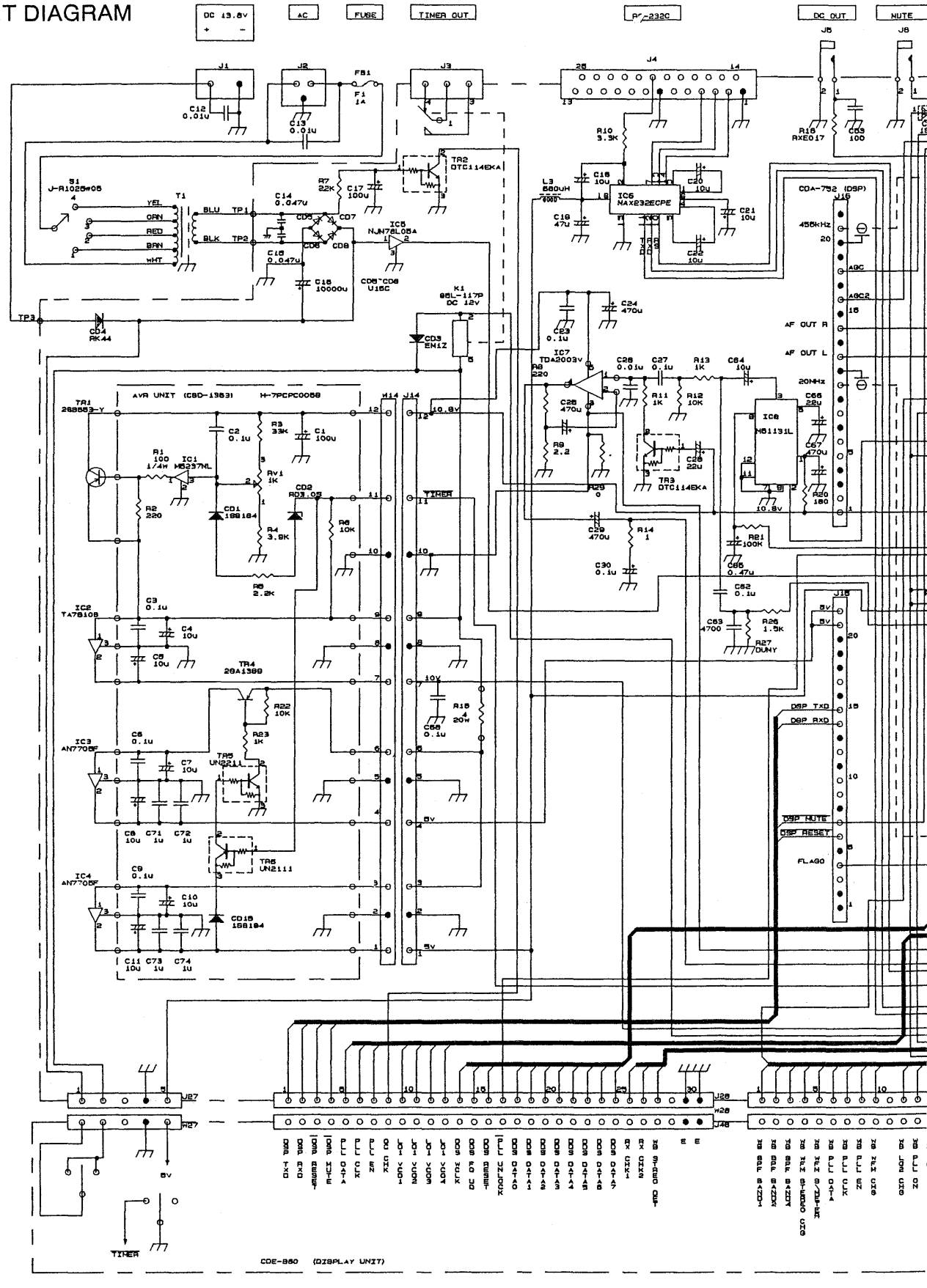
verter Unit Blockdiagram



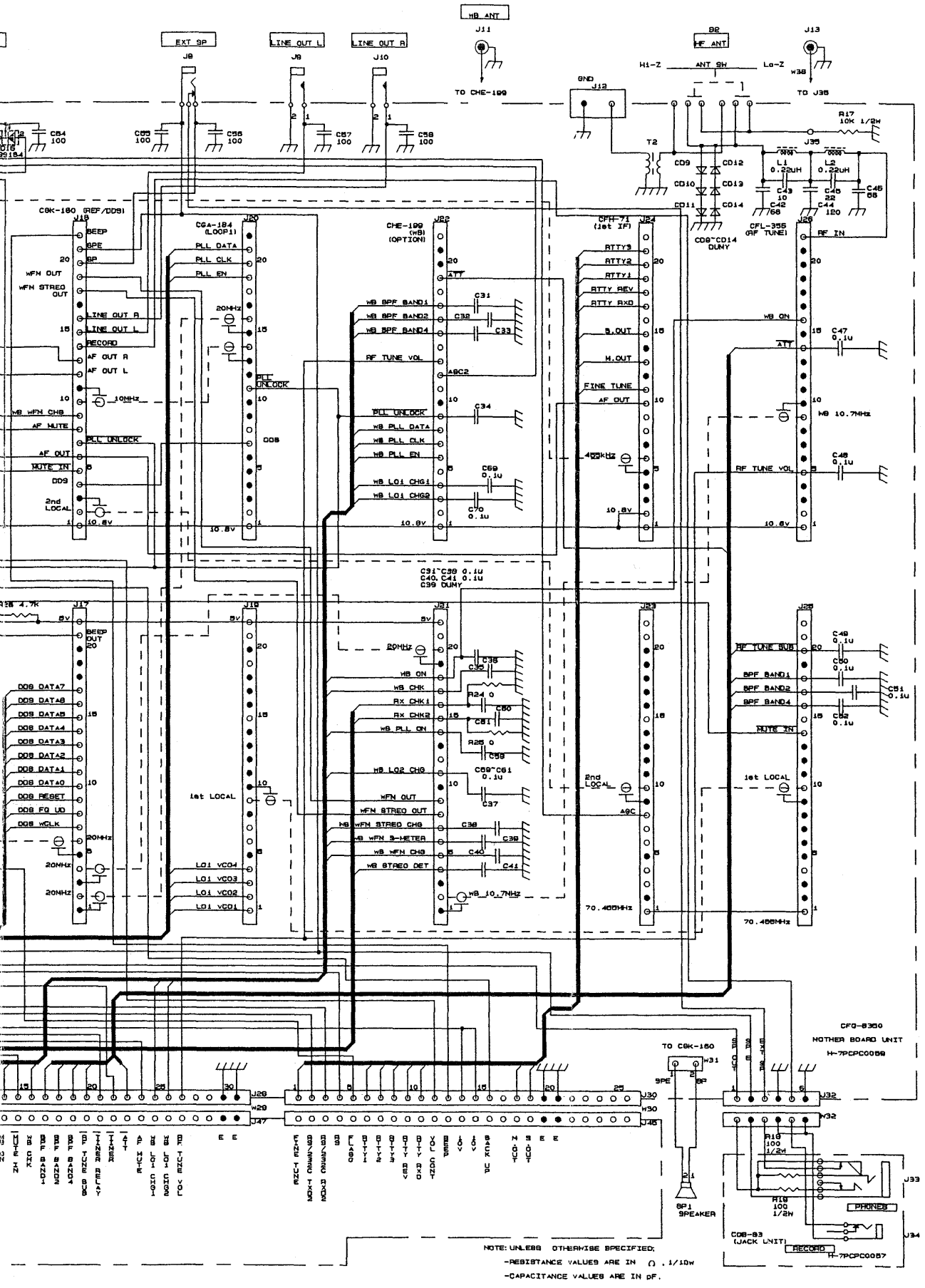
Downloaded by
RadioManual.EU

9. CIRCUIT DIAGRAM AND PCBLAYOUT

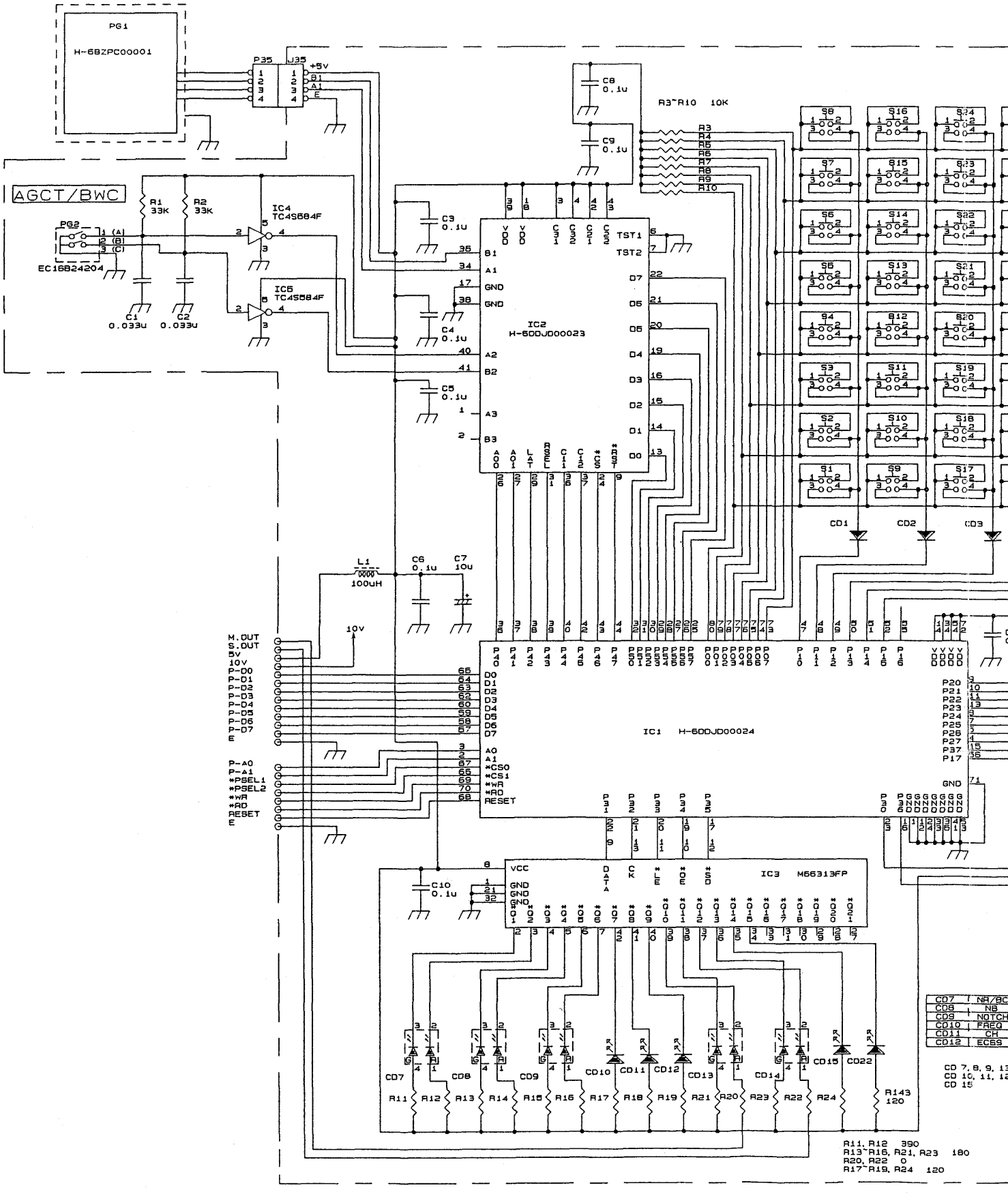
9-1 CIRCUIT DIAGRAM



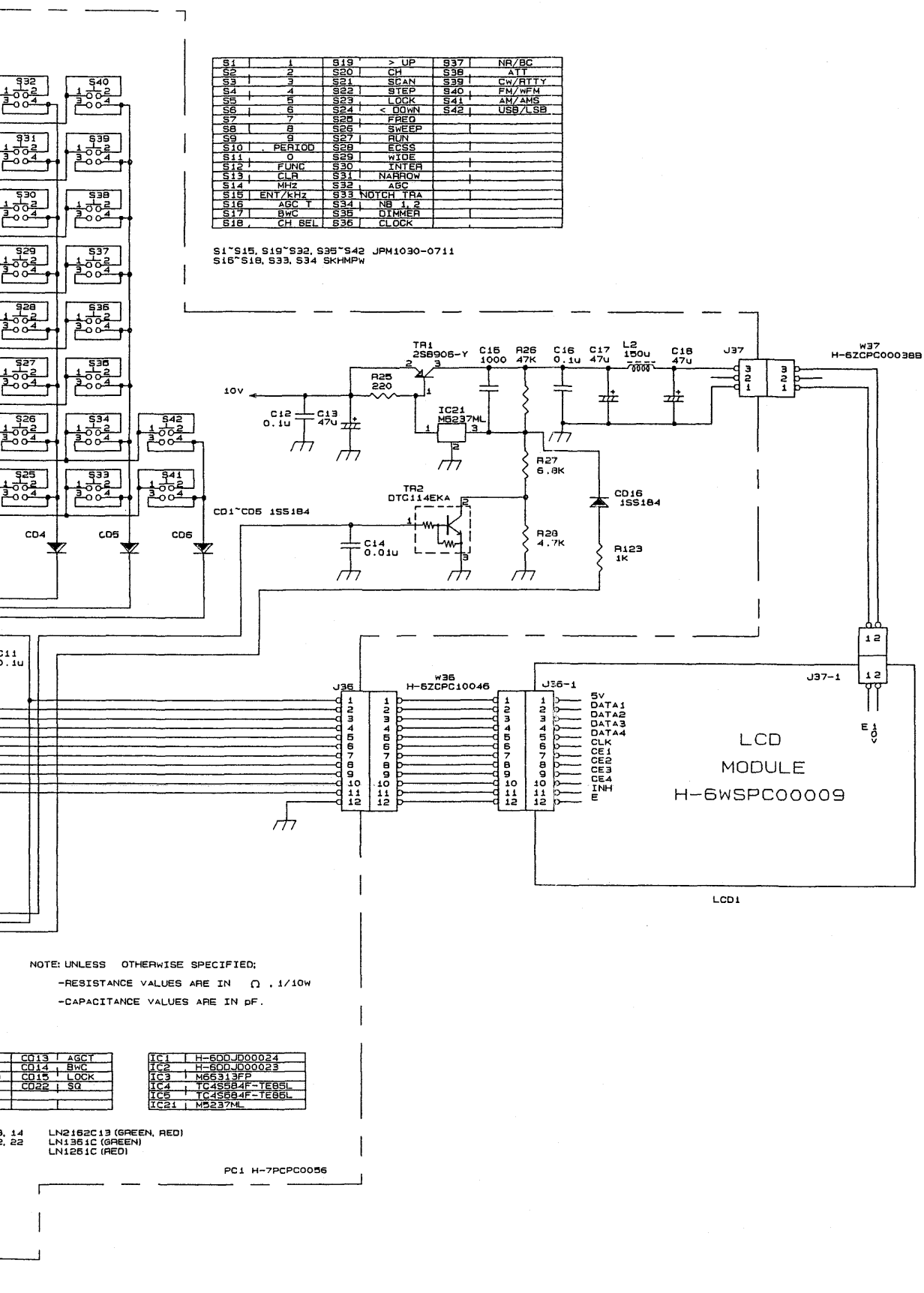
Downloaded by
RadioManual.EU



Downloaded by RadioManual.EU



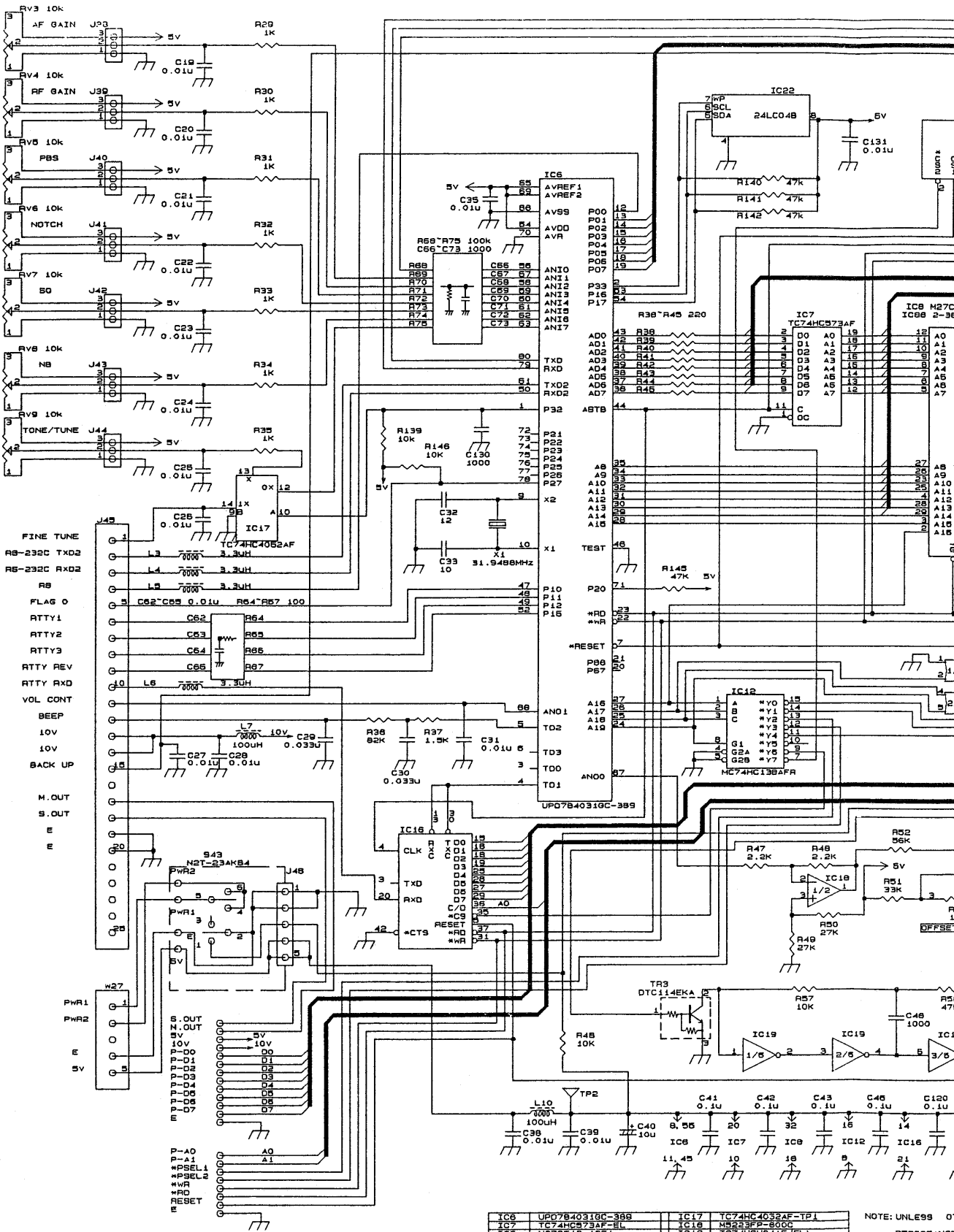
Downloaded by
RadioManual.EU



CDE-860

DISPLAY UNIT (1/2)

Downloaded by RadioManual.EU



IC6	UPD784031GC-389	IC17	TC74HC4052AF-TP1
IC7	TC74HC573AF-EL	IC18	M5223FP-600C
IC8	M27C512-12F1	IC19	TC74HCU04AF(EL)
IC9	HM622568LFP-85LT	IC20	T0520B3F
IC10	MSM6242B69	IC22	24LC04B-T-SN
IC11	TC4S66F	IC23	MS19538FP
IC12	MC74HC138AFR	IC24	TC4S584F-TE85L
IC15	H-60DJ000024	IC29	TC74HC32AF
IC16	UPD71051GB-384		

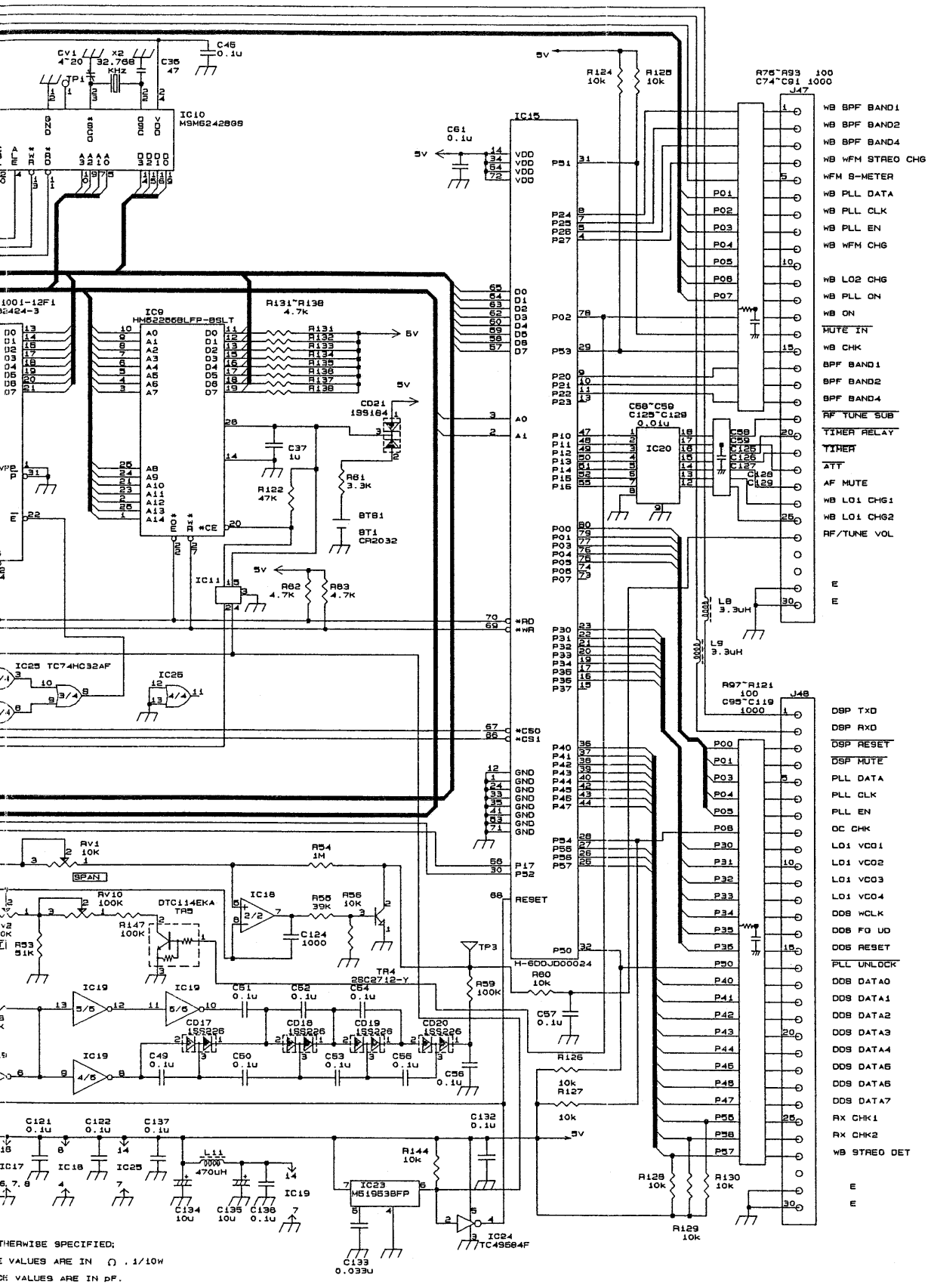
NOTE: UNLESS O

-RESISTANCE

-CAPACITANC

PC1 H-7PCPC005

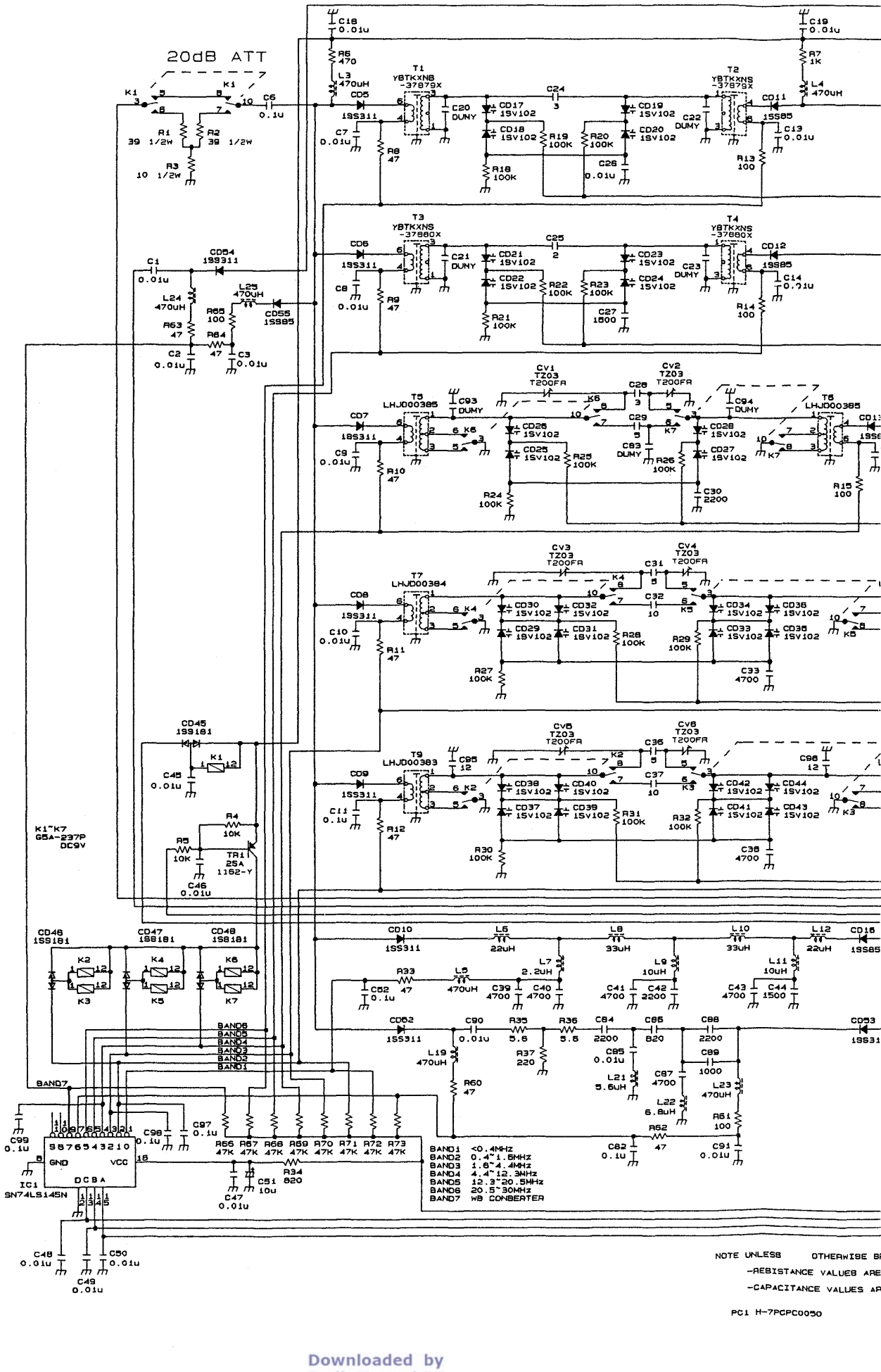
Downloaded by
RadioManual.EU



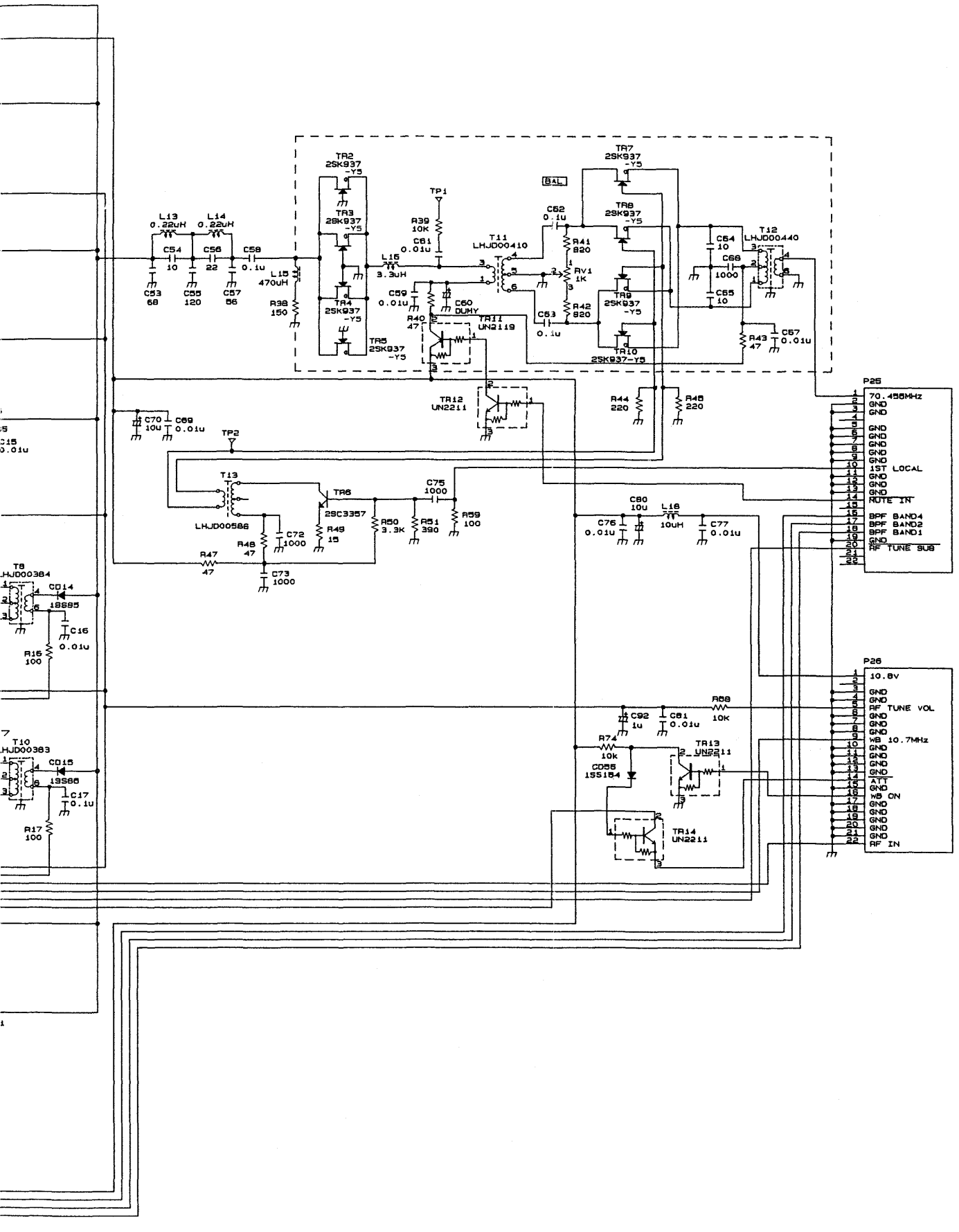
CDE-860

DISPLAY UNIT (2/2)

Downloaded by RadioManual.EU



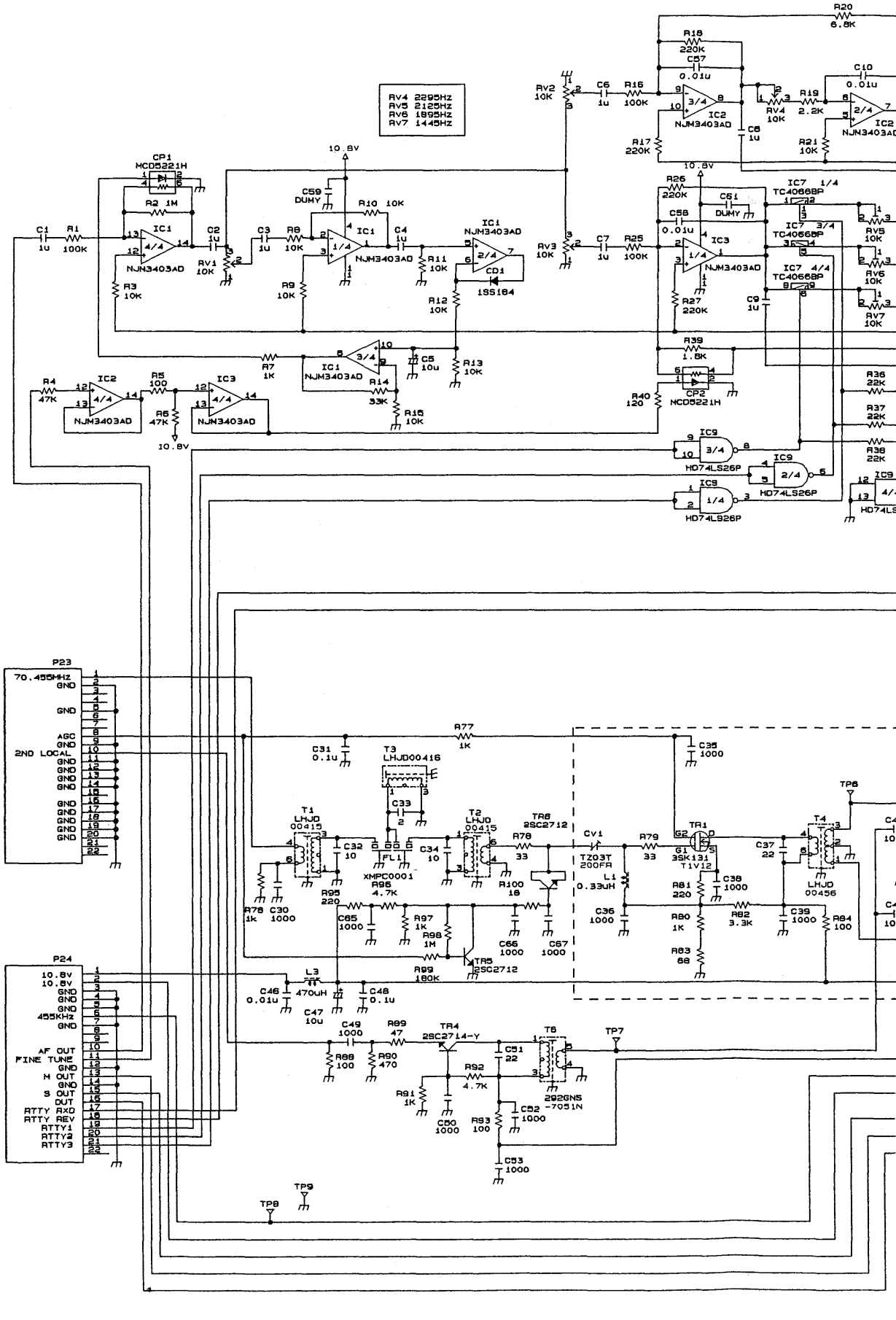
Downloaded by
RadioManual.EU



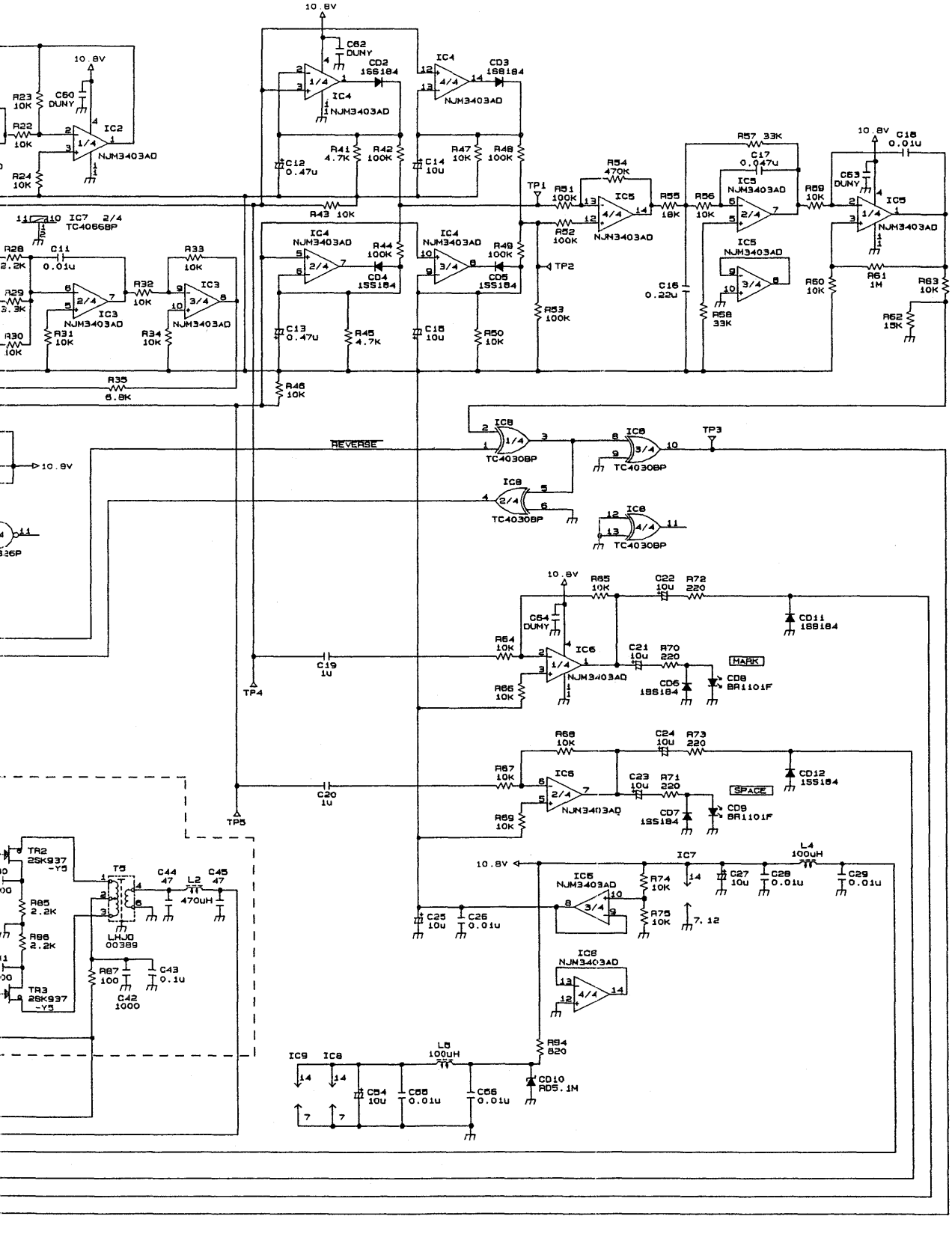
CFL-356

RF TUNE UNIT

Downloaded by RadioManual.EU



Downloaded by
RadioManual.EU



NOTE: UNLESS OTHERWISE SPECIFIED

-RESISTANCE VALUES ARE IN Ω 1/10W

-CAPACITANCE VALUES ARE IN pF

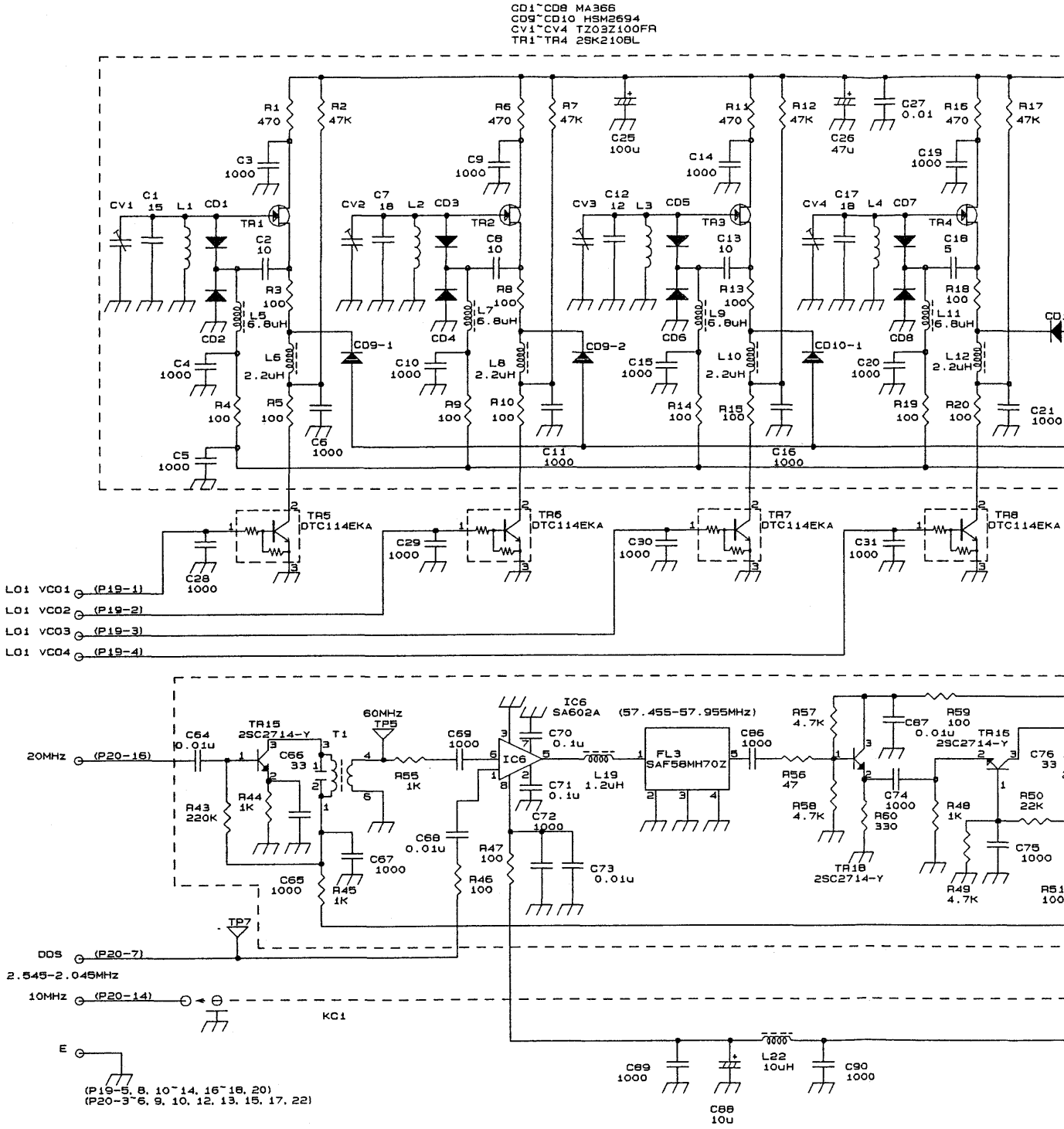
PCI H-7PCPC0051

CFH-71

1ST IF UNIT

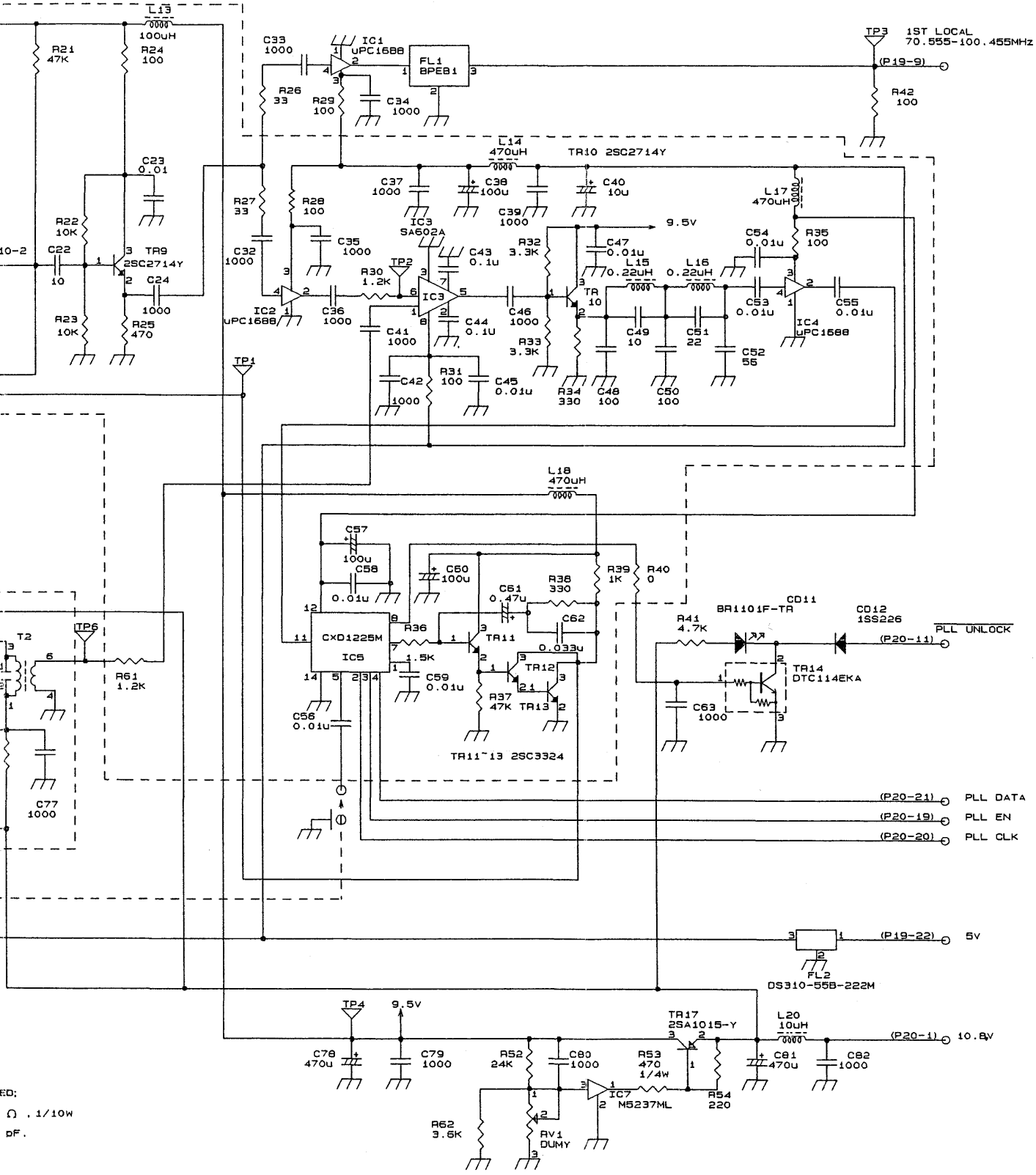
Downloaded by RadioManual.EU

CD1~CD8 MA366
CD9~CD10 HSM2694
CV1~CV4 TZ03Z100FR
TR1~TR4 2SK210BL



NOTE: UNLESS OTHERWISE SPECIFI
-RESISTANCE VALUES ARE IN
-CAPACITANCE VALUES ARE IN
PC1 H-7PCPC0053

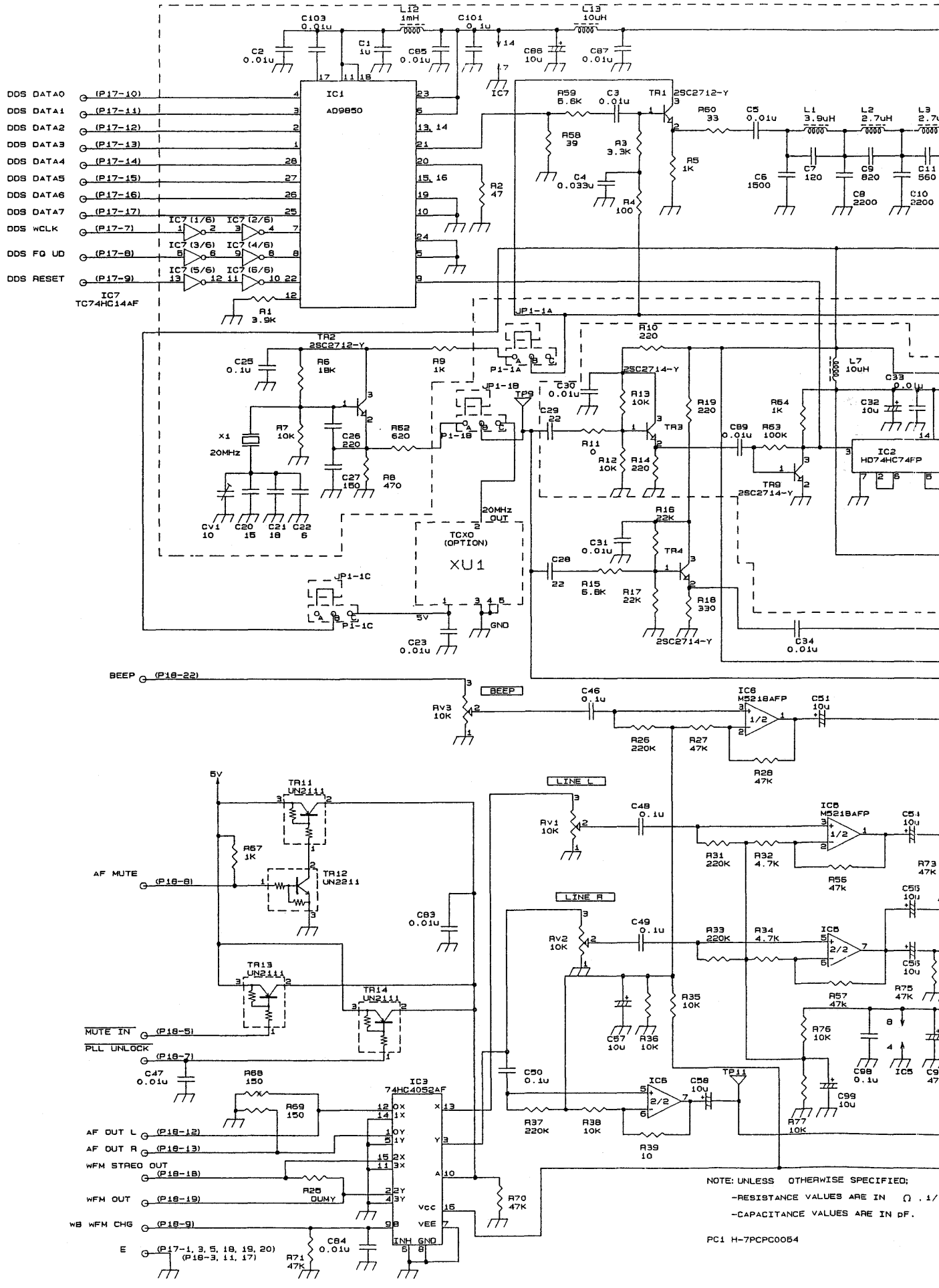
Downloaded by
RadioManual.EU



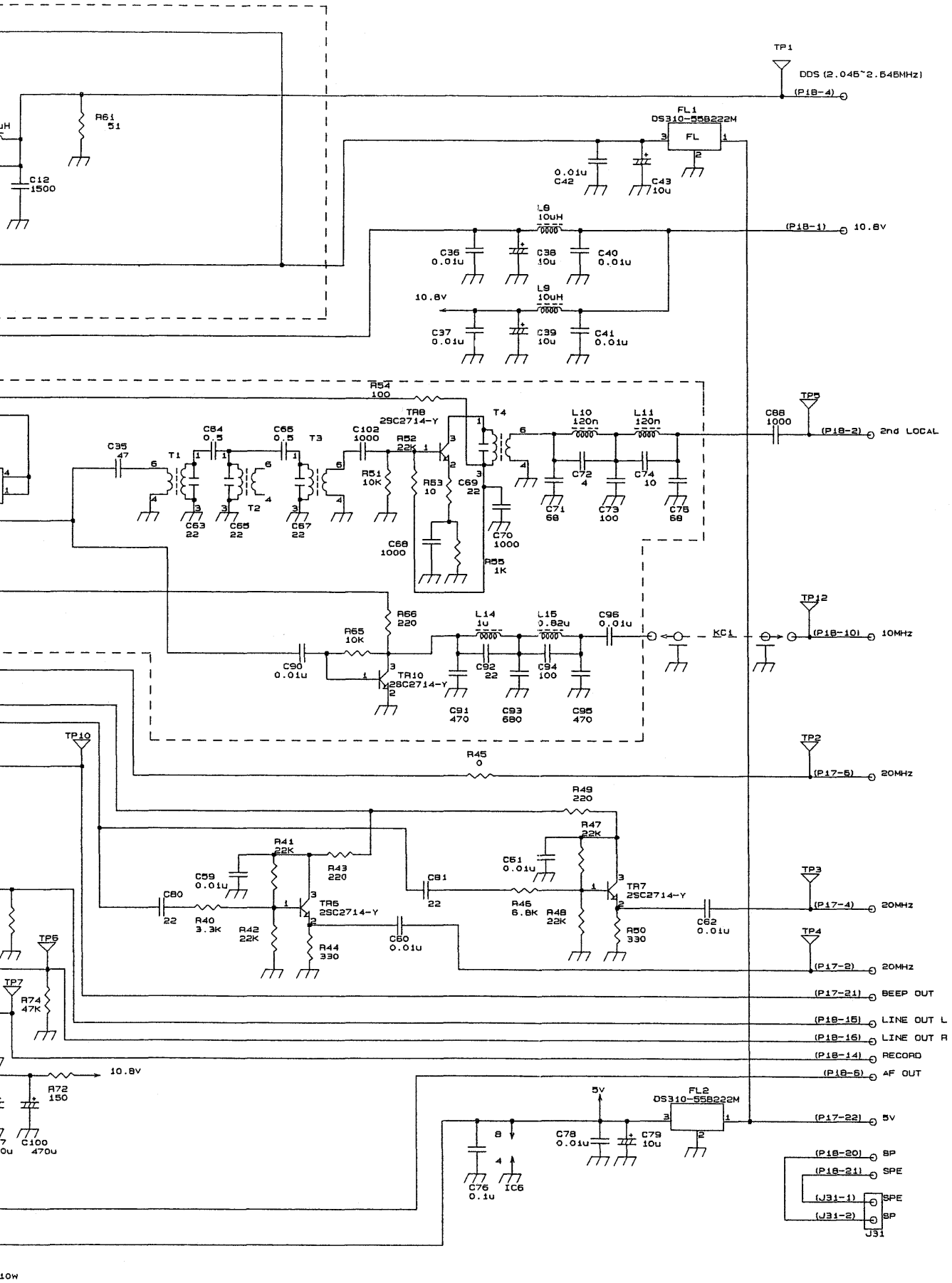
CGA-184

LOOP1 UNIT 49

Downloaded by
RadioManual.EU



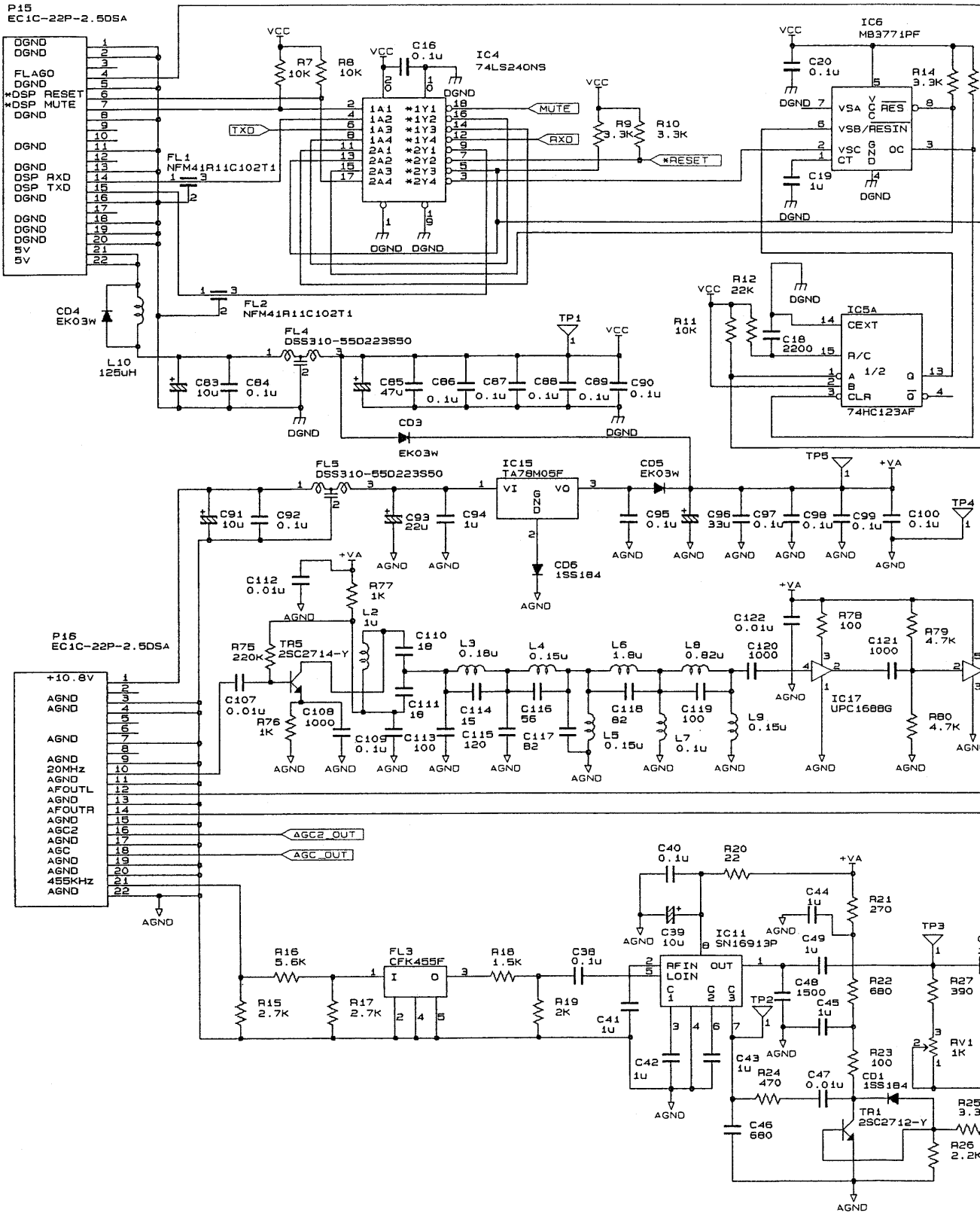
Downloaded by
RadioManual.EU



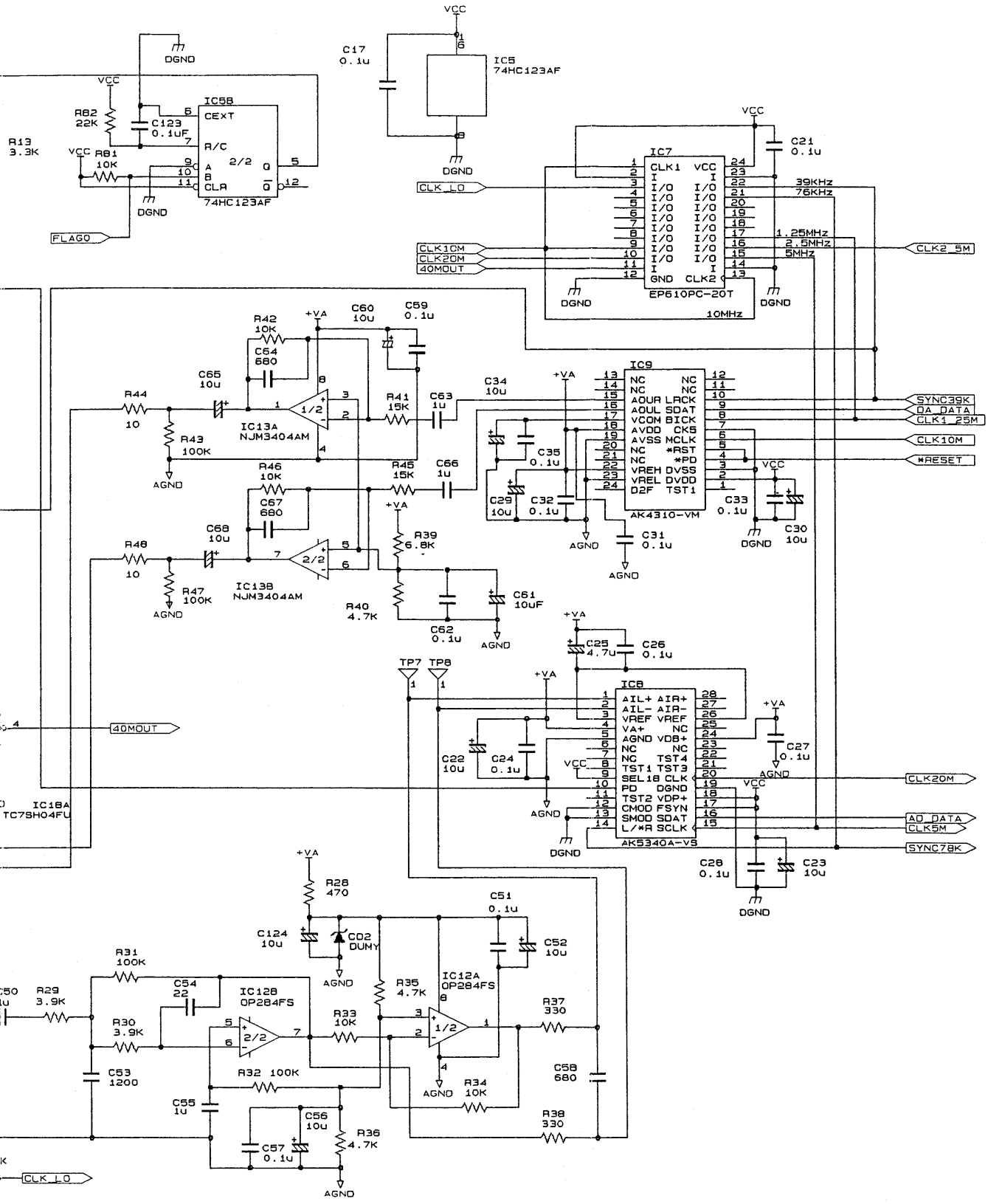
CGK-160

REF/DDS UNIT

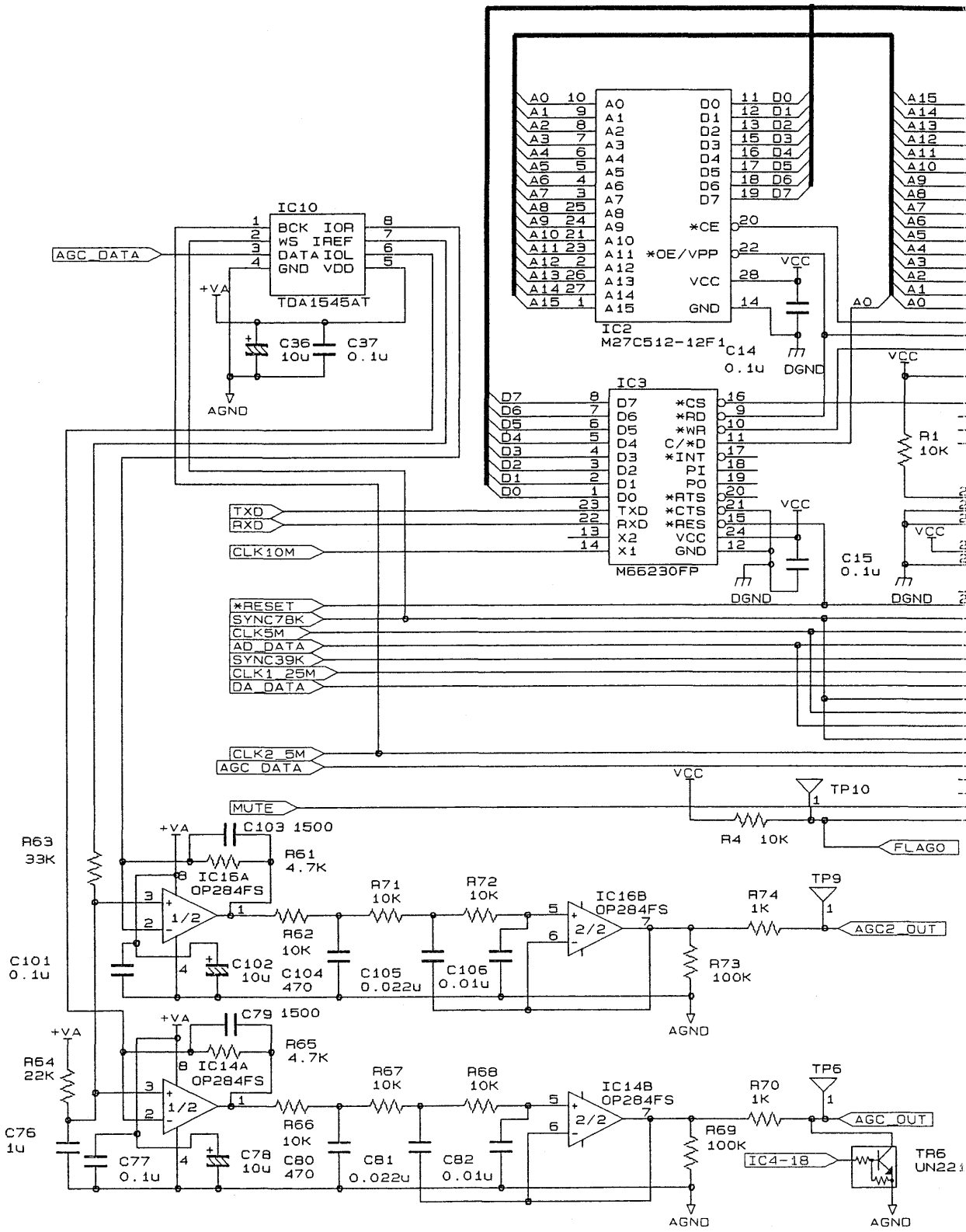
Downloaded by
RadioManual.EU



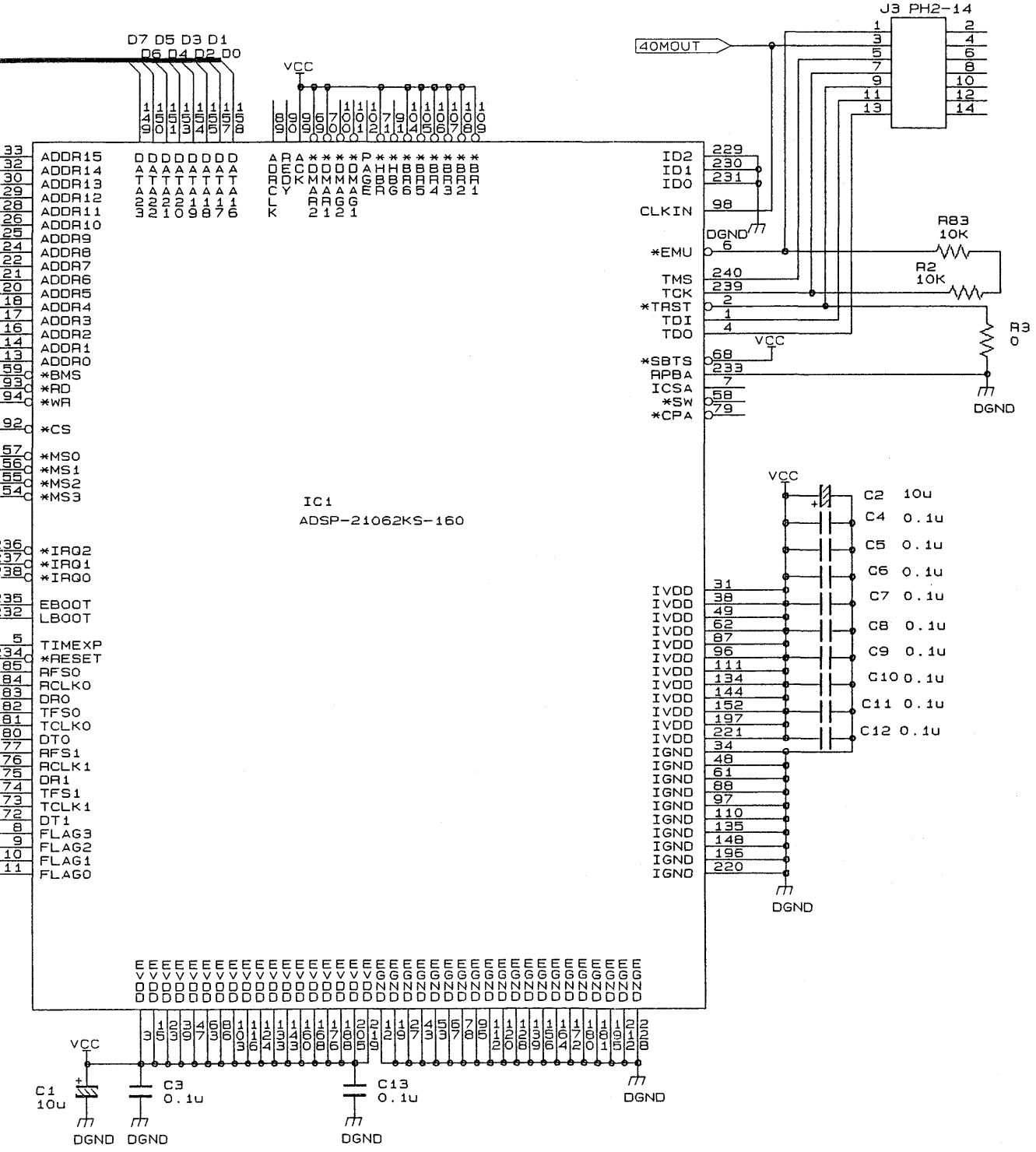
Downloaded by
RadioManual.EU



Downloaded by
RadioManual.EU



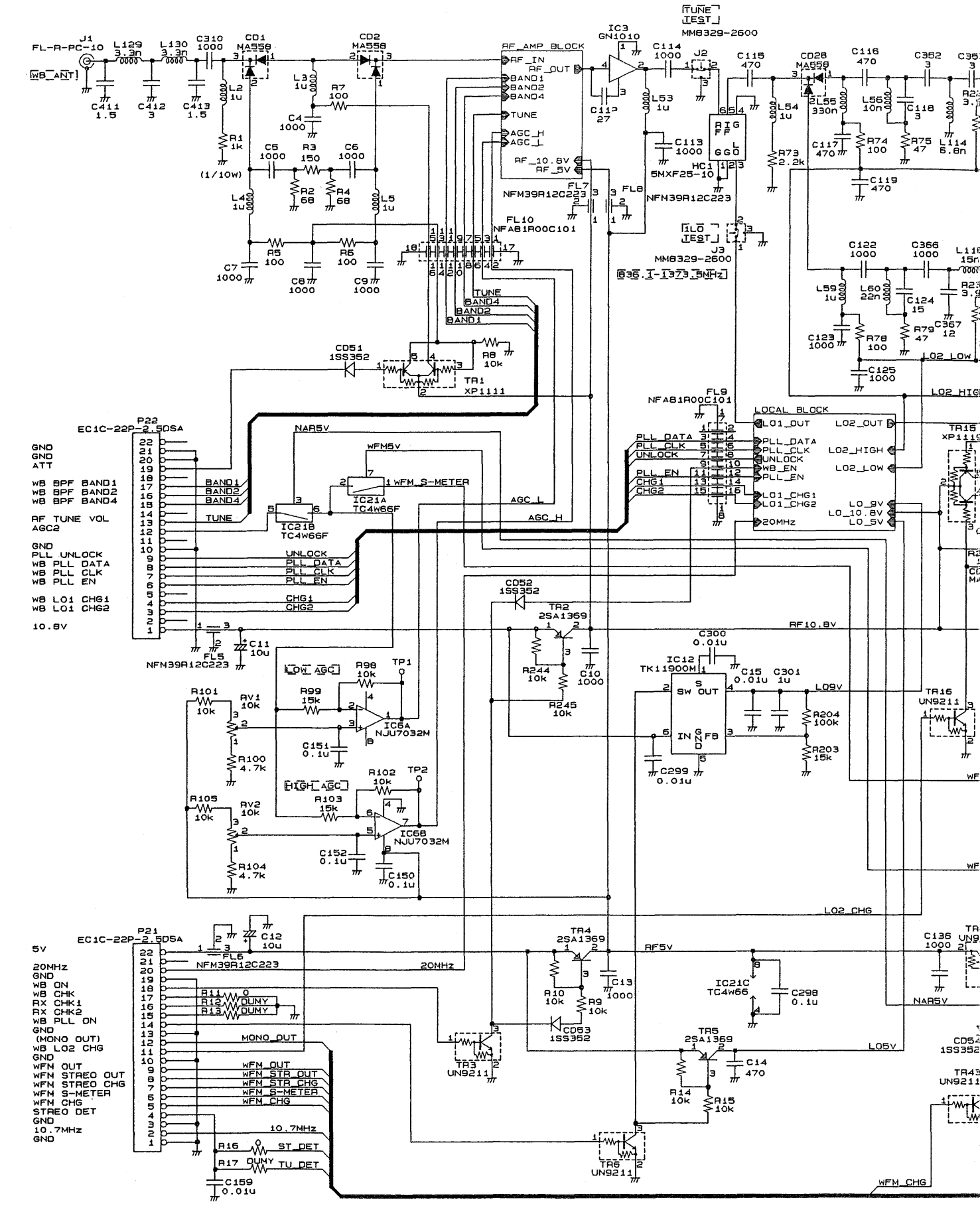
Downloaded by
RadioManual.EU



CDA-752

DSP UNIT(2/2)

Downloaded by
RadioManual.EU



NOTE: Unless otherwise specified;

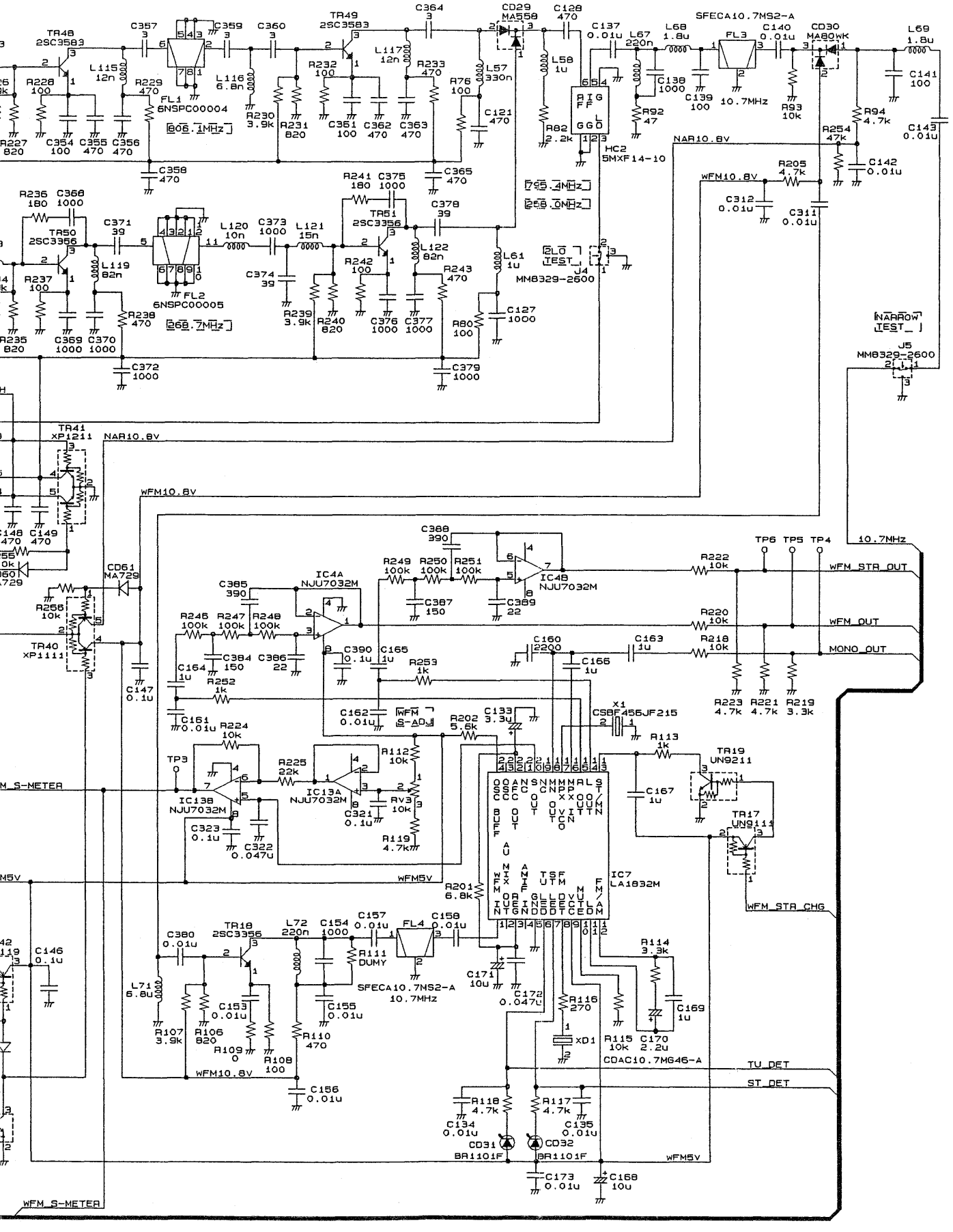
-Capacitance values are in pF.

-Inductance values are in H.

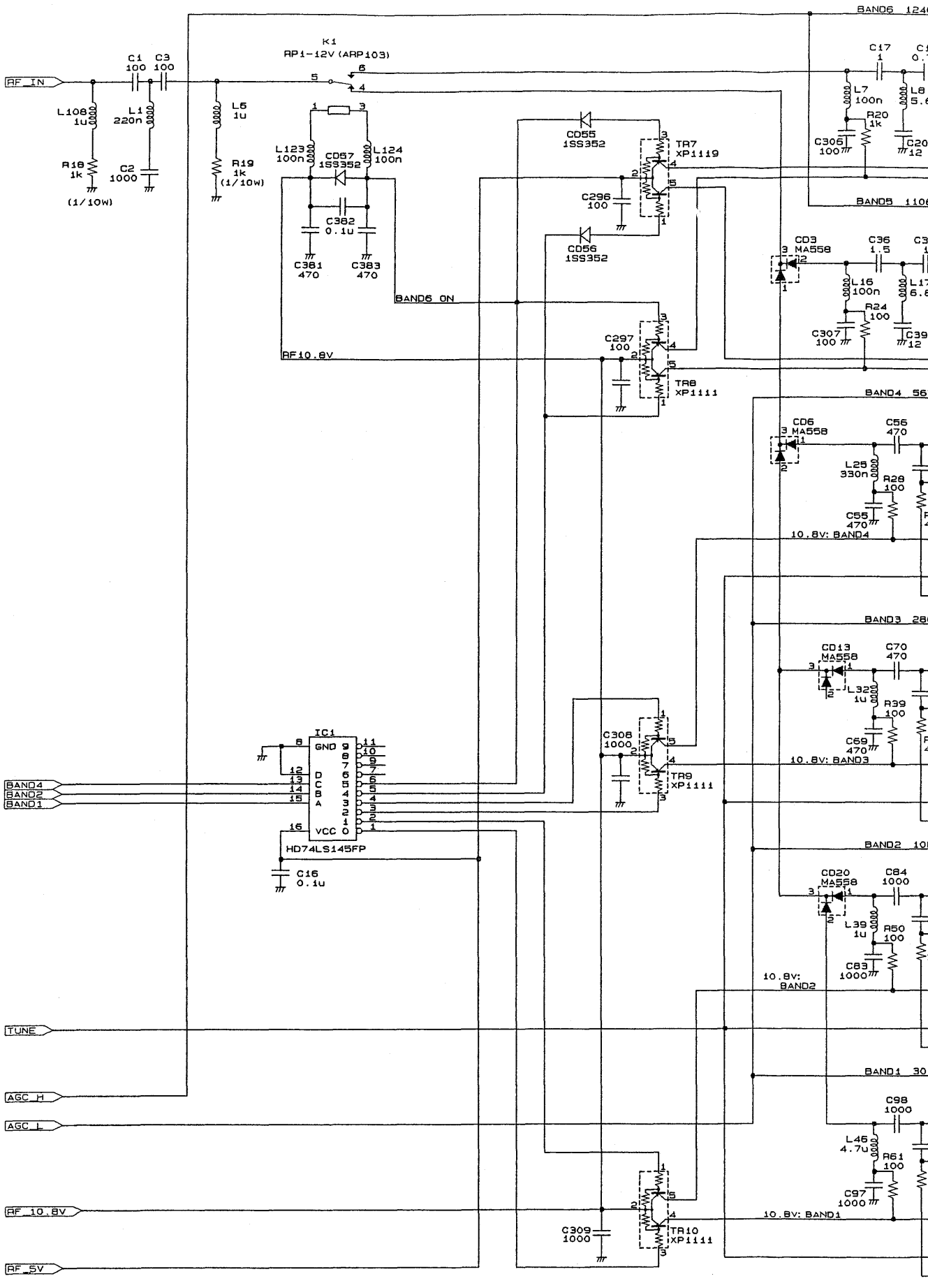
-Resistance values are in Ω. (1/16W)

PC: 7PCPC0052A

Downloaded by
RadioManual.EU



Downloaded by
RadioManual.EU



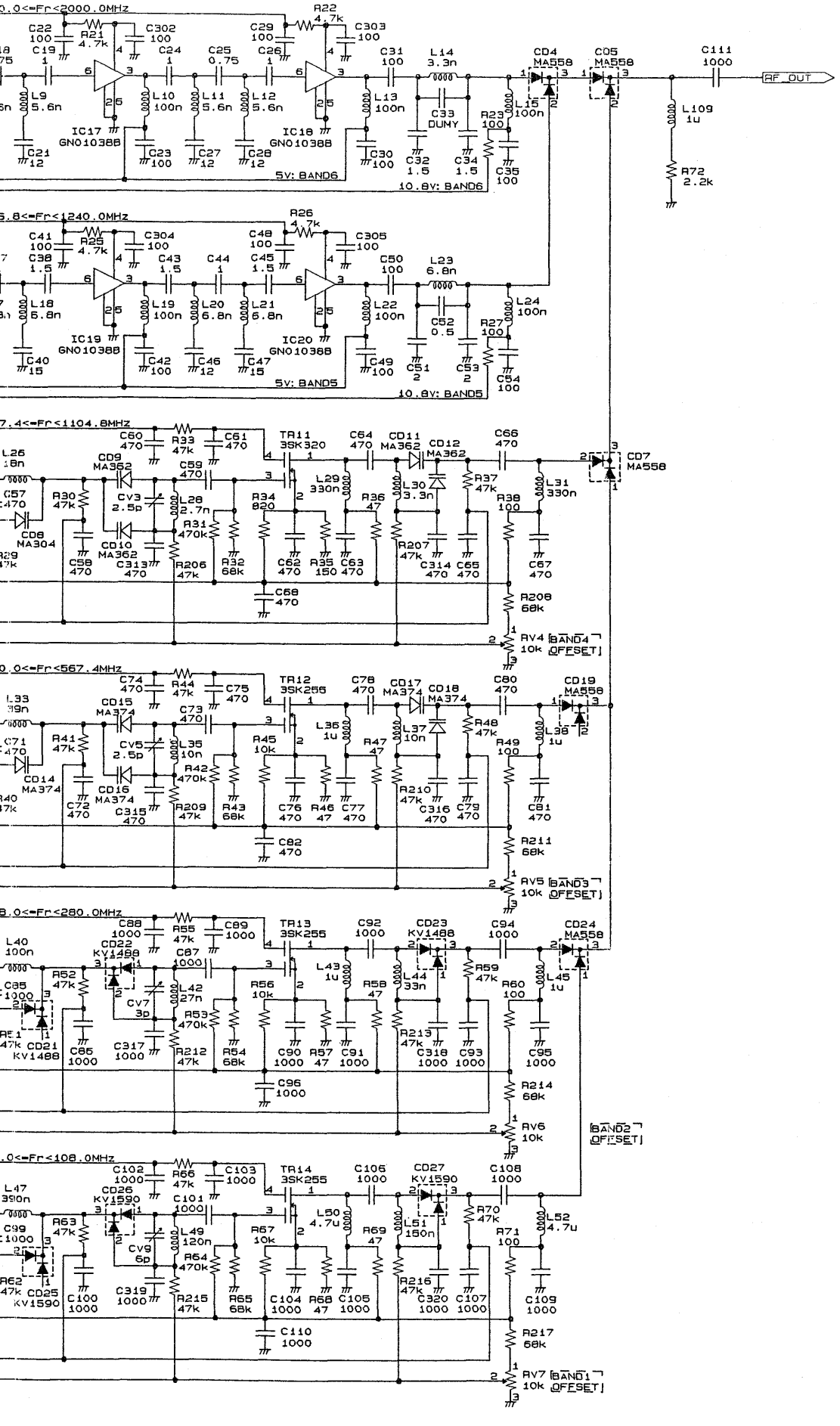
NOTE: Unless otherwise specified;

-Capacitance values are in pF.

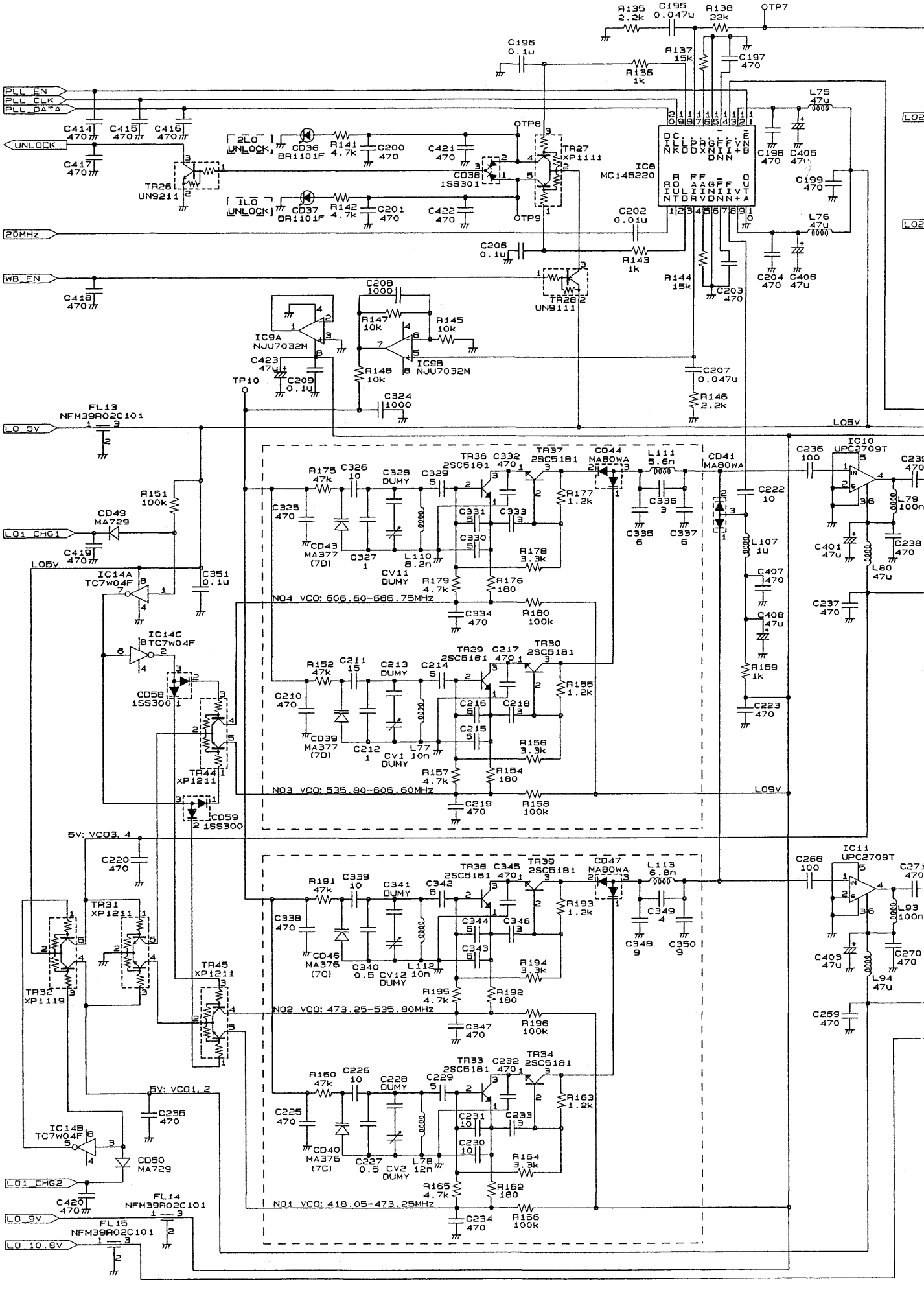
-Inductance values are in H.

-Resistence values are in Ω. (1/16W)

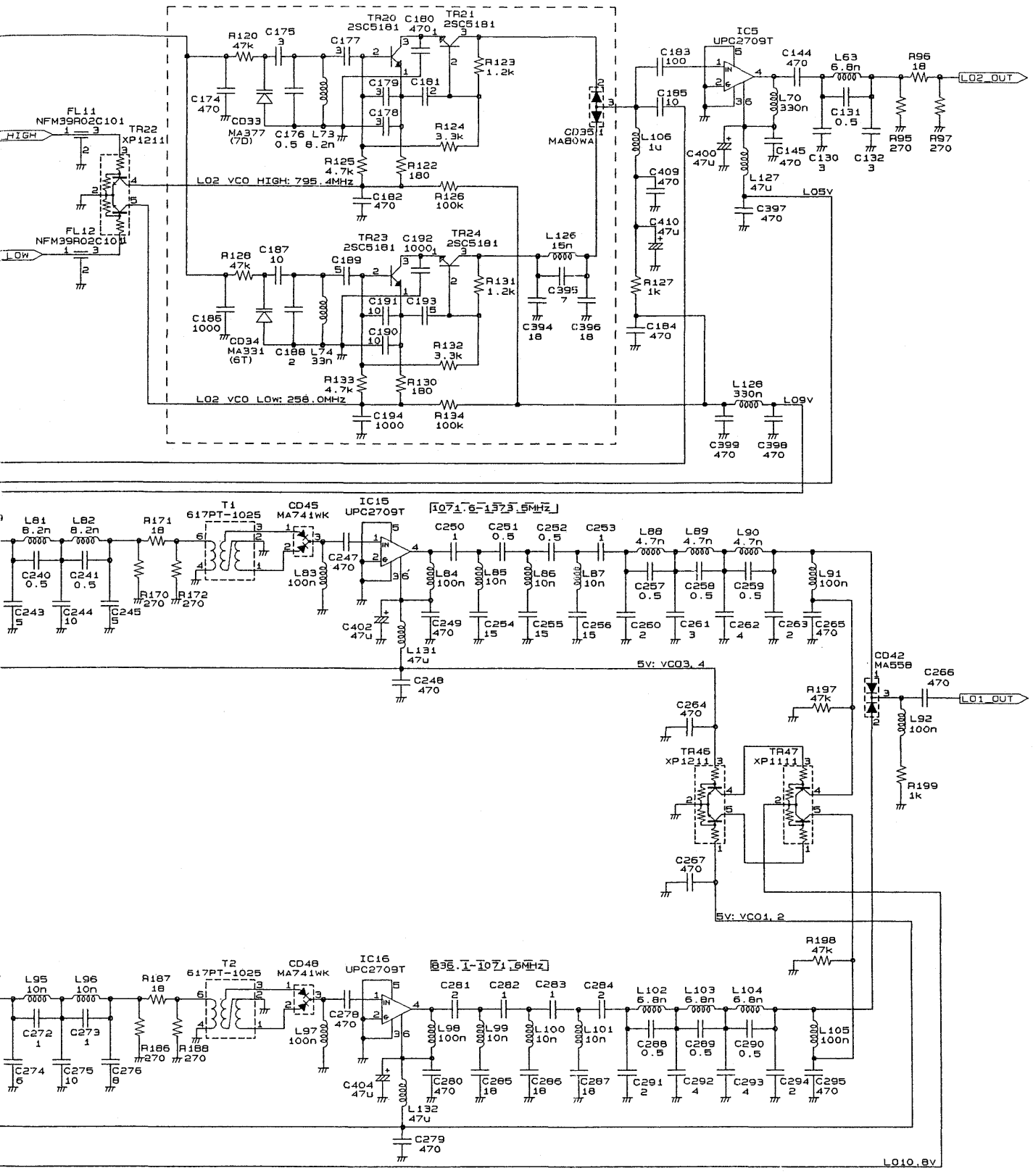
Downloaded by
RadioManual.EU



Downloaded by
RadioManual.EU



Downloaded by
RadioManual.EU



VCO SELECT TABLE

CHG2	CHG1	ON VCO
HI-Z	HI-Z	NO4 VCO
HI-Z	LO	NO3 VCO
LO	HI-Z	NO2 VCO
LO	LO	NO1 VCO

NOTE: Unless otherwise specified;
- -Capacitance values are in pF.
- -Inductance values are in H.
- -Resistance values are in Ω. (1/16W)

Downloaded by RadioManual.EU