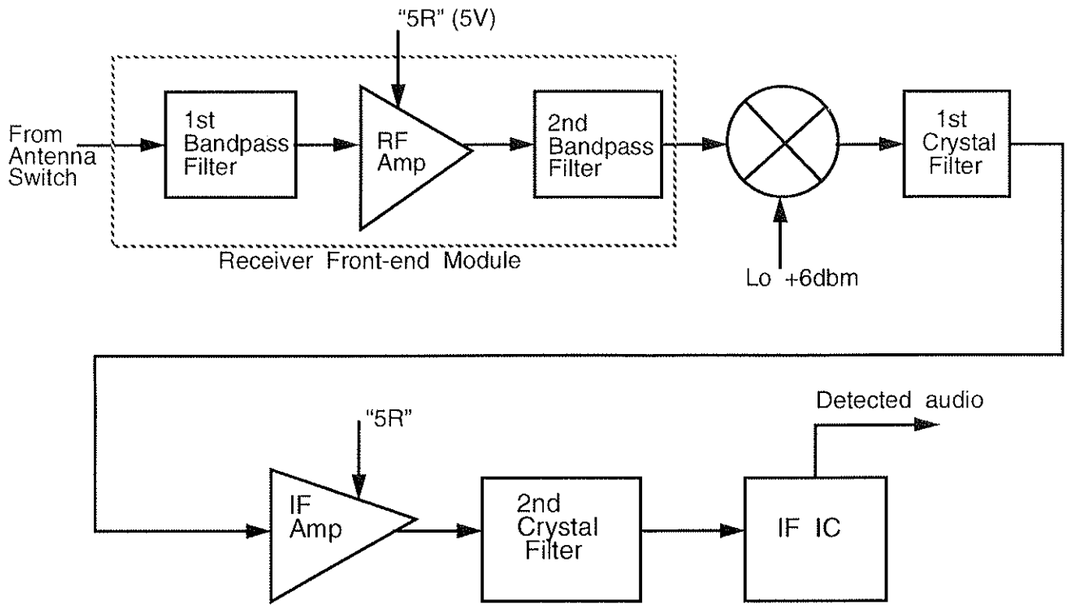
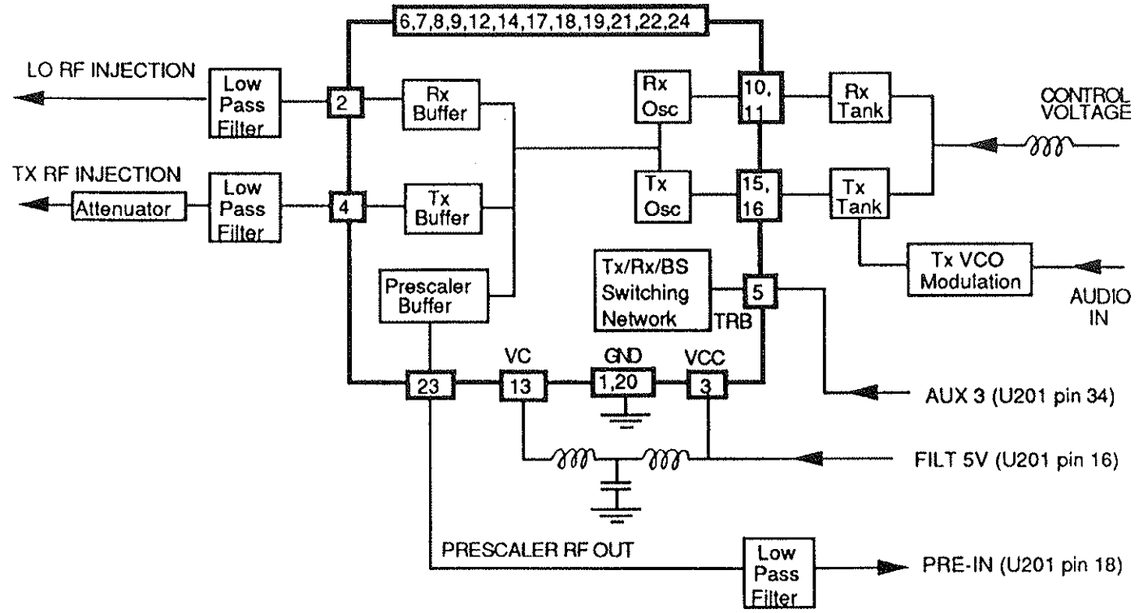
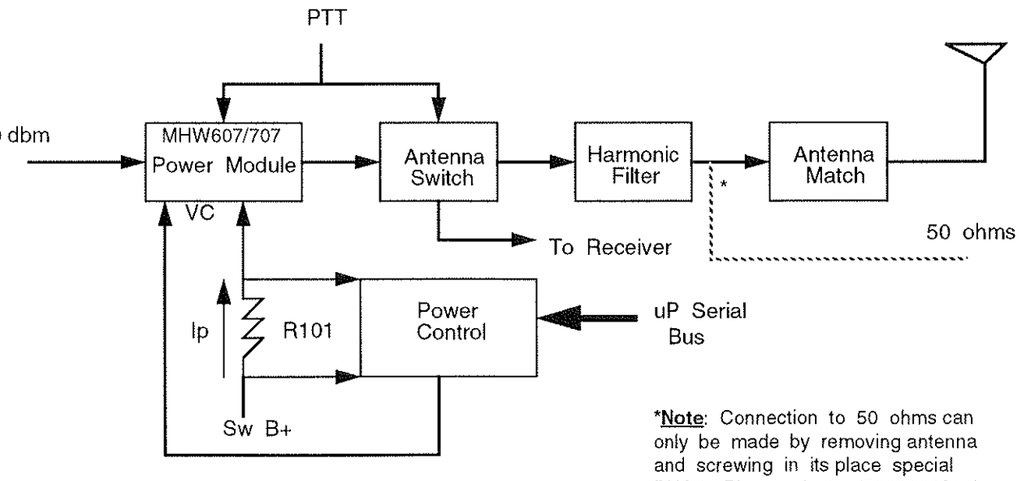
RECEIVER BLOCK DIAGRAM



VCO BLOCK DIAGRAM

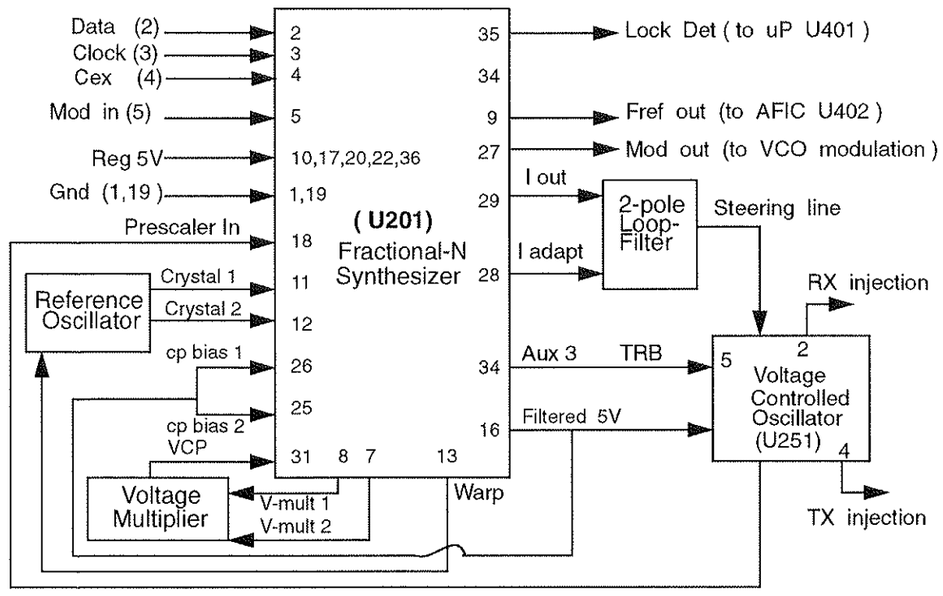


TRANSMITTER BLOCK DIAGRAM



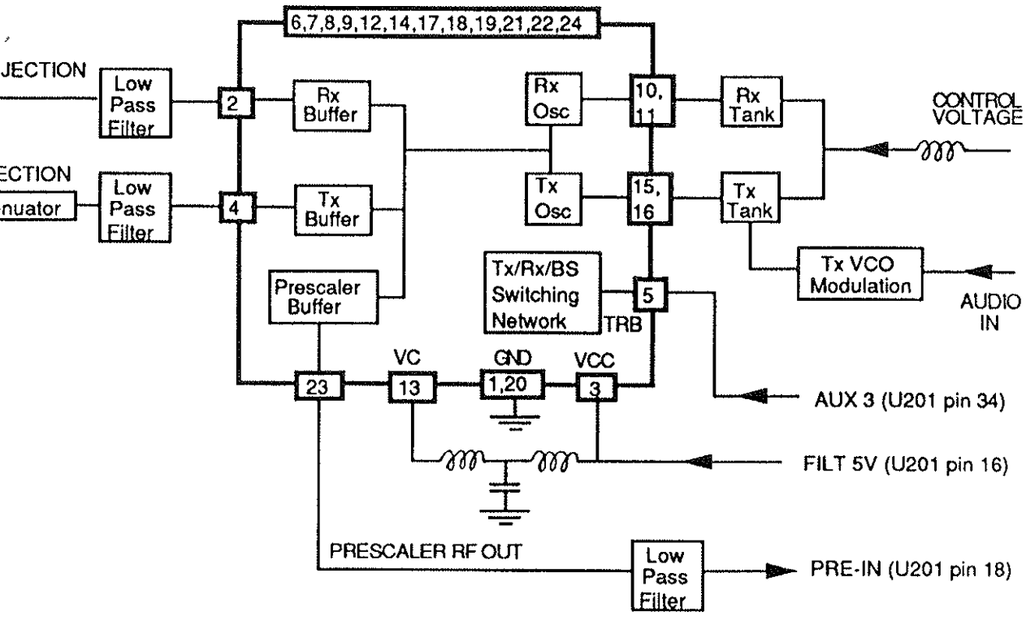
***Note**: Connection to 50 ohms can only be made by removing antenna and screwing in its place special BNC-to-Phono adapter (5880166S01).

SYNTHESIZER BLOCK DIAGRAM

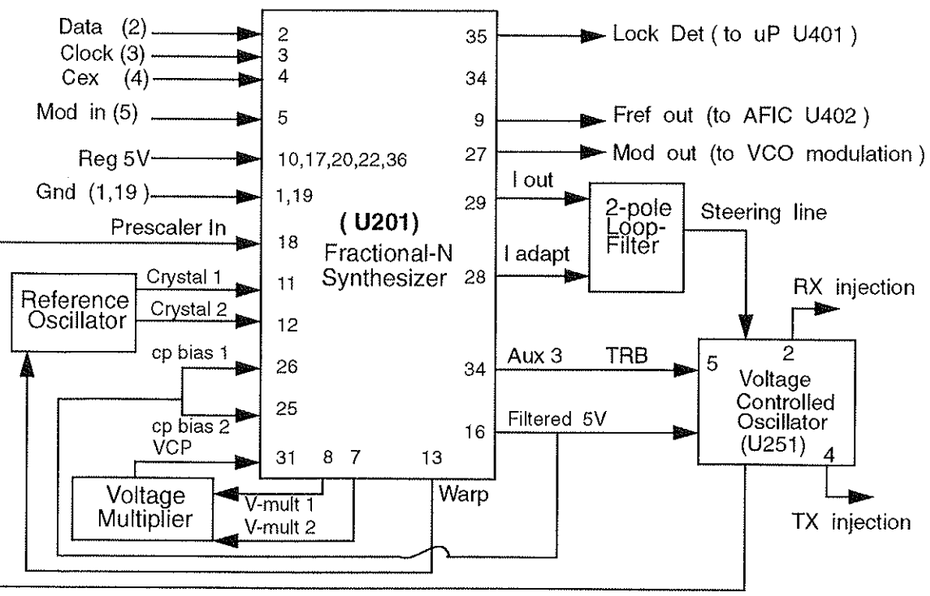


ns for Receiver, Transmitter, izer, and AFIC

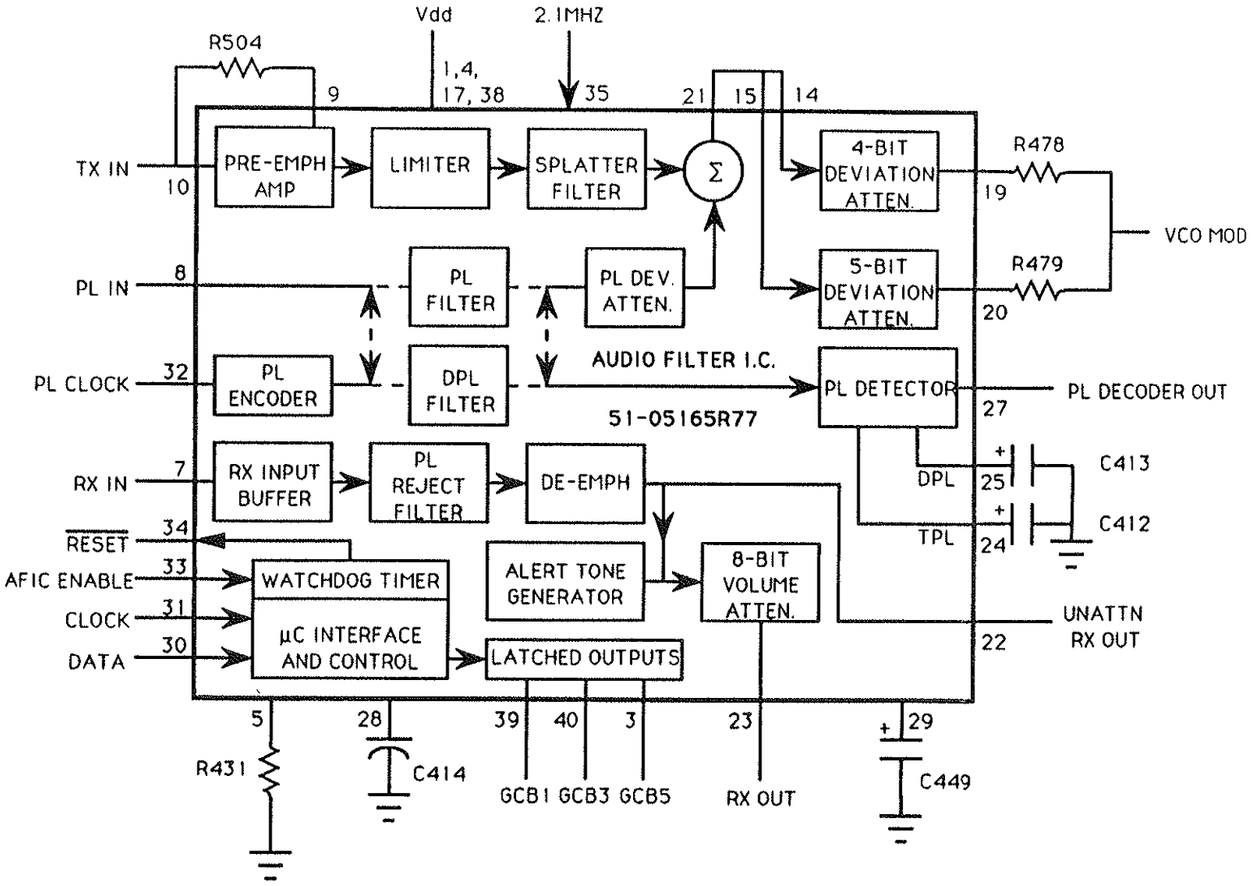
VCO BLOCK DIAGRAM

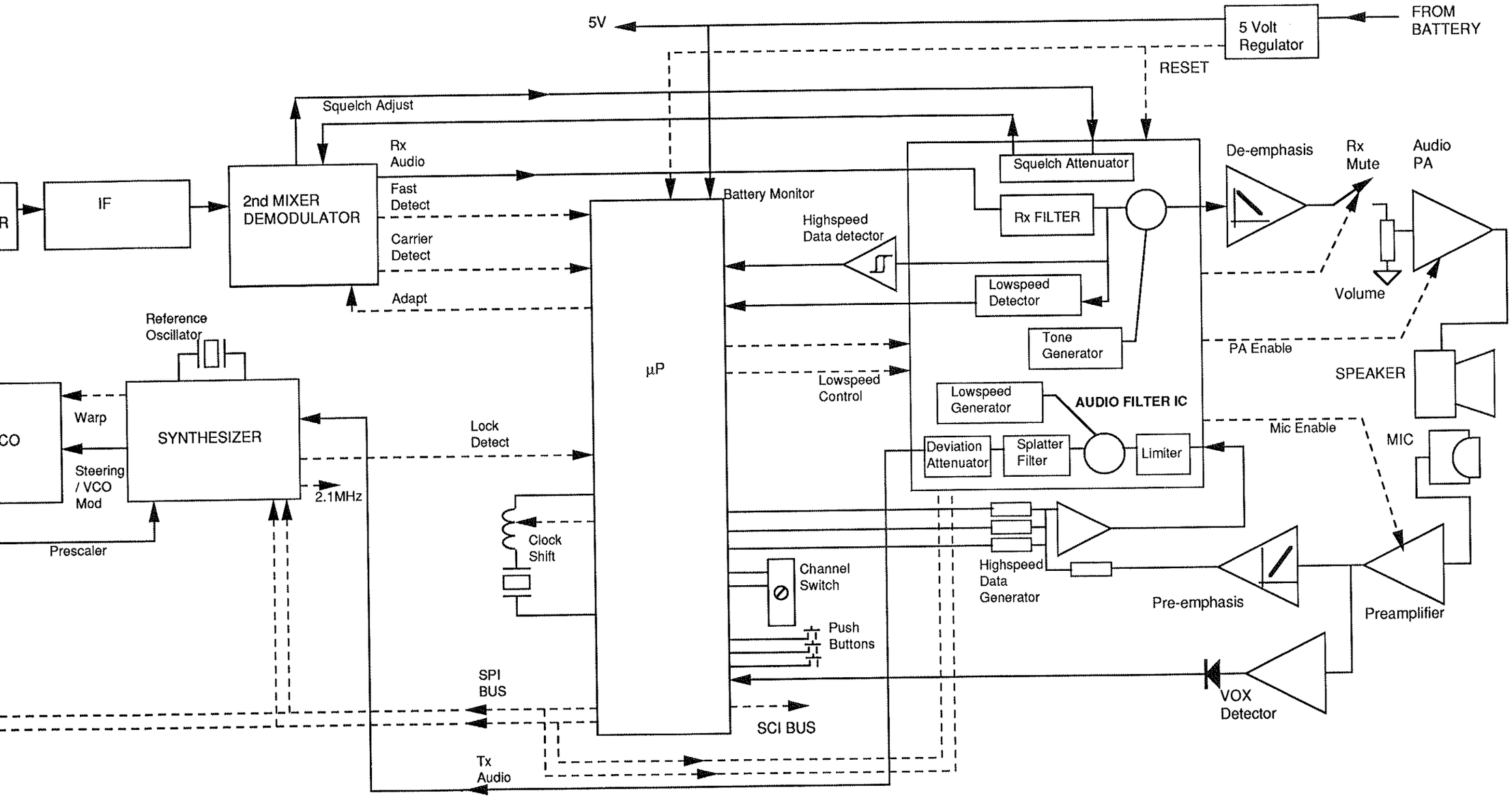


SYNTHESIZER BLOCK DIAGRAM

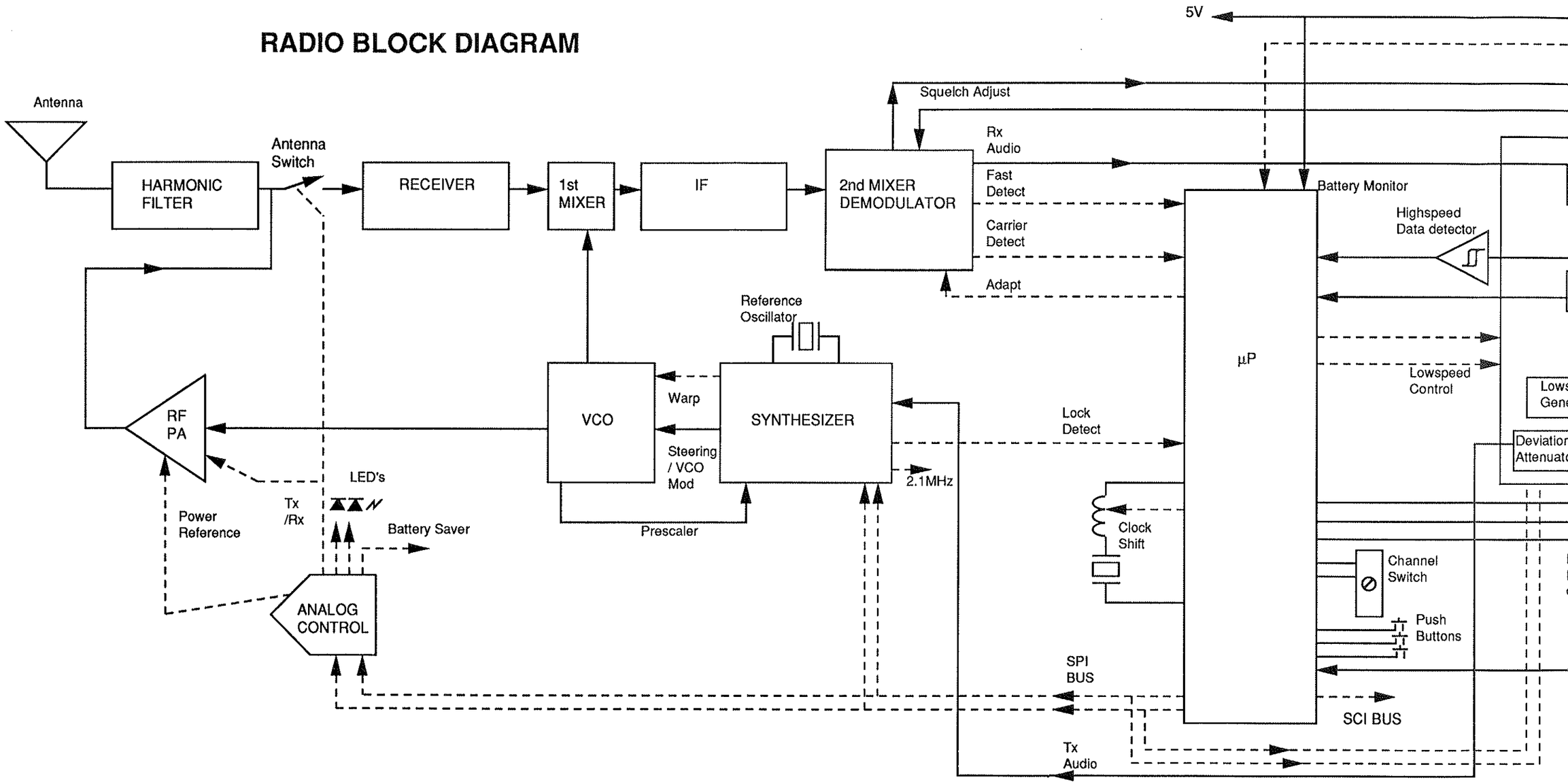


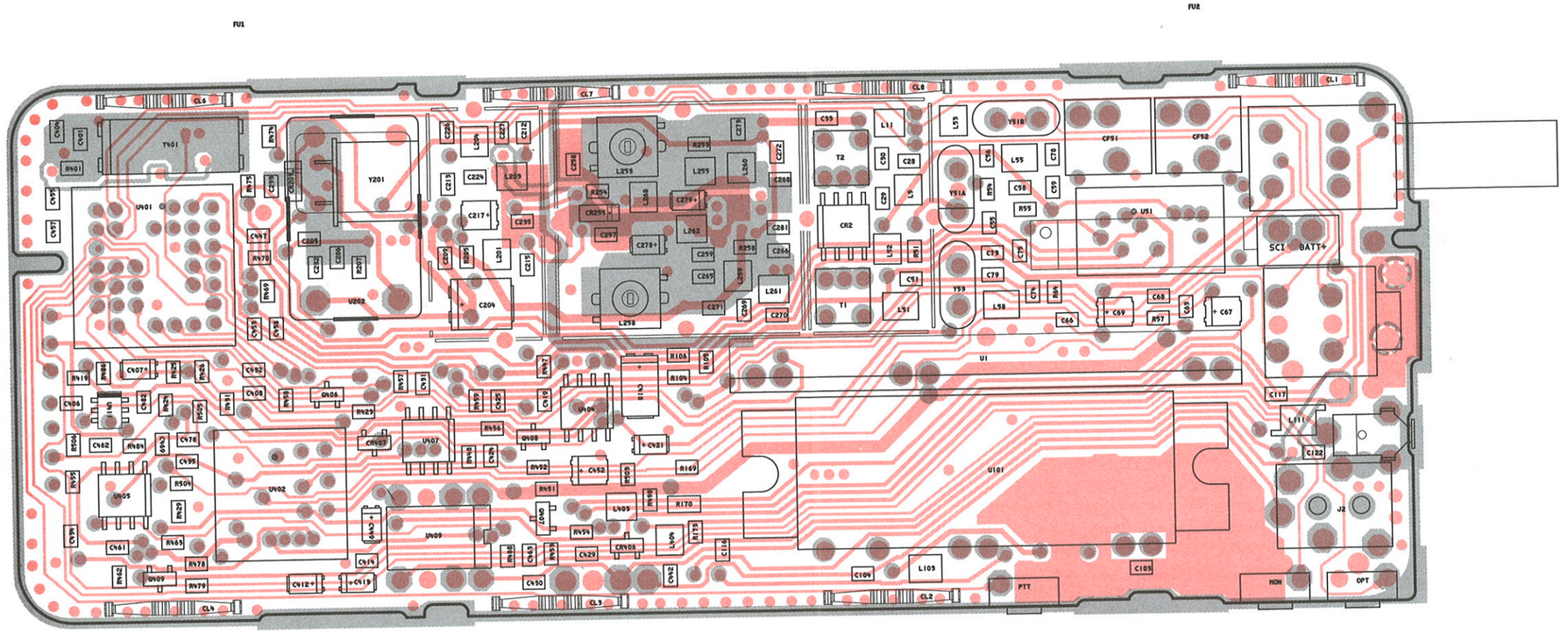
AFIC BLOCK DIAGRAM




5V
5 Volt Regulator
FROM BATTERY
RESET
Squelch Adjust
Rx Audio
Fast Detect
Carrier Detect
Adapt
IF
2nd MIXER DEMODULATOR
Battery Monitor
Highspeed Data detector
Squelch Attenuator
Rx FILTER
Lowspeed Detector
Tone Generator
De-emphasis
Rx Mute
Audio PA
Volume
PA Enable
SPEAKER
Reference Oscillator
µP
Lowspeed Control
Lowspeed Generator
AUDIO FILTER IC
Deviation Attenuator
Splatter Filter
Limiter
Mic Enable
MIC
Warp
SYNTHESIZER
Steering / VCO Mod
2.1MHz
Lock Detect
Prescaler
Clock Shift
Channel Switch
Push Buttons
Highspeed Data Generator
Pre-emphasis
Preamplifier
SPI BUS
SCI BUS
VOX Detector
Tx Audio

RADIO BLOCK DIAGRAM



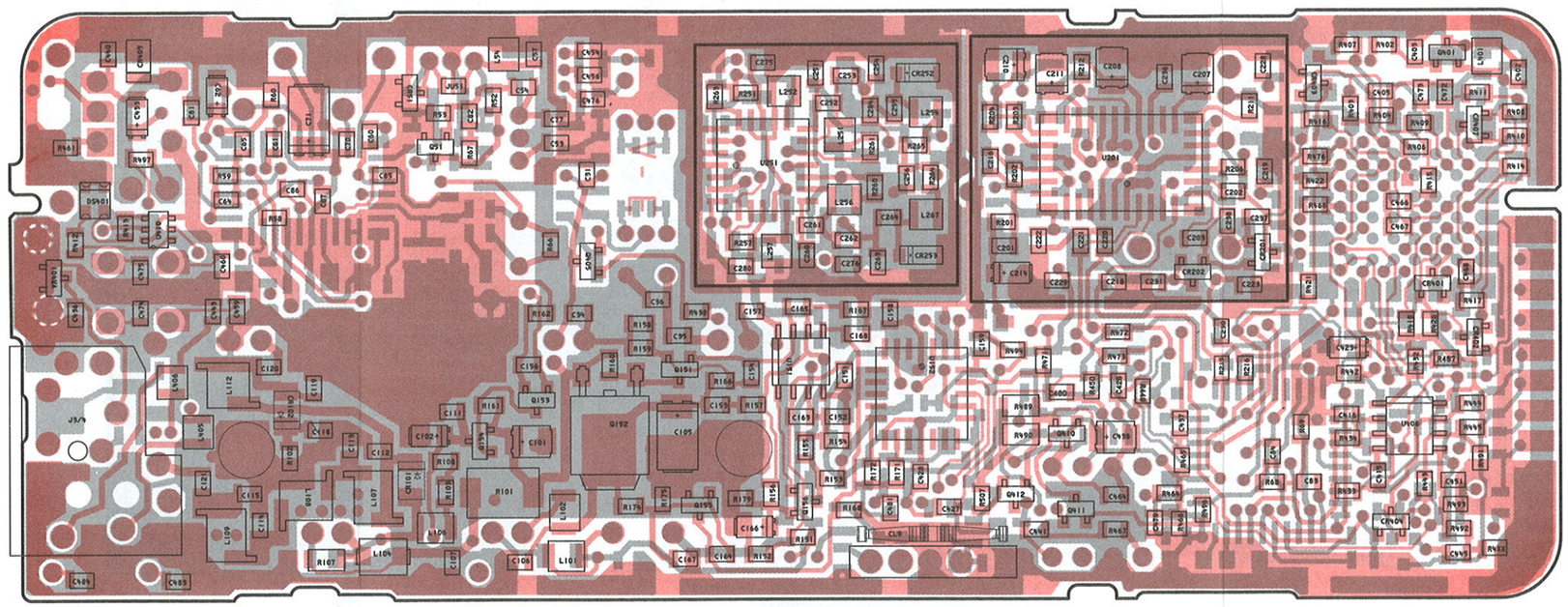


COMPONENT SIDE INNER LAYER (GRAY) RCB-93122-O
SOLDER SIDE INNER LAYER (PINK) RCB-93123-O
OVERLAY ----- RCB-93125-O

COMPONENT SIDE VIEW

COMPONENT SIDE (GRAY) RCB-93121-O
SOLDER SIDE (PINK) RCB-93124-O
OVERLAY ----- RCB-93125-O

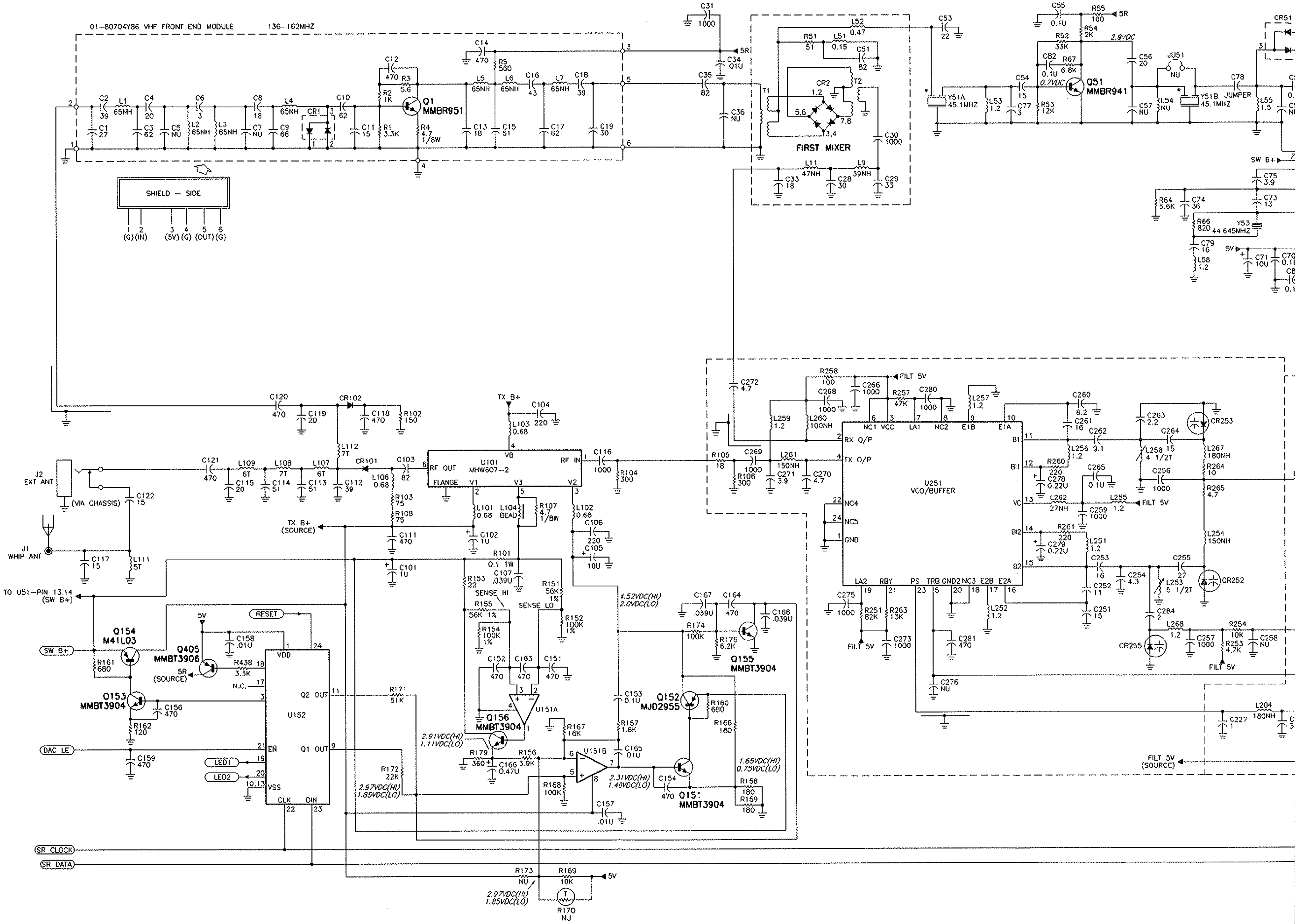
COMPONENT SIDE VIEW



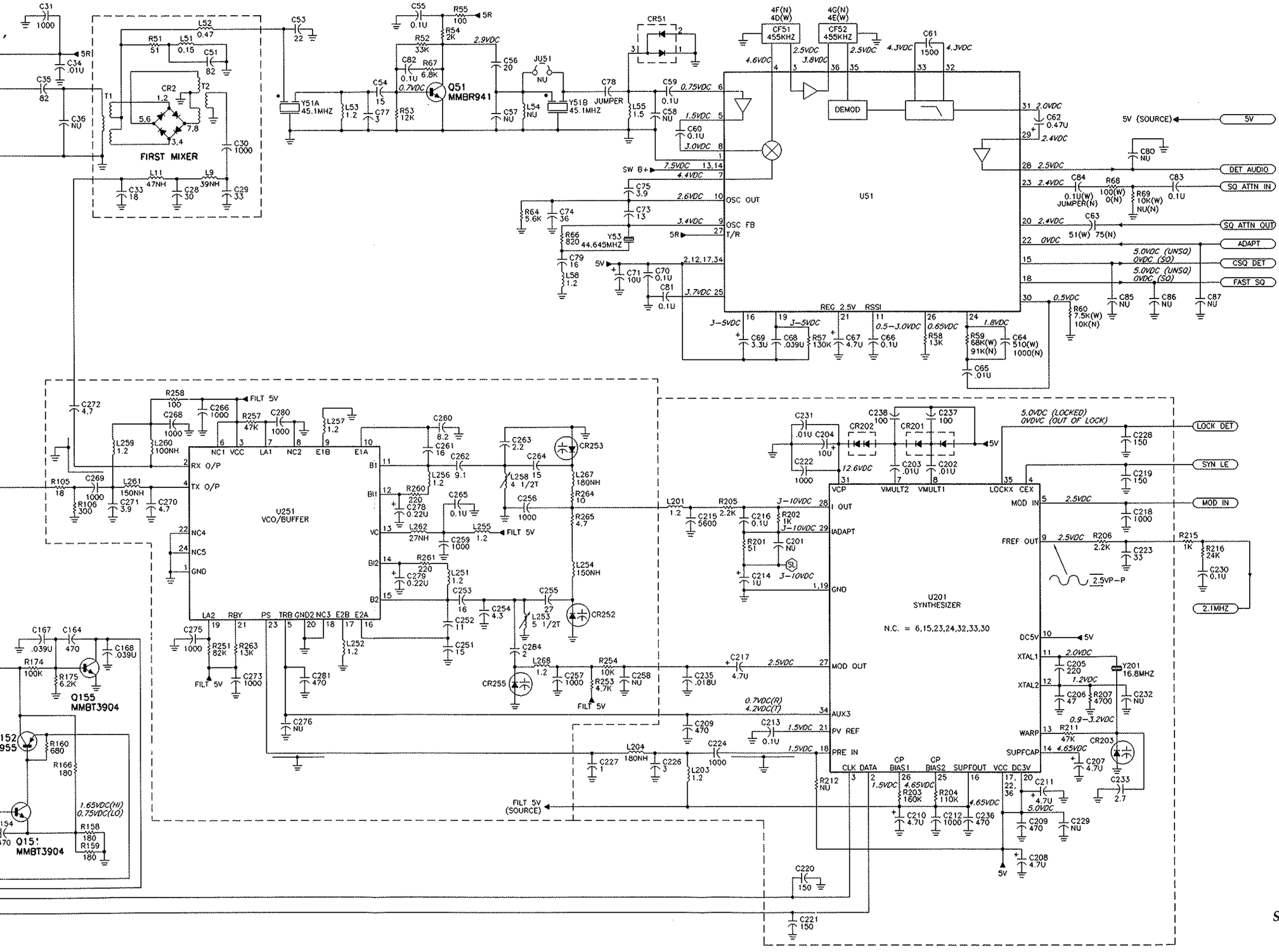
PCB.8480501B04.G
10/27/93

COMPONENT SIDE (GRAY)	RCB-93121-O
SOLDER SIDE (PINK)	RCB-93124-O
OVERLAY -----	RCB-93126-O

SOLDER SIDE VIEW



01-80704Y86 VHF FRONT END MODULE
136-162MHZ
C2 39
L1 65NH
C4 20
C6 3
C8 18
L4 65NH
C10 62
C12 470
R3 5.6
Q1 MMBR951
C14 470
R5 560
L5 65NH
L6 65NH
C16 43
L7 65NH
C18 39
C1 27
C3 62
C5 NU
L2 65NH
L3 65NH
C7 NU
C9 68
CR1
C11 15
R2 1K
R1 3.3K
R4 4.7 1/8W
C13 18
C15 51
C17 62
C19 30
SHIELD — SIDE
1 (G)
2 (IN)
3 (5V)
4 (G)
5 (OUT)
6 (G)
C31 1000
5R
C34 .01U
C35 82
C36 NU
T1
L52 0.47
R51 51
L51 0.15
C51 82
CR2
T2
FIRST MIXER
C30 1000
L11 47NH
L9 39NH
C33 18
C28 30
C29 33
C53 22
Y51A 45.1MHZ
L53 1.2
C54 15
C77 3
C55 0.1U
R55 100
5R
R54 2K
R52 33K
2.9VDC
C82 0.1U
R67 6.8K
0.7VDC
Q51 MMBR941
R53 12K
C56 20
C57 NU
JU51 NU
L54 NU
Y51B 45.1MHZ
C78 JUMPER
L55 1.5
CR51
SW B+
C75 3.9
C73 13
R64 5.6K
C74 36
R66 820
Y53 44.645MHZ
C79 16
L58 1.2
5V
C71 10U
C70 0.1U
C120 470
C119 20
CR102
C118 470
R102 150
TX B+
C104 220
L103 0.68
U101 MHW607-2
RF OUT
RF IN
VB
FLANGE
V1
V3
V2
C116 1000
R104 300
J2 EXT ANT
(VIA CHASSIS)
C121 470
L109 6T
L108 7T
L107 6T
L112 7T
CR101
C103 82
C115 20
C114 51
C113 51
C112 39
L106 0.68
C122 15
R103 75
R108 75
TX B+ (SOURCE)
C111 470
L101 0.68
L104 BEAD
R107 4.7 1/8W
L102 0.68
C106 220
C105 10U
C102 1U
J1 WHIP ANT
C117 15
L111 5T
R101 0.1 1W
C101 1U
C107 .039U
R153 22
SENSE HI
R151 56K 1%
SENSE LO
R155 56K 1%
R152 100K 1%
R154 100K 1%
TO U51-PIN 13,14 (SW B+)
4.52VDC(HI)
2.0VDC(LO)
C167 .039U
C164 470
C168 .039U
RESET
5V
Q154 M41L03
Q405 MMBT3906
C158 .01U
SW B+
R161 680
5R (SOURCE)
R438 3.3K
N.C.
VDD
Q153 MMBT3904
C156 470
U152
Q2 OUT
R171 51K
C152 470
C163 470
C151 470
U151A
R174 100K
R175 6.2K
Q155 MMBT3904
C153 0.1U
Q152 MJD2955
R160 680
R166 180
R162 120
DAC LE
C159 470
EN
Q1 OUT
LED1
LED2
VSS
CLK
DIN
Q156 MMBT3904
2.91VDC(HI)
1.11VDC(LO)
R167 16K
R157 1.8K
C165 .01U
U151B
R179 360
C166 0.47U
R156 3.9K
R172 22K
2.97VDC(HI)
1.85VDC(LO)
R168 100K
2.31VDC(HI)
1.40VDC(LO)
C154 470
Q151 MMBT3904
1.65VDC(HI)
0.75VDC(LO)
R158 180
R159 180
C157 .01U
SR CLOCK
SR DATA
R173 NU
R169 10K
5V
2.97VDC(HI)
1.85VDC(LO)
R170 NU
C272 4.7
R258 100
FILT 5V
C268 1000
C266 1000
R257 47K
C280 1000
L257 1.2
C260 8.2
L259 1.2
L260 100NH
NC1
VCC
LA1
NC2
E1B
E1A
C261 16
C263 2.2
CR253
C262 9.1
C264 15
RX O/P
TX O/P
B1
R105 18
C269 1000
L261 150NH
R106 300
C271 3.9
C270 4.7
L256 1.2
L258 4 1/2T
L267 180NH
R264 10
BI1
R260 220
C278 0.22U
C265 0.1U
C256 1000
U251 VCO/BUFFER
R265 4.7
VC
L262 27NH
L255 1.2
FILT 5V
C259 1000
NC4
NC5
GND
BI2
R261 220
C279 0.22U
L251 1.2
L254 150NH
B2
C253 16
C255 27
C254 4.3
L253 5 1/2T
CR252
LA2
RBY
PS
TRB
GND2
NC3
E2B
E2A
C275 1000
C252 11
R251 82K
R263 13K
L252 1.2
C251 15
C284 2
C281 470
L268 1.2
R254 10K
FILT 5V
C273 1000
CR255
C257 1000
R253 4.7K
C258 NU
FILT 5V
C276 NU
L204 180NH
C227 1
FILT 5V (SOURCE)

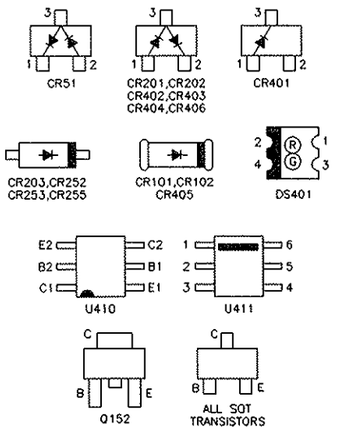


NOTES:

1. UNLESS OTHERWISE INDICATED, RESISTOR VALUES ARE IN OHMS, CAPACITOR VALUES ARE IN PICOFARADS, INDUCTOR VALUES ARE IN MICROHENRIES.
2. NON-POLARIZED CAPACITORS ARE CHIP-TYPE UNLESS OTHERWISE INDICATED.
3. POLARIZED CAPACITORS ARE CHIP-TANTALUM TYPE UNLESS OTHERWISE INDICATED.
4. "NU" MEANS COMPONENT IS NOT USED.
5. DC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE (10 MEGOHM) DC VOLTMETER.
6. AC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE AC RMS VOLTMETER.
7. ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:

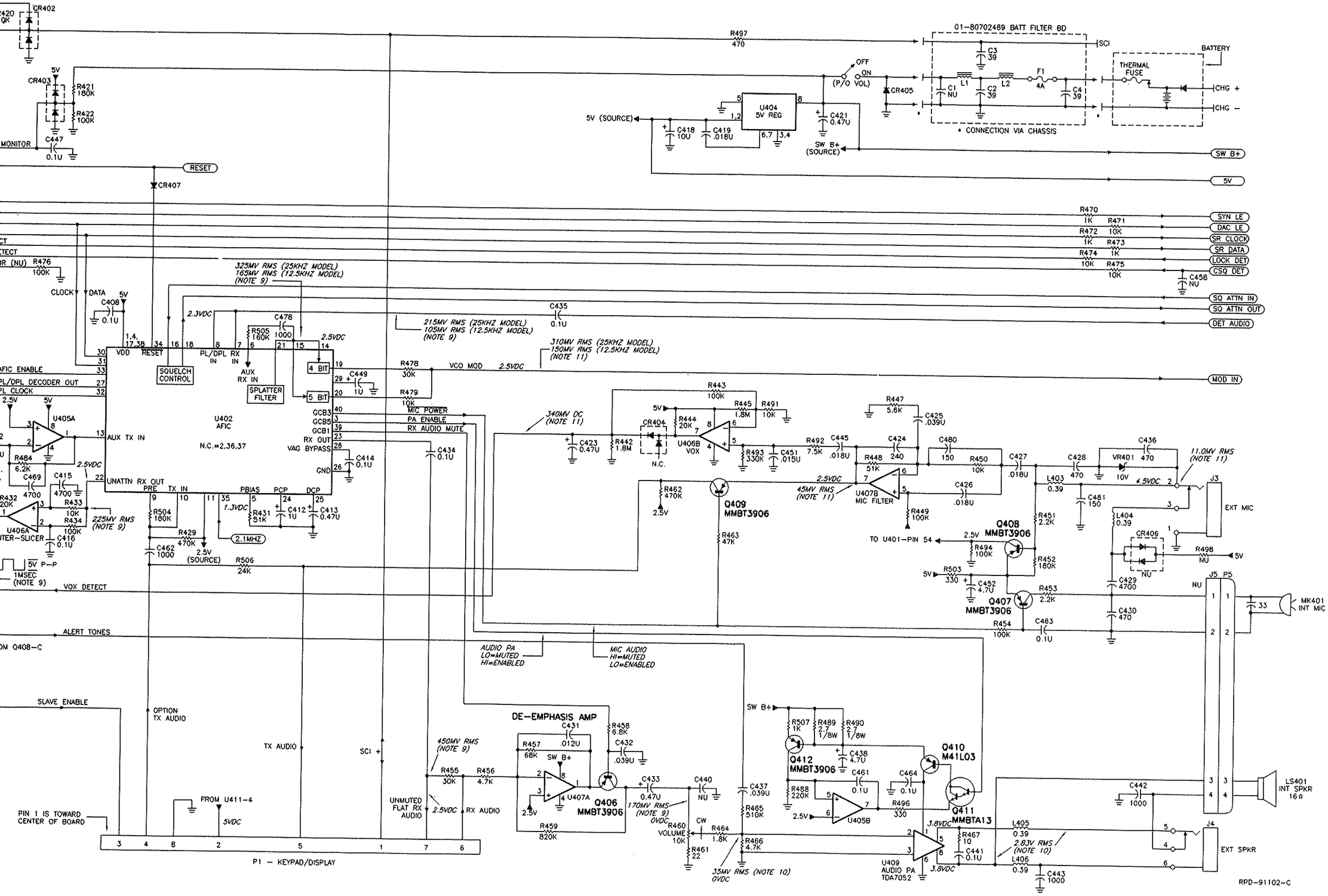
   (R) RECEIVE MODE
   (T) TRANSMIT MODE

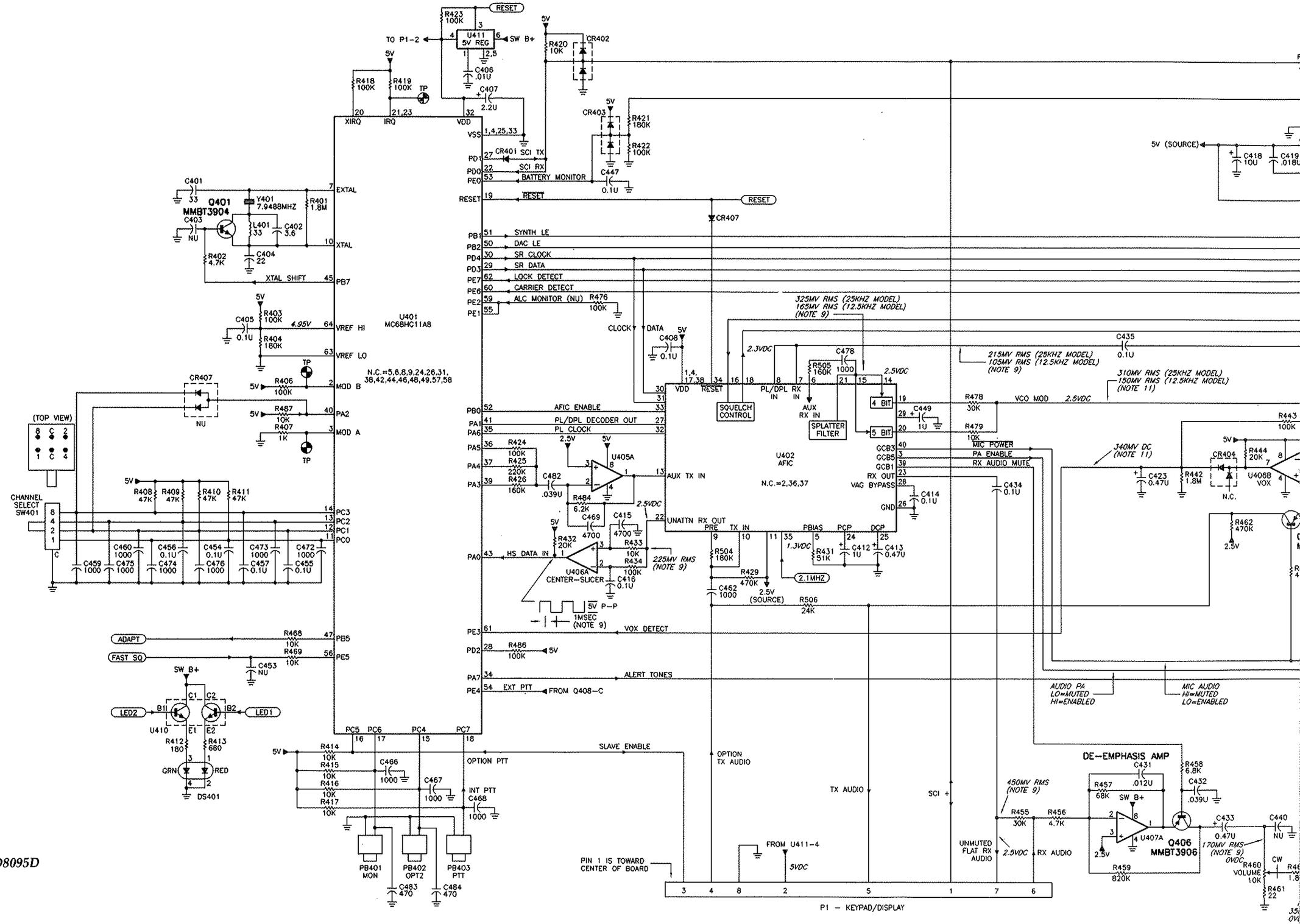
8. MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL UNMODULATED SIGNAL AT A LEVEL OF -20 DBM.
9. MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION (FOR 20/25 KHZ MODELS) OR 1.5 KHZ DEVIATION (FOR 12.5 KHZ MODELS), MEASURED WITH AN AC RMS VOLTMETER.
10. SAME AS NOTE 8 EXCEPT WITH VOLUME CONTROL ADJUSTED FOR 500 MILLIWATTS (2.82 VOLTS RMS ACROSS 16-OHM LOAD CONNECTED TO THE EXT SPKR JACK).
11. MEASURED IN THE TRANSMIT MODE WITH A 1 KHZ, 11 MV RMS SIGNAL APPLIED TO THE EXTERNAL MICROPHONE INPUT.



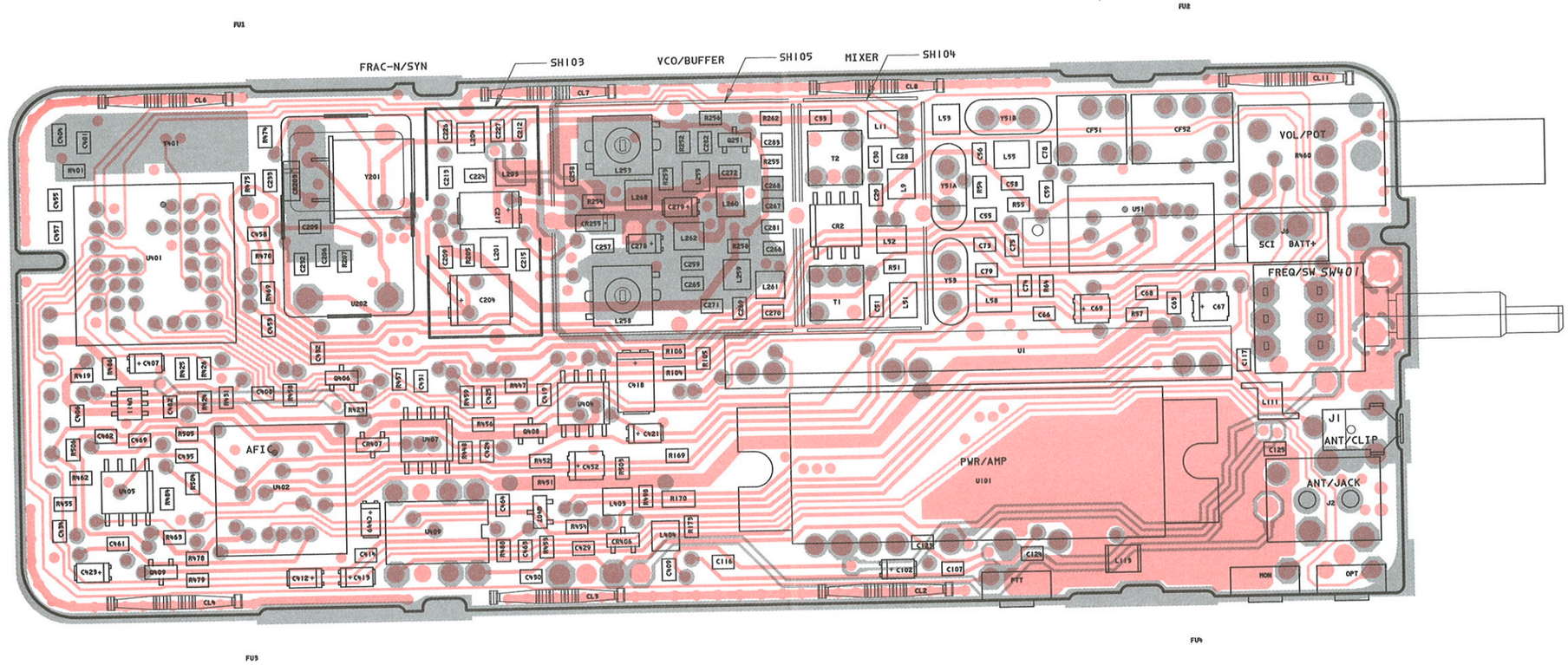
RPD-92101-B

Schematic Diagram for HLD8094C and HLD8095D
VHF Main Boards, 136-162 MHz
(sheet 1 of 2)


CR402
CR403
5V
R421 180K
R422 100K
C447 0.1U
MONITOR
RESET
CR407
R497 470
01-80702489 BATT FILTER BD
SCI
BATTERY
OFF
ON
(P/O VOL)
CR405
C3 39
C1 NU
L1
C2 39
L2
F1 4A
C4 39
THERMAL FUSE
CHG +
CHG –
* CONNECTION VIA CHASSIS
U404 5V REG
5V (SOURCE)
C418 10U
C419 .018U
C421 0.47U
SW B+ (SOURCE)
SW B+
5V
R470 1K
R471 10K
R472 1K
R473 1K
R474 10K
R475 10K
C458 NU
SYN LE
DAC LE
SR CLOCK
SR DATA
LOCK DET
CSQ DET
SQ ATTN IN
SQ ATTN OUT
DET AUDIO
R476 100K
CLOCK
DATA
5V
C408 0.1U
325MV RMS (25KHZ MODEL)
165MV RMS (12.5KHZ MODEL)
(NOTE 9)
2.3VDC
C478 1000
R505 160K
2.5VDC
C435 0.1U
215MV RMS (25KHZ MODEL)
105MV RMS (12.5KHZ MODEL)
(NOTE 9)
310MV RMS (25KHZ MODEL)
150MV RMS (12.5KHZ MODEL)
(NOTE 11)
1,4, 17,38 VDD
34 RESET
16
18
8 PL/DPL RX IN
7
6 AUX RX IN
21
15
14
30
31
AFIC ENABLE
33
PL/DPL DECODER OUT
27
PL CLOCK
32
SQUELCH CONTROL
SPLATTER FILTER
4 BIT
5 BIT
19
20
C449 1U
R478 30K
R479 10K
VCO MOD
2.5VDC
MOD IN
R443 100K
R445 1.8M
R491 10K
R444 20K
CR404
N.C.
U406B VOX
R442 1.8M
C423 0.47U
R493 330K
C451 .015U
R492 7.5K
C445 .018U
R447 5.6K
C425 .039U
C424 240
R448 51K
U407B MIC FILTER
R449 100K
C480 150
R450 10K
C426 .018U
C427 .018U
C428 470
C436
VR401 470
10V
11.0MV RMS
(NOTE 11)
4.5VDC
J3
EXT MIC
L403 0.39
C481 150
L404 0.39
CR406
NU
R498
5V
J5 P5
NU
1
2
3
4
5
6
J4
EXT SPKR
MK401 INT MIC
33
LS401 INT SPKR 16Ω
C442 1000
C443 1000
L405 0.39
L406 0.39
2.83V RMS
(NOTE 10)
3.8VDC
U409 AUDIO PA TDA7052
R467 10
C441 0.1U
Q410 M41L03
Q411 MMBTA13
Q412 MMBT3906
R507 1K
R489 2.7 1/8W
R490 2.7 1/8W
C438 4.7U
C461 0.1U
C464 0.1U
R488 220K
R496 330
U405B
2.5V
Q408 MMBT3906
R494 100K
R452 180K
TO U401–PIN 54
R503 330
C452 4.7U
Q407 MMBT3906
R453 2.2K
R454 100K
C463 0.1U
C429 4700
C430 470
R451 2.2K
U405A
R484 6.2K
C469 4700
C415 4700
R433 10K
R434 100K
C416 0.1U
225MV RMS
(NOTE 9)
U406A
INTER-SLICER
5V P-P
1MSEC
(NOTE 9)
VOX DETECT
ALERT TONES
FROM Q408-C
U402 AFIC
N.C.=2,36,37
AUX TX IN
2.5VDC
22 UNATTN RX OUT
PRE
9
TX IN
10
11
35
PBIAS
5
PCP
24
DCP
25
1.3VDC
R504 180K
R429 470K
2.5V (SOURCE)
R506 24K
C462 1000
R431 51K
C412 1U
C413 0.47U
2.1MHZ
GCB3 40
GCB5 3
GCB1 39
RX OUT 23
VAG BYPASS 28
GND 26
C414 0.1U
C434 0.1U
MIC POWER
PA ENABLE
RX AUDIO MUTE
340MV DC
(NOTE 11)
R462 470K
2.5V
Q409 MMBT3906
R463 47K
AUDIO PA
LO=MUTED
HI=ENABLED
MIC AUDIO
HI=MUTED
LO=ENABLED
SLAVE ENABLE
OPTION
TX AUDIO
TX AUDIO
SCI
DE-EMPHASIS AMP
C431 .012U
R457 68K
SW B+
R458 6.8K
C432 .039U
450MV RMS
(NOTE 9)
R455 30K
R456 4.7K
U407A
Q406 MMBT3906
C433 0.47U
170MV RMS
(NOTE 9)
0VDC
C440 NU
C437 .039U
R465 510K
R460 VOLUME 10K
CW
R464 1.8K
R461 22
R466 4.7K
35MV RMS (NOTE 10)
0VDC
UNMUTED FLAT RX AUDIO
2.5VDC
RX AUDIO
R459 820K
PIN 1 IS TOWARD CENTER OF BOARD
FROM U411-4
5VDC
3 4 8 2 5 1 7 6
P1 – KEYPAD/DISPLAY
RPD-91102-C



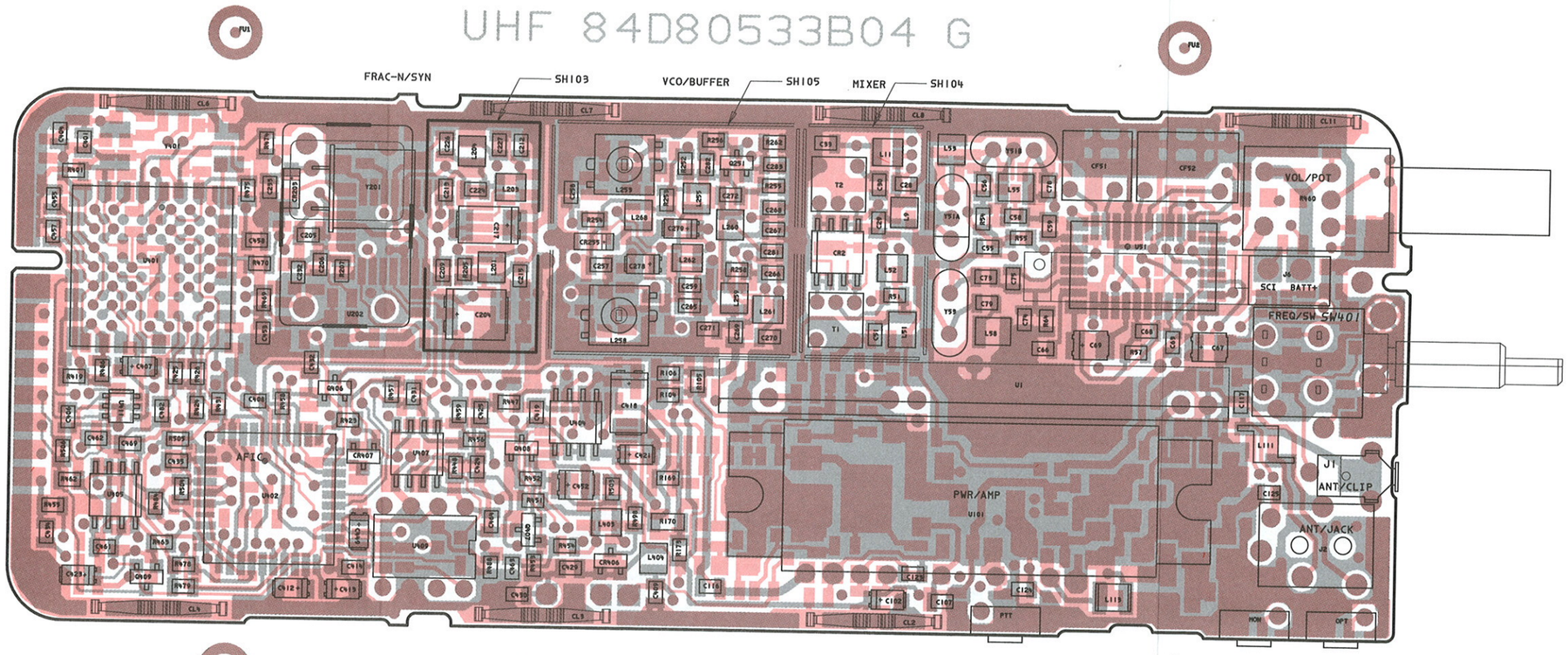
Schematic Diagram for HLD8094C and HLD8095D
VHF Main Boards, 136-162 MHz
(sheet 2 of 2)



COMPONENT SIDE INNER LAYER (GRAY) RCB-93128-O
SOLDER SIDE INNER LAYER (PINK) RCB-93129-O
OVERLAY ----- RCB-93131-O

COMPONENT SIDE VIEW

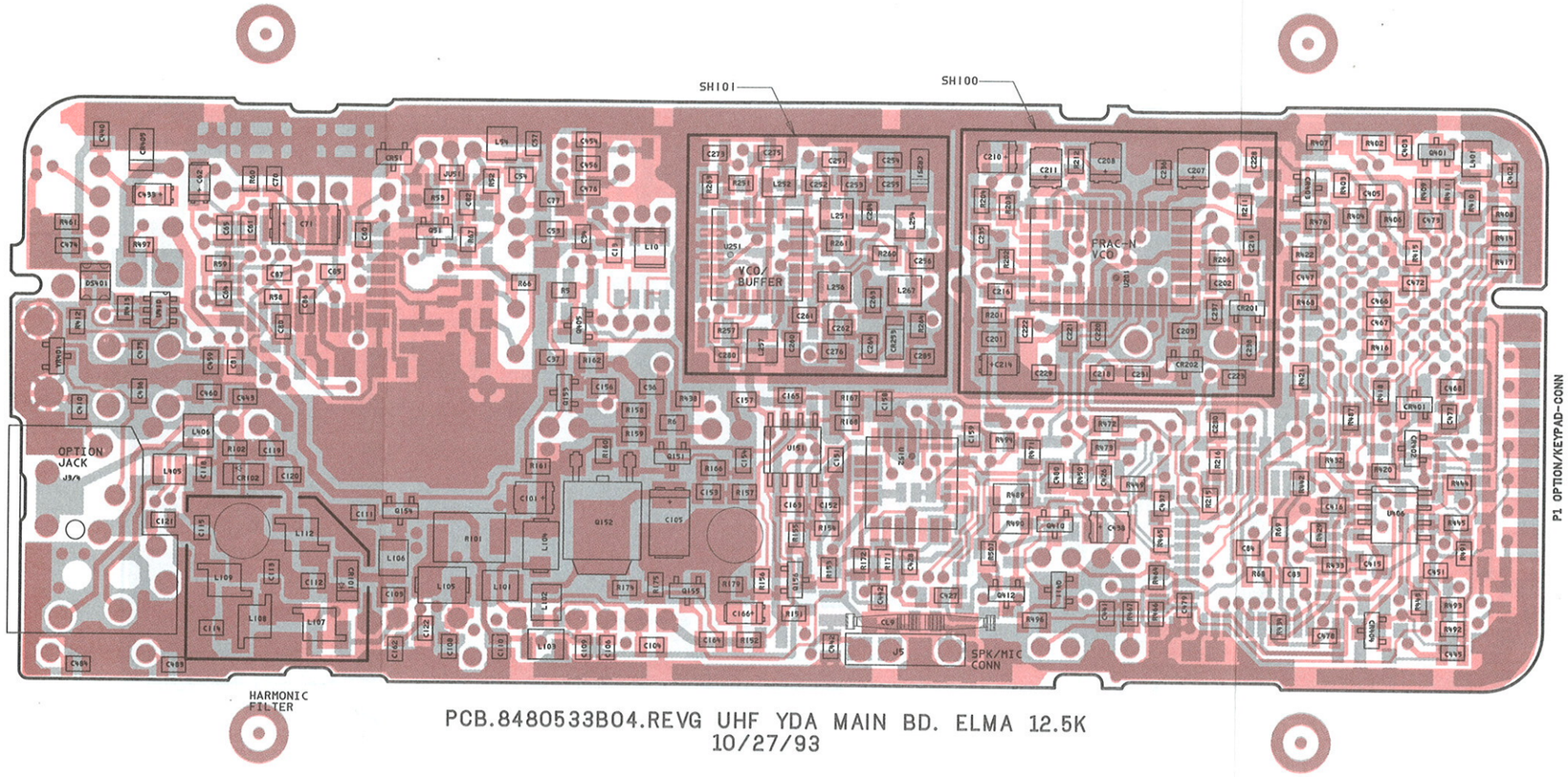
UHF 84D80533B04 G



ELMA 12.5K

COMPONENT SIDE (GRAY)	RCB-93127-O
SOLDER SIDE (PINK)	RCB-93130-O
OVERLAY -----	RCB-93131-O

COMPONENT SIDE VIEW



PCB.8480533B04.REVG UHF YDA MAIN BD. ELMA 12.5K
10/27/93

COMPONENT SIDE (GRAY)	RCB-93127-O
SOLDER SIDE (PINK)	RCB-93130-O
OVERLAY -----	RCB-93132-O

SOLDER SIDE VIEW

01-80706Y40 UHF FRONT END MODULE 438-470MHZ

SHIELD — SIDE

1 2 (G) (IN) 3 4 (5V) (G) 5 (OUT) 6 (G)

Q1 MMBR571

FIRST MIXER

MIXER SHIELD

Q51 MMBR941

Y51A 45.1MHZ

Y51B 45.1MHZ

JU51 JUMPER

CR51

Y53 44.645MHZ

SW B+

5V

5R

Q251 MMBR941

U251 VCO/BUFFER

RX VCO

TX VCO

VCO SHIELD

FILT 5V

50 Ω

J2 EXT ANT

(VIA CHASSIS)

J1 WHIP ANT

HARMONIC FILTER

U101 MHW707-2 RF POWER AMPLIFIER

RF IN

RF OUT

FLANGE

TX B+ (SOURCE)

TO U51--PIN 13,14 (SW B+)

Q154 M41L03

Q405 MMBT3906

Q153 MMBT3904

Q155 MMBT3904

Q156 MMBT3904

Q152 MJD2955

Q151 MMBT3904

U152

U151A

U151B

RESET

DAC LE

LED1

LED2

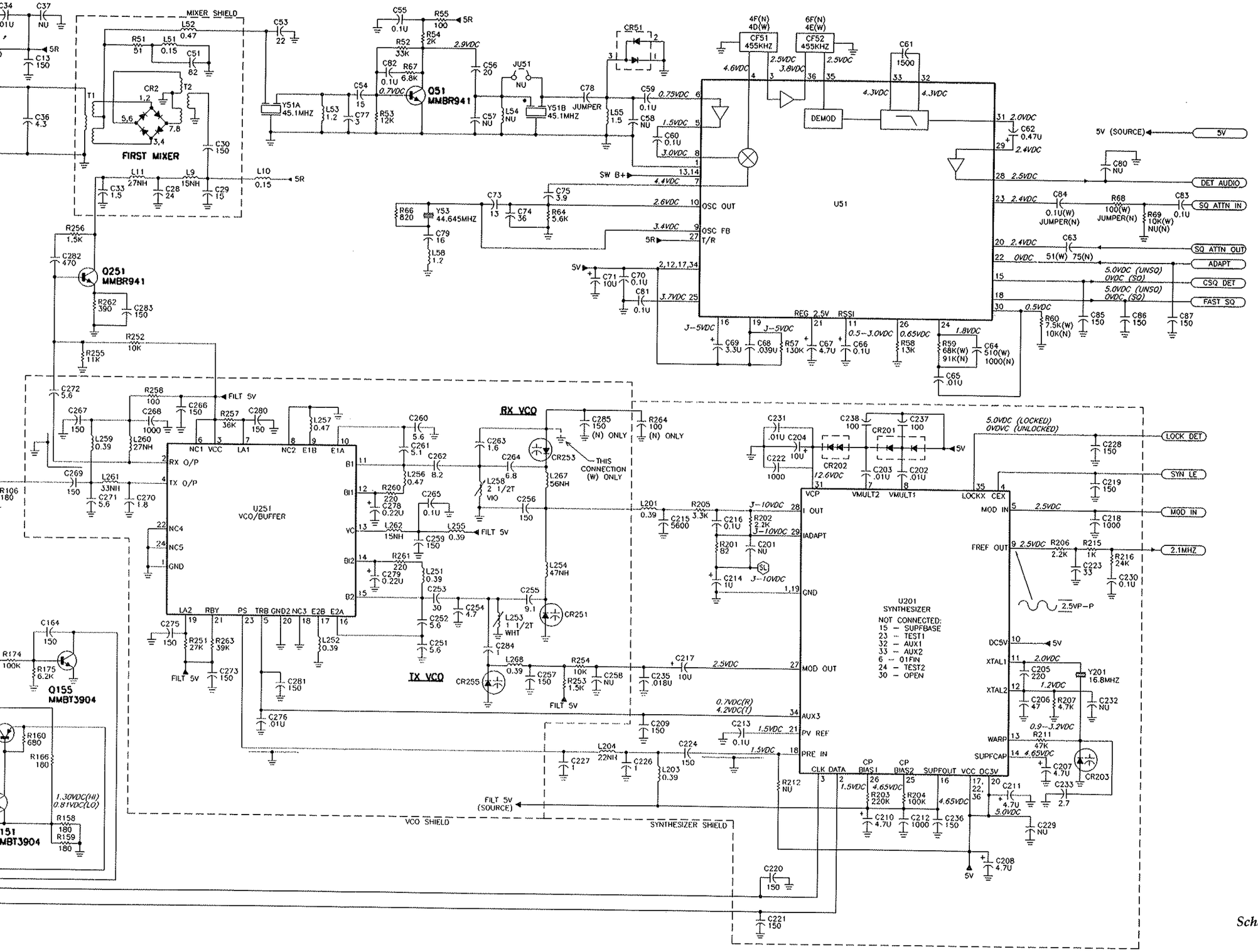
SR CLOCK

SR DATA

THIS CONNECTION (W) ONLY

(N) ONLY

SYNTHESIZER



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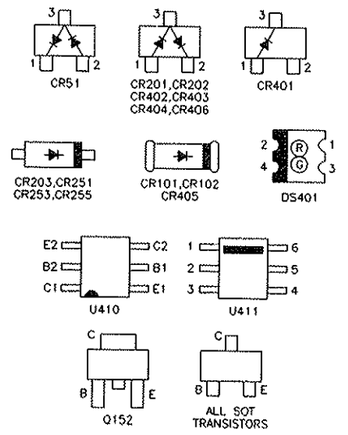
3. POLARIZED CAPACITORS ARE CHIP-TANTALUM TYPE UNLESS OTHERWISE INDICATED.
4. "NU" MEANS COMPONENT IS NOT USED.
5. DC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE (10 MEGOHM) DC VOLTMETER.
6. AC VOLTAGES ARE MEASURED WITH A HIGH IMPEDANCE AC RMS VOLTMETER.
7. ALL VOLTAGE MEASUREMENTS ARE IN THE RECEIVE MODE UNLESS INDICATED AS FOLLOWS:

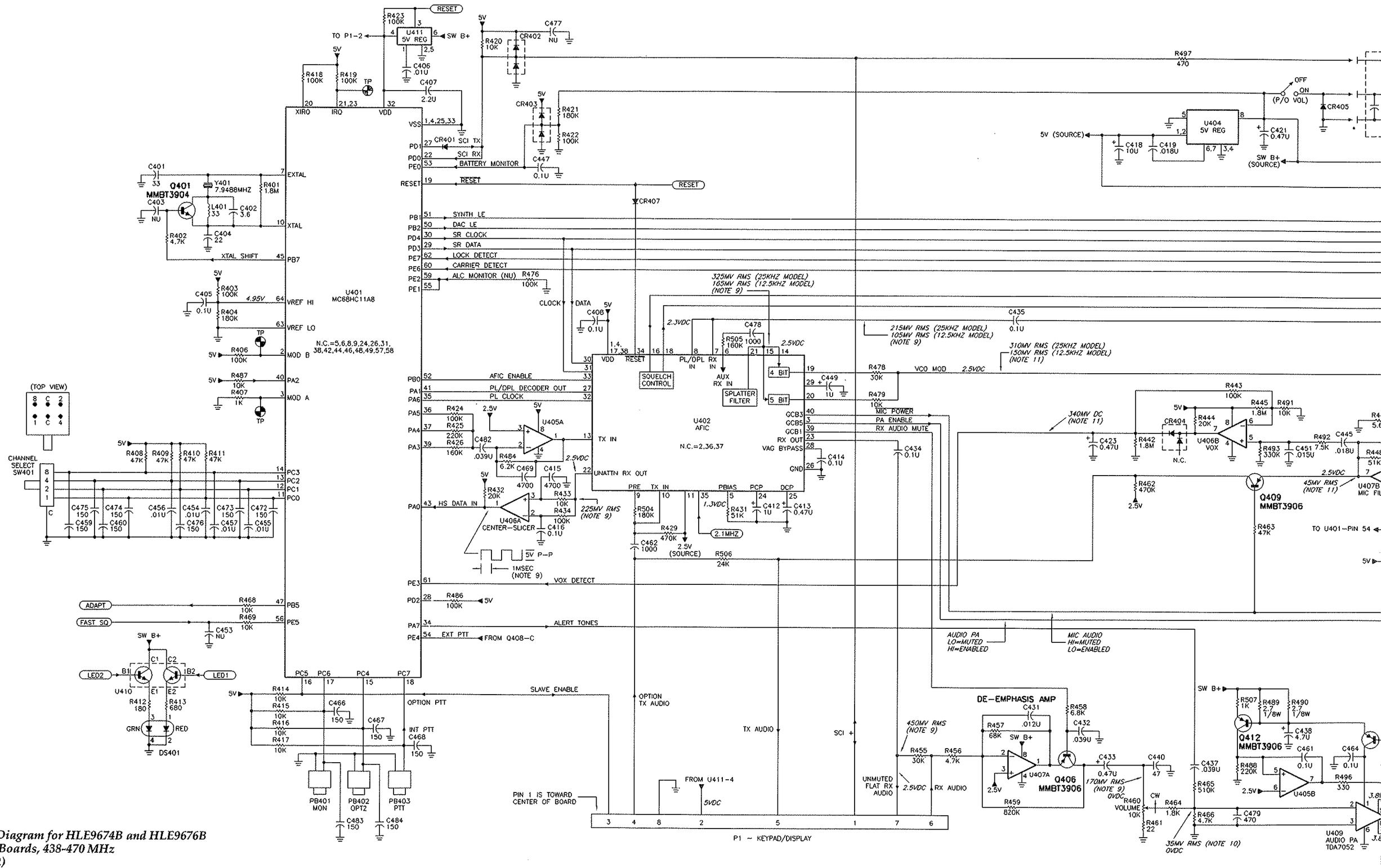
   (R) RECEIVE MODE
   (T) TRANSMIT MODE

8. MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL UNMODULATED SIGNAL AT A LEVEL OF -20 DBM.
9. MEASURED IN THE RECEIVE MODE WITH AN ON-CHANNEL SIGNAL AT A LEVEL OF -20 DBM, MODULATED WITH 1 KHZ AT 3 KHZ DEVIATION (FOR 20/25 KHZ MODELS) OR 1.5 KHZ DEVIATION (FOR 12.5 KHZ MODELS), MEASURED WITH AN AC RMS VOLTMETER.
10. SAME AS NOTE 8 EXCEPT WITH VOLUME CONTROL ADJUSTED FOR 500 MILLIWATTS (2.82 VOLTS RMS ACROSS 16-OHM LOAD CONNECTED TO THE EXT SPKR JACK).
11. MEASURED IN THE TRANSMIT MODE WITH A 1 KHZ, 11 MV RMS SIGNAL APPLIED TO THE EXTERNAL MICROPHONE INPUT.

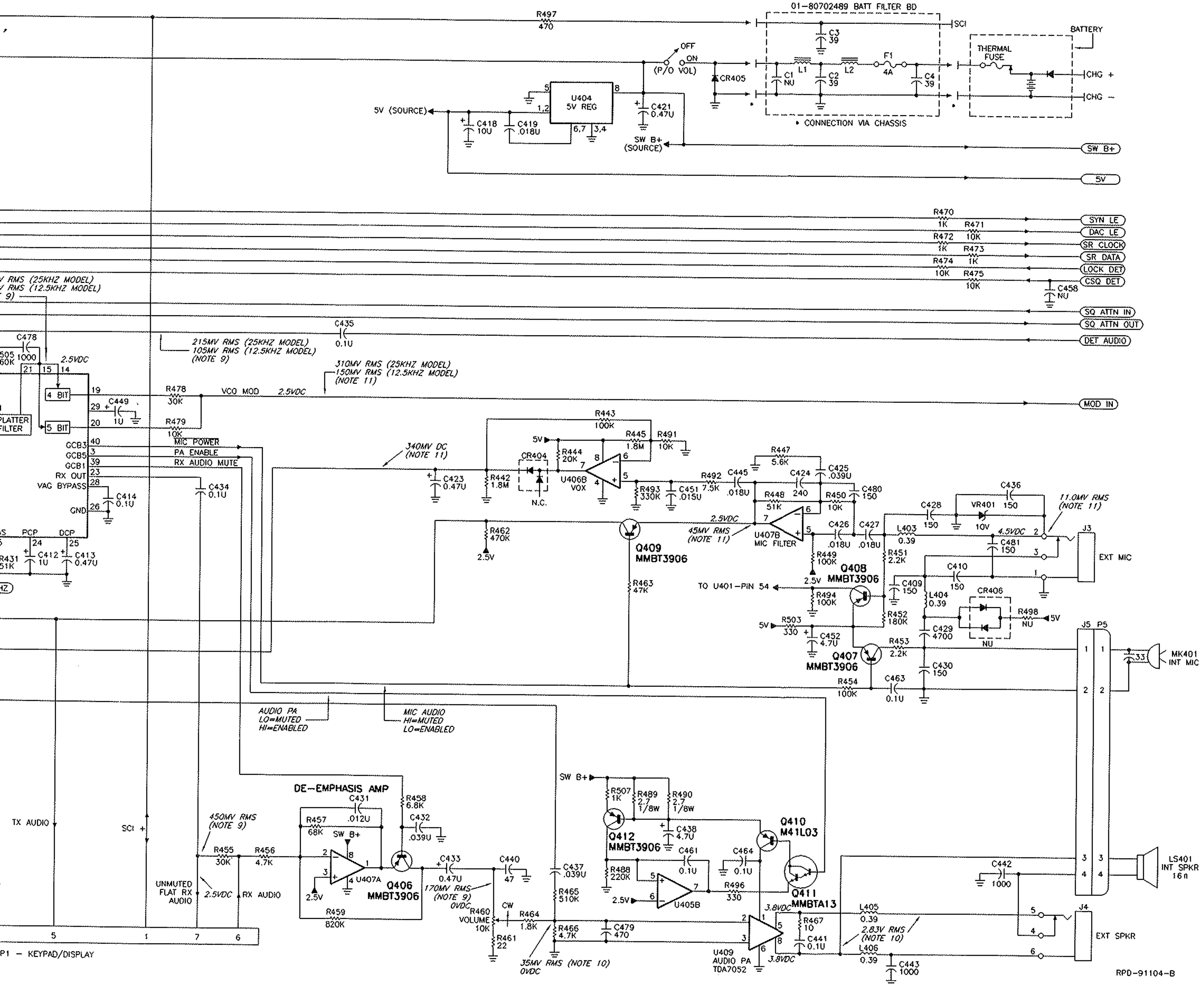


RPD-91103-B

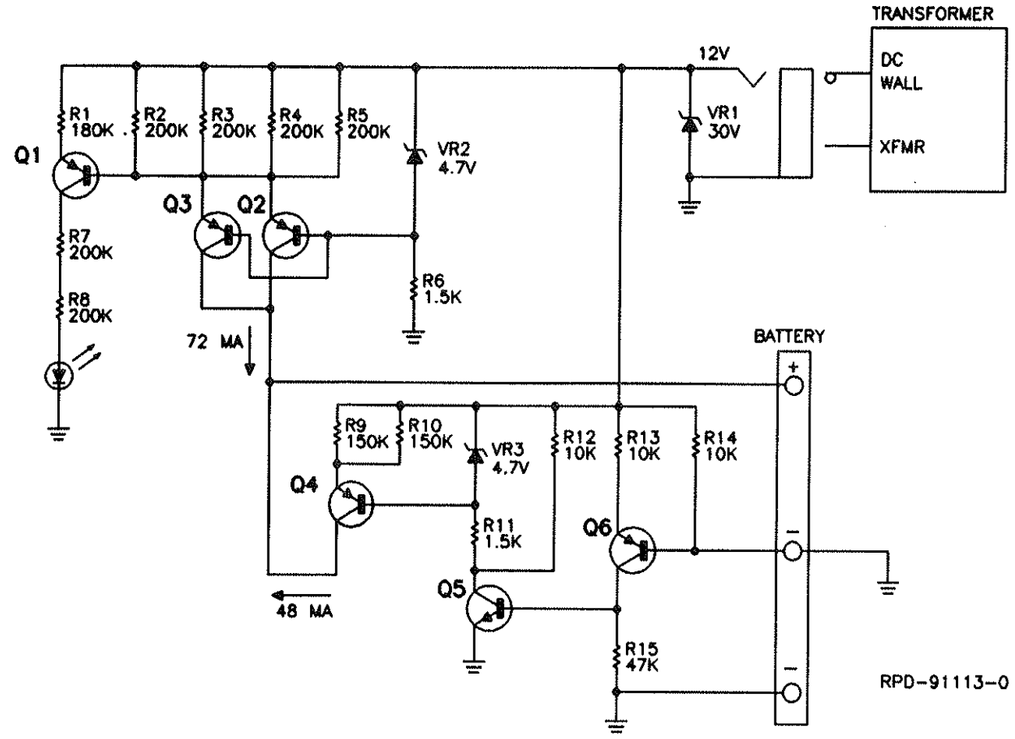
Schematic Diagram for HLE9674B and HLE9676B UHF Main Boards, 438-470 MHz (sheet 1 of 2)



Schematic Diagram for HLE9674B and HLE9676B UHF Main Boards, 438-470 MHz (sheet 2 of 2)



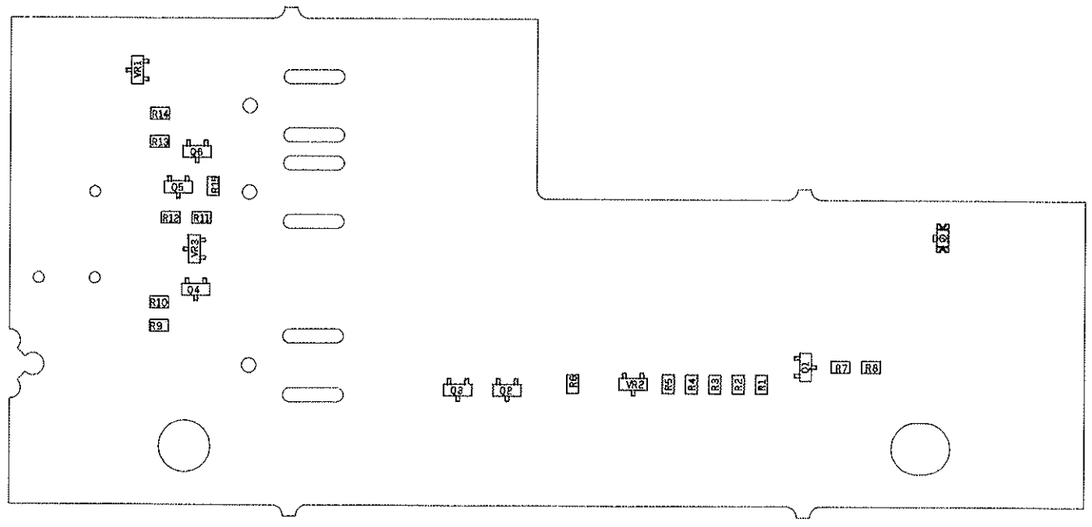
R497
470
01-80702489 BATT FILTER BD
SCI
C3
39
BATTERY
THERMAL FUSE
OFF
ON
(P/O VOL)
CR405
C1
NU
L1
C2
39
L2
F1
4A
C4
39
CHG +
CHG −
U404
5V REG
C421
0.47U
5V (SOURCE)
C418
10U
C419
.018U
SW B+ (SOURCE)
• CONNECTION VIA CHASSIS
SW B+
5V
R470
1K
R471
10K
R472
1K
R473
1K
R474
10K
R475
10K
SYN LE
DAC LE
SR CLOCK
SR DATA
LOCK DET
CSQ DET
C458
NU
SQ ATTN IN
SQ ATTN OUT
DET AUDIO
C435
0.1U
215MV RMS (25KHZ MODEL)
105MV RMS (12.5KHZ MODEL)
(NOTE 9)
310MV RMS (25KHZ MODEL)
150MV RMS (12.5KHZ MODEL)
(NOTE 11)
C478
1000
2.5VDC
4 BIT
5 BIT
C449
1U
R478
30K
R479
10K
VCO MOD
2.5VDC
MOD IN
GCB3
GCB5
GCB1
RX OUT
VAG BYPASS
GND
MIC POWER
PA ENABLE
RX AUDIO MUTE
C414
0.1U
C434
0.1U
PCP
DCP
C412
1U
C413
0.47U
R431
51K
340MV DC (NOTE 11)
C423
0.47U
R442
1.8M
CR404
N.C.
R443
100K
5V
R444
20K
U406B
VOX
R445
1.8M
R491
10K
R493
330K
C451
.015U
R492
7.5K
C445
.018U
R447
5.6K
C424
240
C425
.039U
R448
51K
R450
10K
C480
150
R462
470K
2.5V
Q409
MMBT3906
2.5VDC
45MV RMS (NOTE 11)
U407B
MIC FILTER
C426
.018U
C427
.018U
L403
0.39
C428
150
VR401
10V
C436
150
11.0MV RMS (NOTE 11)
4.5VDC
C481
150
J3
EXT MIC
R449
100K
R451
2.2K
Q408
MMBT3906
C410
150
C409
150
R463
47K
TO U401-PIN 54
R494
100K
L404
0.39
CR406
R498
NU
R452
180K
R503
330
C452
4.7U
C429
4700
NU
J5
P5
Q407
MMBT3906
R453
2.2K
C430
150
MK401
INT MIC
R454
100K
C463
0.1U
AUDIO PA
LO=MUTED
HI=ENABLED
MIC AUDIO
HI=MUTED
LO=ENABLED
DE-EMPHASIS AMP
R458
6.8K
C431
.012U
R457
68K
SW B+
C432
.039U
TX AUDIO
SCI
450MV RMS (NOTE 9)
R455
30K
R456
4.7K
U407A
Q406
MMBT3906
C433
0.47U
C440
47
C437
.039U
UNMUTED FLAT RX AUDIO
2.5VDC
RX AUDIO
170MV RMS (NOTE 9)
0VDC
R459
820K
R460
VOLUME
10K
CW
R464
1.8K
R465
510K
R466
4.7K
R461
22
35MV RMS (NOTE 10)
0VDC
P1 — KEYPAD/DISPLAY
R507
1K
R489
2.7
1/8W
R490
2.7
1/8W
Q412
MMBT3906
C438
4.7U
Q410
M41L03
C461
0.1U
C464
0.1U
R488
220K
U405B
R496
330
Q411
MMBTA13
C479
470
3.8VDC
R467
10
C441
0.1U
U409
AUDIO PA
TDA7052
L405
0.39
2.83V RMS (NOTE 10)
L406
0.39
C443
1000
C442
1000
LS401
INT SPKR
16Ω
J4
EXT SPKR
RPD-91104-B

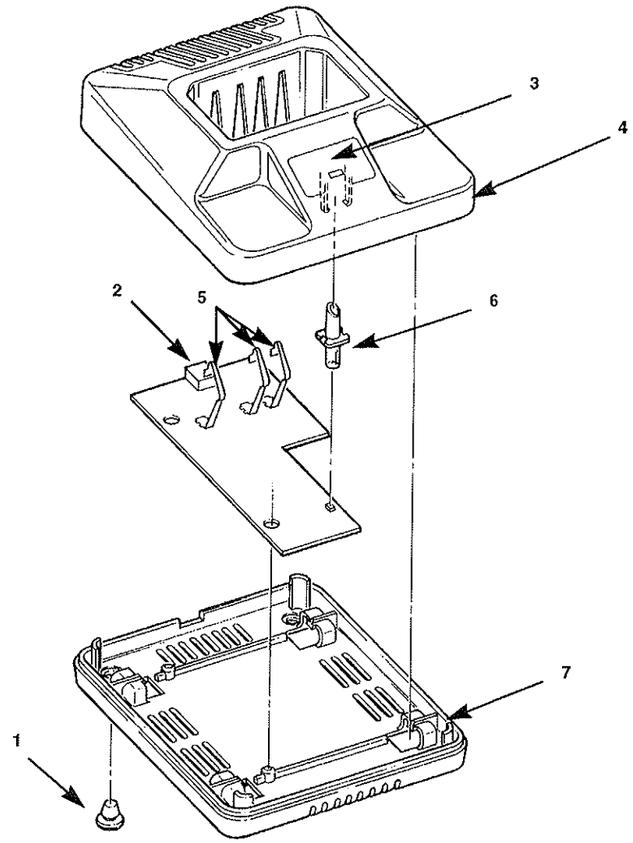


parts list

(16/Hr Standard rate charger, Electrical)

REF SYMBOL	MOTOROLA PART NUMBER	DESCRIPTION
		Resistors, chip, 5%, 1/8W, unless otherwise specified
R1	06-60076A31	180 k
R2 - R5	06-60076A32	200 k
R6	06-60076A53	1.5 k
R7 - R8	06-60076A32	200 k
R9 - R10	06-60076A29	150 k
R11	06-60076A53	1.5 k
R12 - R14	06-60076A73	10 k
R15	06-60076A89	47 k
		Diodes
VR1	48-11058B05	ZENER, 30V
VR2	48-80140L05	ZENER, 4.7V
VR3	48-80140L05	ZENER, 4.7V
		Transistors
Q1	48-05128M94	PNP
Q2 - Q4	48-11056B02	PNP
Q5	48-80214G02	NPN
Q6	48-05128M94	PNP





Parts List

10 Hour Standard Rate Charger, Mechanical — PL-941004-O

REFERENCE SYMBOL	MOTOROLA PART NO.	DESCRIPTION
1	05-00812634	Rubber feet; 4 used
2	09-02157J01	DC Power Jack; 1 used
3	13-80403B03	Escutcheon - slow charger; 1 used
4	15-80952Z01	Housing, top; 1 used
5	39-80953Z01	Contact, charging; 3 used
6	61-80966Z01	Lightpipe, charger; 1 used
7	64-80951Z01	Base, charger; 1 used
--	33-80154S01	Charger label; 1 used