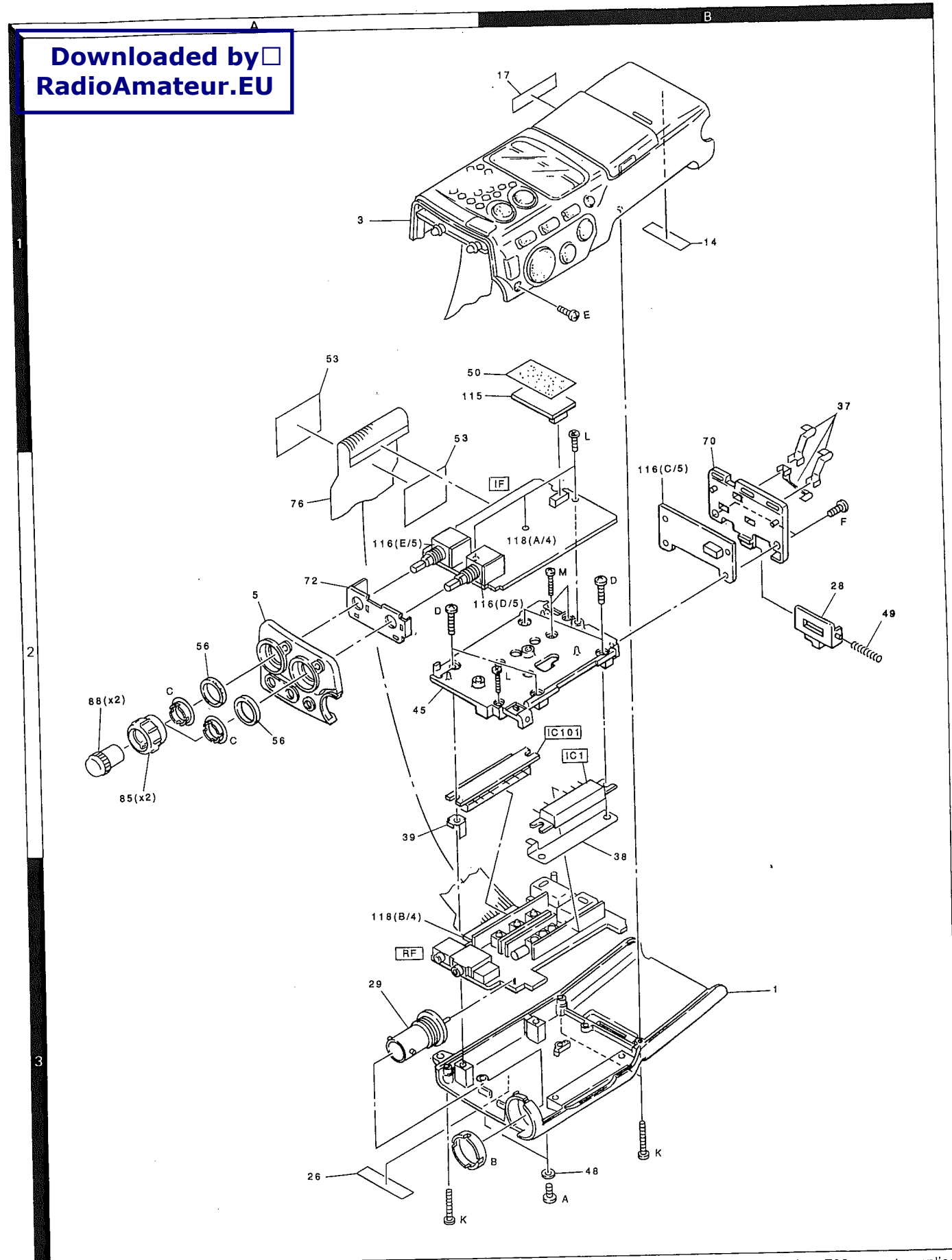


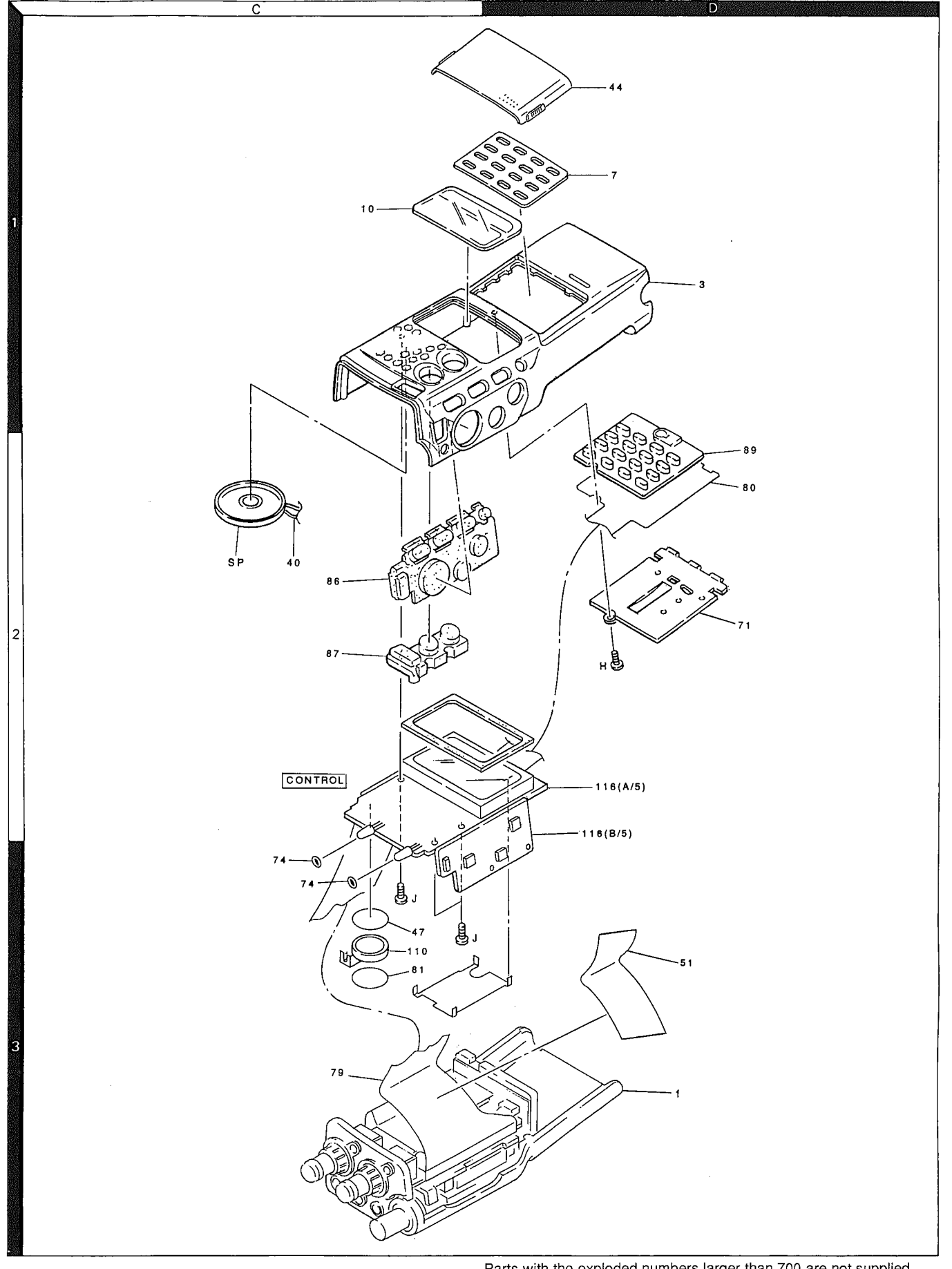
DISASSEMBLY

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Parts with the exploded numbers larger than 700 are not supplied.

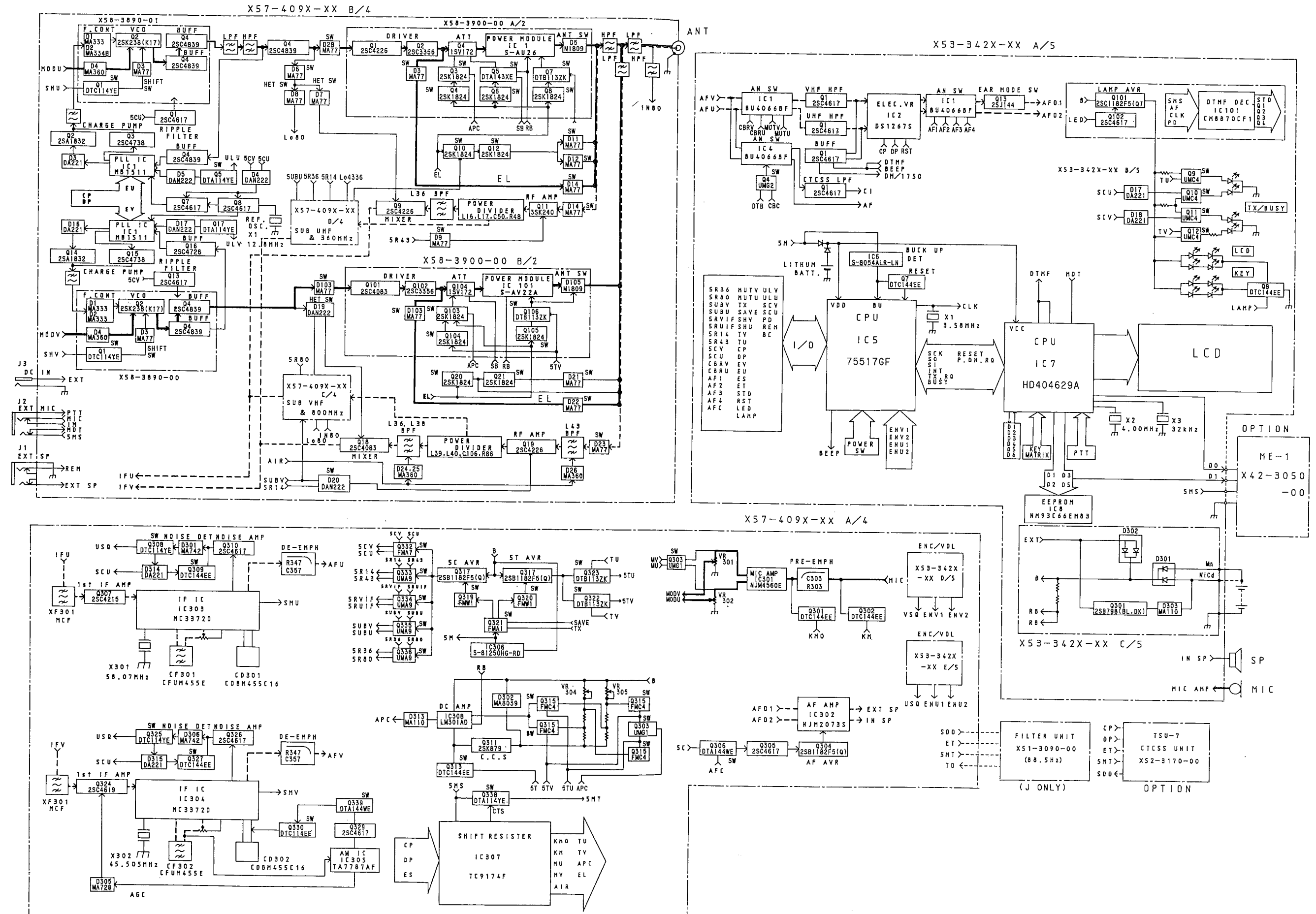
DISASSEMBLY



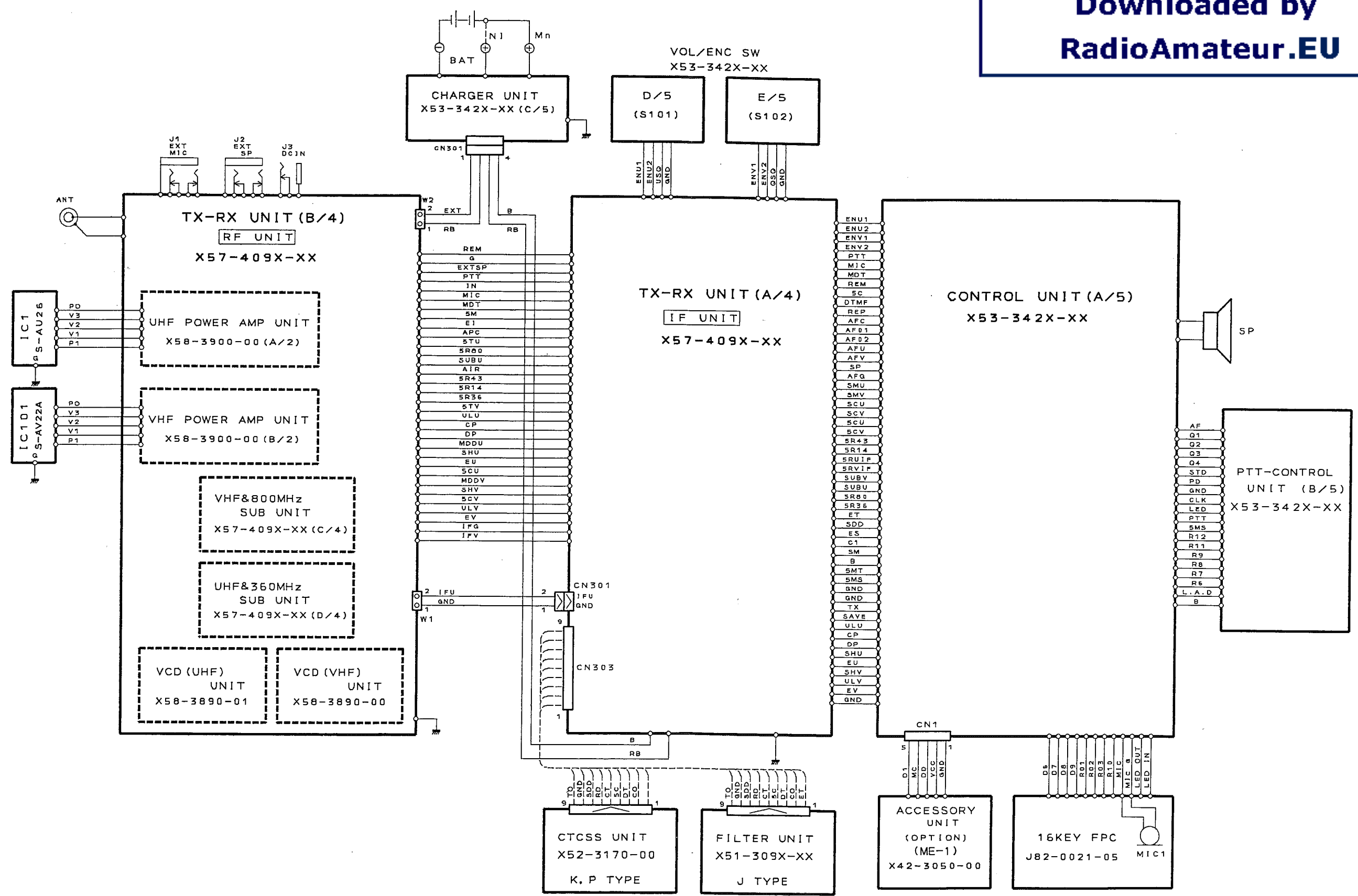
Parts with the exploded numbers larger than 700 are not supplied.

BLOCK DIAGRAM

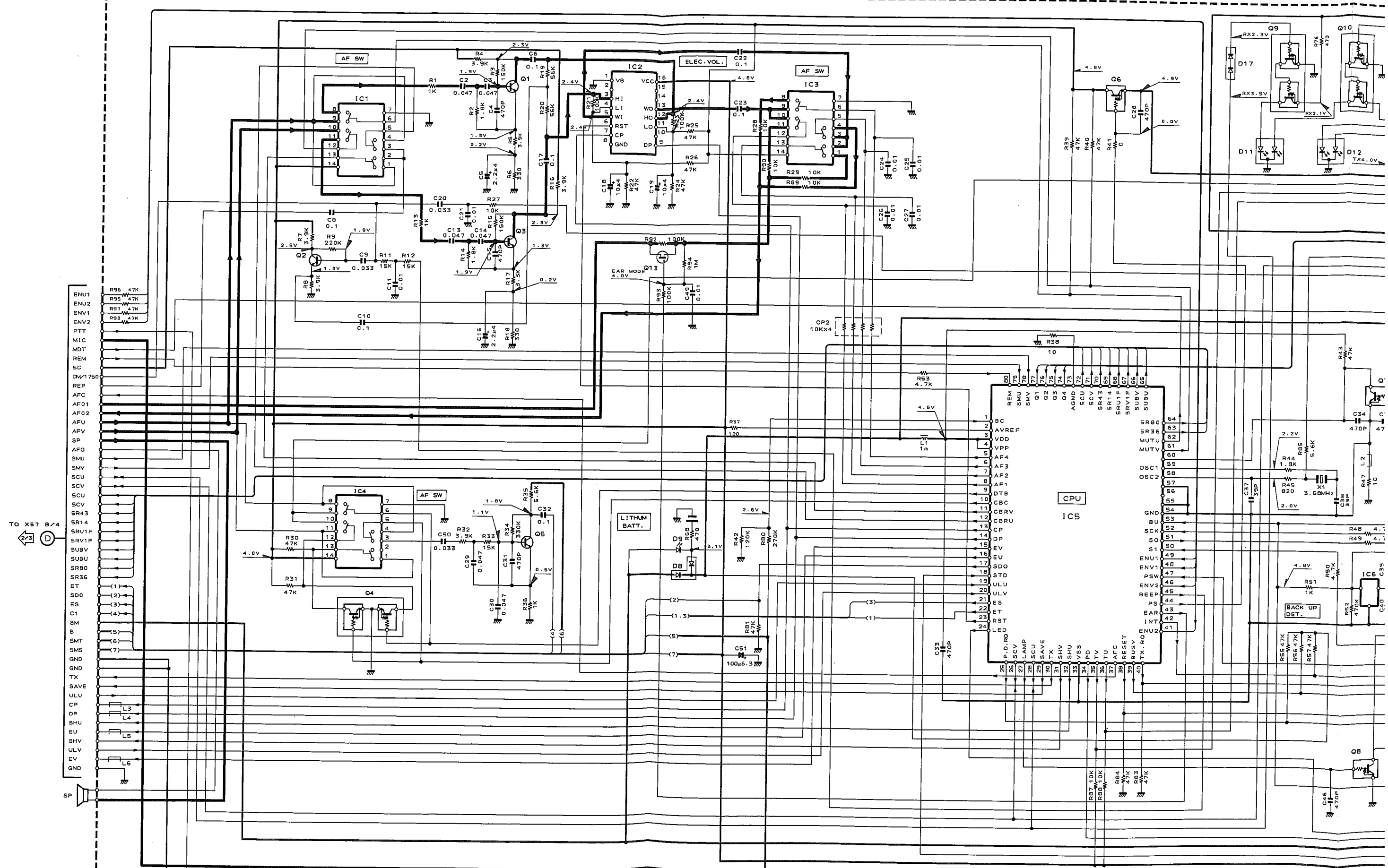
TH-78A/E TH-78A/E



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RadioAmateur.EU



CONTROL UNIT (X53-342X-XX) A/5 0-11: K, P 0-21: M 0-22: M2 0-71: X 2-71: T, E, E3 2-72: E2



- ENU1
- ENU2
- ENV1
- ENV2
- PTT
- MIC
- MDT
- REM
- SC
- DM/1750
- REP
- AFC
- AF01
- AF02
- AFU
- AFV
- SP
- AFG
- SMU
- SMV
- SCU
- SCV
- SCU
- SCV
- SR43
- SR14
- SRU1F
- SRV1F
- SUBV
- SUBU
- SR80
- SR36
- ET
- SD0
- ES
- C1
- SM
- B
- SMT
- SMS
- GND
- TX
- SAVE
- ULU
- CP
- DP
- SHU
- EU
- SHV
- ULV
- EV
- GND
- SP

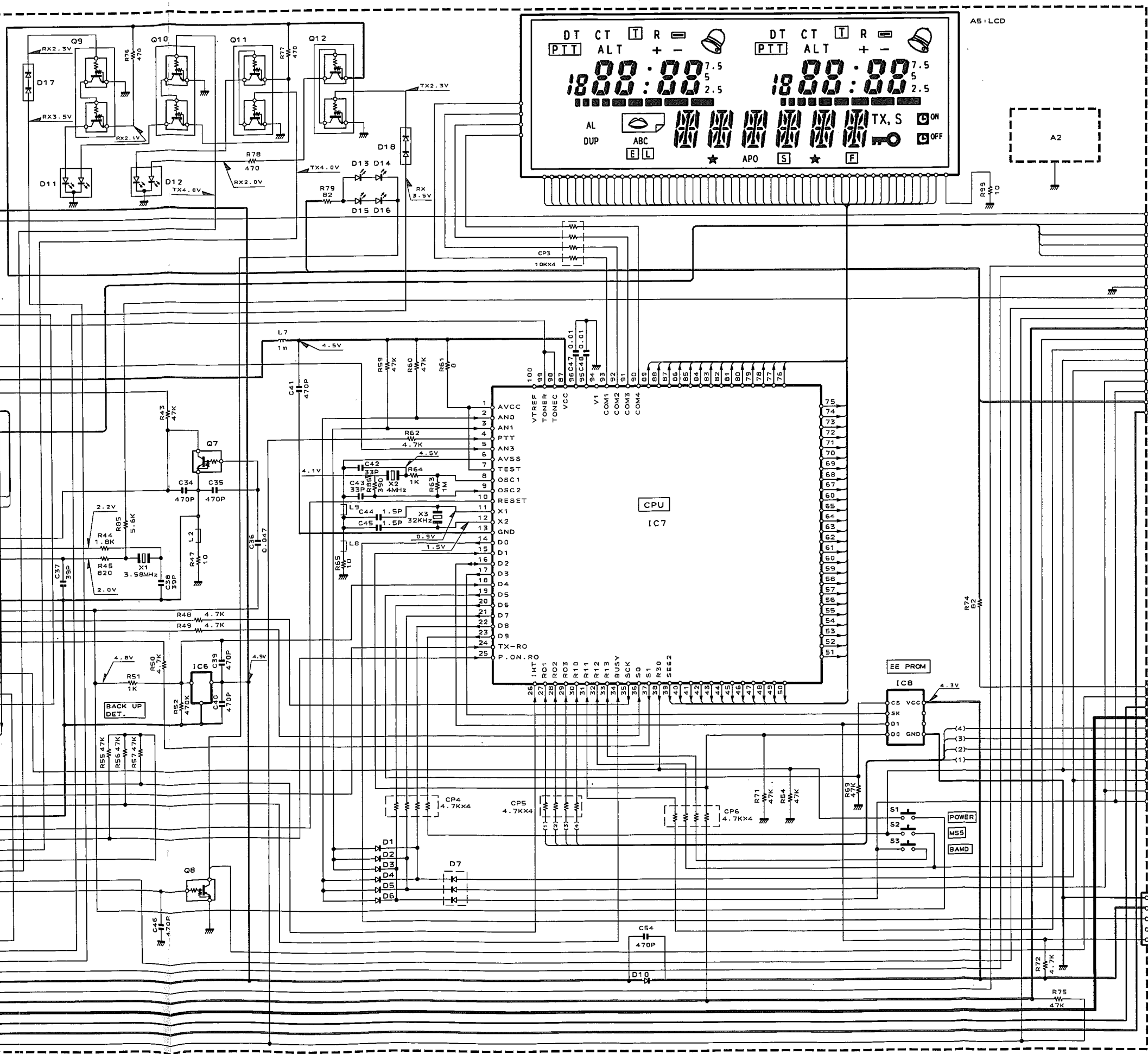
TO X57 B/4

- REM
- SMU
- SMV
- Q1
- Q2
- Q3
- Q4
- AGND
- SCU
- SCV
- SR43
- SR14
- SRU1F
- SRV1F
- SUBV
- SUBU
- SR80
- SR36
- MUTV
- OSC1
- OSC2
- GND
- BU
- SKR
- SO
- S1
- ENV1
- ENV2
- PSW
- BEEP
- PS
- EAR
- INT
- ENU2
- P.D.RO
- SCV
- LAMP
- SCU
- SAVE
- TX
- SHV
- SHU
- VSS
- PV
- TU
- AFG
- RESET
- BUSY
- TX.RO

CPU IC5

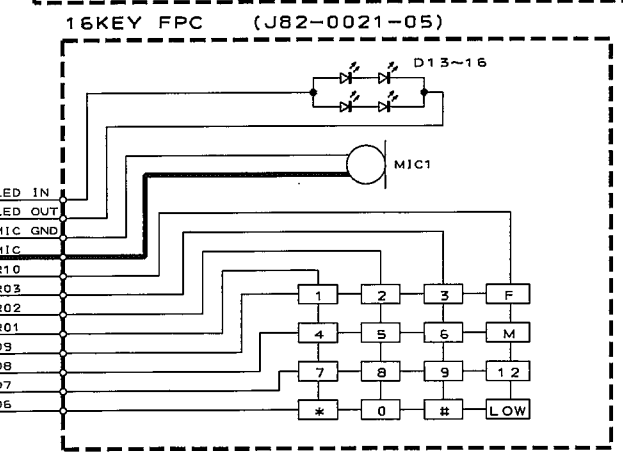
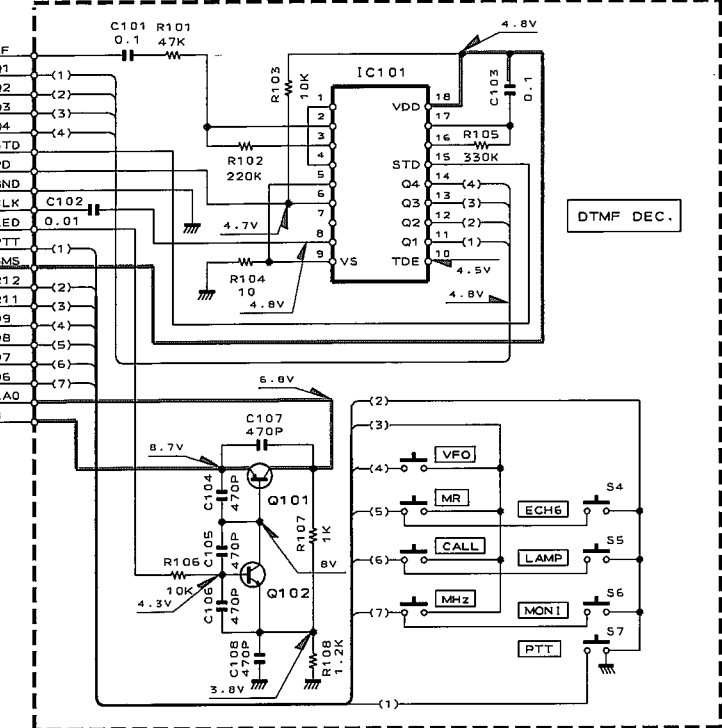
BACK UP DET.

2
3
4
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6
7



DESTINATION	Ref. NO			
	D2	D3	D5	D6
0-00 (J)	NO	NO	NO	YES
0-11 (K,P)	YES	YES	YES	YES
0-21 (M)	YES	NO	YES	YES
0-22 (M2)	YES	NO	YES	NO
0-71 (X)	NO	YES	NO	NO
2-71 (T,E,S)	NO	YES	YES	YES
2-72 (E2)	NO	YES	YES	NO

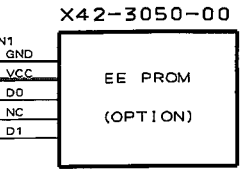
IC101 : CM8870CF1
 Q102 : 2SC4617 (R)
 Q101 : 2SB1182F5 (G)



- X53-3420-00 A/5
- IC1, 3, 4 : BU4066BF
 - IC2 : DS12675-10
 - IC5 : 75517GF-123-3B9
 - IC6 : S-8054ALR-LN
 - IC7 : HD404629A20H
 - IC8 : NM93C66EM83

- Q1~3, 5 : 2SC4617 (R)
- Q4 : UMG2
- Q6 : DTA124EU
- Q7 : DTC144EE
- Q8 : 2SK1824
- Q9~12 : UMC4
- Q13 : 2SJ144 (GR)

- D1~6, 10 : MA110
- D7 : 1MN10
- D8 : MA741WK
- D9 : B30-0897-05
- D11, 12 : B30-2039-05
- D13~16 : B30-2033-05
- D17, 18 : DA221

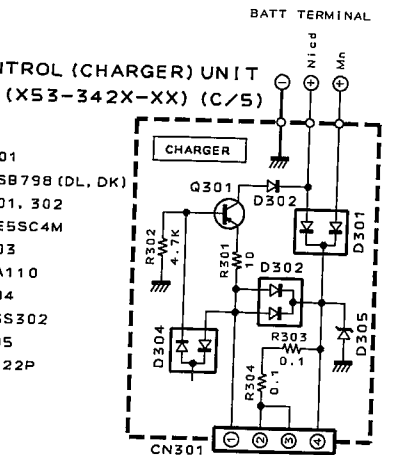


— SIGNAL LINE
 — GND LINE
 — +B LINE

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CONTROL (CHARGER) UNIT
(X53-342X-XX) (C/5)

- Q301 : 2SB798 (DL, DK)
- D301, 302 : DE5SC4M
- D303 : MA110
- D304 : 1SS302
- D305 : RD22P



(X53-) (D/5)

(X53-) (E/5)

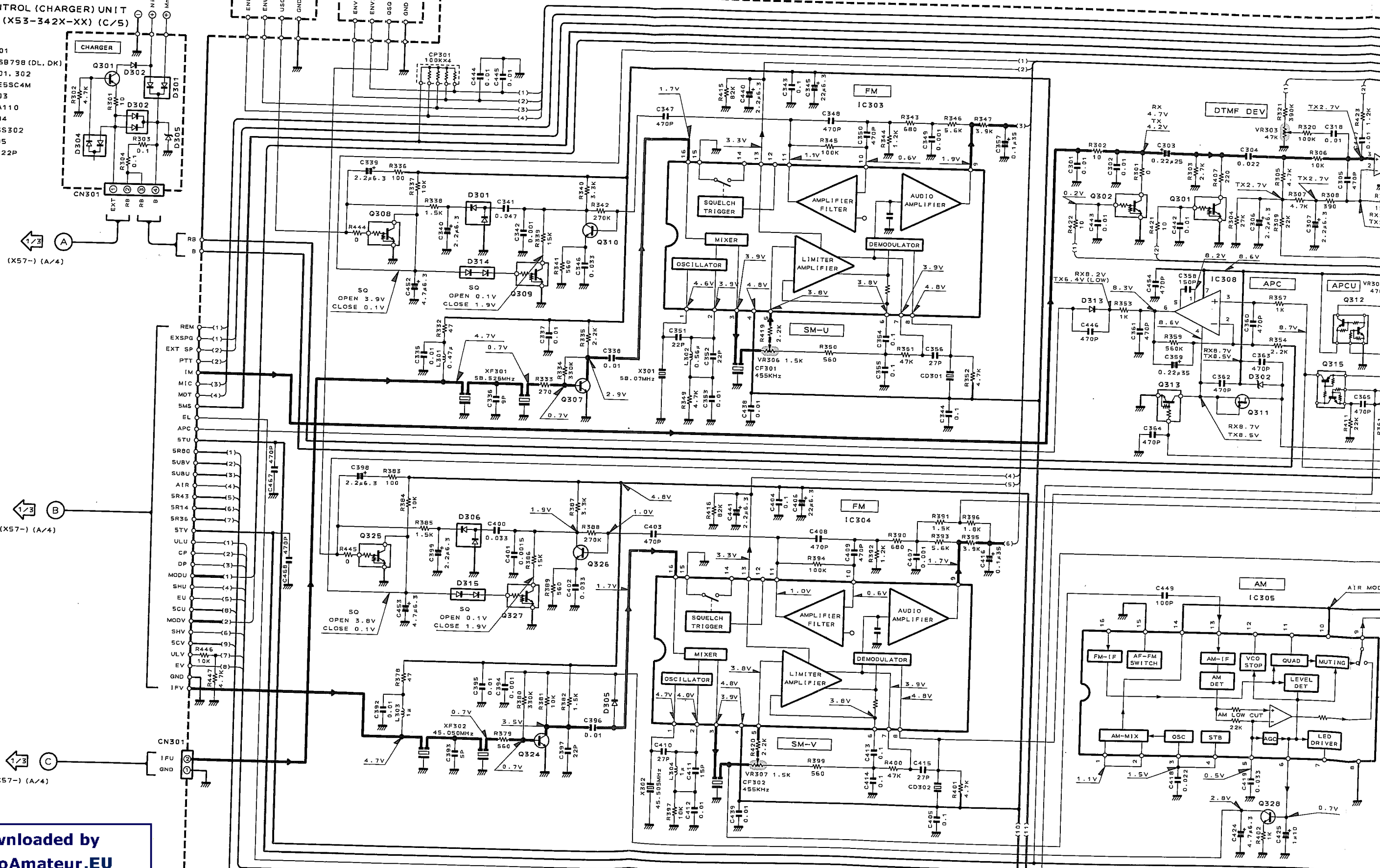
TR-RX UNIT (IF) (X57-409X-XX) (A/4) 0-11: K, P 2-71: T, X, E, E2, E3, M, M2

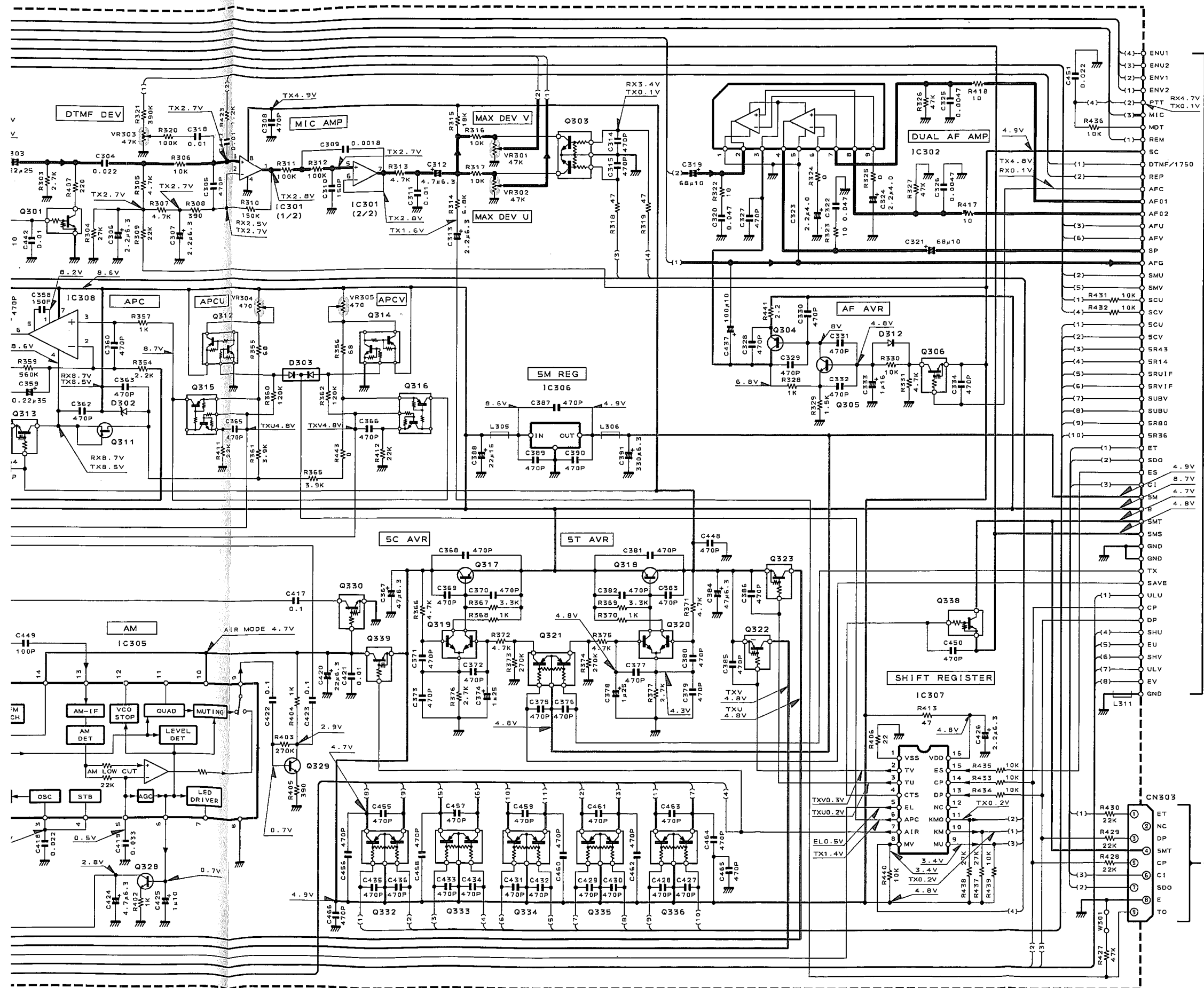
(X57-) (A/4)

(X57-) (A/4)

(X57-) (A/4)

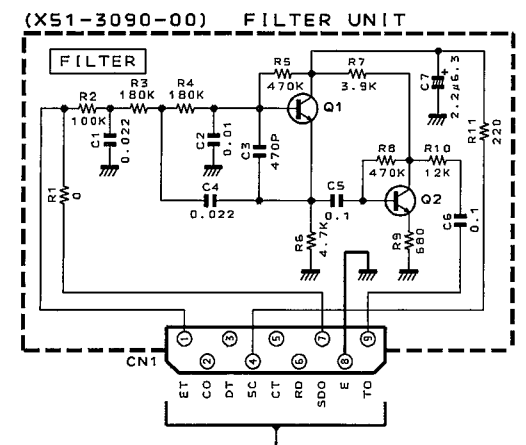
- REM (1)
- EXSPG (1)
- EXT SP (2)
- PTT (2)
- IM (3)
- MIC (3)
- MDT (4)
- SMS (4)
- EL (4)
- APC (4)
- STU (4)
- SR80 (1)
- SUBV (2)
- SUBU (3)
- AIR (4)
- SR43 (5)
- SR14 (6)
- SR36 (7)
- STV (7)
- ULU (1)
- CP (2)
- DP (3)
- MODU (1)
- SHU (4)
- SCU (5)
- MODV (2)
- SHV (6)
- SCV (9)
- ULV (7)
- EV (8)
- GND
- IFV



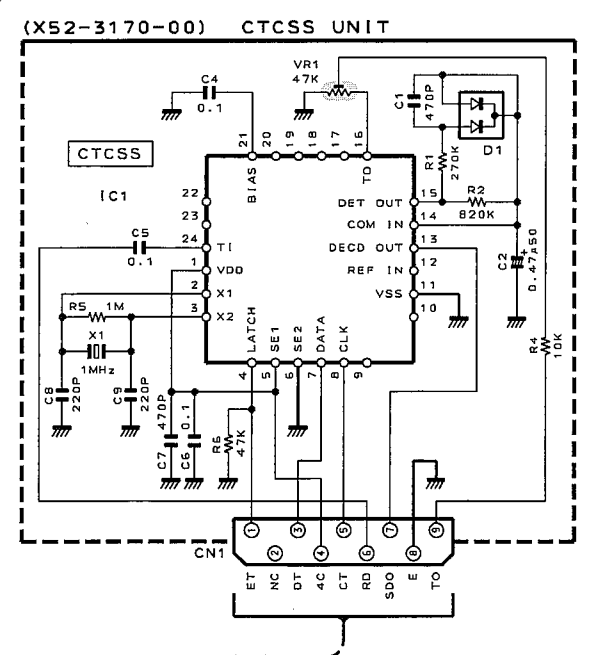


IC301	: NJM4560E	D301, 306	: MA742
IC302	: NJM2073S	D302	: MA8039
IC303, 304	: MC3372D	D303	: DAN222
IC305	: TA7787AF	D305	: MA728
IC306	: S-81250HG-RD	D312, 313	: MA110
IC307	: TC9174F	D314, 315	: DA221
IC308	: LM301AD		
Q301, 302, 309, 313, 327, 330	: DTC144EE		
Q303	: UMG1		
Q304, 317, 318	: 2S81182F5 (Q)		
Q305, 310, 326, 328, 329	: 2SC4617 (R)		
Q306, 339	: DTA144WE		
Q307	: 2SC4215 (Y)		
Q308, 325	: DTC114YE		
Q311	: 2SK879 (Y)		
Q312, 314			
315, 316	: FMC4		
Q319, 320	: FMW1		
Q321	: FMA1		
Q322, 323	: DTB113ZK		
Q324	: 2SC4619 (P, Q)		
Q332	: FMA7		
Q333-336	: UMA9		
Q338	: DTA114YE		

(X53-) (A/S)



Q1	: 2SC4116 (GR)
Q2	: 2SC4116 (Y)



IC1	: FX365LS
D1	: DAN202U

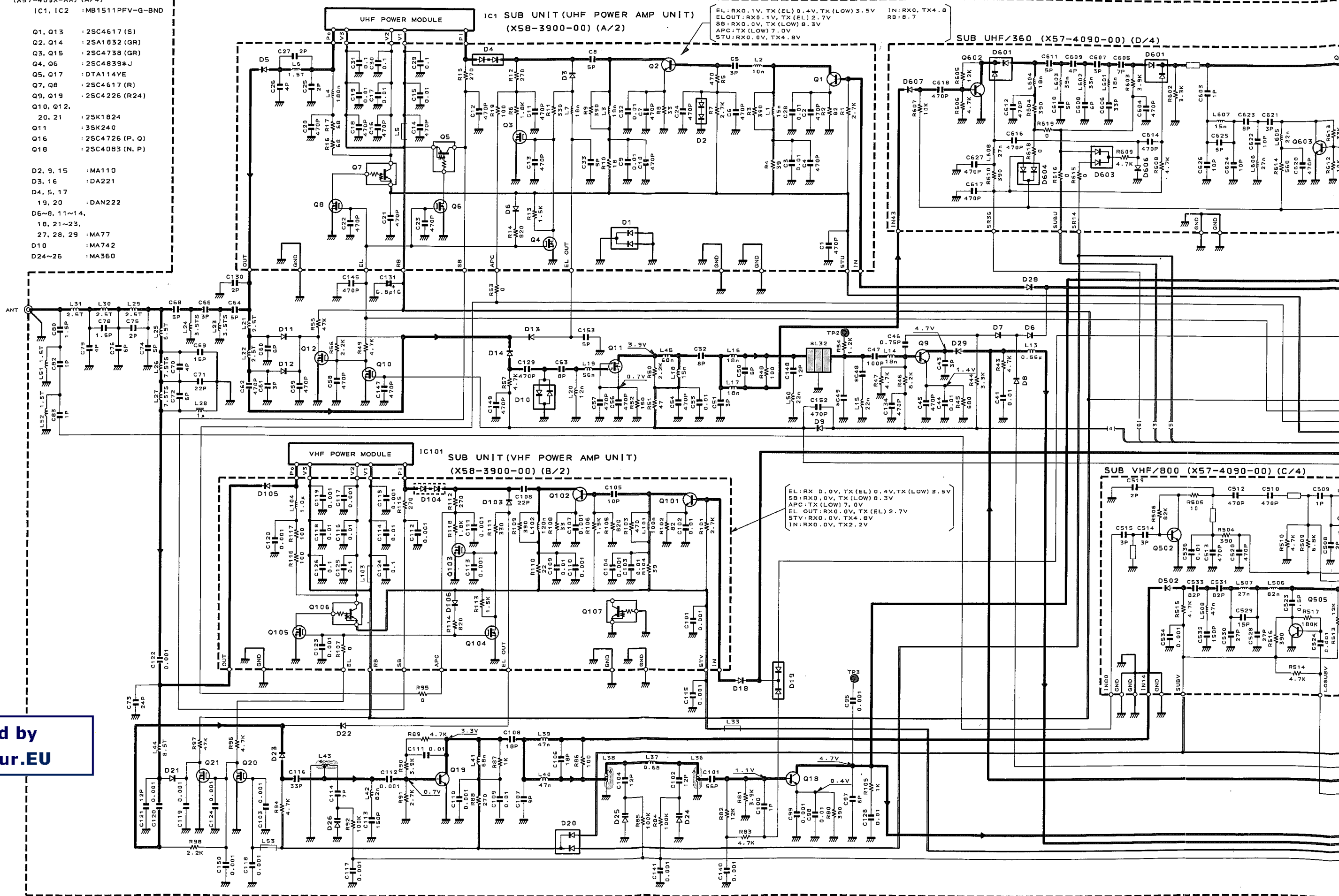
——— SIGNAL LINE
 ——— GND LINE
 ——— +B LINE
 - - - - - -B LINE

(X57-409X-XX) (A/4)
 IC1, IC2 : MB1511PFV-G-BND

Q1, Q13 : 2SC4617 (S)
 Q2, Q14 : 2SA1832 (GR)
 Q3, Q15 : 2SC4738 (GR)
 Q4, Q6 : 2SC4839KJ
 Q5, Q17 : DTA114YE
 Q7, Q8 : 2SC4617 (R)
 Q9, Q19 : 2SC4226 (R24)
 Q10, Q12, 20, 21 : 2SK1824
 Q11 : 3SK240
 Q16 : 2SC4726 (P, Q)
 Q18 : 2SC4083 (N, P)

D2, 9, 15 : MA110
 D3, 16 : DA221
 D4, 5, 17, 19, 20 : DAN222
 D6~8, 11~14, 18, 21~23, 27, 28, 29 : MA77
 D10 : MA742
 D24~26 : MA360

TX-RX UNIT (RF) (X57-409X-XX) (B/4) 0-11: K, P 2-71: T, X, E, E2, E3, M, M2



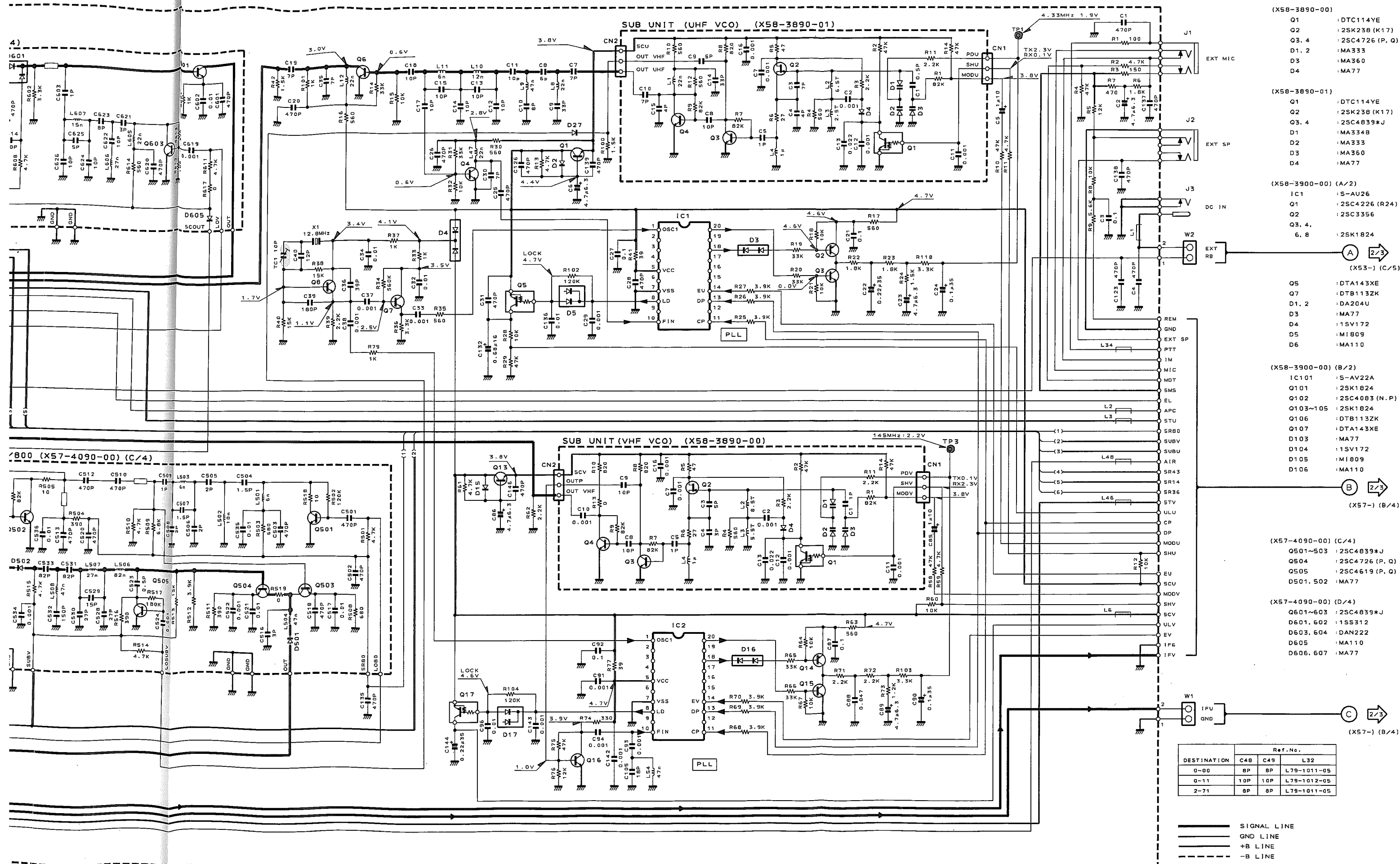
EL: RX 0.1V, TX (EL) 0.4V, TX (LOW) 3.5V
 EL OUT: RX 0.1V, TX (EL) 2.7V
 SB: RX 0.0V, TX (LOW) 8.3V
 APC: TX (LOW) 7.0V
 STV: RX 0.0V, TX 4.8V

IN: RX 0, TX 4.8
 RB: 8, 7

EL: RX 0.0V, TX (EL) 0.4V, TX (LOW) 3.5V
 SB: RX 0.0V, TX (LOW) 8.3V
 APC: TX (LOW) 7.0V
 STV: RX 0.0V, TX (EL) 2.7V
 IN: RX 0.0V, TX 2.2V

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TX-RX UNIT (RF)



- (X58-3890-00)
- Q1 : DTC114YE
 - Q2 : 2SK238 (K17)
 - Q3, 4 : 2SC4726 (P, Q)
 - D1, 2 : MA333
 - D3 : MA360
 - D4 : MA77

- (X58-3890-01)
- Q1 : DTC114YE
 - Q2 : 2SK238 (K17)
 - Q3, 4 : 2SC4839*J
 - D1 : MA334B
 - D2 : MA333
 - D3 : MA360
 - D4 : MA77

- (X58-3900-00) (A/2)
- IC1 : S-AU26
 - Q1 : 2SC4226 (R24)
 - Q2 : 2SC3356
 - Q3, 4, 6, 8 : 2SK1824

- (X53-) (C/5)
- Q5 : DTA143XE
 - D7 : DTB113ZK
 - D1, 2 : DA204
 - D3 : MA77
 - D4 : 1SV172
 - D5 : MI809
 - D6 : MA110

- (X58-3900-00) (B/2)
- IC101 : S-AV22A
 - Q101 : 2SK1824
 - Q102 : 2SC4083 (N, P)
 - Q103~105 : 2SK1824
 - Q106 : DTB113ZK
 - Q107 : DTA143XE
 - D103 : MA77
 - D104 : 1SV172
 - D105 : MI809
 - D106 : MA110

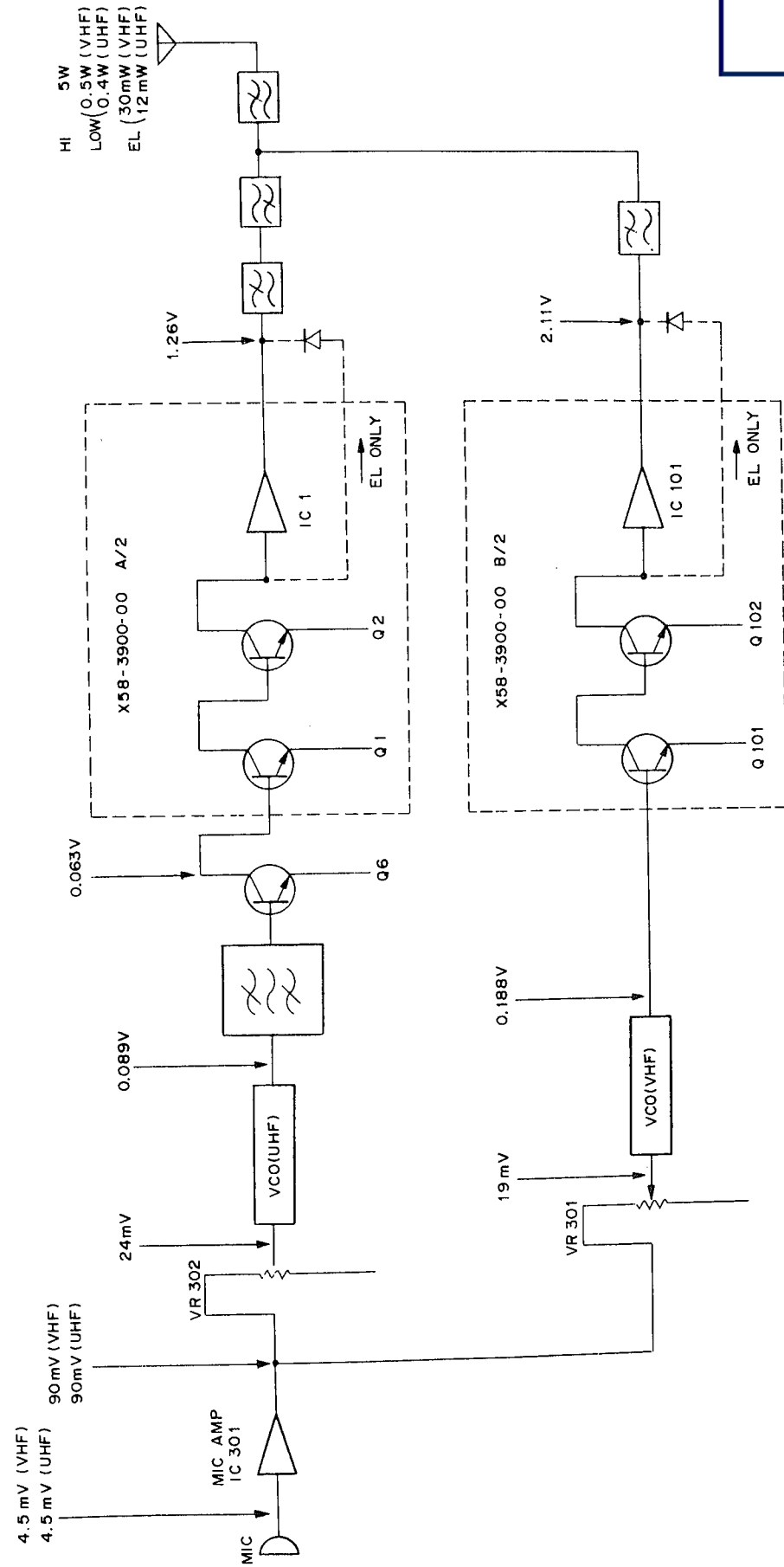
- (X57-4090-00) (C/4)
- Q501~503 : 2SC4839*J
 - Q504 : 2SC4726 (P, Q)
 - Q505 : 2SC4619 (P, Q)
 - D501, 502 : MA77

- (X57-4090-00) (D/4)
- Q601~603 : 2SC4839*J
 - D601, 602 : 1SS312
 - D603, 604 : DAN222
 - D605 : MA110
 - D606, 607 : MA77

DESTINATION	Ref. No.			
	C48	C49	L32	
0-00	8P	8P	L79-1011-05	
0-11	10P	10P	L79-1012-05	
2-71	8P	8P	L79-1011-05	

— SIGNAL LINE
 — GND LINE
 — +B LINE
 - - - -B LINE

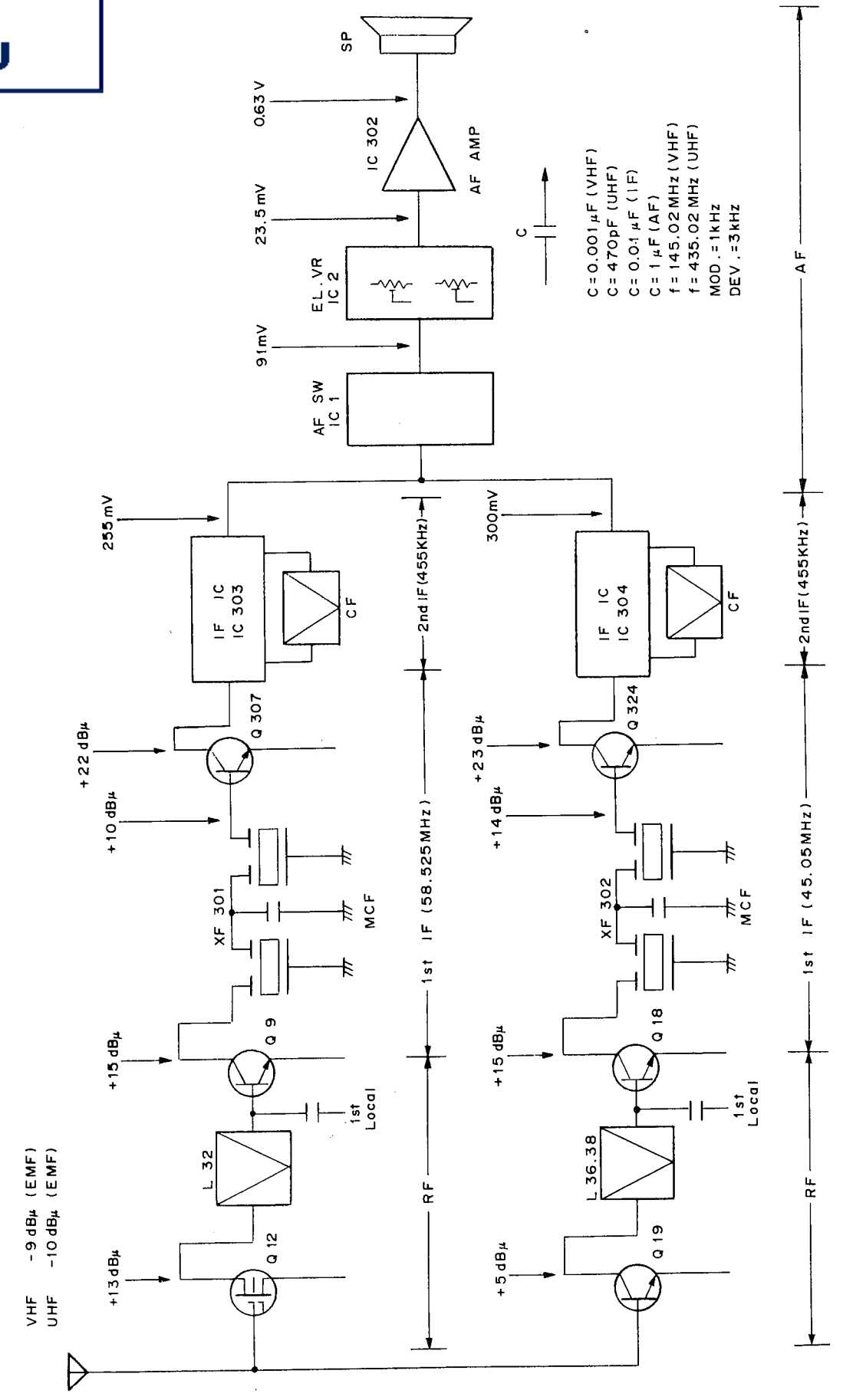
LEVEL DIAGRAM



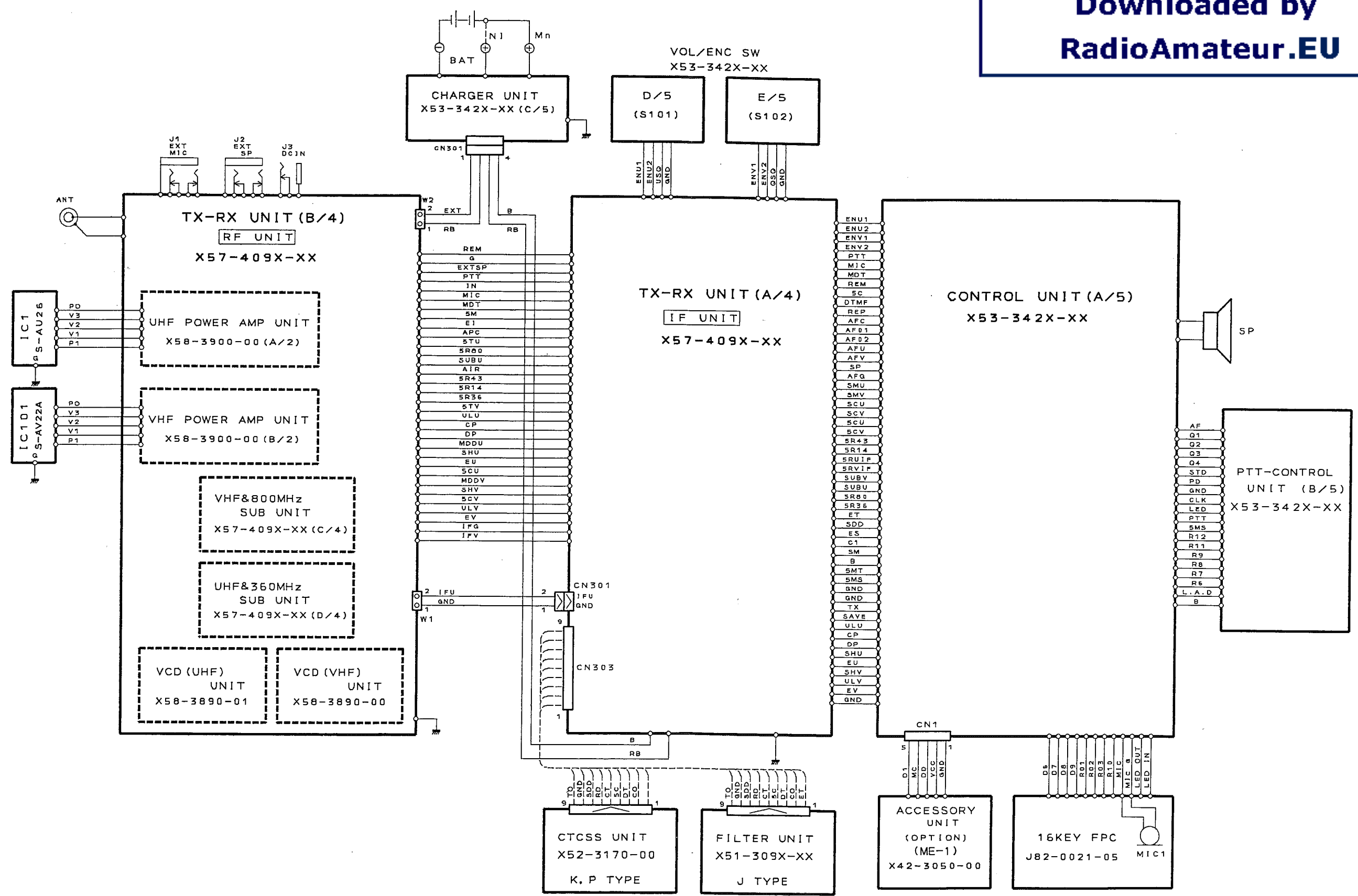
* All sent in an EL level.

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LEVEL DIAGRAM



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UNIT BOARDS

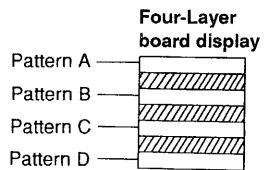
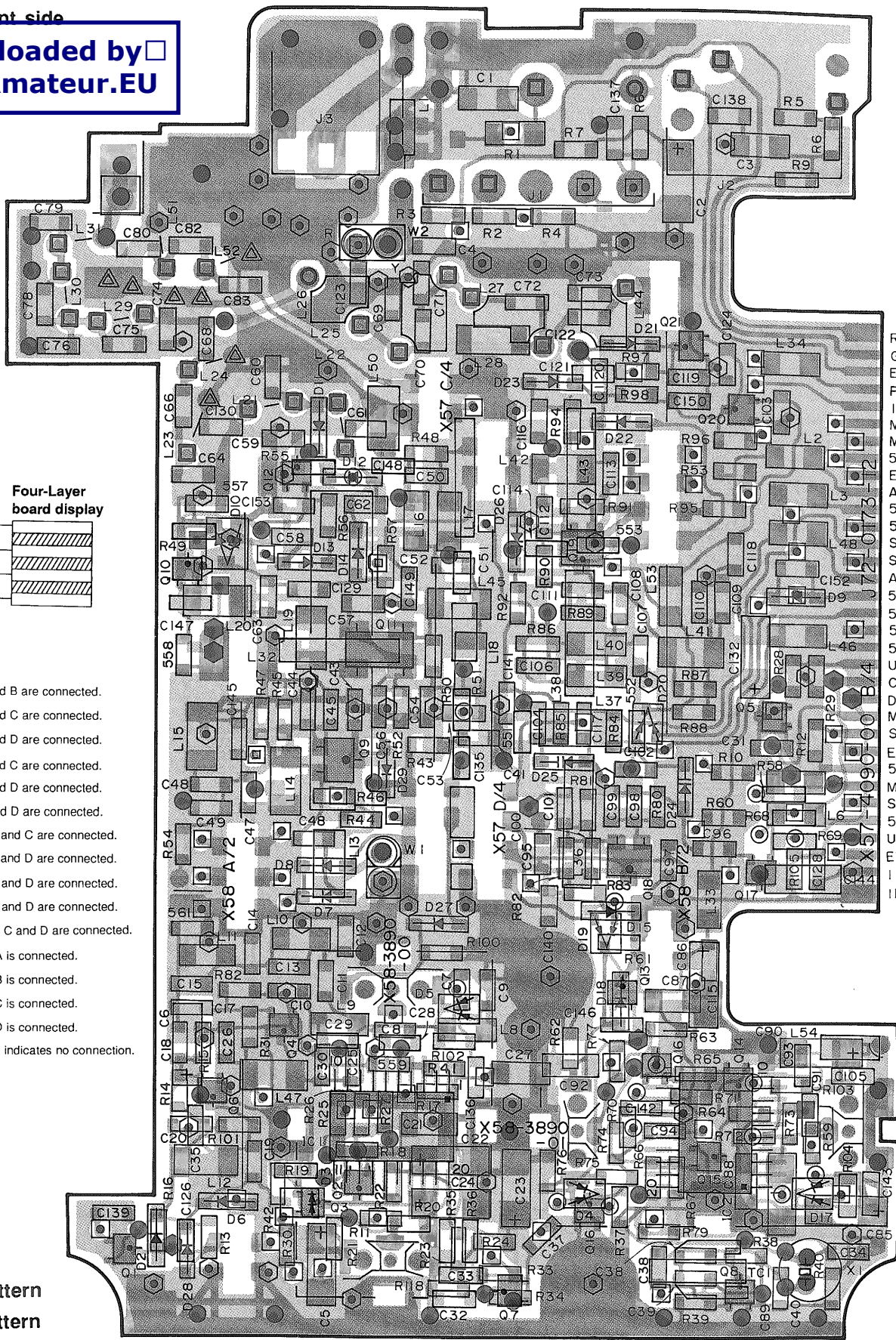
TX-RX UNIT·RF (X57-409X-XX) B/4 0-11: K, P 2-71: T, X, E, E2, E3, M, M2

TH-78A/E


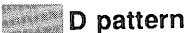
Component side

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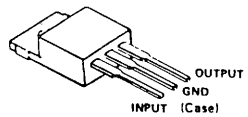


- Patterns A and B are connected.
 - ⊙ Patterns A and C are connected.
 - Patterns A and D are connected.
 - △ Patterns B and C are connected.
 - ▲ Patterns B and D are connected.
 - Patterns C and D are connected.
 - ⊙ Patterns A, B and C are connected.
 - ⊙ Patterns A, B and D are connected.
 - Patterns A, C and D are connected.
 - Patterns B, C and D are connected.
 - △ Patterns A, B, C and D are connected.
 - Only pattern A is connected.
 - ◇ Only pattern B is connected.
 - ▲ Only pattern C is connected.
 - Only pattern D is connected.
- The non-mark indicates no connection.

 A pattern
 D pattern

REM
G
EXTS
PTT
IM
MIC
MDT
5MS
EL
APC
5TU
5R80
SUBV
SUBU
AIR
5R43
5R14
5R36
5TV
ULU
CP
DP
MODU
SHU
EU
5CU
MODV
SHV
5CV
ULV
EV
1F6
1FV

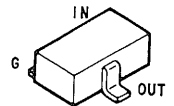
MA110
MA8039



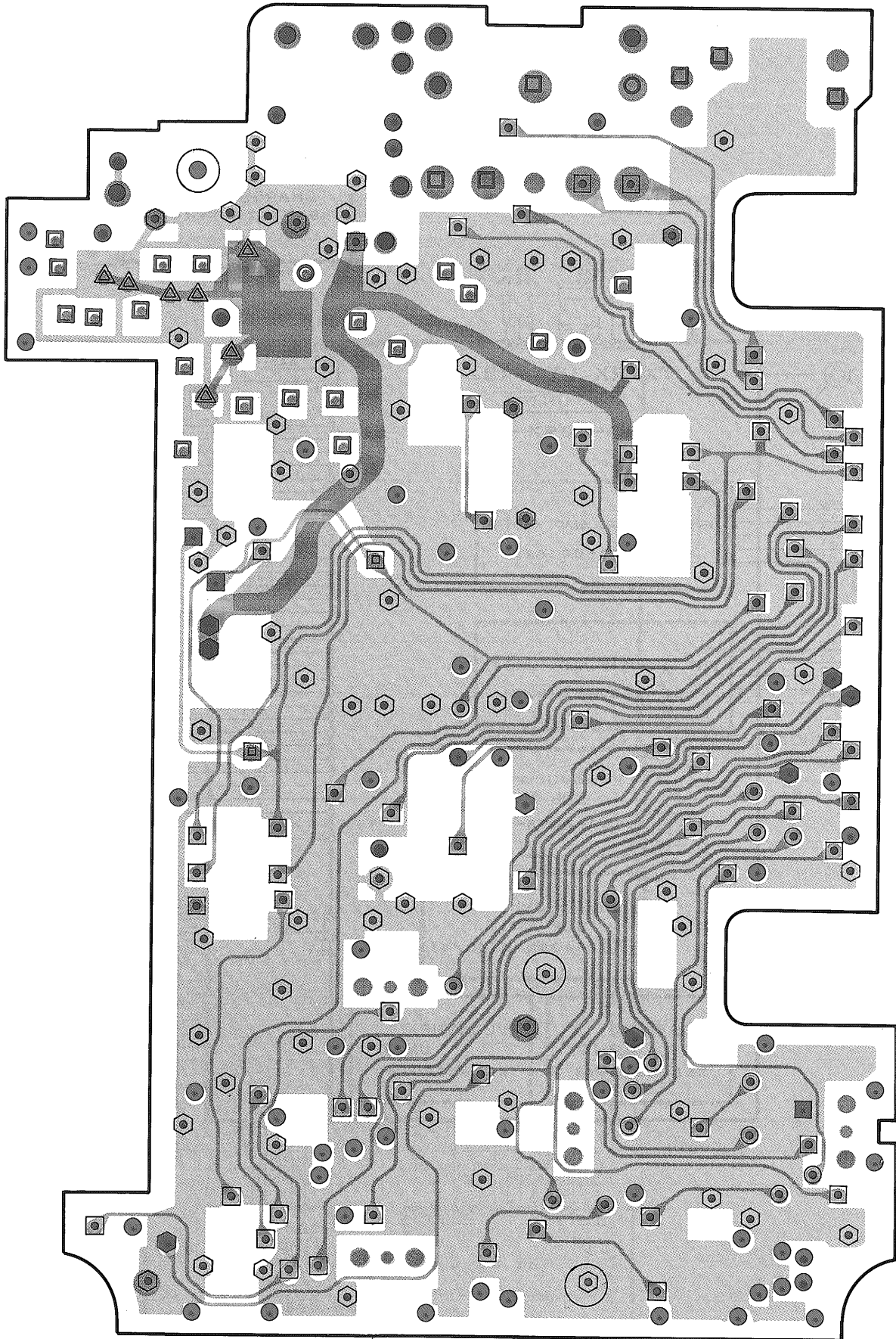
DTB113ZK
2SC4215
2SC4617
2SC4619





DTA114YE
DTA144WE
DTC114EE
DTC114YE
DTC144EE

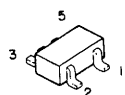


TH-78A/E

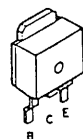


 B pattern
 C pattern

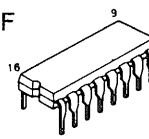
FMA1
FMC4
FMW1



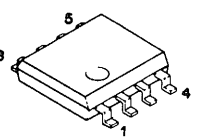
2SB1182F5



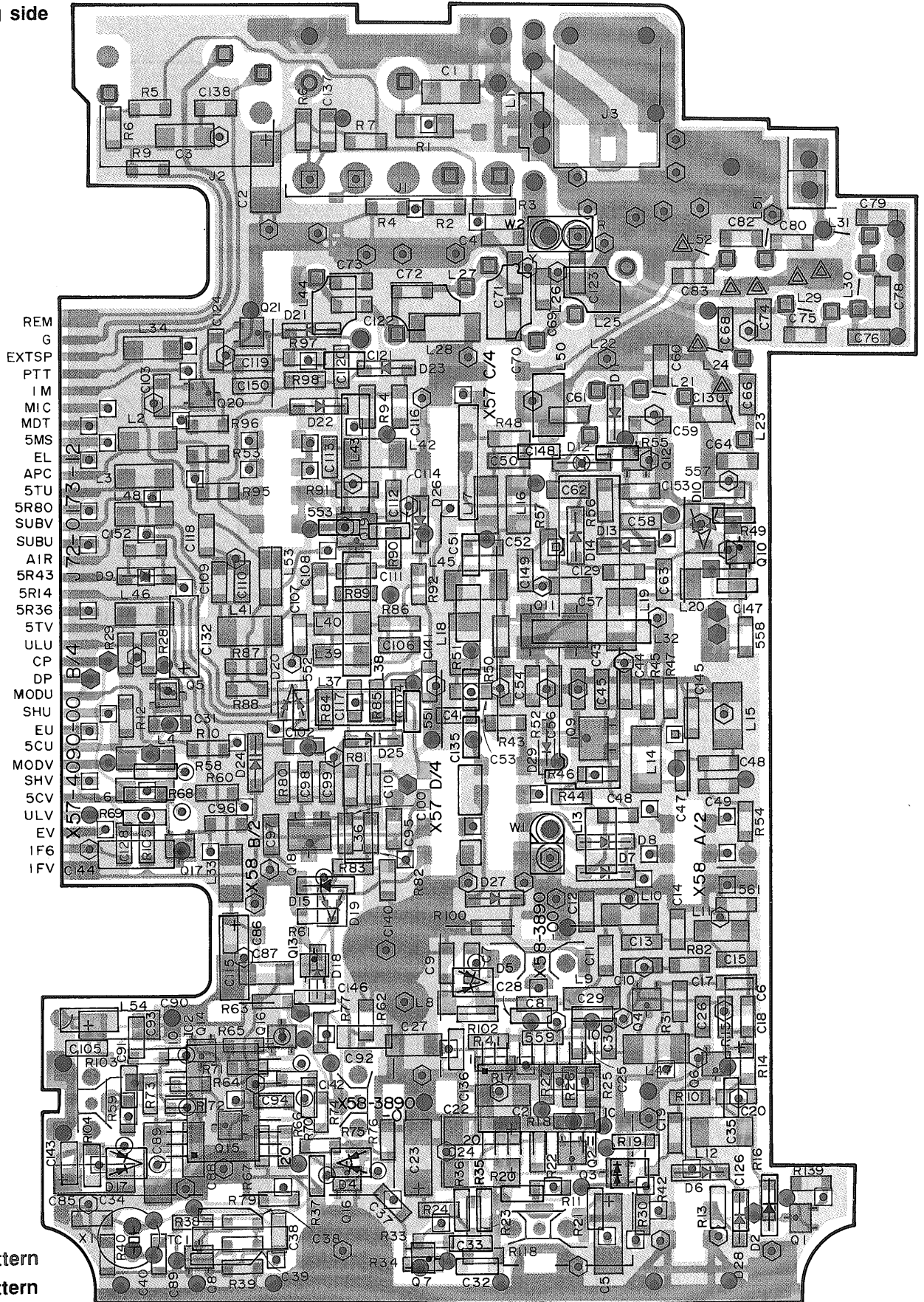
TC9174F



LM301AD
NJM4560E

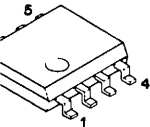


Soldering side



- REM
- G
- EXTSP
- PTT
- IM
- MIC
- MDT
- 5MS
- EL
- APC
- 5TU
- 5R80
- SUBV
- SUBU
- AIR
- 5R43
- 5R14
- 5R36
- 5TV
- ULU
- CP
- DP
- MODU
- SHU
- EU
- 5CU
- MODV
- SHV
- 5CV
- ULV
- EV
- IF6
- IFV

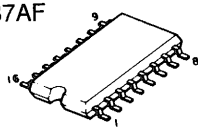
B pattern
 A pattern
 C pattern
 D pattern



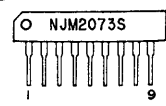
2SK879



TA7787AF

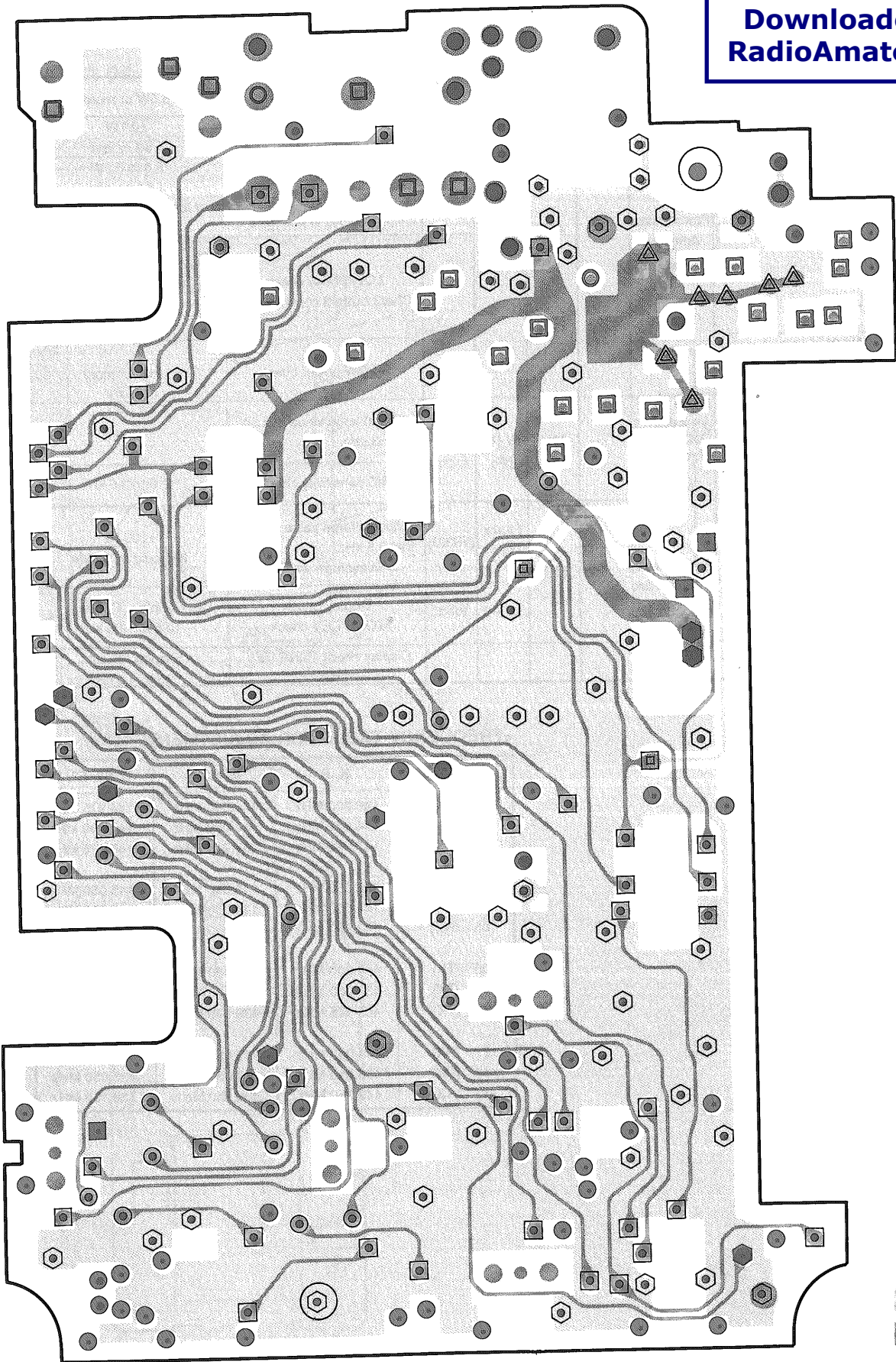




NJM2073S



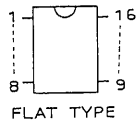
TH-78A/E

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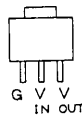


 B pattern
 C pattern

MC3372D



S-81250HG-RD



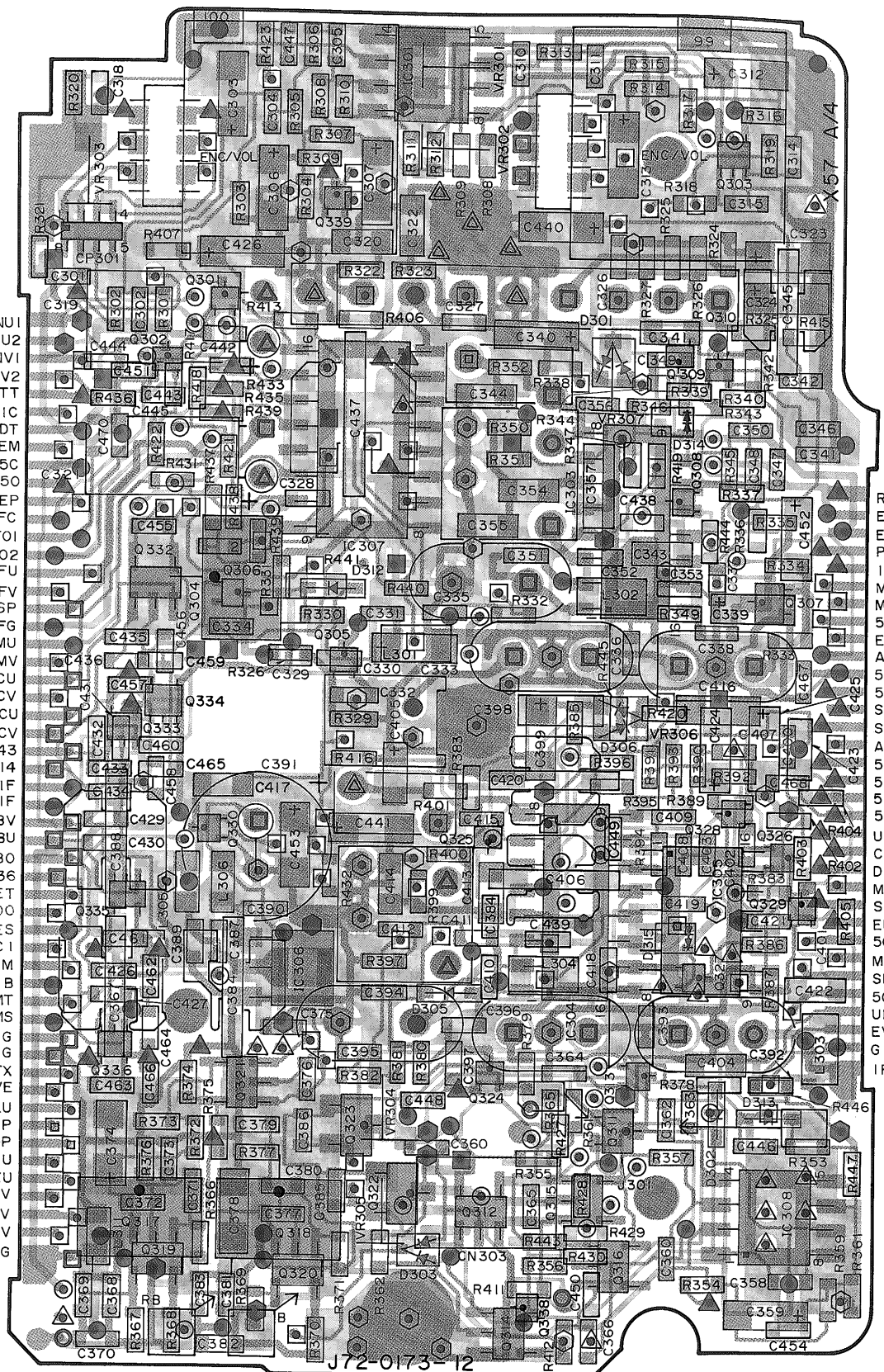
UNIT BOARDS

TX-RX UNIT-IF (X57-409X-XX) A/4 0-11: K, P 2-71: T, X, E, E2, E3, M, M2

TH-78A/E

Component side

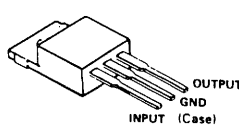
1
2
3
4
5
6
7



- Four-Layer board display**
- Pattern A
 - Pattern B
 - Pattern C
 - Pattern D
- Patterns A and B are connected.
 - Patterns A and C are connected.
 - Patterns A and D are connected.
 - Patterns B and C are connected.
 - Patterns B and D are connected.
 - Patterns C and D are connected.
 - Patterns A, B and C are connected.
 - Patterns A, B and D are connected.
 - Patterns A, C and D are connected.
 - Patterns B, C and D are connected.
 - Patterns A, B, C and D are connected.
 - Only pattern A is connected.
 - Only pattern B is connected.
 - Only pattern C is connected.
 - Only pattern D is connected.
- The non-mark indicates no connection.

A pattern
 D pattern

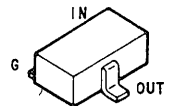
MA110
MA360
MA77



2SC4083
2SC4617
2SA1832
2SC4726
2SC4738
2SC4839-J
2SC4226

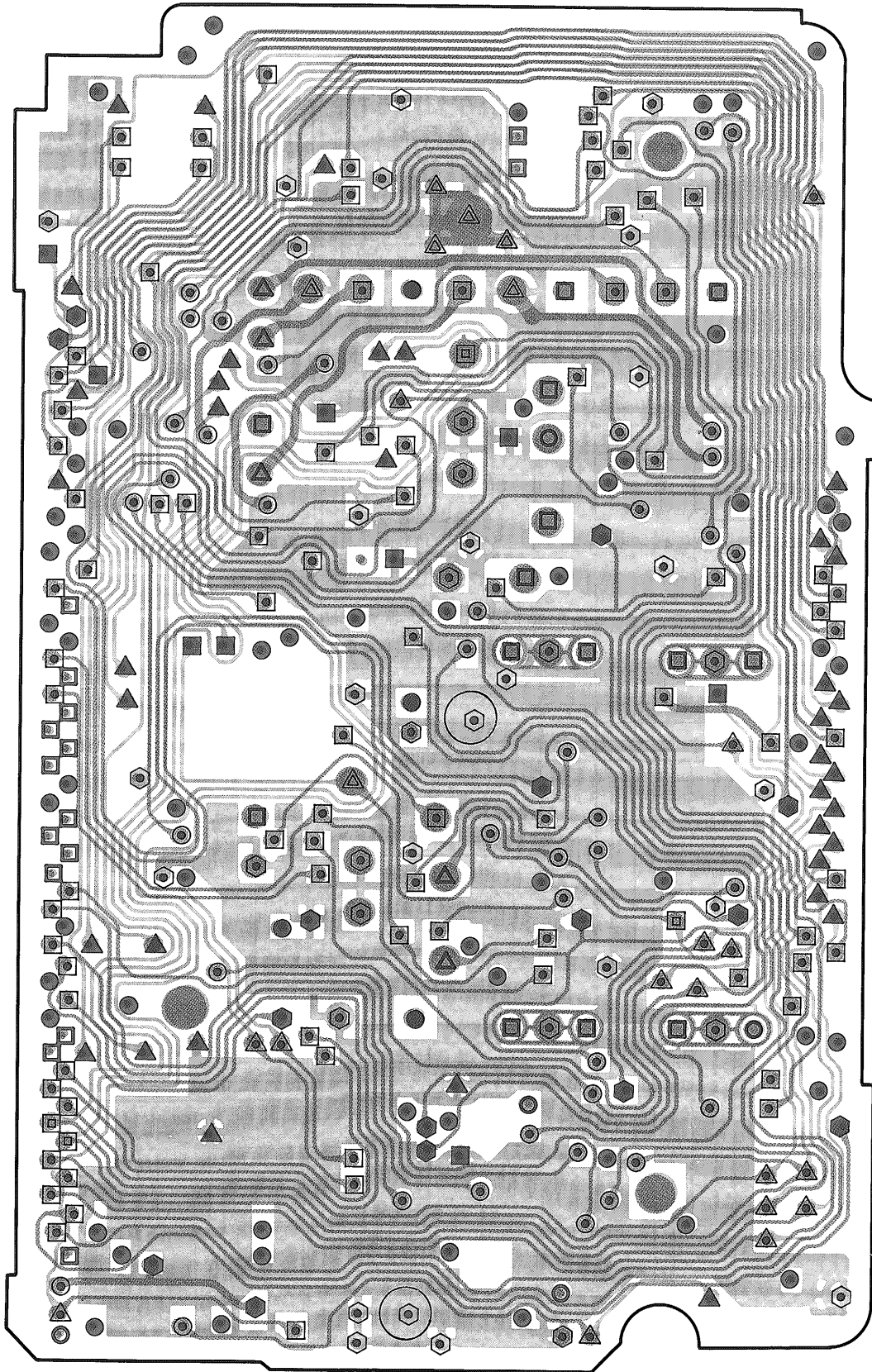




DTC114YE



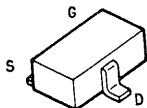
TH

TH-78A/E

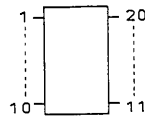


 B patter
 C patter

2SK1824



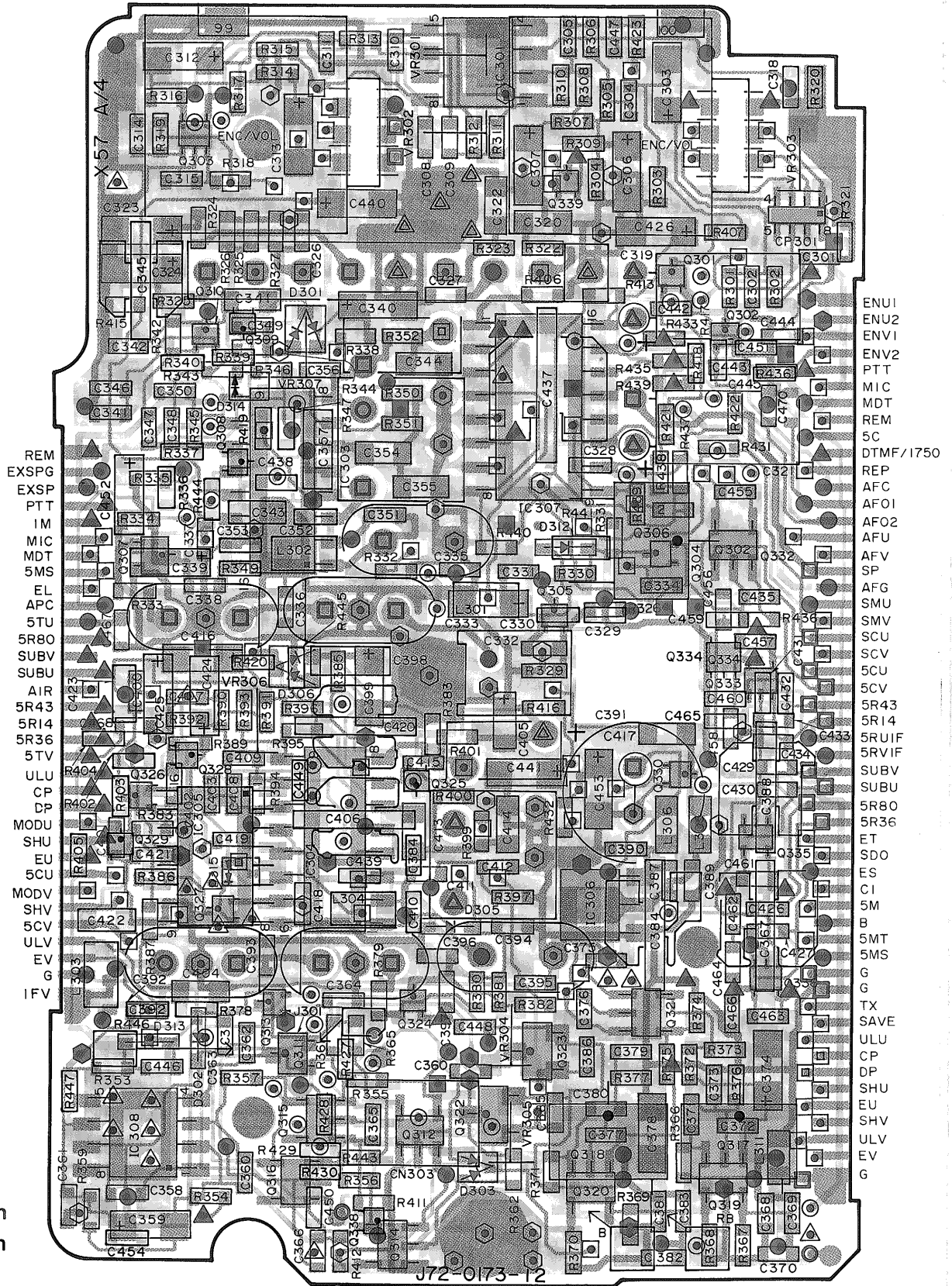
MB1511PFV-G-BND



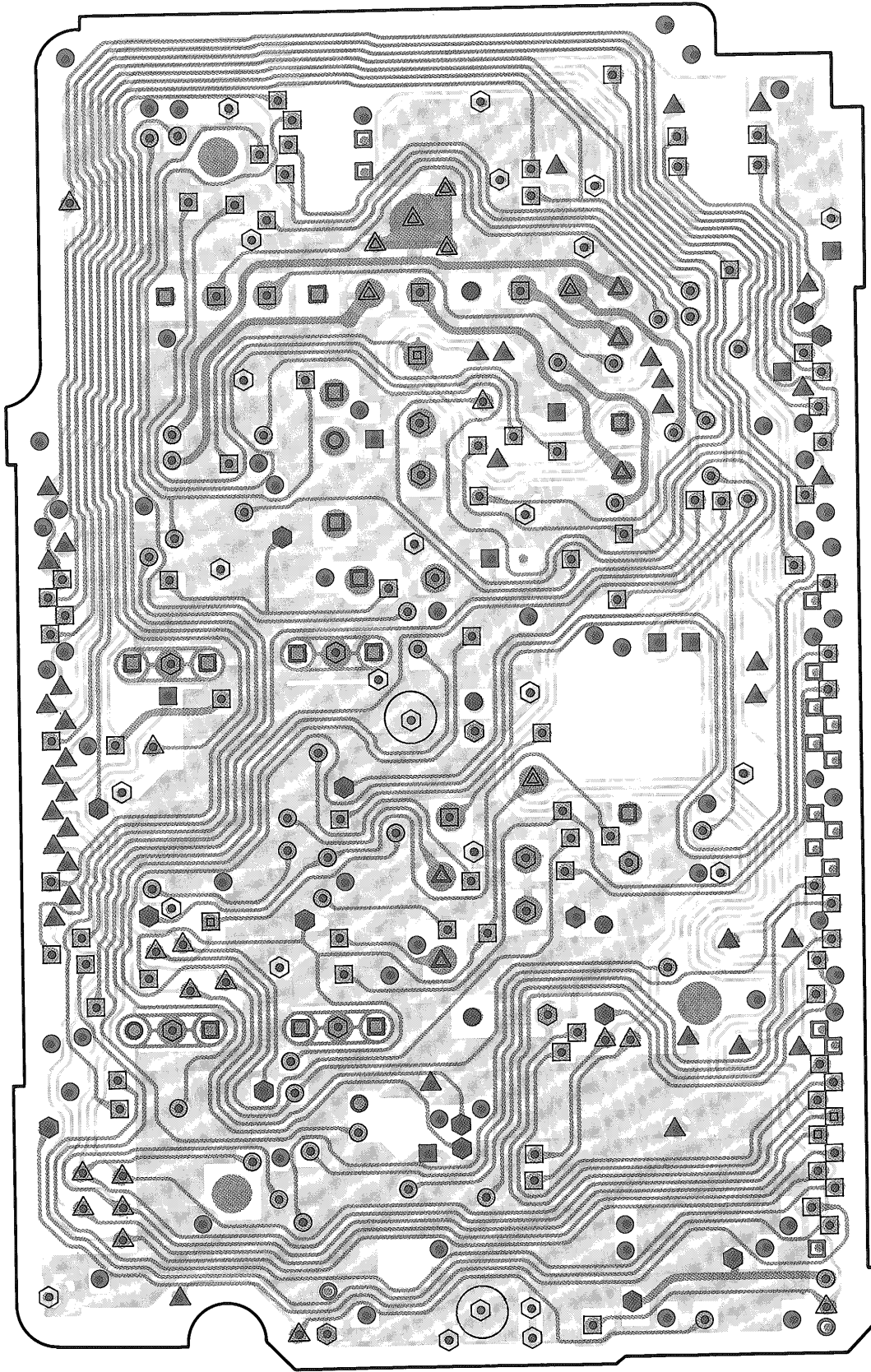
TH-78A/E

TX RX UNIT-IF (X57-409X-XX) A/4 0-11: K, P 2-71: T, X, E, E2, E3, M, M2

Soldering side



TH-78A/E



▨ B pattern
■ C pattern

UNIT BOARDS

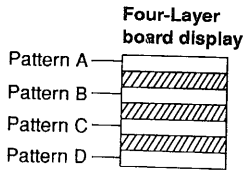
CONTROL UNIT (X53-342X-XX) A/5

0-11: K, P 0-21: M 0-22: M2 0-71: X

2-71: T, E, E3 2-72: E2

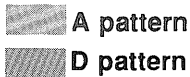
TH-78A/E

Component side



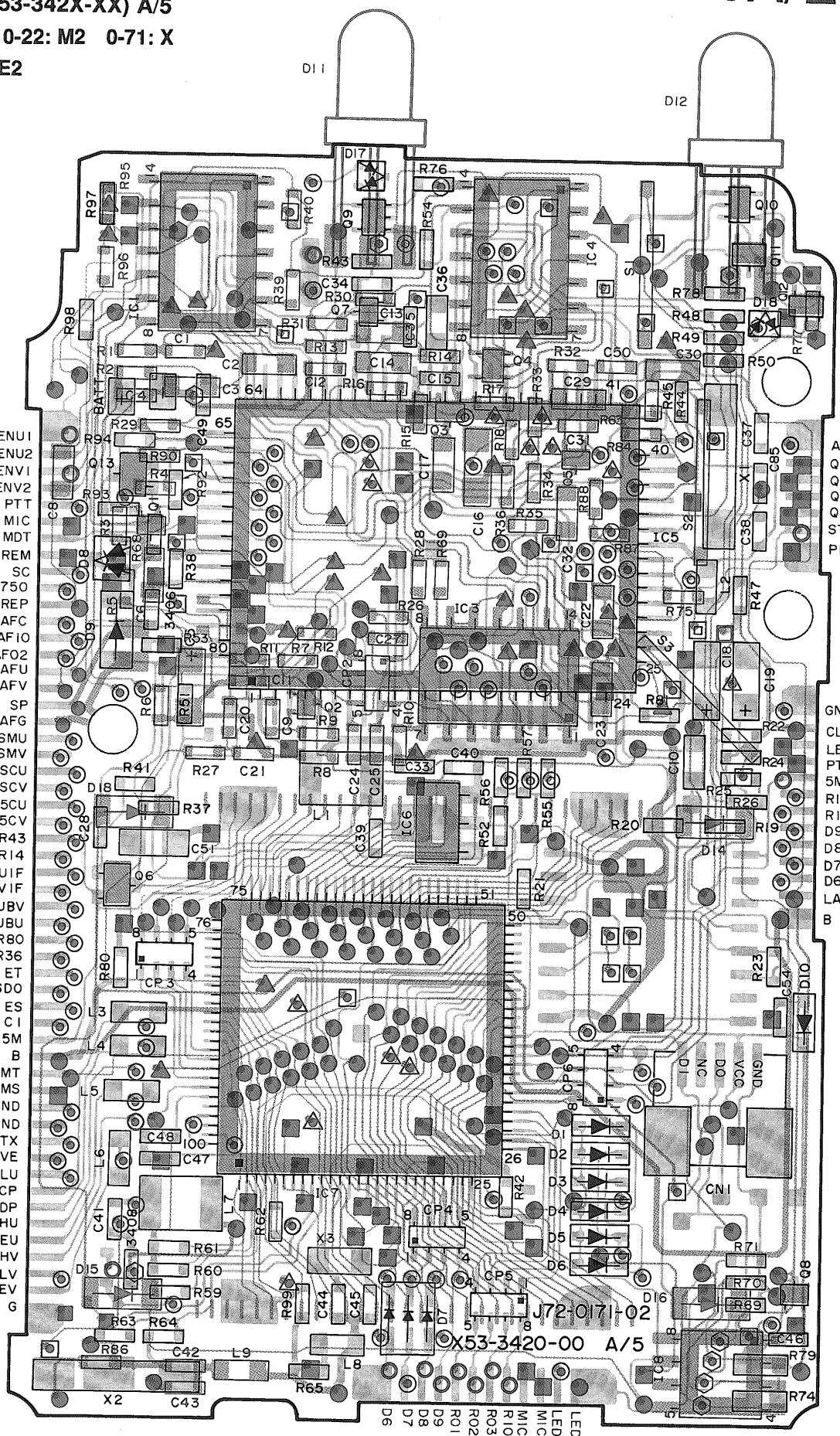
- Patterns A and B are connected.
- ▽ Patterns A and C are connected.
- Patterns A and D are connected.
- Patterns B and C are connected.
- ▽ Patterns B and D are connected.
- Patterns C and D are connected.
- ◆ Patterns A, B and C are connected.
- ⊙ Patterns A, B and D are connected.
- ⊙ Patterns A, C and D are connected.
- ⊙ Patterns B, C and D are connected.
- ▽ Patterns A, B, C and D are connected.
- ▽ Only pattern A is connected.
- Only pattern B is connected.
- Only pattern C is connected.
- Only pattern D is connected.

The non-mark indicates no connection.



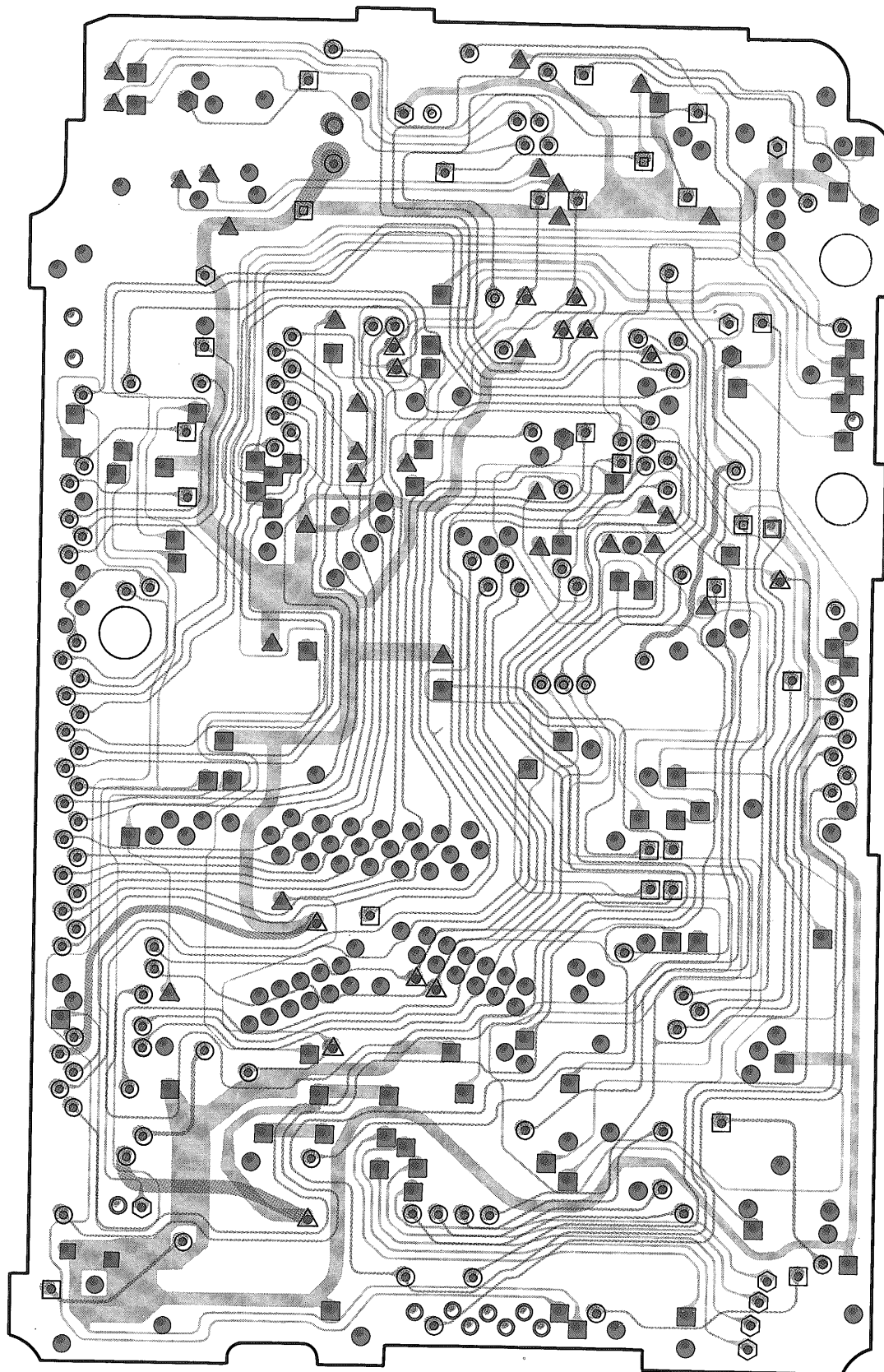
ENU1
 ENU2
 ENVI
 ENV2
 PTT
 MIC
 MDT
 REM
 SC
 DM/1750
 REP
 AFC
 AF10
 AFO2
 AFU
 AFV
 SP
 AFG
 SMU
 SMV
 SCU
 SCV
 5CU
 5CV
 SR43
 SR14
 5RUIF
 5RVIF
 SUBV
 SUBU
 5R80
 5R36
 ET
 SDO
 ES
 CI
 5M
 B
 5MT
 5MS
 GND
 GND
 TX
 SAVE
 ULU
 CP
 DP
 SHU
 EU
 SHV
 ULV
 EV
 G

AF
 Q1
 Q2
 Q3
 Q4
 STD
 PD
 GND
 CLK
 LED
 PTT
 5MS
 R12
 R11
 D9
 D8
 D7
 D6
 LAD
 B

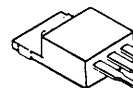


X53-3420-00 A/5

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B30-0897-C
B30-2033-C
B30-2039-C
MA110



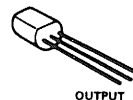
DTA143XE
2SC4617



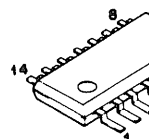
2SJ144



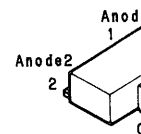
S-8054ALR-





BU4066BF



MA741WK



 B pattern
 C pattern

UNIT BOARDS

TH-78A/E

CONTROL UNIT (X53-342X-XX) A/5

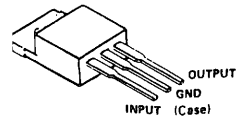
0-11: K, P 0-21: M

0-22: M2 0-71: X

2-71: T, E, E3 2-72: E2

Soldering side

B30-0897-05
B30-2033-05
B30-2039-05
MA110



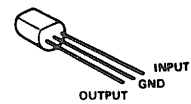
DTA143XE
2SC4617



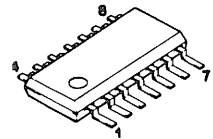
2SJ144



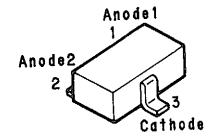
3-8054ALR-LN



BU4066BF

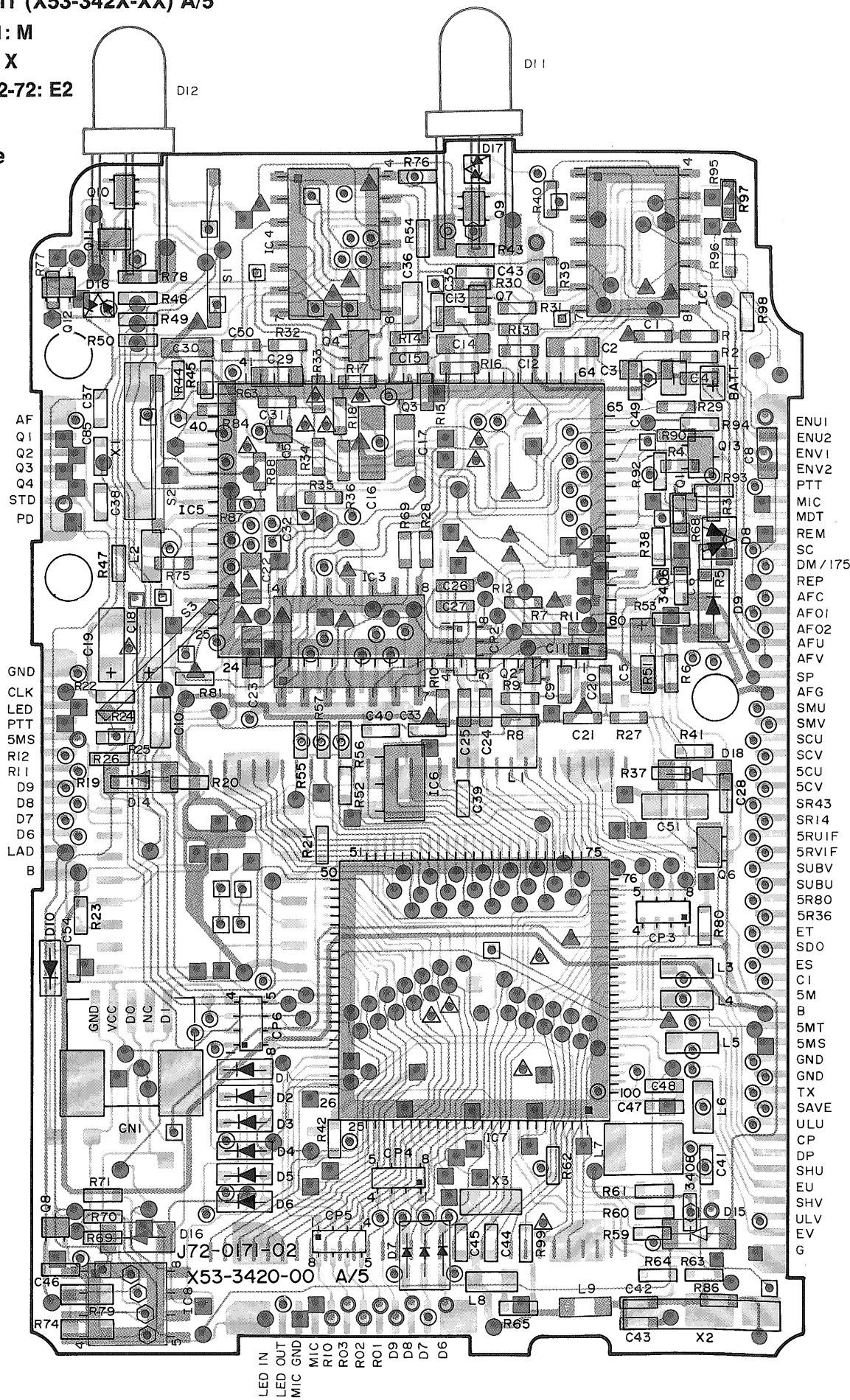


MA741WK



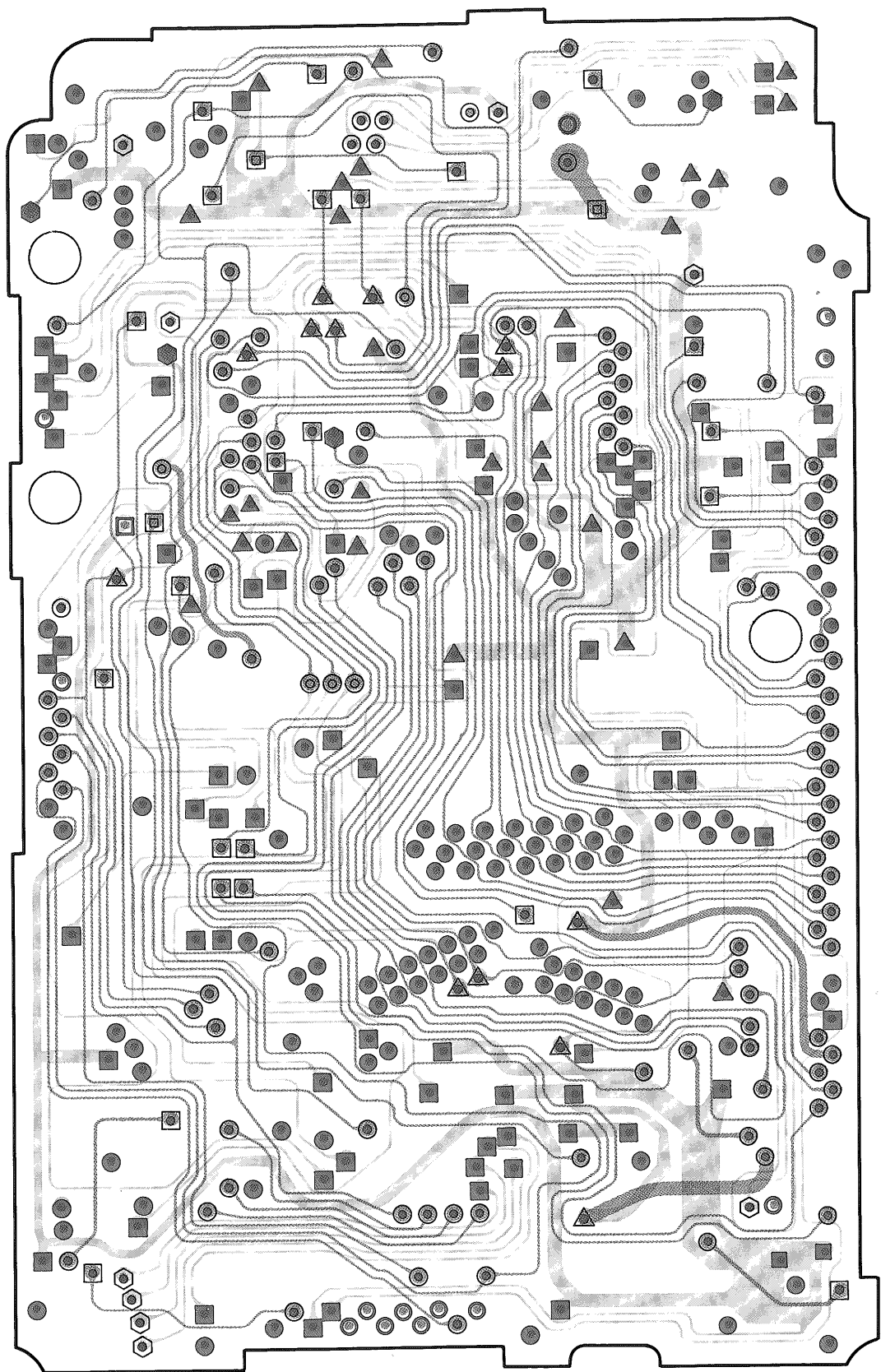
B pattern
C pattern

A pattern
D pattern

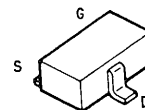


J72-0171-02
X53-3420-00 A/5

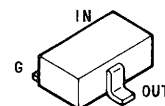
TH-78A/E



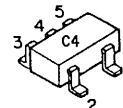
2SK1824



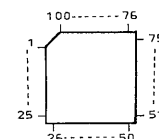
DTC114EE



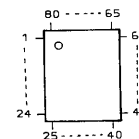
UMC4



HD404629A20H





75517GF-122-3B9



DS1267S-10



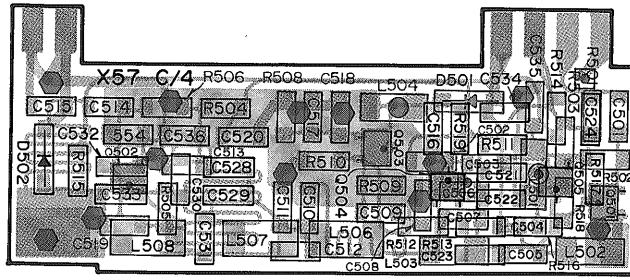
 B pattern
 C pattern

UNIT BOARDS

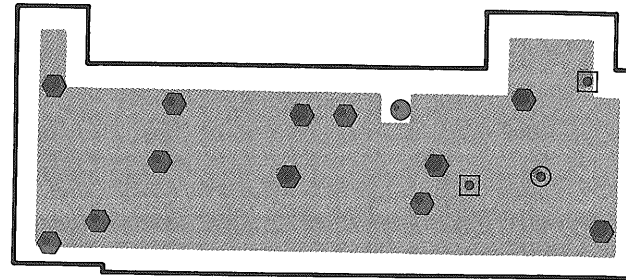
TX-RX UNIT (X57-409X-XX) C/4

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Component side

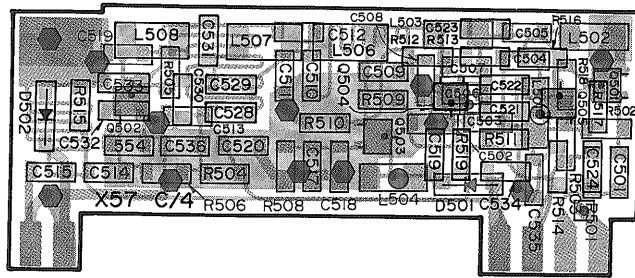


A pattern
D pattern

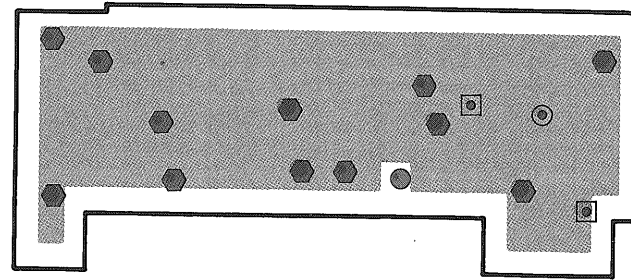


B pattern
C pattern

Soldering side



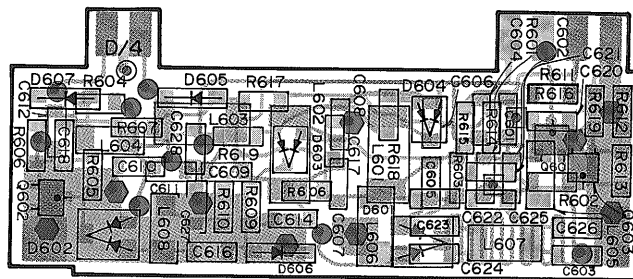
A pattern
D pattern



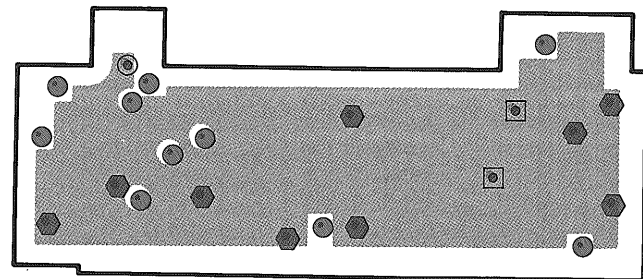
B pattern
C pattern

TX-RX UNIT (X57-409X-XX) D/4

Component side

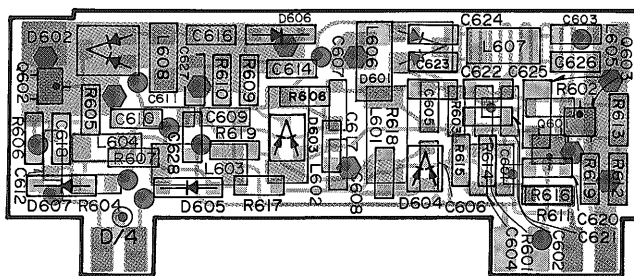


A pattern
D pattern

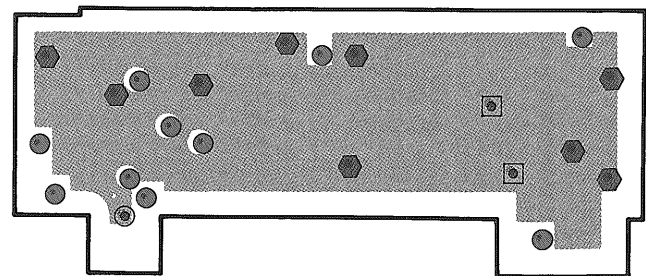


B pattern
C pattern

Soldering side



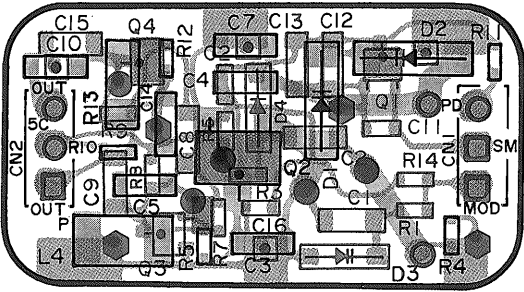
A pattern
D pattern



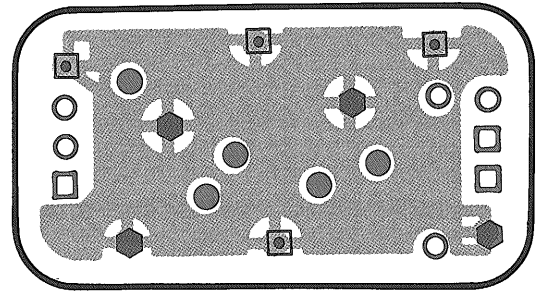
B pattern
C pattern

SUB UNIT (VHF VCO) (X58-3890-00)

Component side

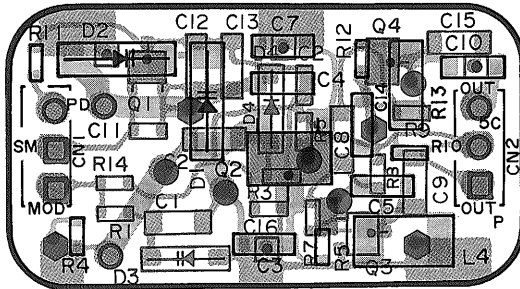


■ A pattern
■ D pattern

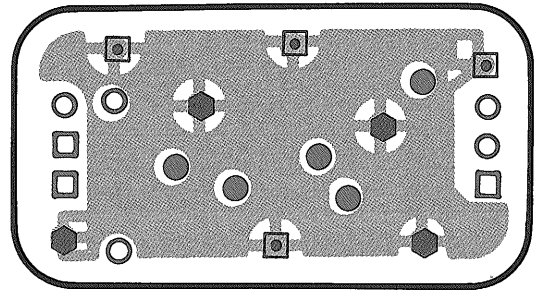


■ C pattern

Soldering side



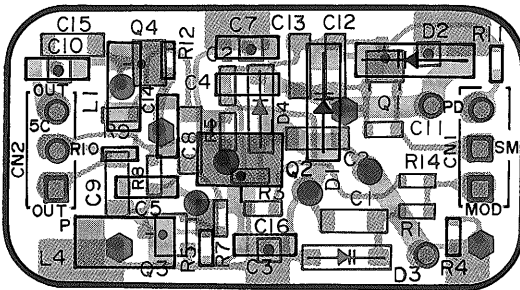
■ A pattern
■ D pattern



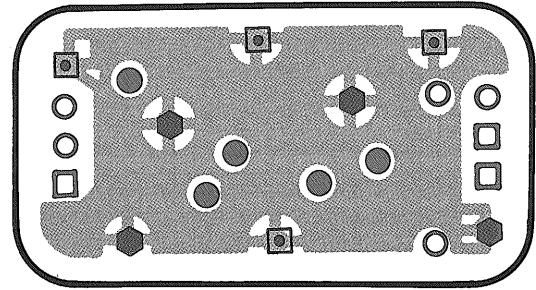
■ C pattern

SUB UNIT (UHF VCO) (X58-3890-01)

Component side

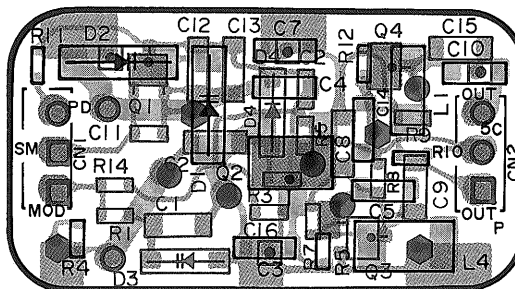


■ A pattern
■ D pattern

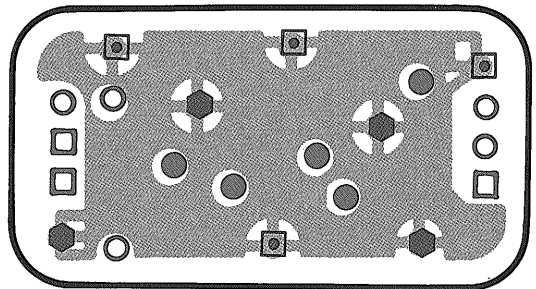


■ C pattern

Soldering side

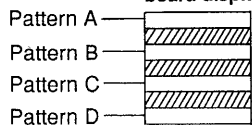


■ B pattern
■ C pattern



■ C pattern

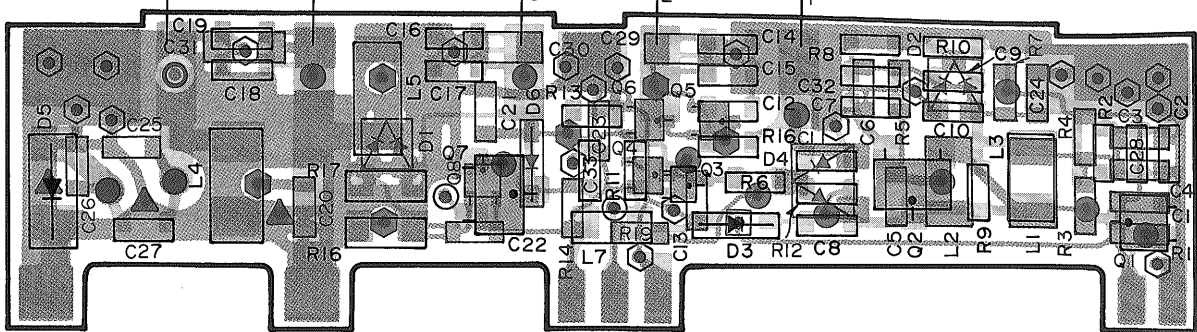
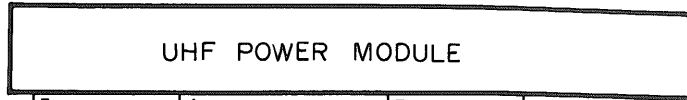
Four-Layer board display



- Patterns A and B are connected.
- ⊙ Patterns A and C are connected.
- Patterns A and D are connected.
- △ Patterns B and C are connected.
- ▲ Patterns B and D are connected.
- Patterns C and D are connected.
- ⊙ Patterns A, B and C are connected.
- ⊙ Patterns A, B and D are connected.
- ◆ Patterns A, C and D are connected.
- ⊙ Patterns B, C and D are connected.
- △ Patterns A, B, C and D are connected.
- Only pattern A is connected.
- Only pattern B is connected.
- △ Only pattern C is connected.
- Only pattern D is connected.
- The non-mark indicates no connection.

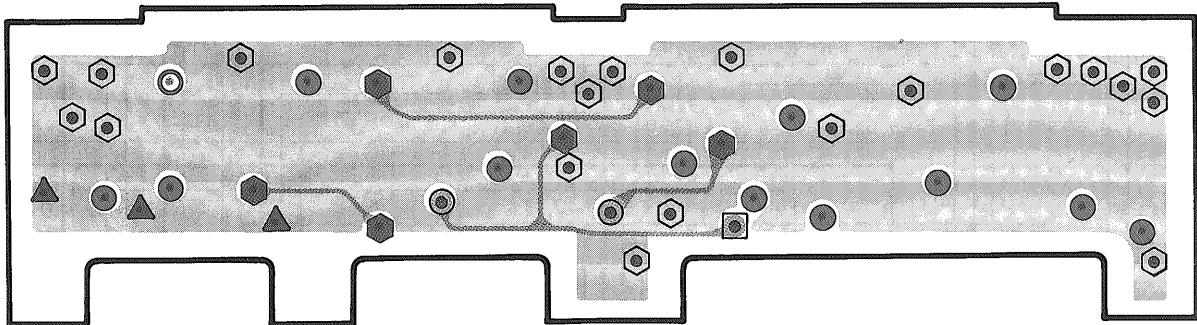
SUB UNIT (UHF POWER AMP) (X58-3900-00) A/2

Component side



C pattern

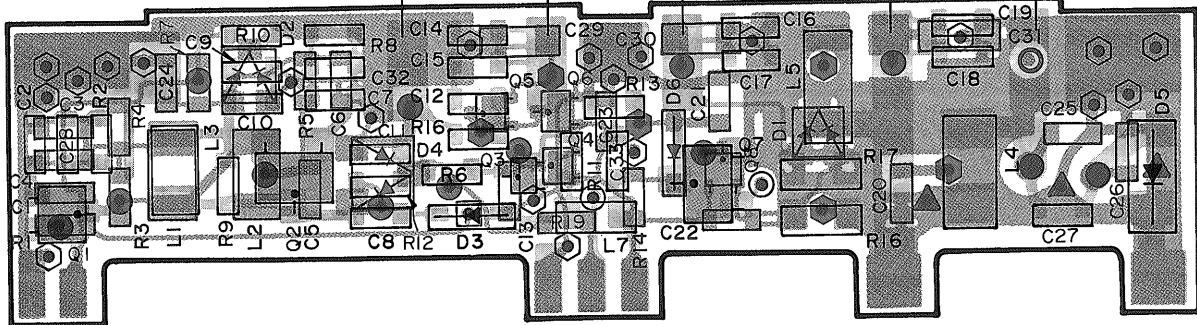
A patt
D patt



C pattern

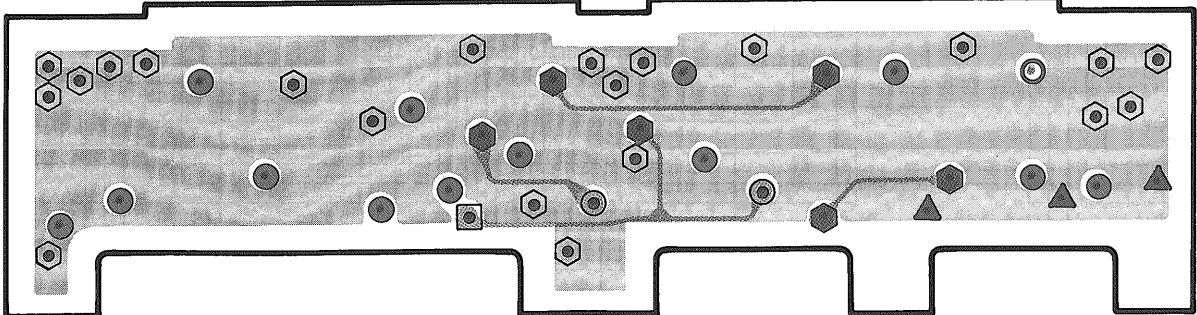
B patt
C patt

Soldering side



C pattern

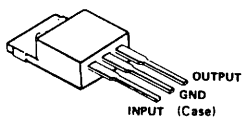
A patt
D patt



C pattern

B patt
C patt

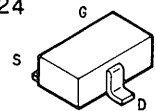
MA333
MA360
MA77
MA110
1SV172



DTB113ZK
2SC3356
2SC4083
DTA143XE
2SC4226
2SC4619
2SC4726
2SC4738



2SK1824

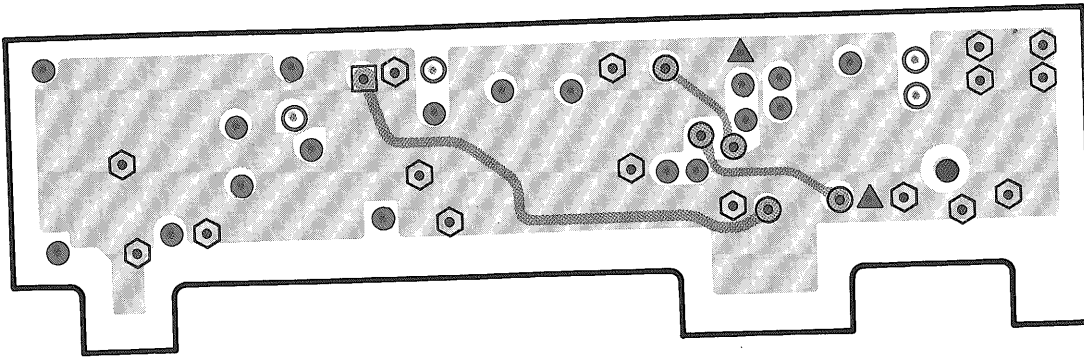


SUB UNIT (VHF POWER AMP) (X58-3900-00) B/2

Component side

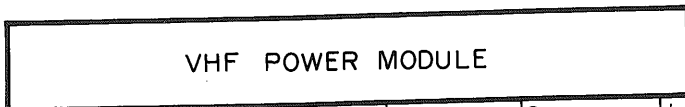


A pattern
D pattern

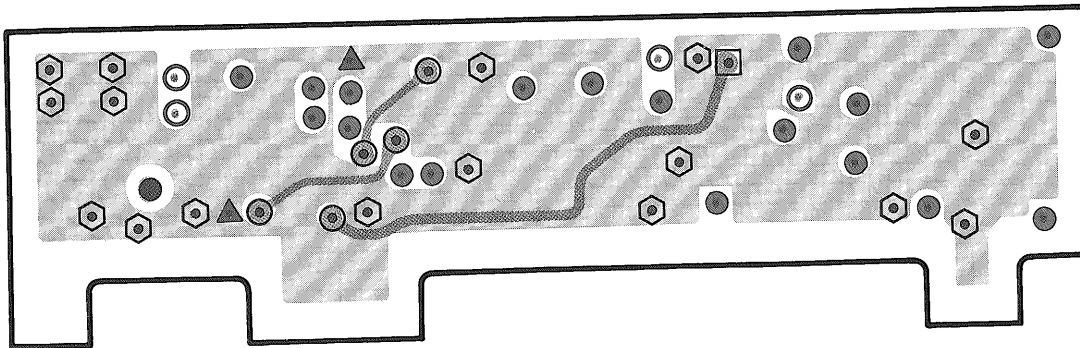


B pattern
C pattern

Soldering side

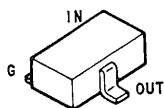


A pattern
D pattern

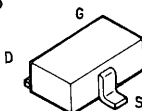


B pattern
C pattern

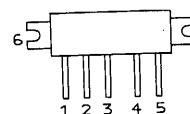
DTC114YE



2SK238



S-AV22A

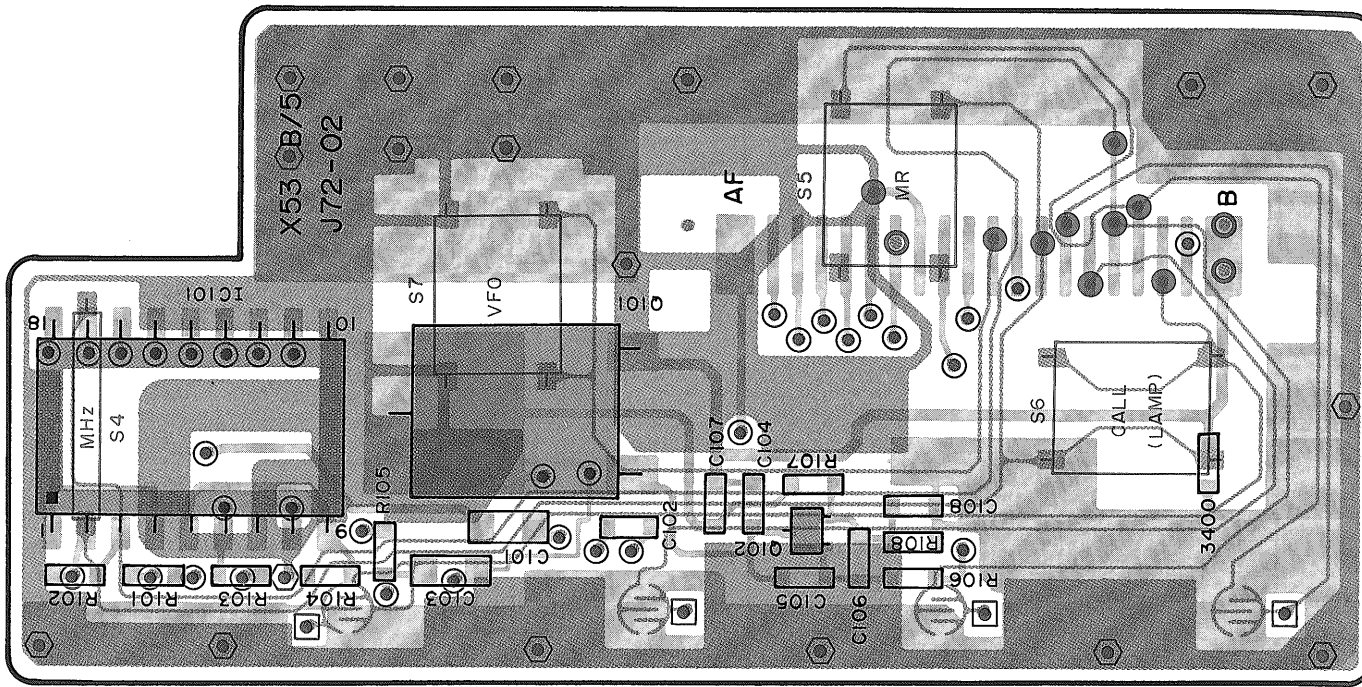




UNIT BOARDS

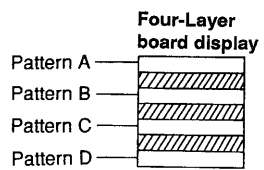
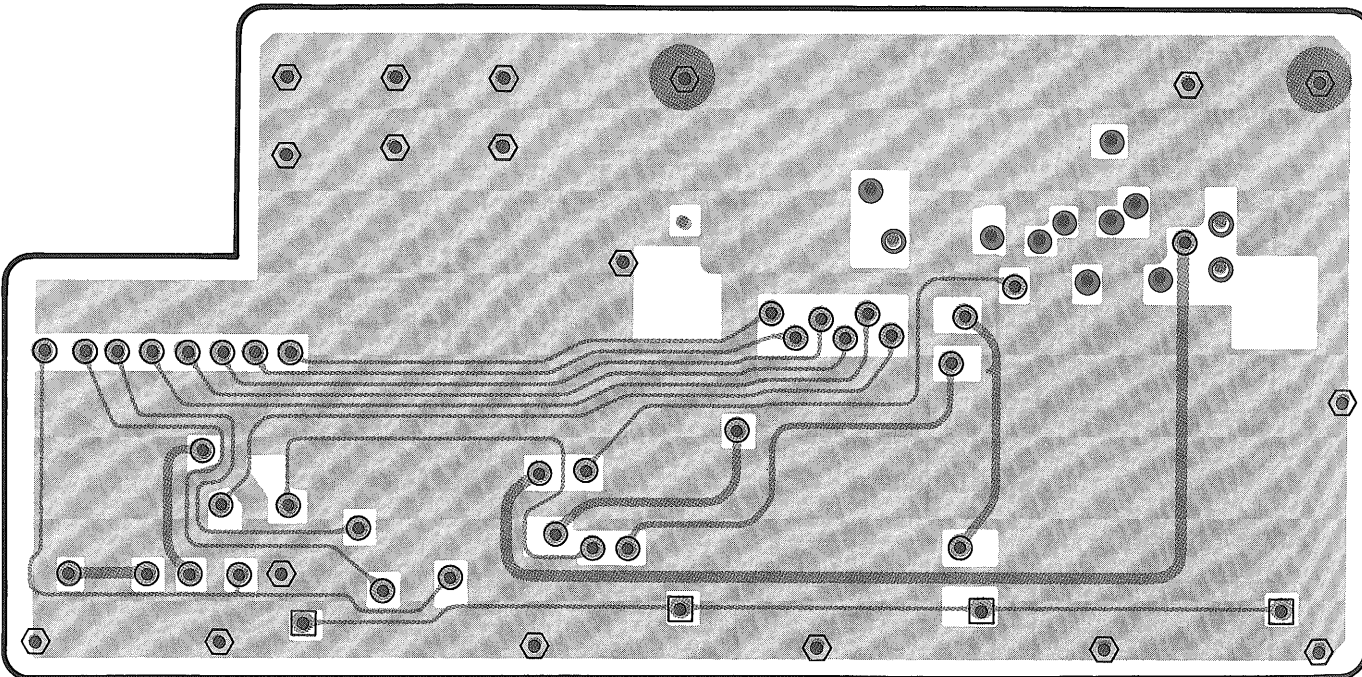
CONTROL UNIT (X53-342X-XX) B/5

Component side

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 A pattern
 D pattern



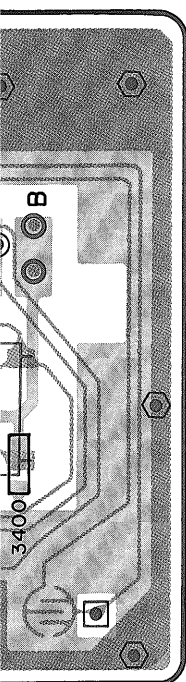
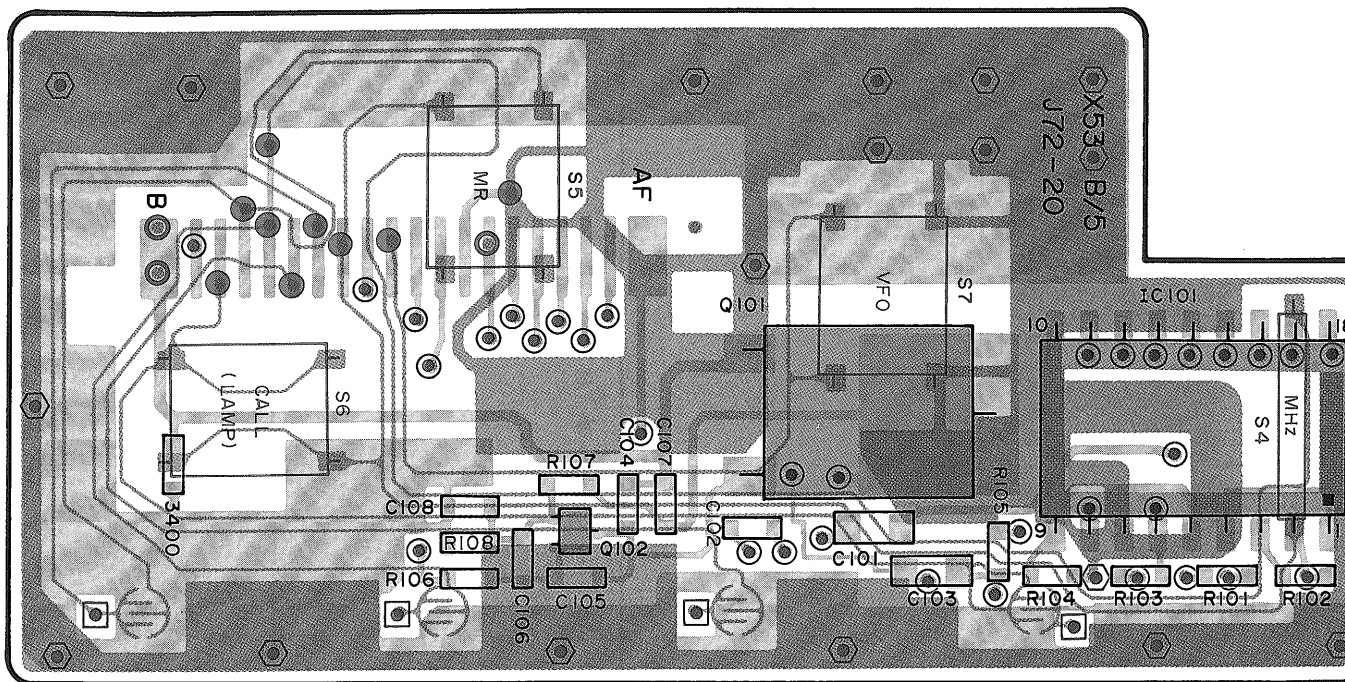
- Patterns A and B are connected.
- ⊙ Patterns A and C are connected.
- Patterns A and D are connected.
- △ Patterns B and C are connected.
- ▲ Patterns B and D are connected.
- Patterns C and D are connected.
- ⊖ Patterns A, B and C are connected.
- ⊕ Patterns A, B and D are connected.



- ◆ Patterns A, C and D are connected.
- ⊞ Patterns B, C and D are connected.
- ⊡ Patterns A, B, C and D are connected.
- Only pattern A is connected.
- ⊖ Only pattern B is connected.
- △ Only pattern C is connected.
- Only pattern D is connected.



 B pattern
 C pattern

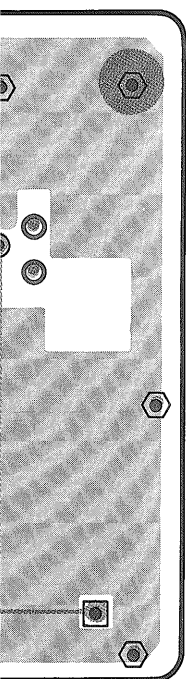
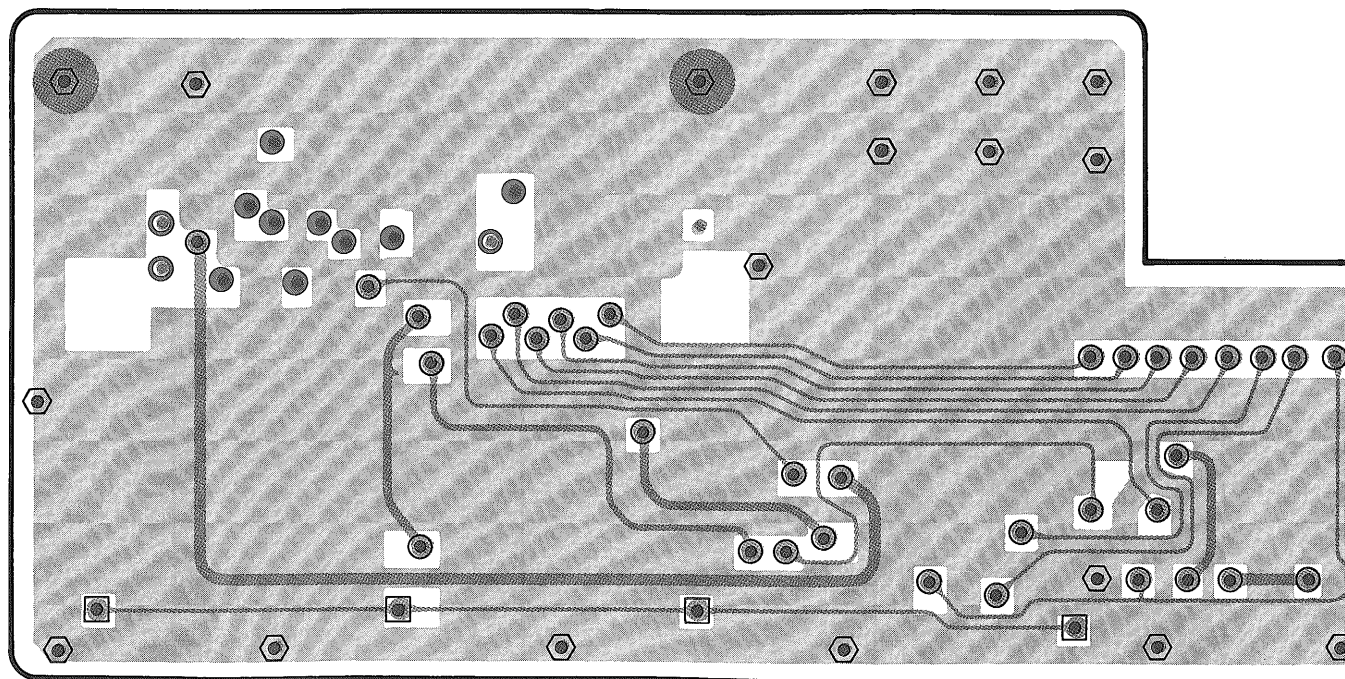
The non-mark indicates no connection.



Soldering side





 A pattern
 D pattern

 A patter
 D patter

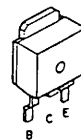


 B pattern
 C pattern

 B patte
 C patte

2SC4617

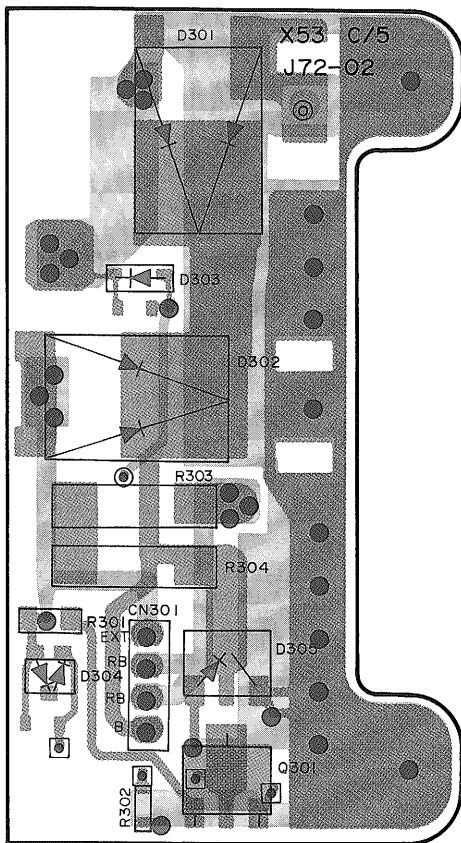
2SB1182F5



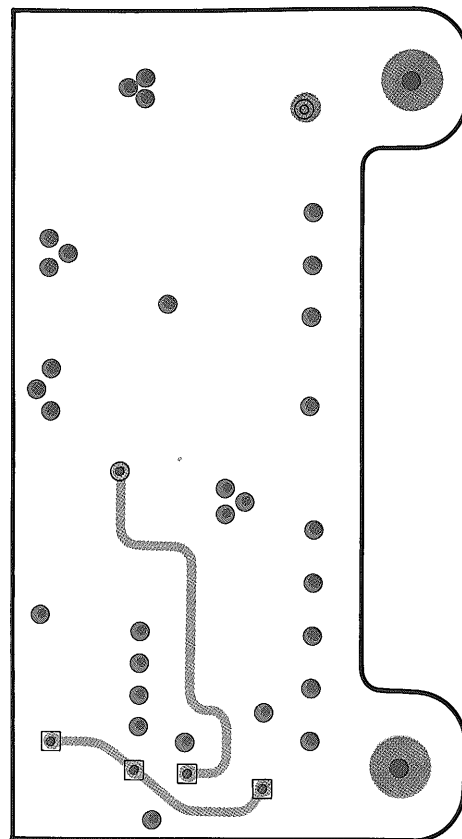
UNIT BOARDS

CONTROL UNIT (X53-342X-XX) C/5

Component side

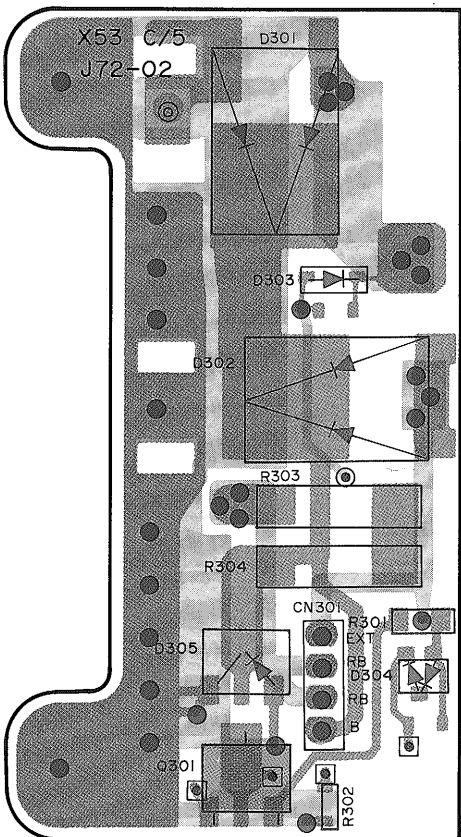


A pattern
B pattern
C pattern
D pattern

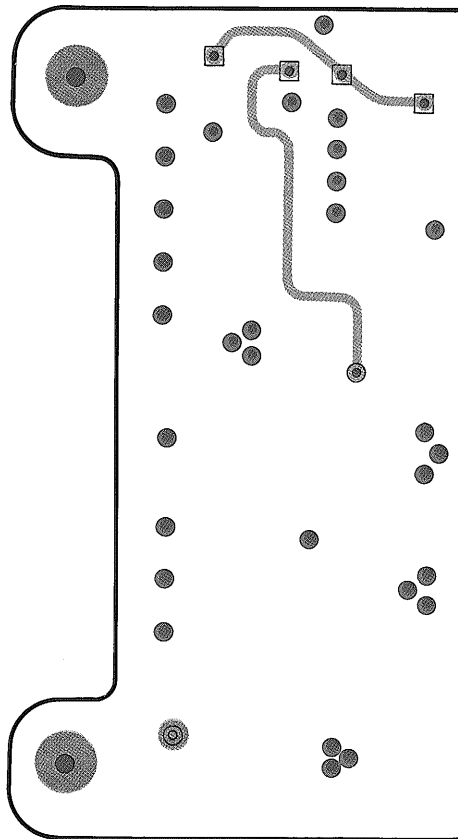


B pattern
C pattern

Soldering side



A pattern
B pattern
C pattern
D pattern

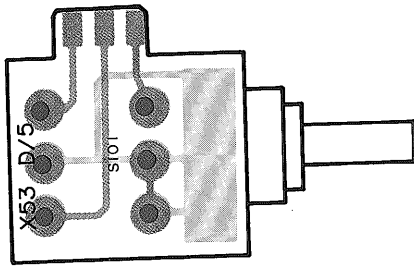


B pattern
C pattern

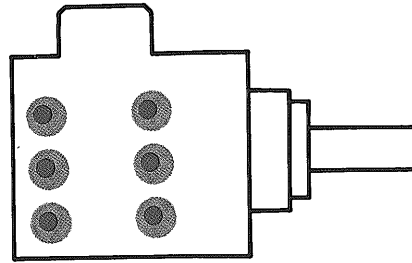
1
2
3
4
5
6
7

CONTROL UNIT (X53-342X-XX) C/5

Component side

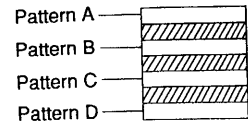


A pattern
D pattern



B pattern
C pattern

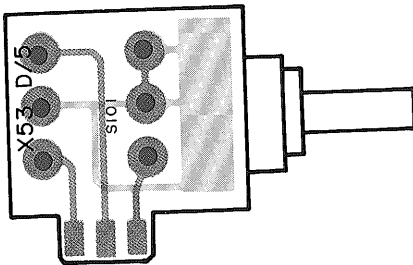
Four-Layer board display



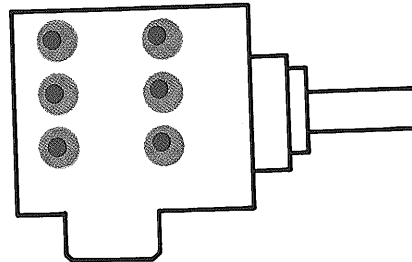
- Patterns A and B are connected.
- ⊙ Patterns A and C are connected.
- Patterns A and D are connected.
- △ Patterns B and C are connected.
- ▲ Patterns B and D are connected.
- ◻ Patterns C and D are connected.
- ⊖ Patterns A, B and C are connected.
- ⊕ Patterns A, B and D are connected.
- ⊗ Patterns A, C and D are connected.
- ⊘ Patterns B, C and D are connected.
- ⊙△ Patterns A, B, C and D are connected.
- Only pattern A is connected.
- ◇ Only pattern B is connected.
- △ Only pattern C is connected.
- ◻ Only pattern D is connected.

The non-mark indicates no connection.

Soldering side



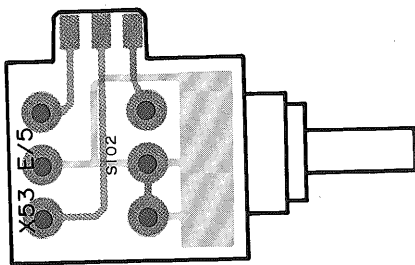
A pattern
D pattern



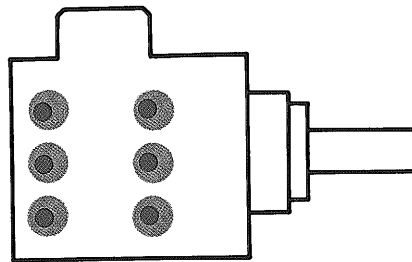
B pattern
C pattern

CONTROL UNIT (X53-342X-XX) E/5

Component side

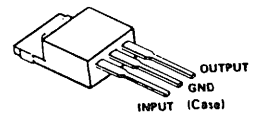


A pattern
D pattern

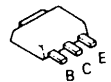


B pattern
C pattern

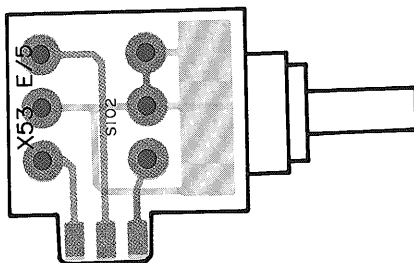
MA110



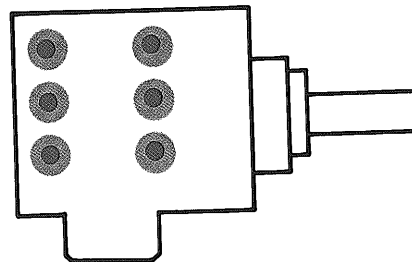
2SB798



Soldering side



A pattern
D pattern



B pattern
C pattern

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