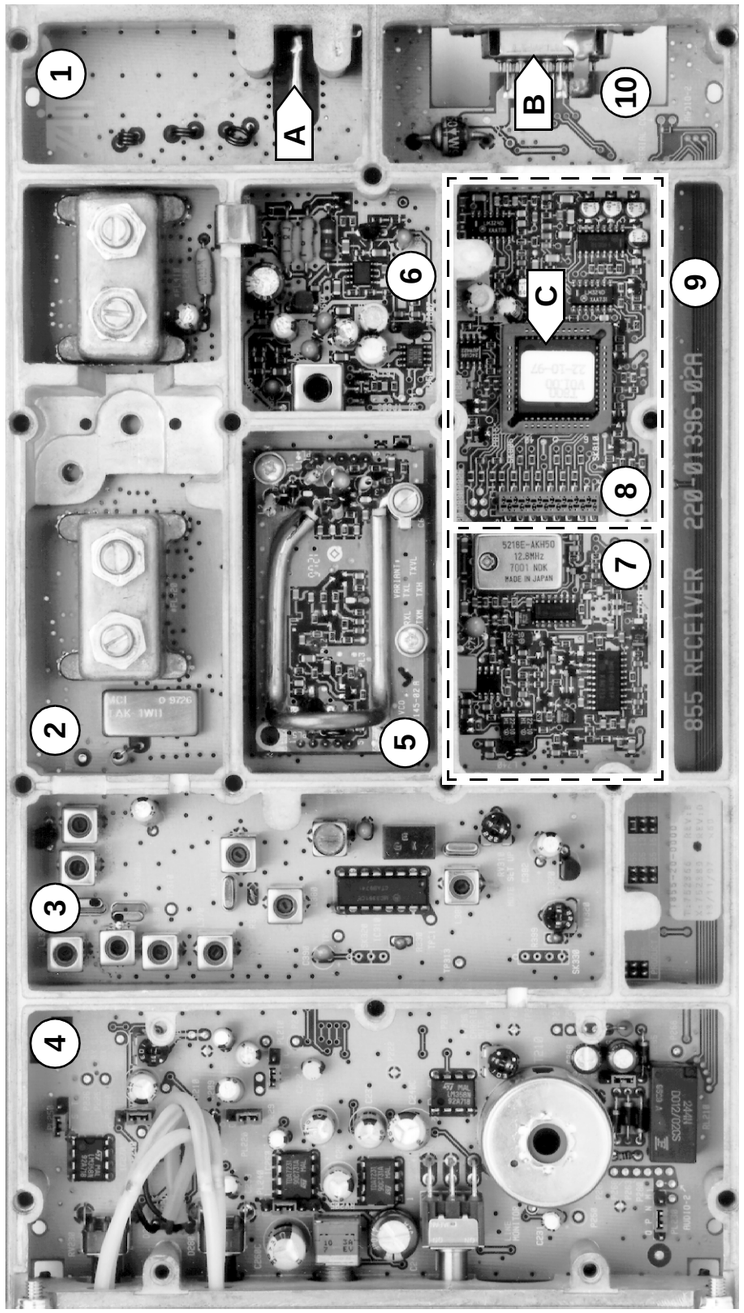
The photograph in Figure 1.1 on the next page will help you to identify the main circuit blocks in the T855.

There is a similar photograph in Figure 4.3 which shows the main tuning and adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.2 on the next page shows the T855 front panel controls.

Copyright TEL



Key:

1 low pass filter
2 receiver front end
3 receiver IF
4 audio processor
5 VCO
6 regulators
7 synthesiser
8 microcontroller and CTCSS
9 duct for cabling to extra D-range (if fitted)
10 D-range

A RF input
B D-range connector ("D-range 1") incl. audio out & DC in (refer to Section 1.2 in Part F)
C microcontroller

Figure 1.1 T855 Main Circuit Block Identification

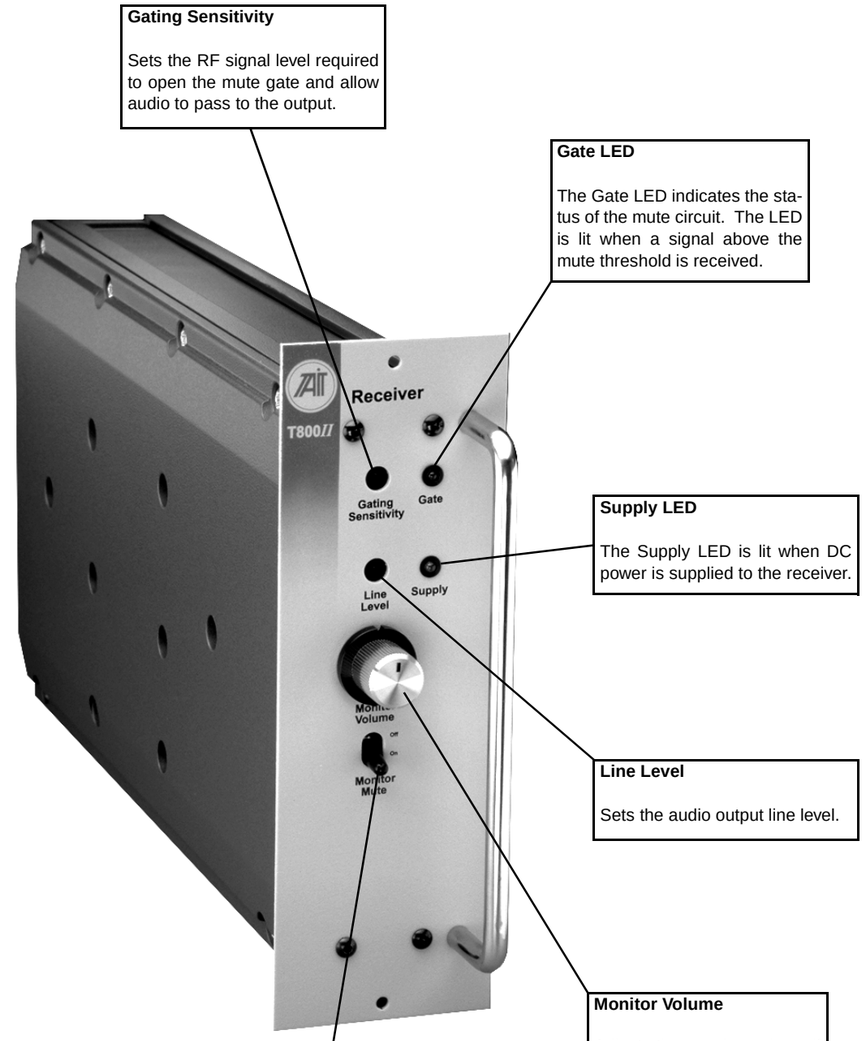


Figure 1.2 T855 Front Panel Controls

Copyright TEL

The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T855.

There is a similar photograph in Figure 1.1 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

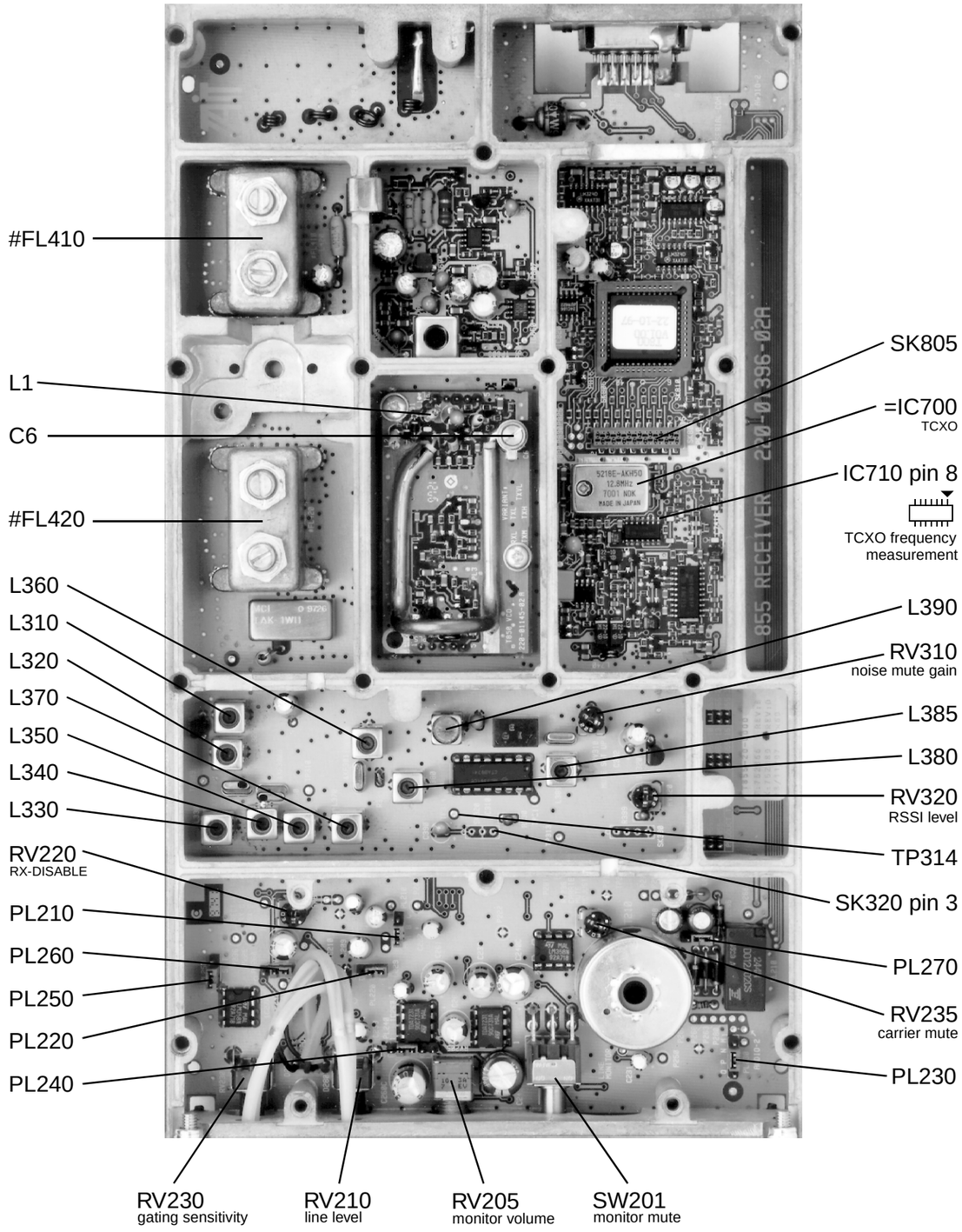


Figure 4.3 T855 Main Tuning & Adjustment Controls

Copyright TEL

P2
3 EDGE CONN PINS

P1
4 EDGE CONN PINS

DC VOLTAGES

+9V-SW
GND
INPUT
D1 BAV99
R1 1K0
R2 2K2
R3 1K0
R4 2K2
R5 56K
R6 39K
R7 10K
R8 680
R9 8K2
R10 220K
R11 470
R12 330K
R13 100K
R14 100K
R15 22K
R16 1M0
R17 33K
R18 1K0
R19 10K
R20 10K
R21 330K
R22 4K7
R23 10K
R24 150K
R25 100K
R26 82K
R29 4K7
R30 10K
R31 22K
R32 4K7
C1 1N0
C2 1N0
C3 330P
C4 10N
C5 1N0
C6 10N
C7 4N7
C8 10N
C9 1N0
Q1 3346
IC1 LM324D
5.35V
5.1V
3.0V
4.8V
0.55V
REF
O/P
GND
NTC
V+
V-

REV/ISS	AMENDMENTS	DRAWN	CHKD	D. O.	APVD	DATE
0B	UPDATED ASSEMBLY DRAWINGS.	MC				
C	VOLTAGE OVERLAY	WD				
B	ADDED ASSEMBLY DRAWING.	GWLK				
A	UPDATED SYMBOLS	DE				
T-99	ORIGINAL	J. S				

© TAIT ELECTRONICS

T800-04-0000 RSSI

IPN:	ISSUE:	ID:
220-01138-00	B	2. SC.1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO. SHEETS:
		700RSL0B	09/08/92	1

T800-04-0000 RSSI
220-01138-00

Copyright TEL

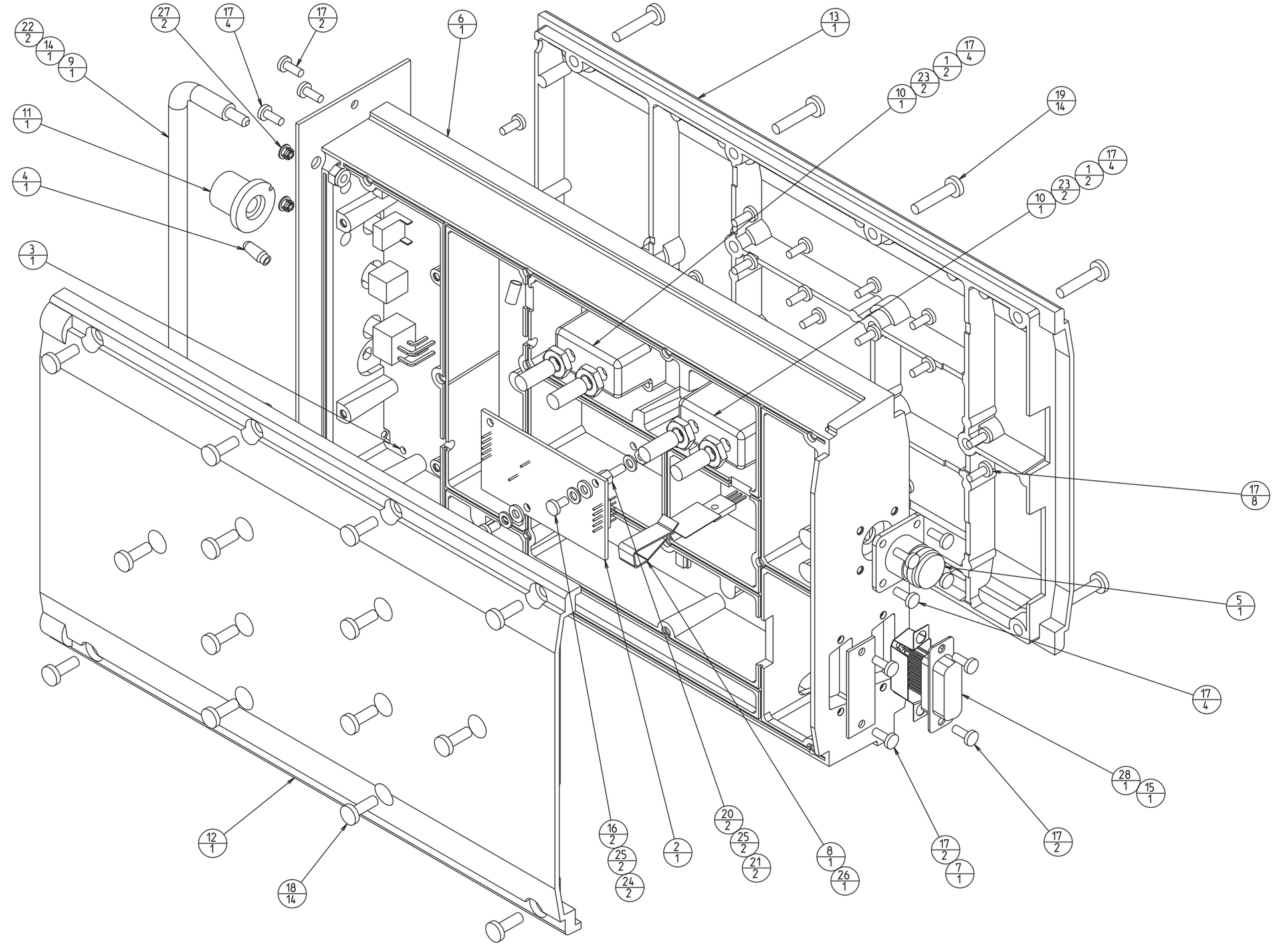
Copyright TEL

Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

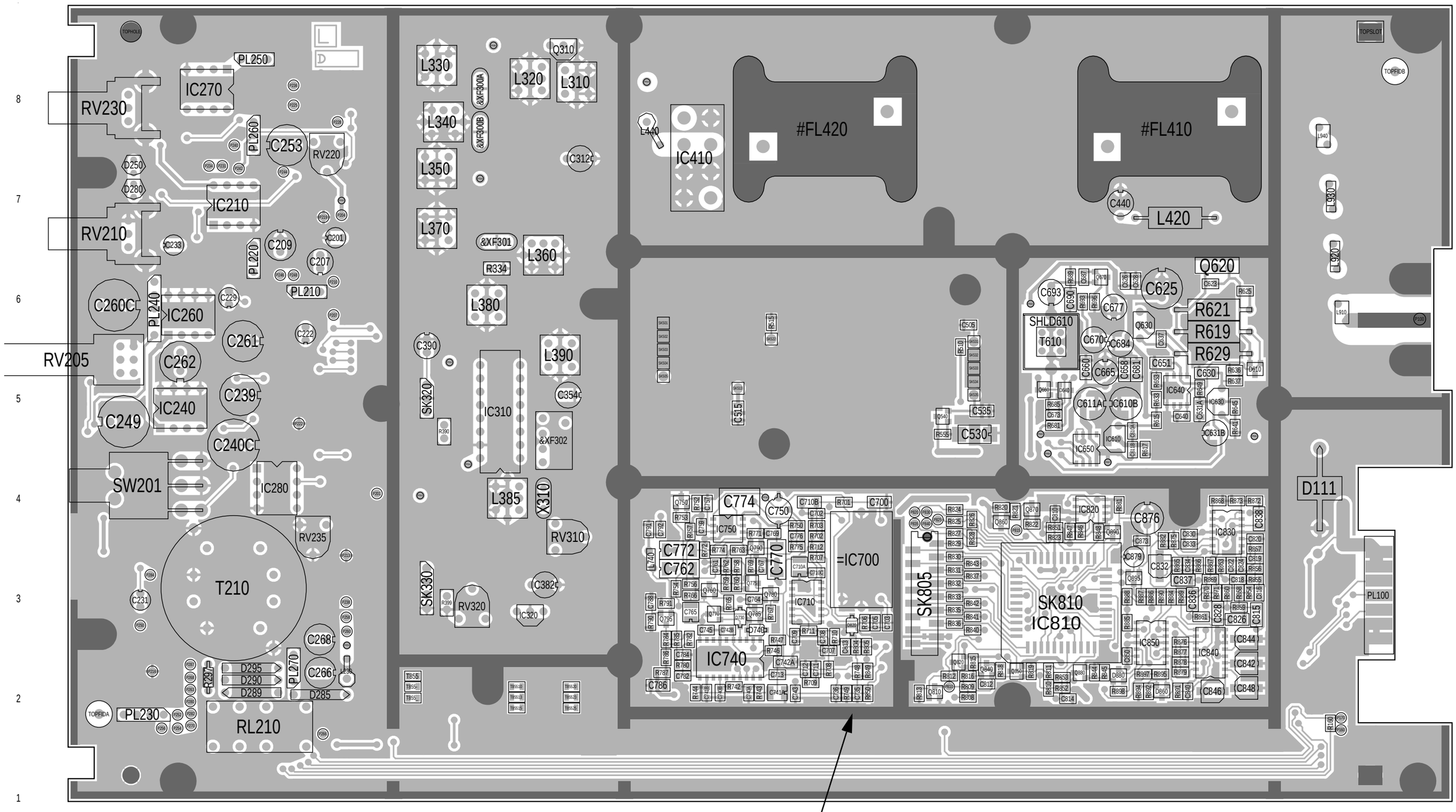
The lower number indicates how many of this component are used in this location or function.



T855 Mechanical Assembly
220-01396-02

Copyright TEL

Copyright TEL

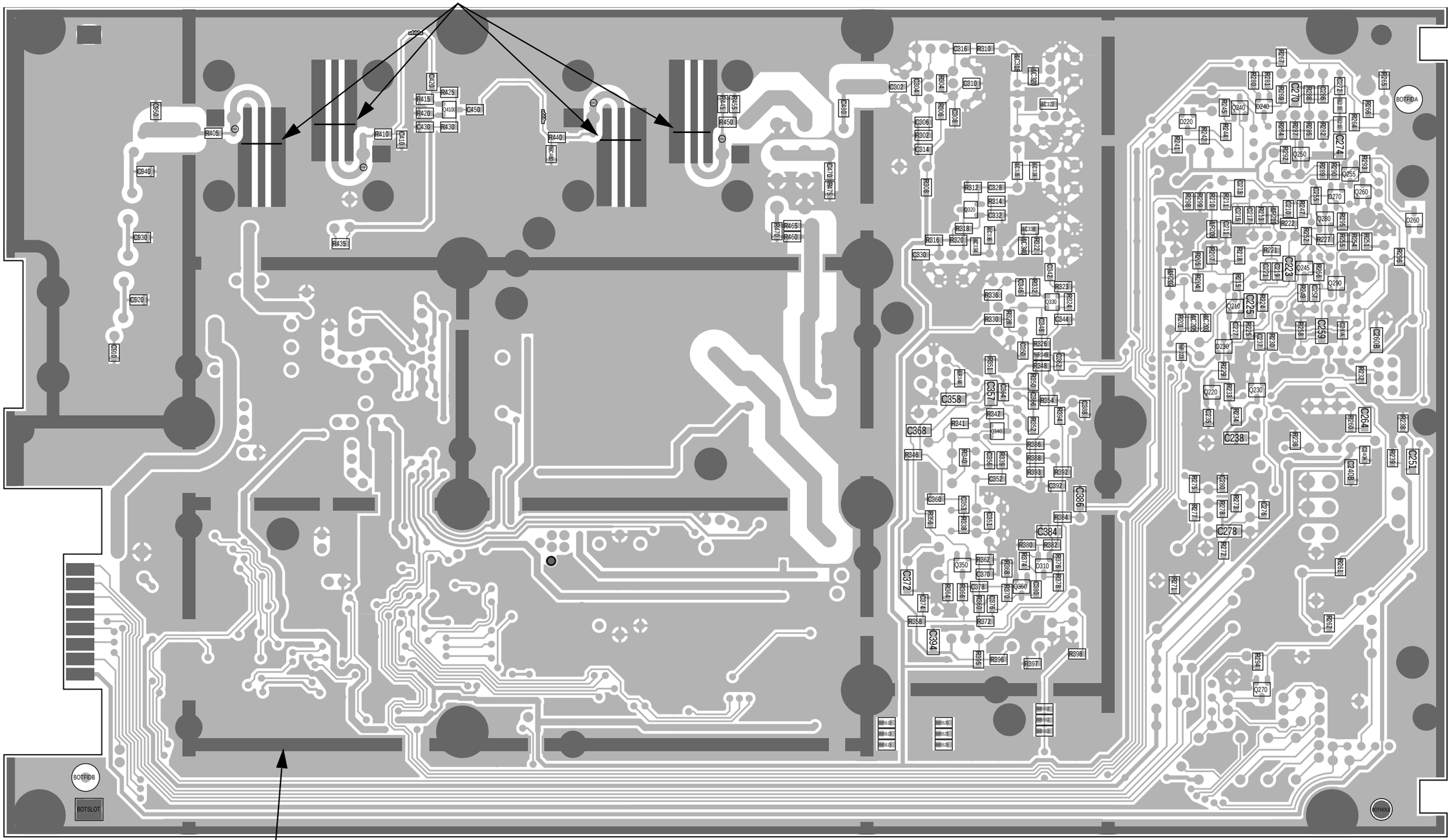


The darker shading shows the outline of the chassis.

T855 PCB Layout - Top Side
220-01396-02

Copyright TEL

These link wires are positioned according to frequency range and should not be moved as their position is optimised in the factory.

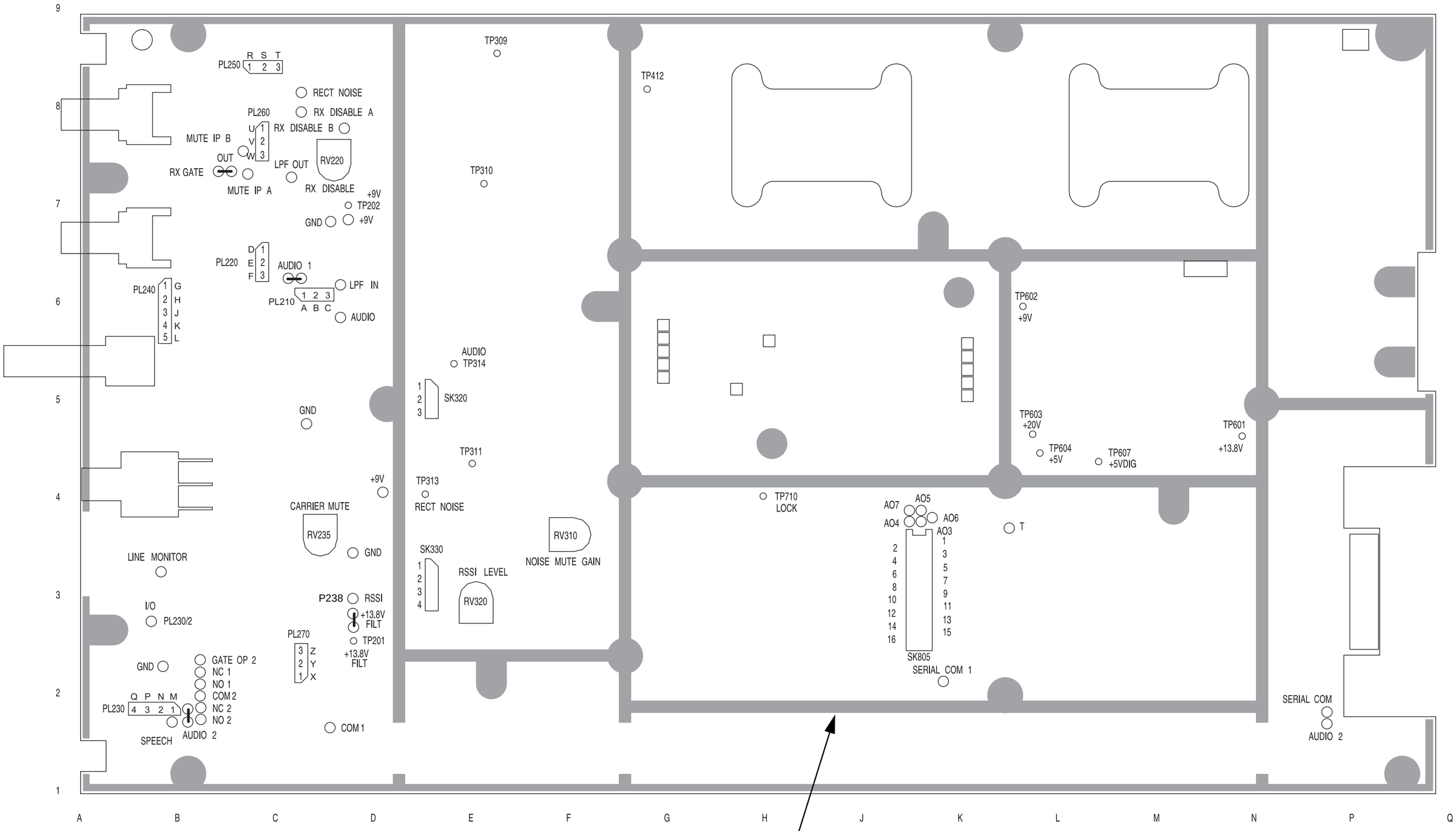


The darker shading shows the footprint of the bottom cover.

T855 PCB Layout - Bottom Side
220-01396-02

31/09/98

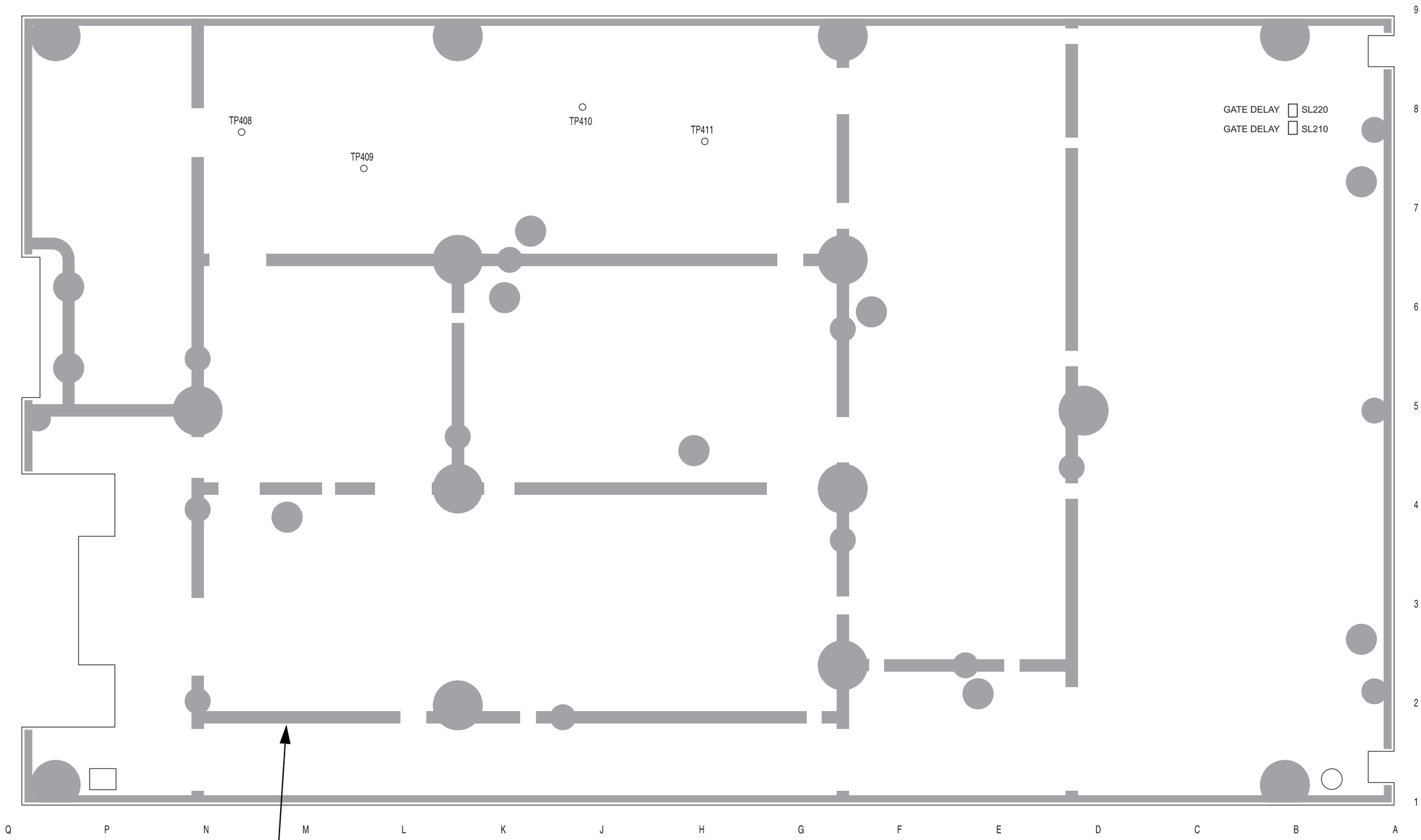
Copyright TEL



The darker shading shows the outline of the chassis.

T855 Test Points & Options Connections - Top Side
220-01396-02

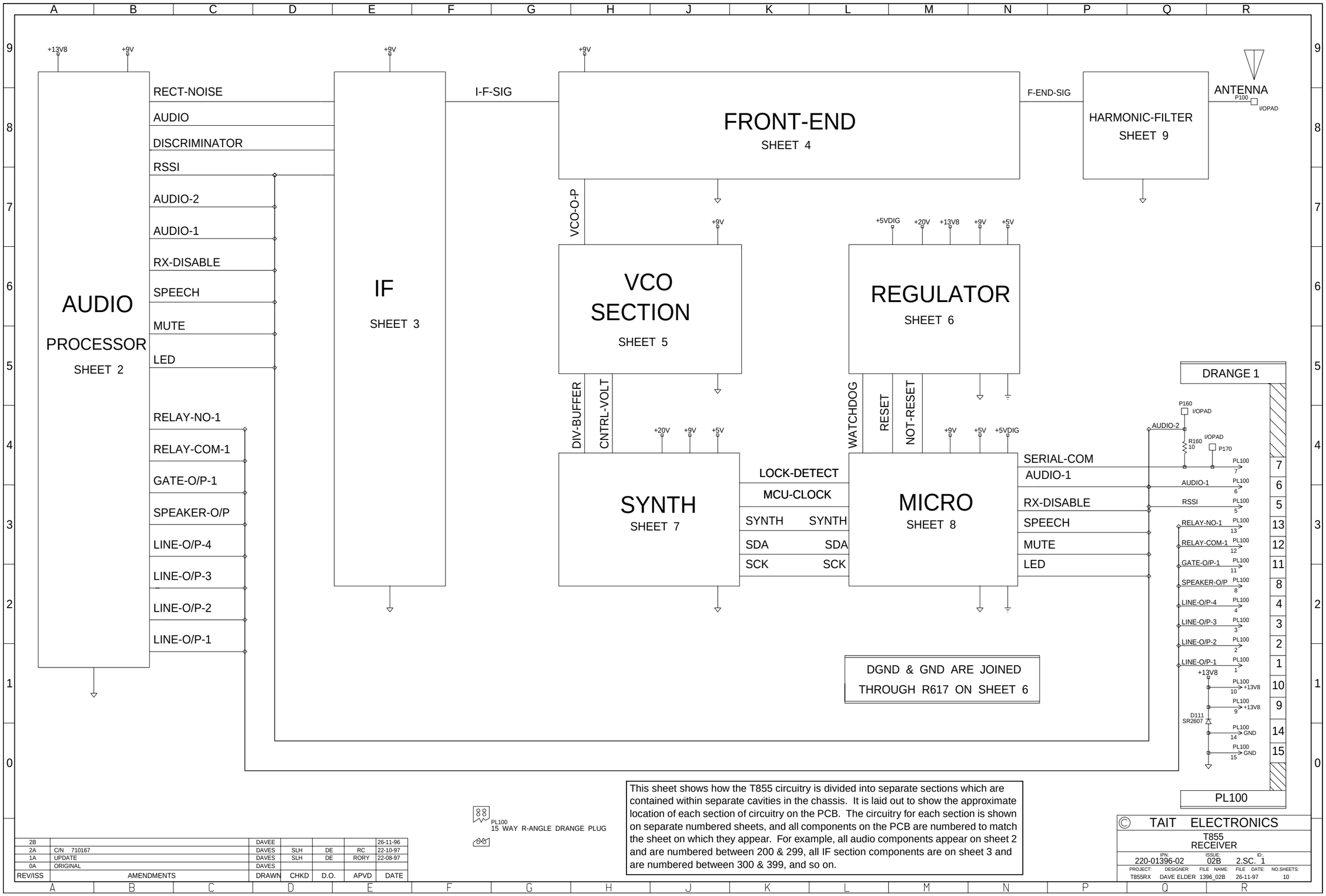
Copyright TEL



T855 Test Points & Options Connections - Bottom Side
220-01396-02

31/09/98

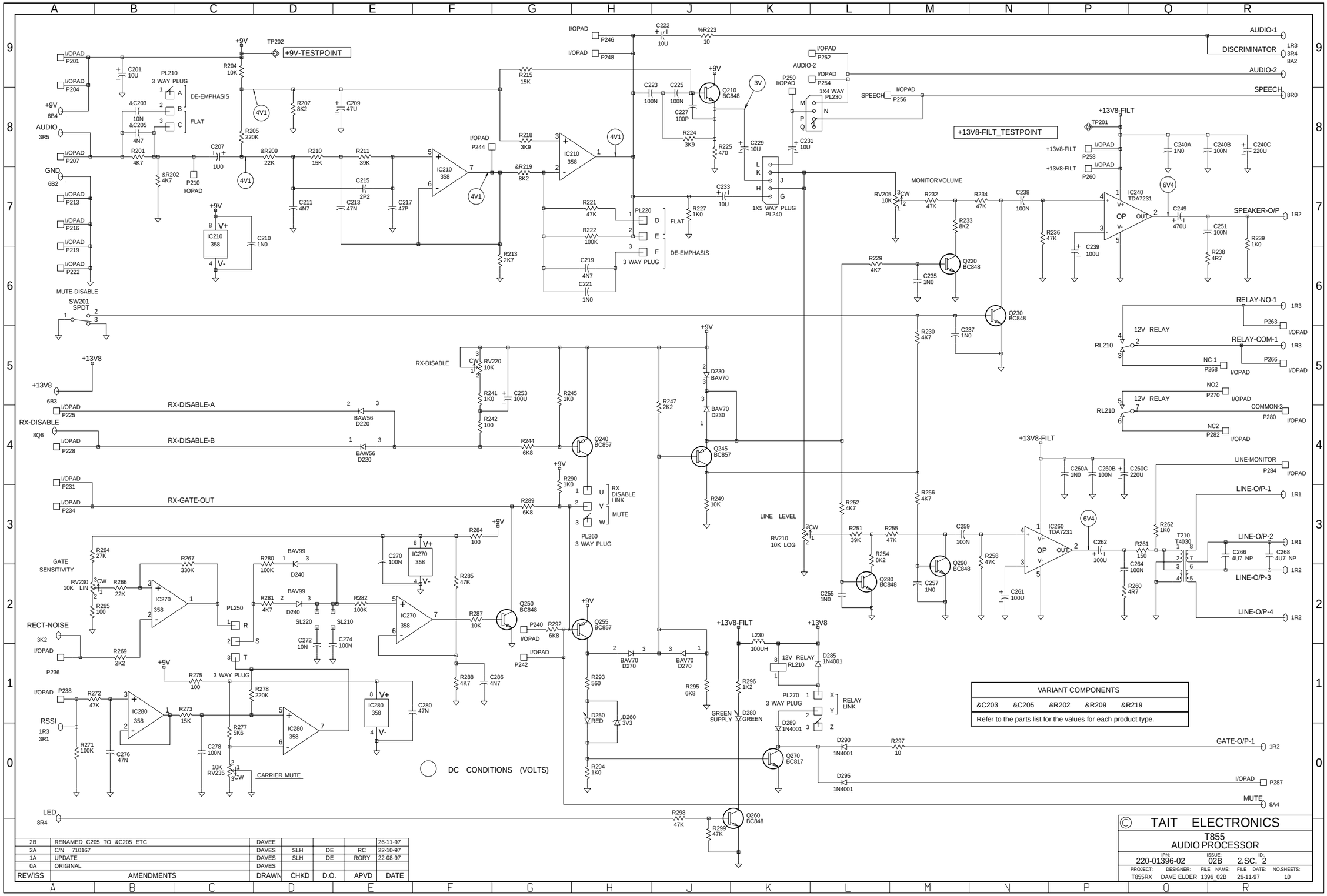
Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B		DAVEE				26-11-96
2A	C/N 710167	DAVES	SLH	DE	RC	22-10-97
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

Sheet 1 - T855 Receiver Overview
220-01396-02

Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	RENAMED C205 TO &C205 ETC	DAVEE				26-11-97
2A	C/N 710167	DAVES	SLH	DE	RC	22-10-97
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

© TAIT ELECTRONICS

T855
AUDIO PROCESSOR

IPN:	ISSUE:	ID:
220-01396-02	02B	2.SC. 2

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Sheet 2 - T855 Audio Processor
220-01396-02

Copyright TEL

VARIANT COMPONENTS					
&C318	&C324	&C336	&R344	&XF300A	&XF301
&C320	&C326	&C338		&XF300B	&XF302
&C322	&C334	&C340			
Refer to the parts list for the values for each product type.					

SENSITIVITY

DC CONDITIONS (VOLTS)

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES OF &C320 ETC	DAVEE				26-11-97
2A	C/N 710167	DAVES	SLH	DE	RC	22-10-97
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

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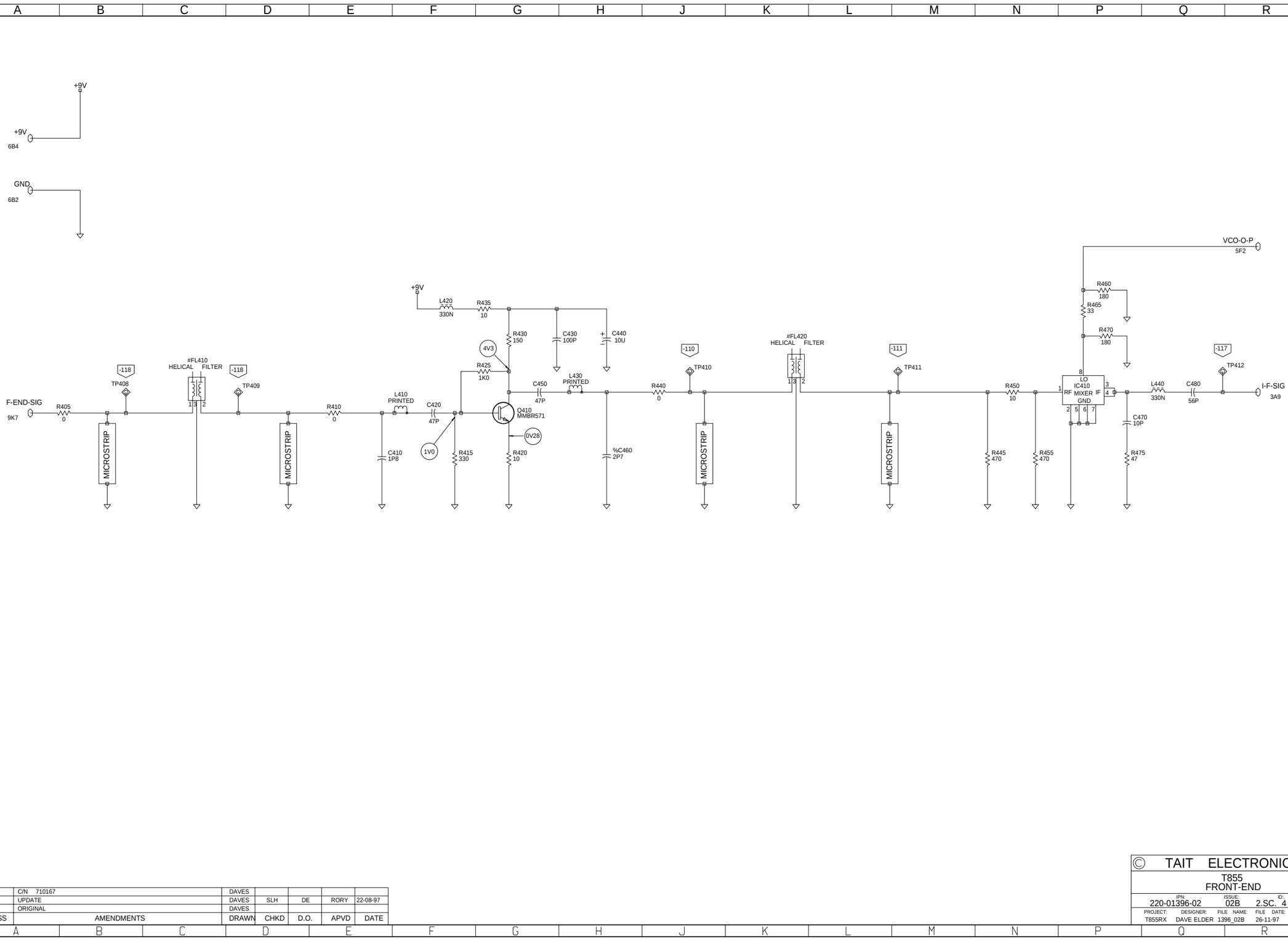
T855
IF

IPN:	ISSUE:	ID:.
220-01396-02	02B	2.SC. 3

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	27-11-97	10

Sheet 3 - T855 IF Section
220-01396-02

Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2A	C/N 710167	DAVES				
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

© TAIT ELECTRONICS

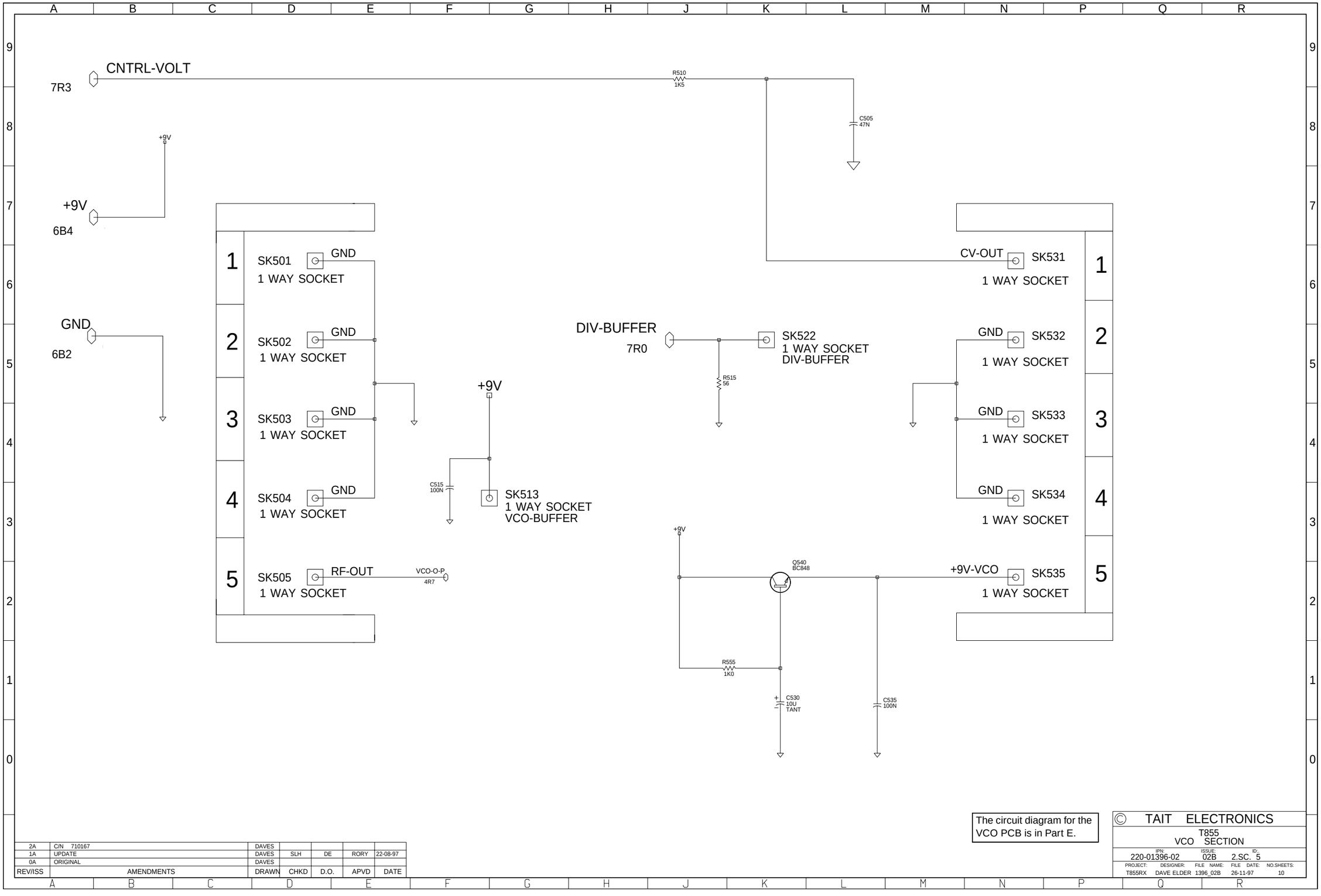
T855
FRONT-END

IPN:	ISSUE:	ID:
220-01396-02	02B	2.SC. 4

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Sheet 4 - T855 Front End
220-01396-02

Copyright TEL



Sheet 5 - T855 VCO Section
220-01396-02

Copyright TEL

+5VDIG TESTPOINT

+5VDIG-SUPPLY

DGND CONNECTS GND THROUGH R617

+13V8-TESTPOINT

+9V-TESTPOINT

+5V REGULATOR

+5V TESTPOINT

+9V REGULATOR

CAN TO SHIELD T610

10MM SQ * 11MM
SHLD610

240KHz
24vpp

+20V TESTPOINT

+20V SUPPLY

IC640
SPARE GATE

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2A	C/N 710167	DAVES				
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

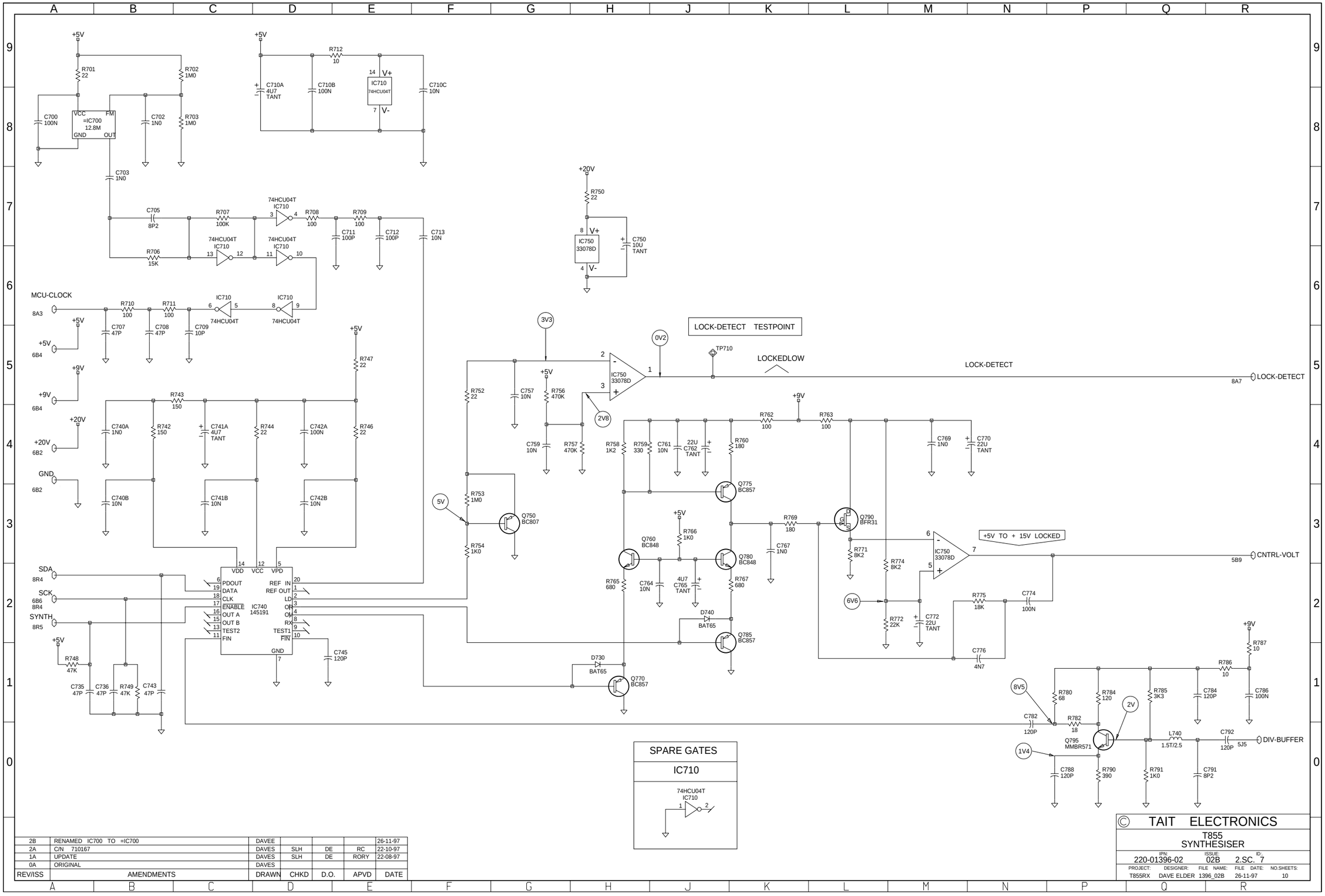
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T855
REGULATORS

IPN:	ISSUE:	ID:
220-01396-02	02B	2.SC. 6

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	RENAMED IC700 TO =IC700	DAVEE				26-11-97
2A	C/N 710167	DAVES	SLH	DE	RC	22-10-97
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

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T855
SYNTHESISER

IPN:	ISSUE:	ID:
220-01396-02	02B	2.SC. 7

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Sheet 7 - T855 Synthesiser
220-01396-02

Copyright TEL

Circuit Diagram Amendment

The line from IC810 pin 19 to SK805 pin 4 was incorrectly labelled “CTCSS_ENABLE”. The label at grid reference H4 has been corrected to read “CTCSS_DISABLE”.

CHANNEL SELECT TO MICRO BUS

MICROMATCH TO D-RANGE2 CONNECTIONS

MICROMATCH PIN	D-RANGE2 PIN
1	1
3	2
5	3
7	4
9	5
11	6
13	7
6	11
16	NC
14	15
12	14
10	13
4	10
8	12
2	9
15	8

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2A	C/N 710167	DAVES	SLH	DE	RC	22-10-97
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

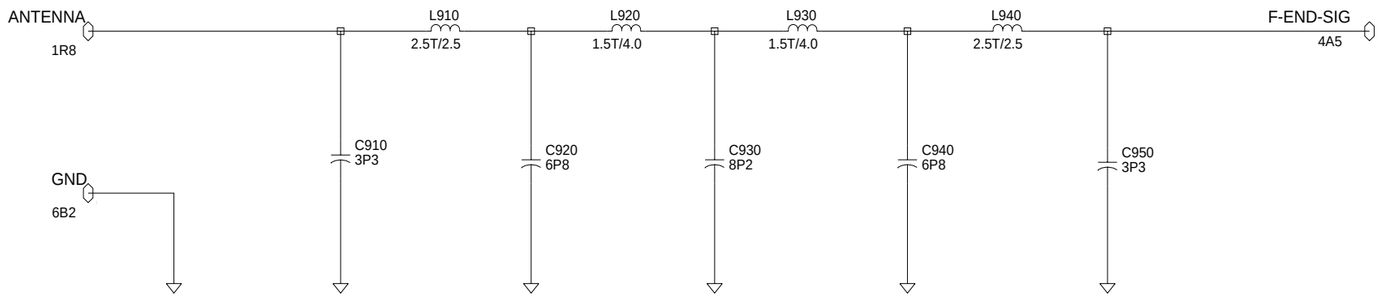
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T855
MICROCONTROLLER

IPN:	ISSUE:	ID:
220-01396-02	02B	2.SC. 8

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Copyright TEL



HARMONIC-FILTER

DIODE PHYSICAL PIN OUTS



BAV70



BAV99
BAT17DS



BAW56

TRANSISTOR PHYSICAL PIN OUTS



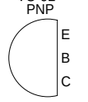
BC857
BC807



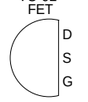
BFR31



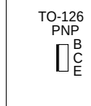
BC848
BC817
MMBR571
MMBR951L



BC557



BF247



BD234

TANTALUMS



CHIP
TANTALUMS

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2A	C/N 710167	DAVES				
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGANAL	DAVES				

© TAIT ELECTRONICS

T855
HARMONIC-FILTER

IPN:	ISSUE:	ID:.
220-01396-02	02B	2.SC. 9

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	DAVE ELDER	1396_02B	26-11-97	10

Sheet 9 - T855 Harmonic Filter
220-01396-02

Copyright TEL

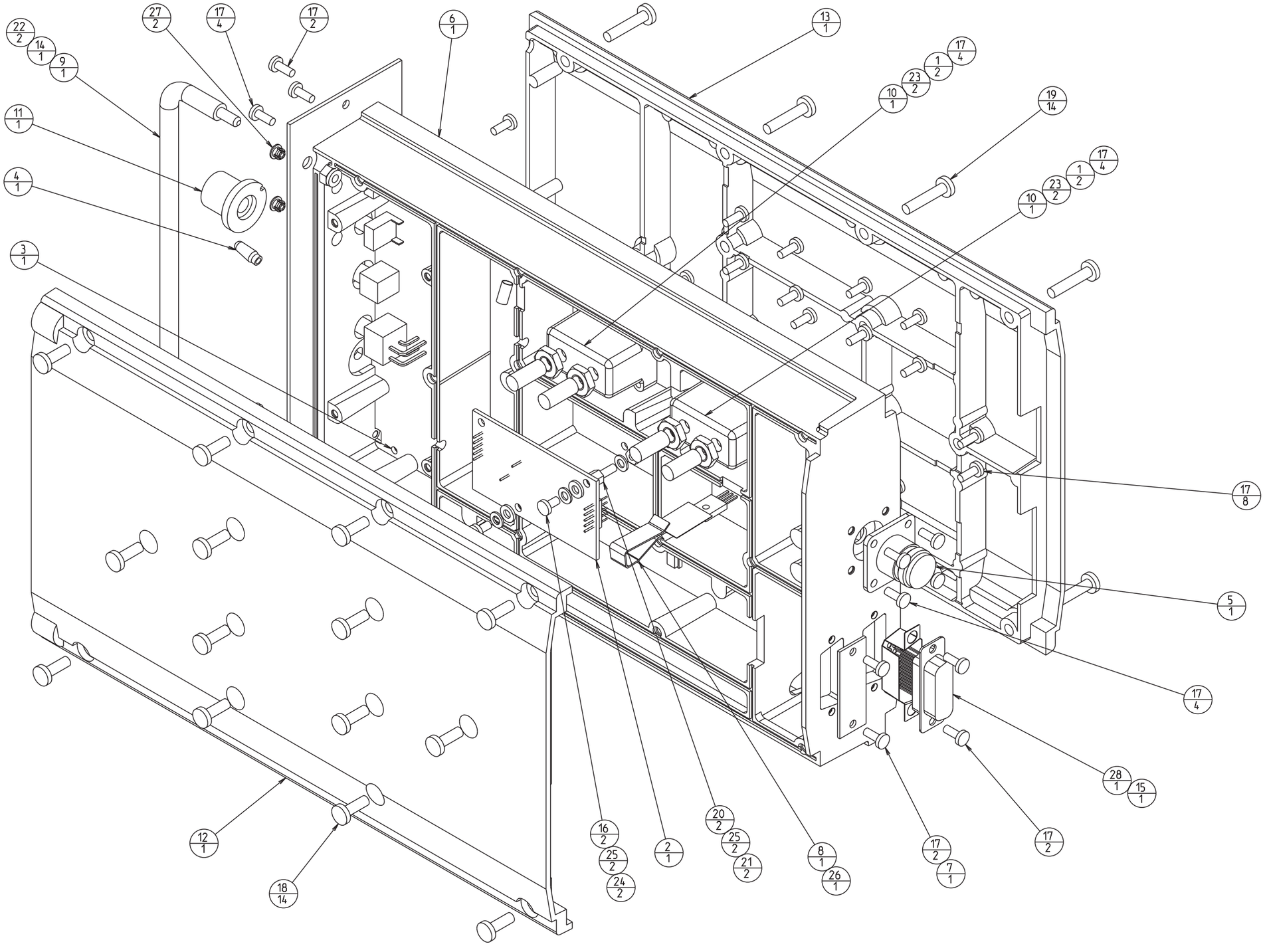
Copyright TEL

Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

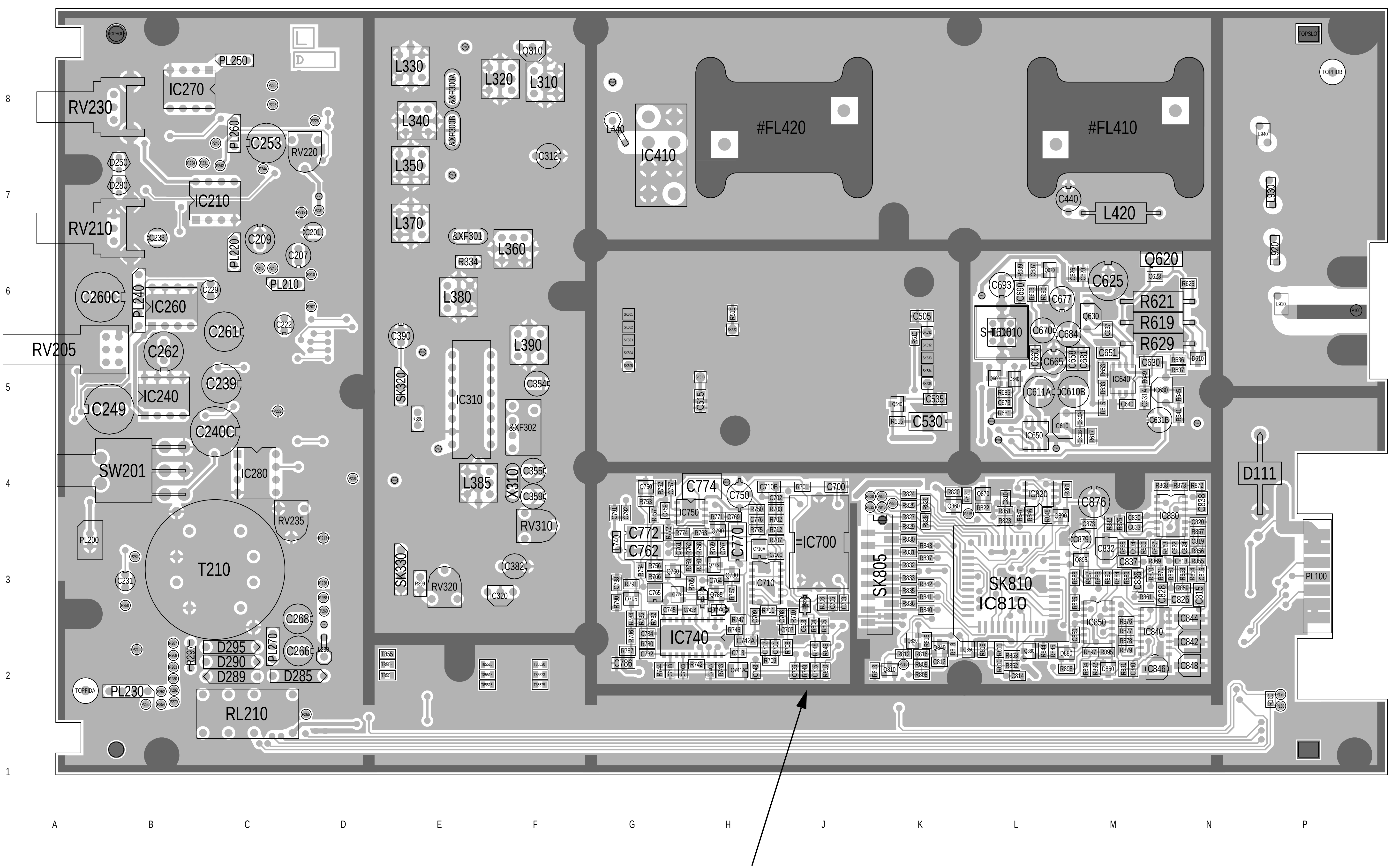
The lower number indicates how many of this component are used in this location or function.



T855 Mechanical Assembly
220-01396-03

Copyright TEL

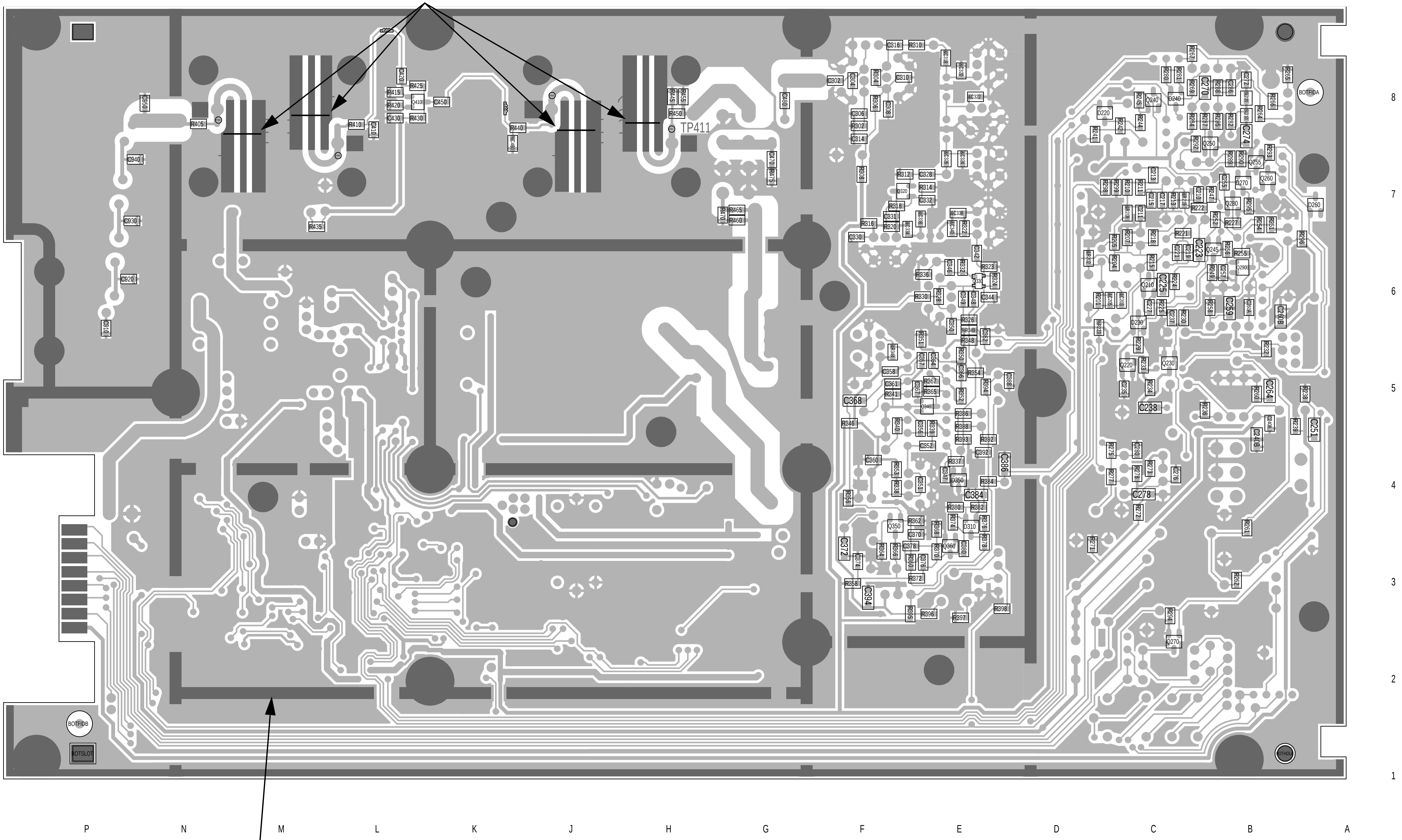
Copyright TEL



The darker shading shows the outline of the chassis.

T855 PCB Layout - Top Side
220-01396-03

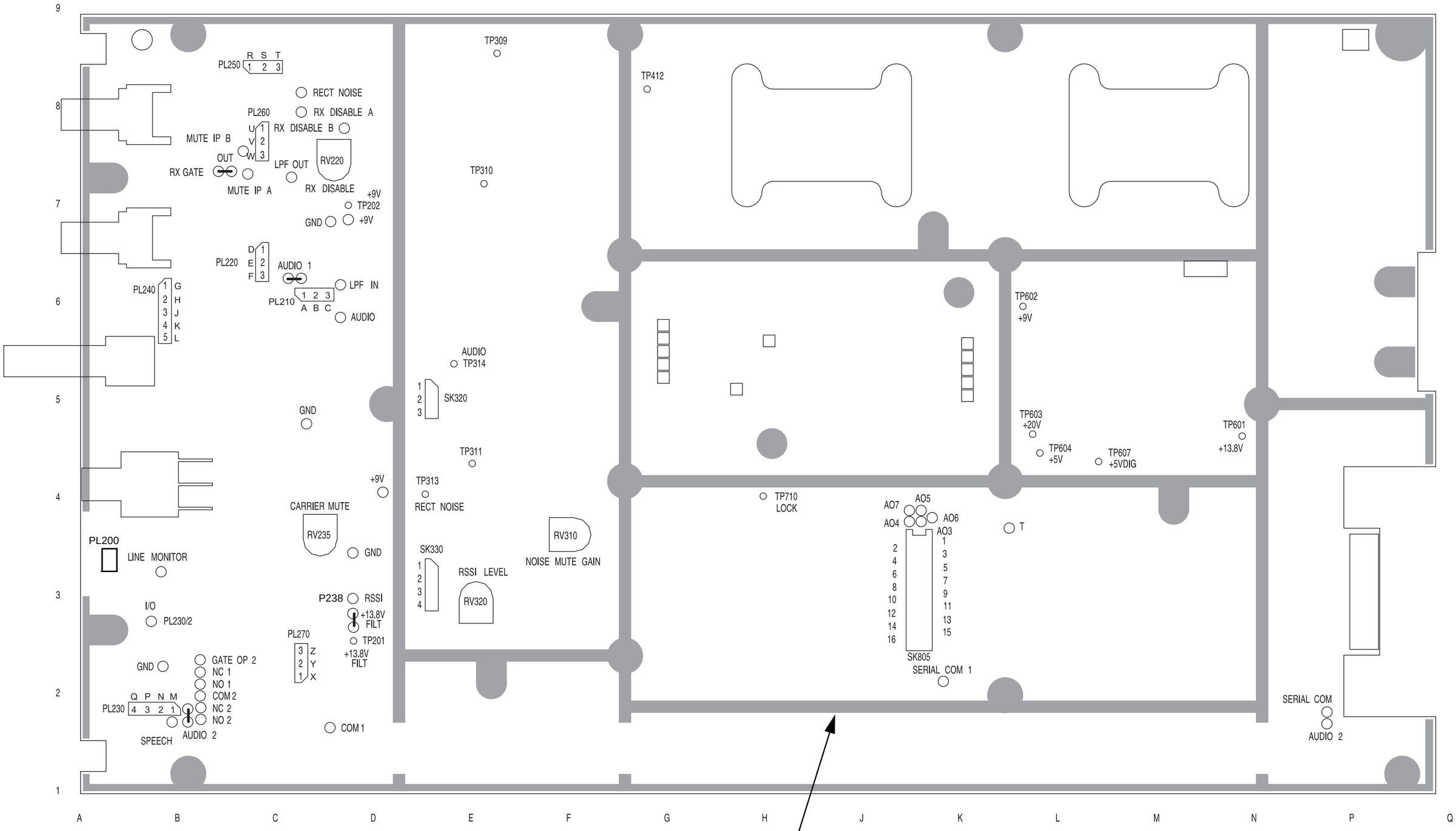
These link wires are positioned according to frequency range and should not be moved as their position is optimised in the factory.



The darker shading shows the footprint of the bottom cover.

T855 PCB Layout - Bottom Side
220-01396-03

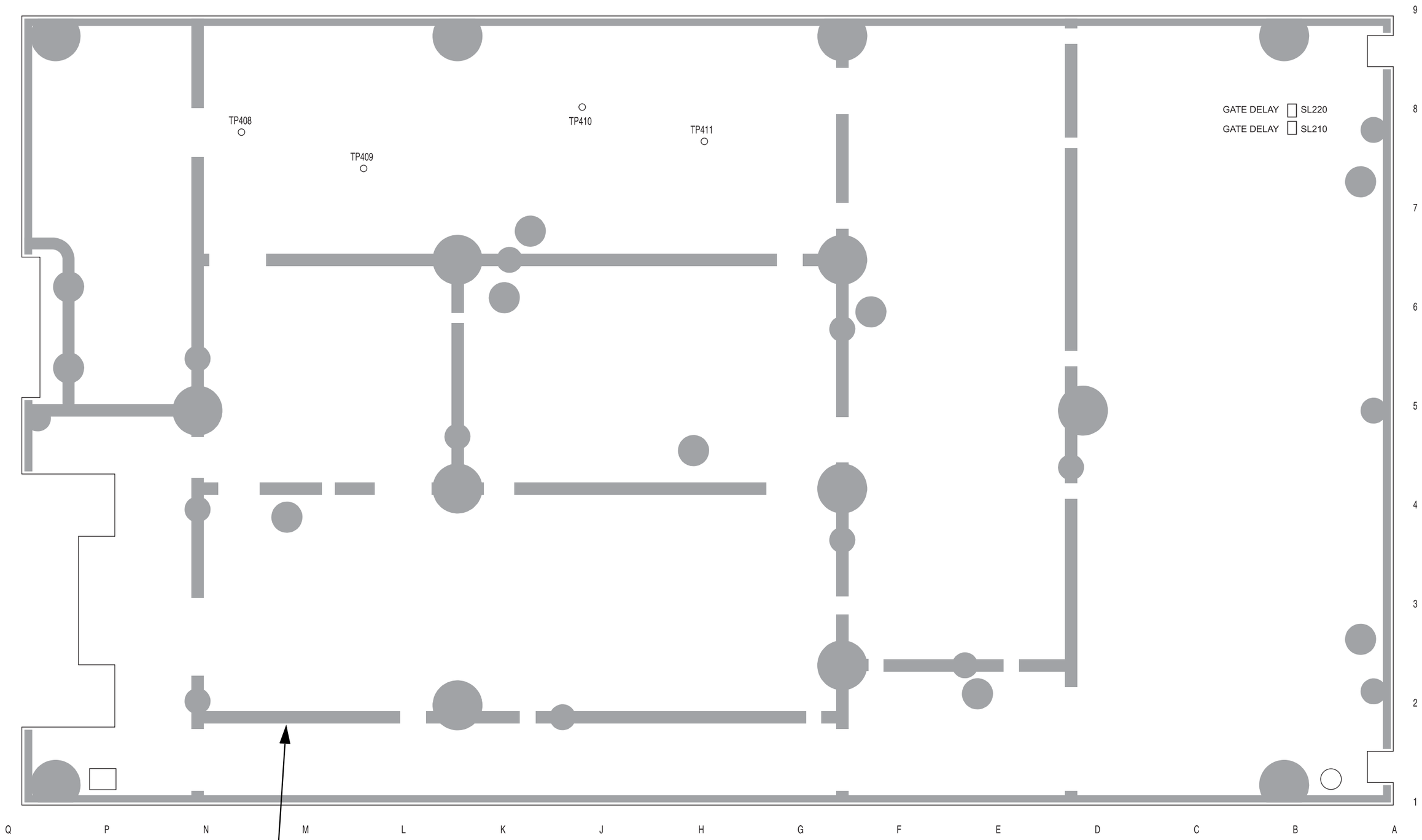
Copyright TEL



The darker shading shows the outline of the chassis.

T855 Test Points & Options Connections - Top Side
220-01396-03

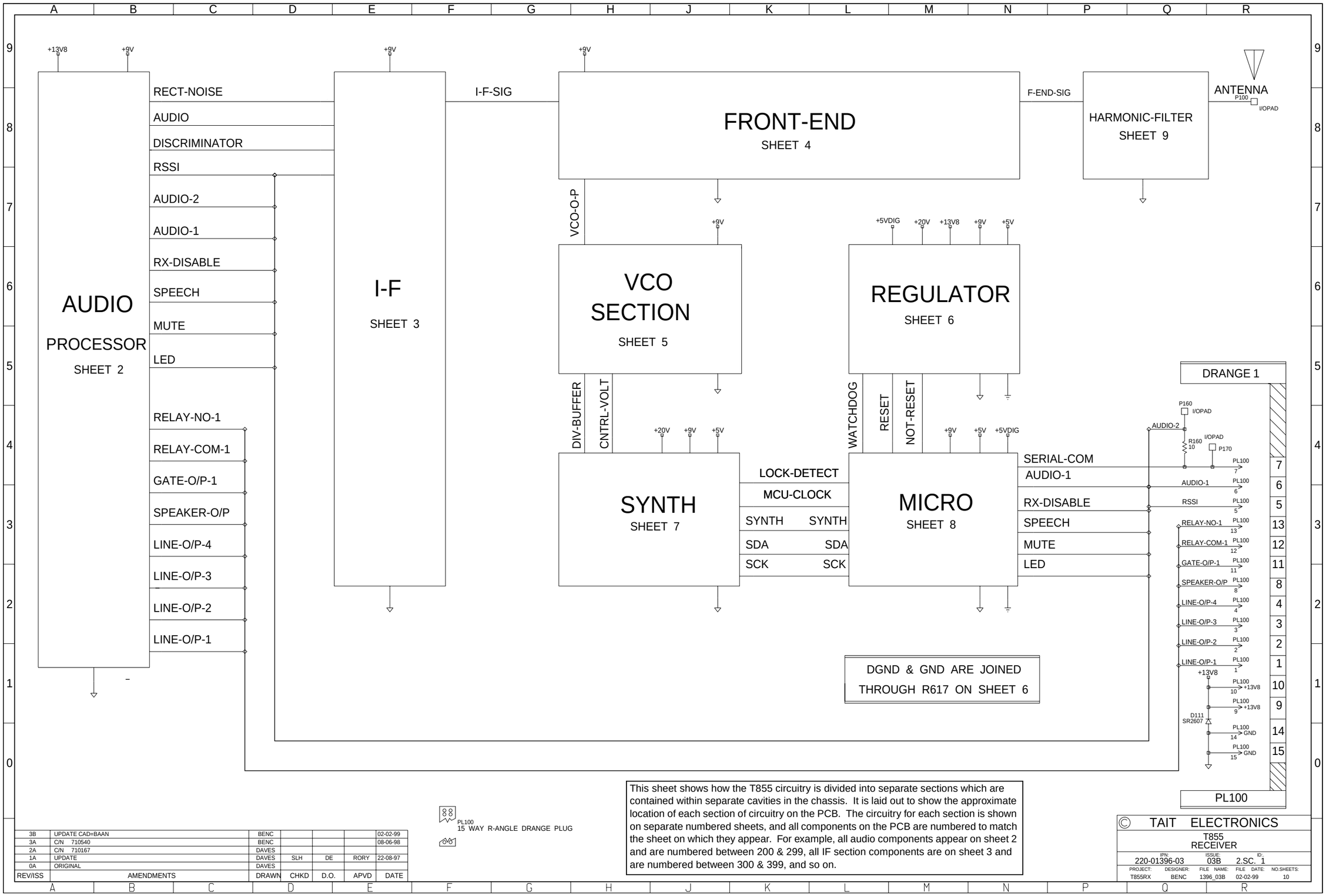
Copyright TEL



T855 Test Points & Options Connections - Bottom Side
220-01396-03

31/01/99

Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
3B	UPDATE CAD=BAAN	BENC				02-02-99
3A	C/N 710540	BENC				08-06-98
2A	C/N 710167	DAVES				
1A	UPDATE	DAVES	SLH	DE	RORY	22-08-97
0A	ORIGINAL	DAVES				

This sheet shows how the T855 circuitry is divided into separate sections which are contained within separate cavities in the chassis. It is laid out to show the approximate location of each section of circuitry on the PCB. The circuitry for each section is shown on separate numbered sheets, and all components on the PCB are numbered to match the sheet on which they appear. For example, all audio components appear on sheet 2 and are numbered between 200 & 299, all IF section components are on sheet 3 and are numbered between 300 & 399, and so on.

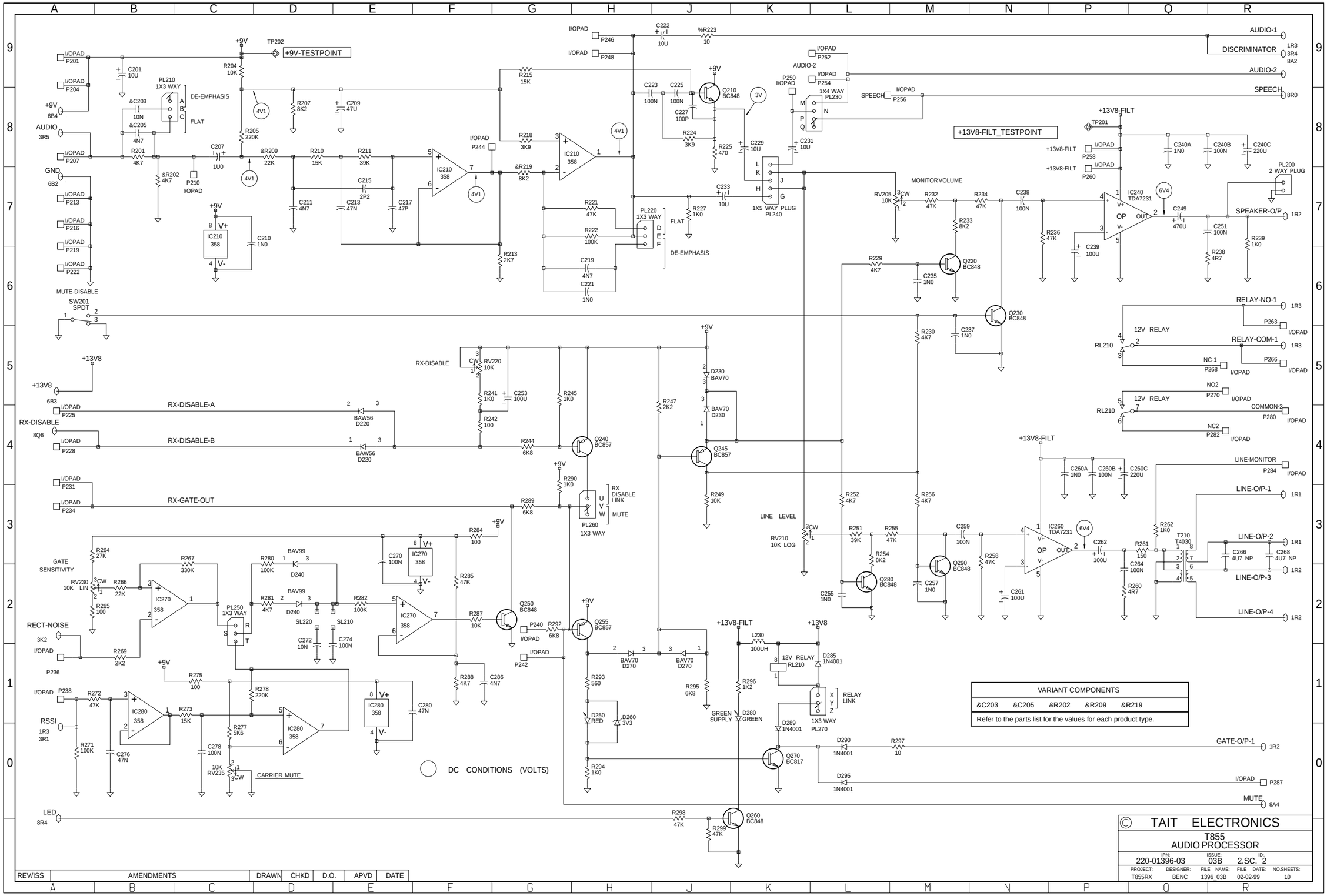
© TAIT ELECTRONICS

T855
RECEIVER

IPN:	ISSUE:	ID:.
220-01396-03	03B	2.SC. 1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

Sheet 1 - T855 Receiver Overview
220-01396-03



Sheet 2 - T855 Audio Processor
220-01396-03

Copyright TEL

VARIANT COMPONENTS					
&C318	&C324	&C336	&R344	&XF300A	&XF301
&C320	&C326	&C338		&XF300B	&XF302
&C322	&C334	&C340			

Refer to the parts list for the values for each product type.

RECT-NOISE_TESTPOINT

SENSITIVITY

DC CONDITIONS (VOLTS)

© TAIT ELECTRONICS

T855
I-F

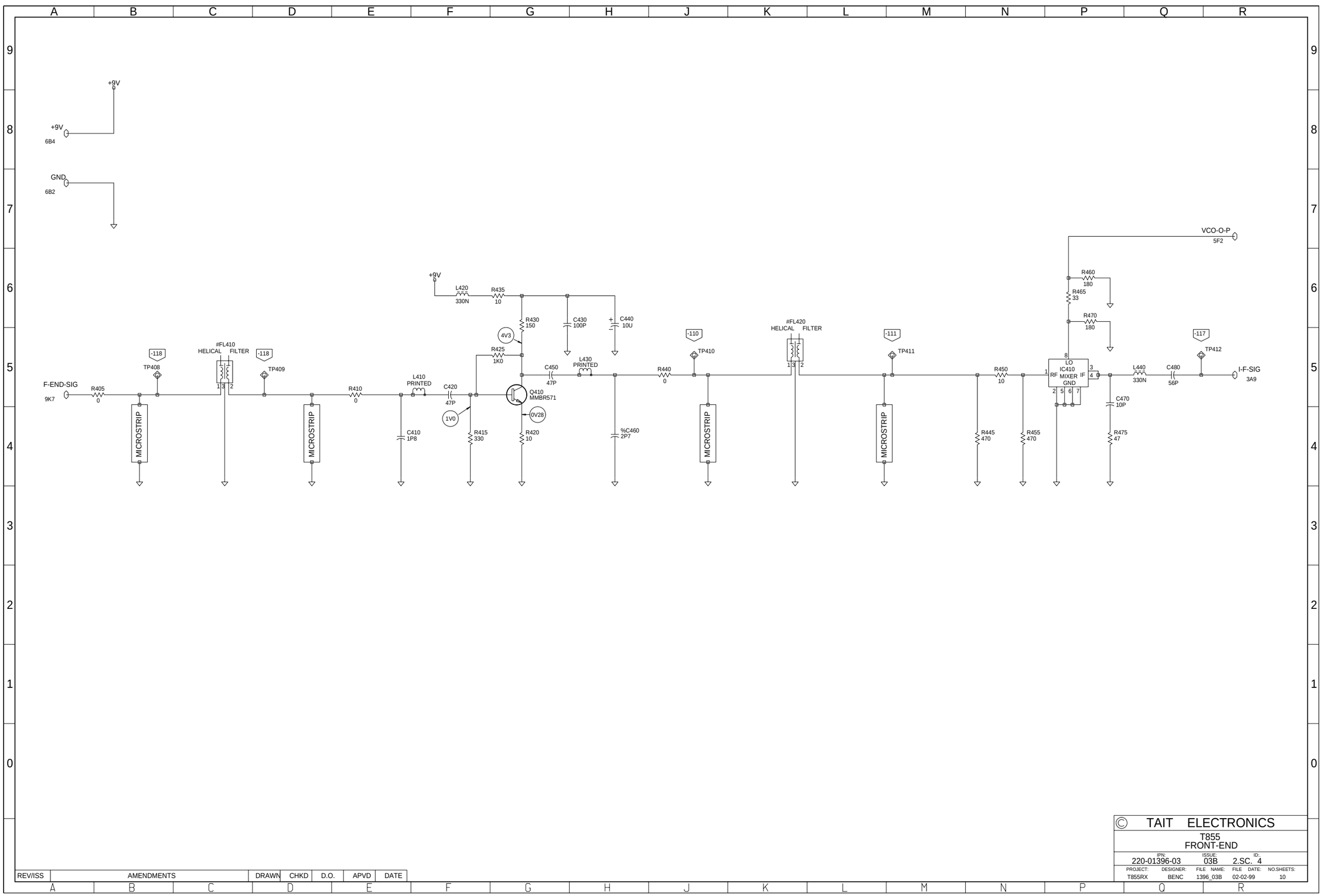
IPN:	ISSUE:	ID.
220-01396-03	03B	2.SC. 3

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

Sheet 3 - T855 IF Section
220-01396-03

Copyright TEL



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

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T855
FRONT-END

IPN:	ISSUE:	ID:
220-01396-03	03B	2.SC. 4

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

Sheet 4 - T855 Front End
220-01396-03

Copyright TEL

CNTRL-VOLT
7R3
R510
2K2
C505
100N
+9V
6B4
GND
6B2
SK501
1 WAY SOCKET
GND
SK502
1 WAY SOCKET
GND
SK503
1 WAY SOCKET
GND
SK504
1 WAY SOCKET
GND
SK505
1 WAY SOCKET
RF-OUT
VCO-O-P
4R7
+9V
C515
100N
SK513
1 WAY SOCKET
VCO-BUFFER
DIV-BUFFER
7R0
R515
56E
SK522
1 WAY SOCKET
DIV-BUFFER
SK531
1 WAY SOCKET
CV-OUT
SK532
1 WAY SOCKET
GND
SK533
1 WAY SOCKET
GND
SK534
1 WAY SOCKET
GND
SK535
1 WAY SOCKET
+9V-VCO
+9V
Q540
BC848
R555
470
C530
22U
TANT
C535
100N

The circuit diagram for the VCO PCB is in Part E.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

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T855
VCO SECTION

IPN:	ISSUE:	ID:
220-01396-03	03B	2.SC. 5

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

Sheet 5 - T855 VCO Section
220-01396-03

Copyright TEL

+5VDIG TESTPOINT

+5VDIG-SUPPLY

DGND CONNECTS GND THROUGH R617

+13V8-TESTPOINT

+9V-TESTPOINT

+5V REGULATOR

+5V TESTPOINT

+9V REGULATOR

CAN TO SHIELD T610

10MM SQ * 11MM
SHLD610

240KHz
24vpp

+20V TESTPOINT

+20V SUPPLY

IC640
SPARE GATE

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

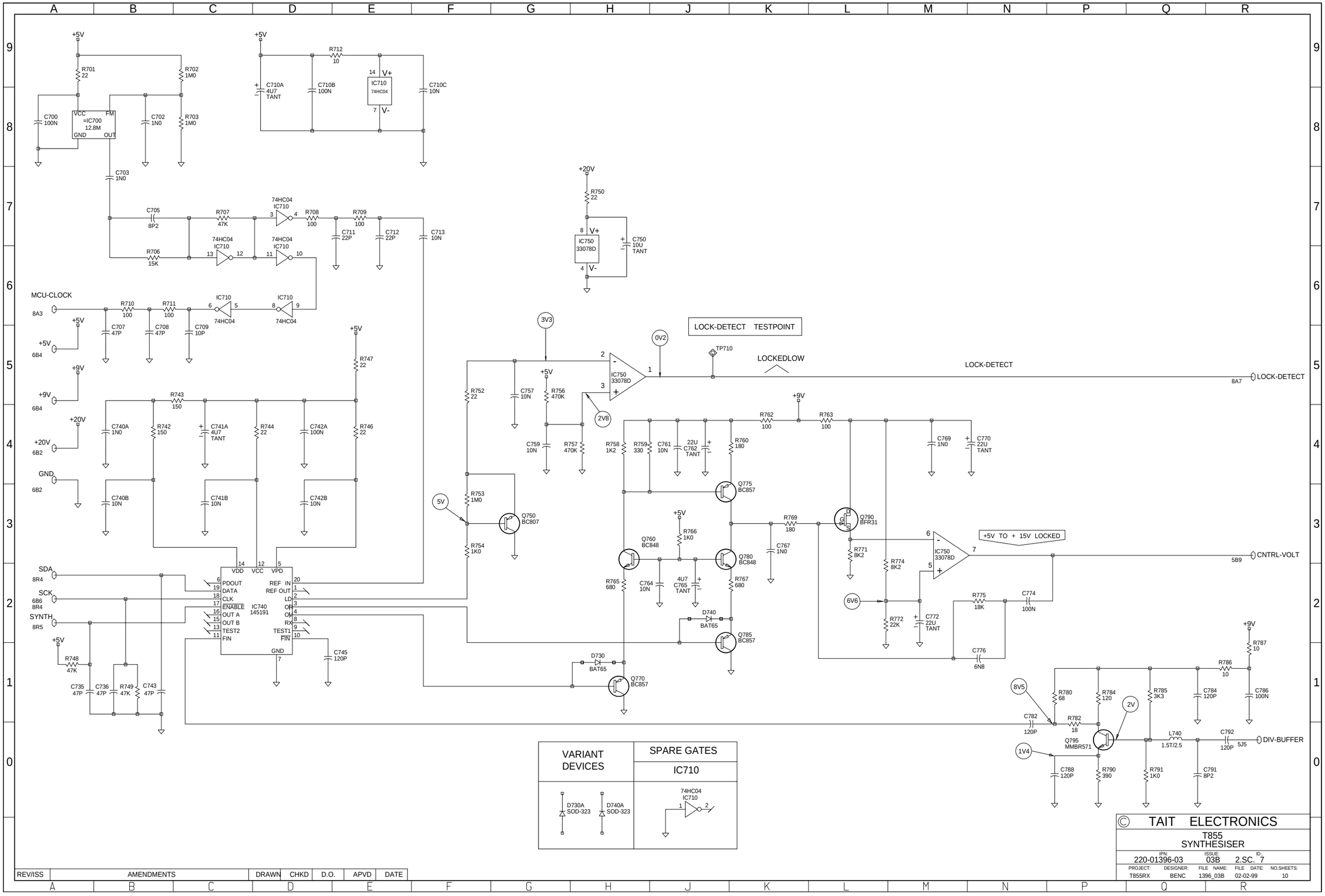
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T855
REGULATORS

IPN:	ISSUE:	ID:
220-01396-03	03B	2.SC. 6

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

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Sheet 7 - T855 Synthesiser
220-01396-03

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CHANNEL SELECT TO MICRO BUS

+5VDIG
+5VDIG 6B4
0V
RESET 6B5
RESET
+5V
R804 47K
LOCK-DETECT 7R5
D820 BAT65
R805 470
SYNTH_LOCK_DETECT
+5VDIG
R810 4K7
R809 4K7
Q820 BC857
R811 4K7
SERIAL-COM 1R4
R808 10
R812 4K7
Q810 BC817
R813 4K7
5V
I/OPAD P810
+9V
R820 47K
P815 I/OPAD
Q860 BC857
R821 47K
MUTE 2R0
Q870 BC848
R823 47K
R822 47K
MCU-CLOCK 7A6
MCU-CLOCK
AUDIO-1 1R3 2R9 2R9 3R4
C816 10N
C815 10N
+5V 6B4
+9V 6B4
DGND 6B0
GND 6B2
R854 330K
R855 47K
R856 150K
R857 150K
C822 22N
C824 47N
C819 33P
C818 10N
C820 220P
R858 27K 1%
R859 1M2 1%
R860 820K 1%
C826 10N
C828 10N
R861 5K1 1%
R868 4K7
C832 1U0
R865 2K7
C834 10N
R866 820K
C833 22N
R867 820K
R869 27K 1%
R870 1M2 1%
R871 820K 1%
R872 5K1 1%
R873 2K2
R875 4K7
C836 10N
C837 10N
C838 10N
4V2
LM324D IC830
C830 47N
C831 47N
+5VDIG
Q840 BC857
R818 4K7
R819 4K7
Q850 BC848
C812 100P
R815 47K
R816 150K
C810 10N
C813 1N0
12.8MHz
SK810 80C51
RST
VCC
P1.7
P1.6
P1.5
P1.4
P1.3
P1.2
P1.1
P1.0
P0.7
P0.6
P0.5
P0.4
P0.3
P0.2
P0.1
P0.0
P3.7/RD
P3.6/WR
P3.5/T1
P3.4/T0
P3.3/INT1
P3.2/INT0
P3.1/TXD
P3.0/RXD
EA
ALE
PSEN
P2.7
P2.6
P2.5
P2.4
P2.3
P2.2
P2.1
P2.0
VSS
XTL1
XTL2
MUTE_OUT
WATCHDOG
SYNS
SDA
SCK
CTCSS_LSB
CTCSS_RX
CTCSS_MSB
DCS_INPUT
CTCSS_ENABLE
LED_FLASH
SERIAL_COM-1
MUTE_OUT
R824 2K2
R825 2K2
R826 2K2
R827 2K2
R828 2K2
P820
P825
P830
P835
P840
I/OPAD
CH-SLCT-0
CH-SLCT-1
CH-SLCT-2
CH-SLCT-3
CH-SLCT-4
CH-SLCT-5
CH-SLCT-6
CH-SLCT-7
R829 2K2
R830 2K2
R831 2K2
R832 2K2
R833 2K2
R835 2K2
R836 2K2
R837 2K2
SK805
R840 2K2
R841 2K2
R842 2K2
R843 2K2
2A4
MICROMATCH PIN
D-RANGE2 PIN
MICROMATCH TO D-RANGE2 CONNECTIONS
1 1
3 2
5 3
7 4
9 5
11 6
13 7
6 11
16 NC
14 15
12 14
10 13
4 10
8 12
2 9
15 8
R846 4K7
R847 4K7
Q880 BC848
R844 47K
R845 150K
IC820 24C16
A0
A1
A2
GND
+V
SCL
SDA
WP
R848 470
R849 470
R850 470
R851 470
R852 4K7
R853 470
C814 1N0
WATCHDOG 6B6
SYNTH 7A2
SDA 7A2
SCK
NOT-RESET 6B6
7A2 LED 2A0
Q890 BC848
R882 47K
R881 47K
IC850 LM324D
+4V2
R884 150K
R885 150K
C873 22N
C876 100U
R886 10K 1%
R887 1K0 1%
R888 8K2 1%
3V8
Q895 BC848
R889 100K
R890 150K
R891 100K
R892 330K
BAV70 D860
R897 10K
R898 470K
BAV70 D880
R895 10K
3V7 WHEN DETECTING TONE
R894 4K7
C879 10U
IC840 4053BD
R876 100K
R877 100K
R878 100K
R879 100K
C840 47N
C842 1U0
C844 1U0
C846 1U0
C848 1U0
SPEECH 2R8
VARIANT DEVICES
D820A SOD-323
C850 47N

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

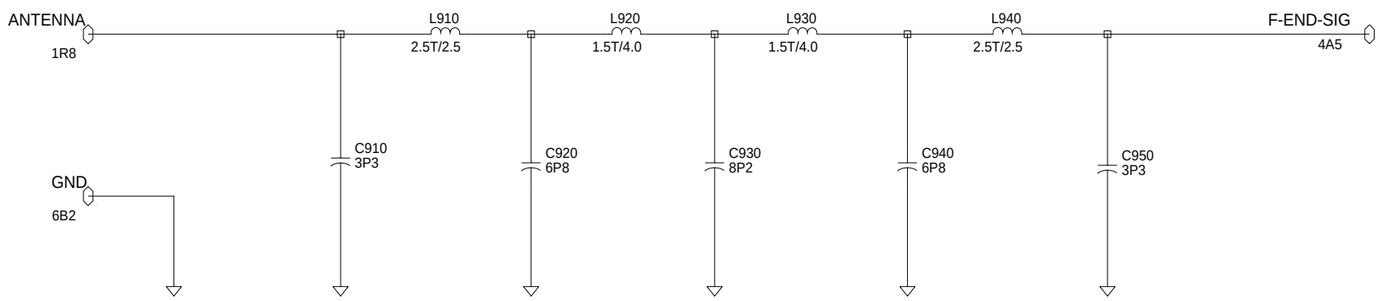
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T855
MICROCONTROLLER

IPN:	ISSUE:	ID:
220-01396-03	03B	2.SC. 8

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T855RX	BENC	1396_03B	02-02-99	10

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HARMONIC-FILTER

DIODE PHYSICAL PIN OUTS



BAV70



BAV99
BAT17DS



BAW56

TRANSISTOR PHYSICAL PIN OUTS



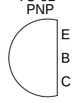
BC857
BC807



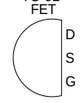
BFR31



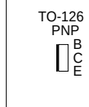
BC848
BC817
MMBR571
MMBR951L



BC557



BF247



BD234

TANTALUMS



CHIP
TANTALUMS

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

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T855
HARMONIC-FILTER

IPN:	ISSUE:	ID:.
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PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T855RX	BENC	1396_03B	02-02-99	10

Sheet 9 - T855 Harmonic Filter
220-01396-03

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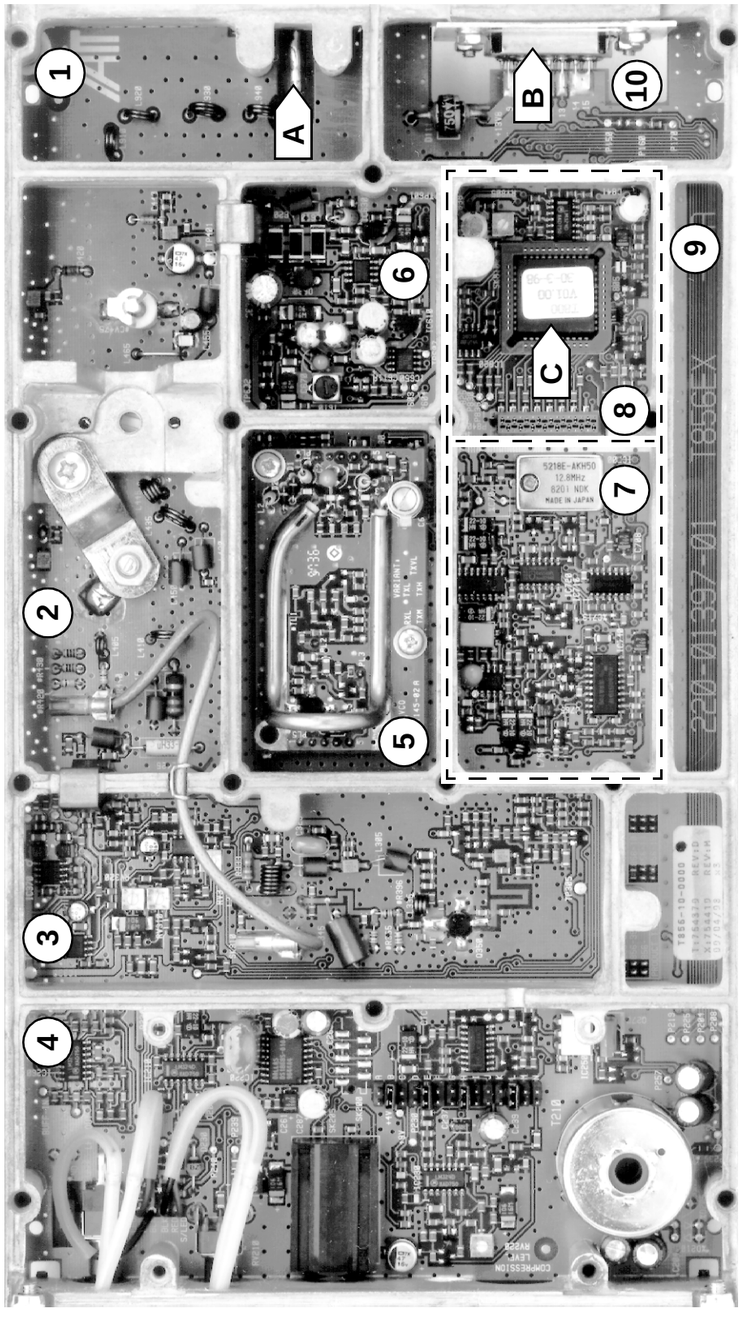
The photograph in Figure 1.1 on the next page will help you to identify the main circuit blocks in the T856.

There is a similar photograph in Figure 4.4 which shows the main tuning and adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.2 on the next page shows the T856 front panel controls.

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Key:

1 low pass filter
2 PA
3 exciter drive amplifier
4 audio processor
5 VCO
6 regulators
7 synthesiser
8 microcontroller and CTCSS
9 duct for cabling to extra D-range (if fitted)
10 D-range

A RF output
B D-range connector ("D-range 1") incl. audio in & DC in (refer to Section 2.2 in Part F)
C microcontroller

Figure 1.1 T856 Main Circuit Block Identification

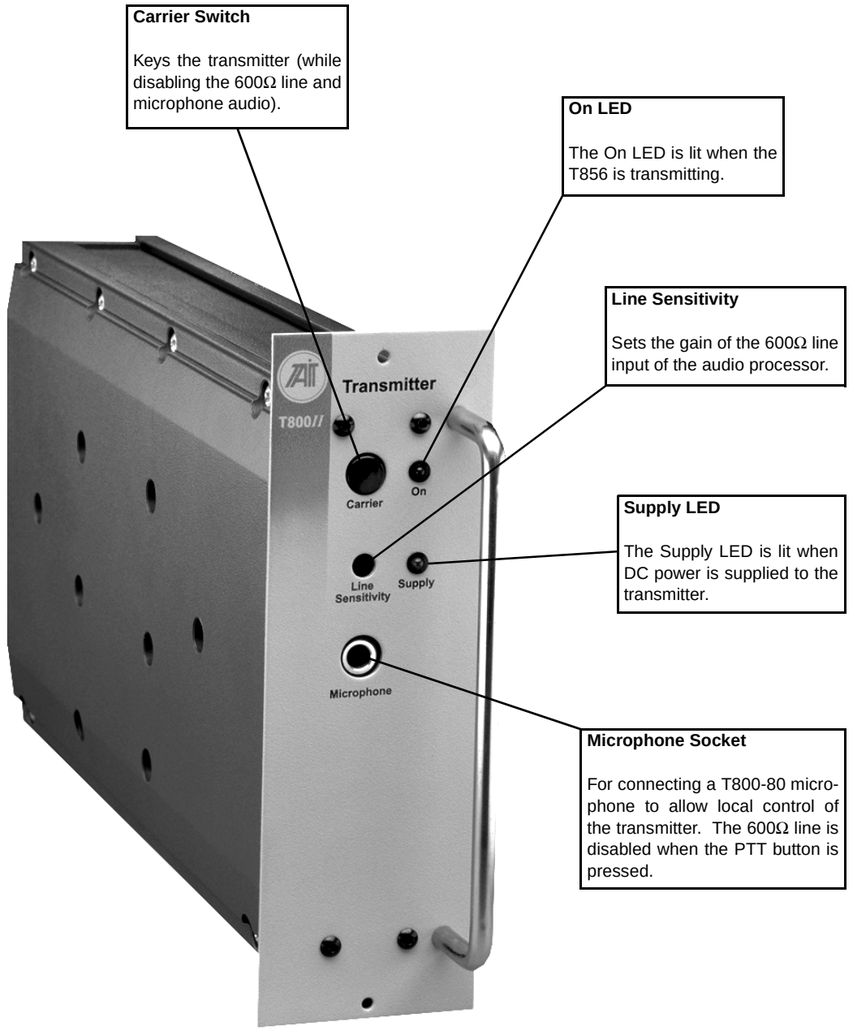


Figure 1.2 T856 Front Panel Controls

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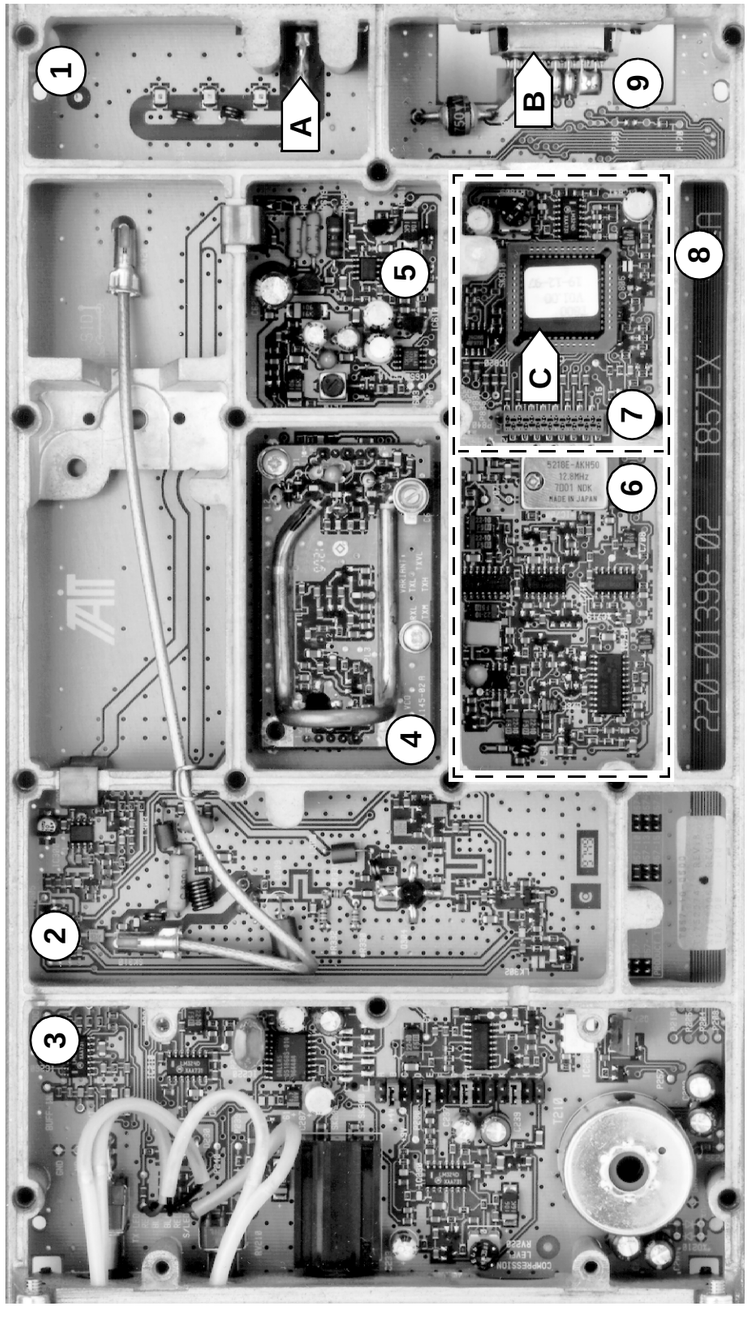
The photograph in Figure 1.3 on the next page will help you to identify the main circuit blocks in the T857.

There is a similar photograph in Figure 4.5 which shows the main tuning and adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.4 on the next page shows the T857 front panel controls.

Copyright TEL



Key:

1 low pass filter
2 exciter drive amplifier
3 audio processor
4 VCO
5 regulators
6 synthesiser
7 microcontroller and CTCSS
8 duct for cabling to extra D-range (if fitted)
9 D-range
A RF output
B D-range connector ("D-range 1") incl. audio in & DC in (refer to Section 2.2 in Part F)
C microcontroller

Figure 1.3 T857 Main Circuit Block Identification

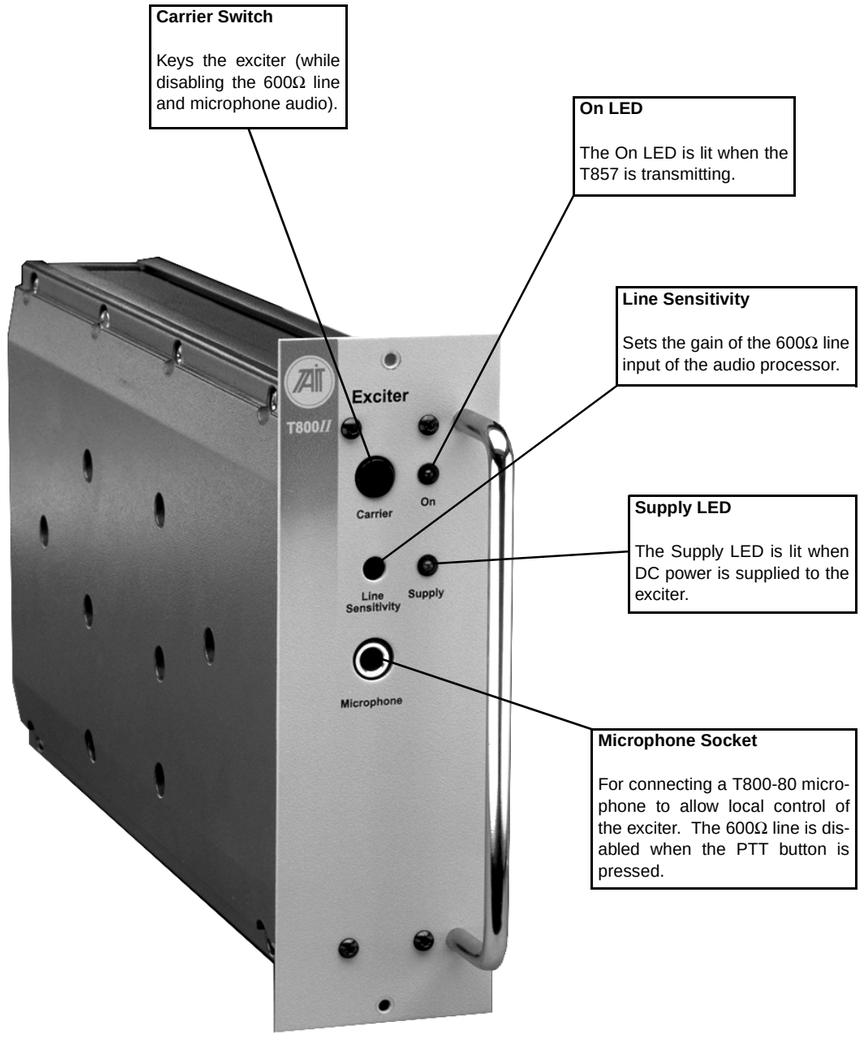


Figure 1.4 T857 Front Panel Controls

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The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T856.

There is a similar photograph in Figure 1.1 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

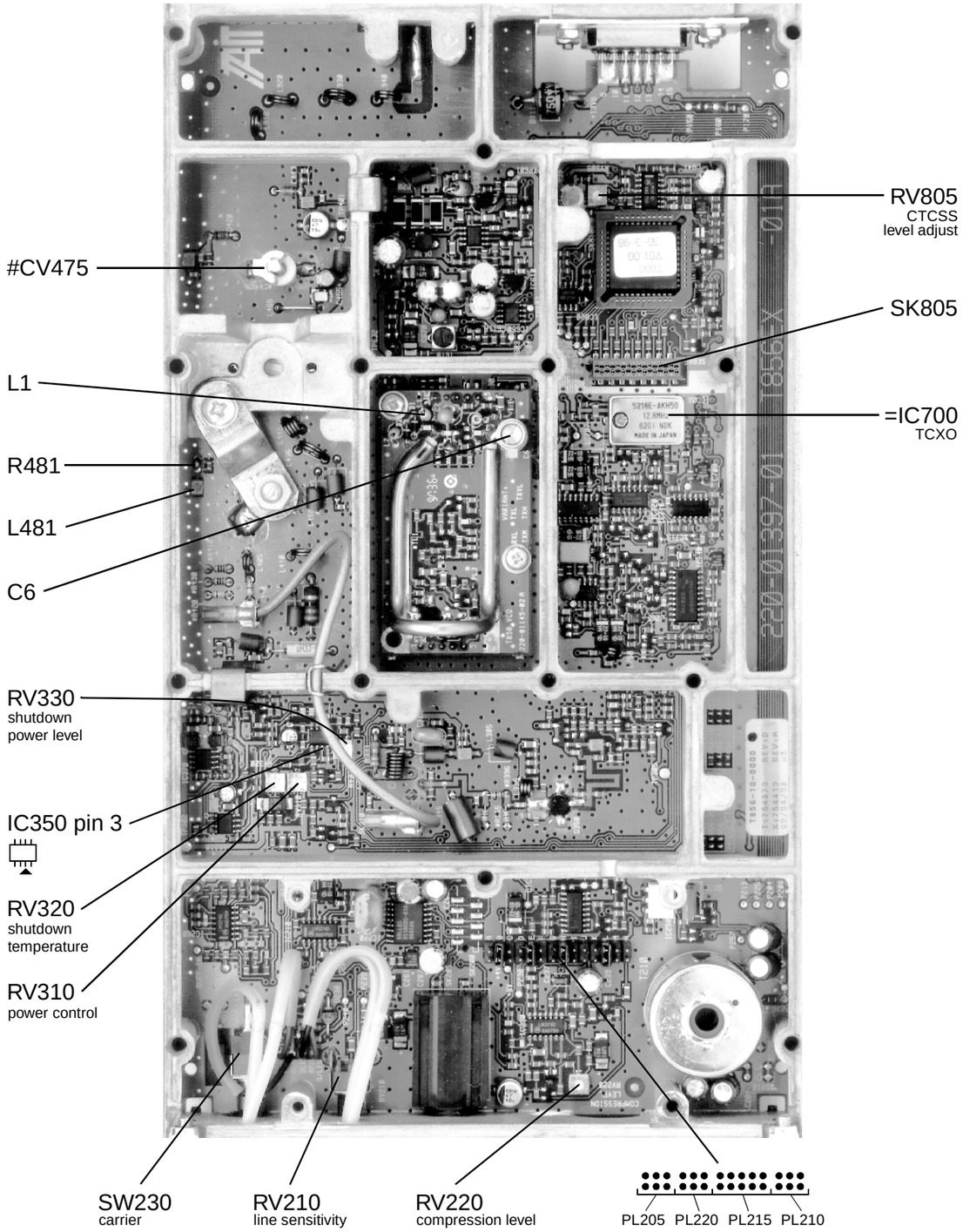


Figure 4.4 T856 Main Tuning & Adjustment Controls

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The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T857.

There is a similar photograph in Figure 1.3 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

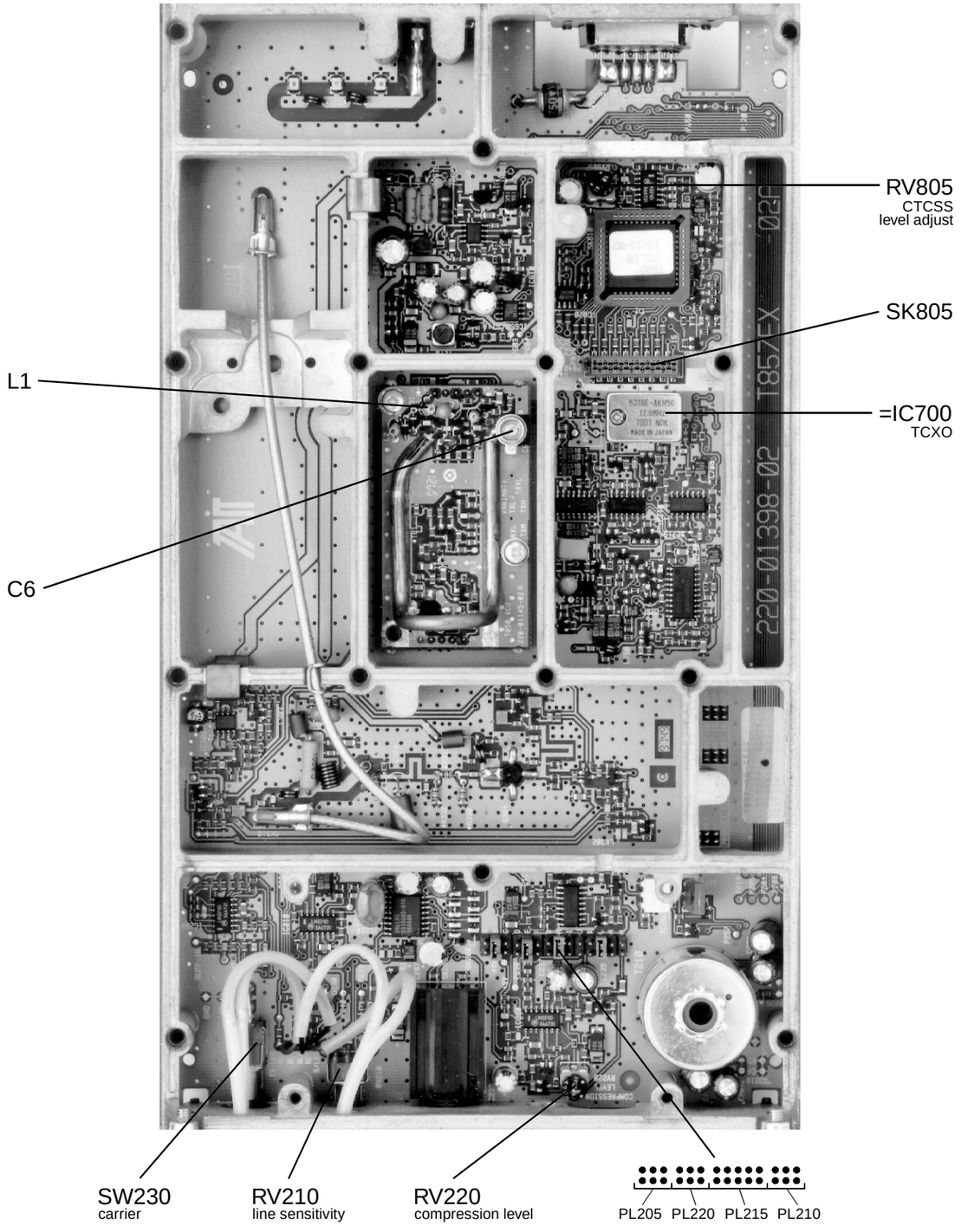


Figure 4.5 T857 Main Tuning & Adjustment Controls

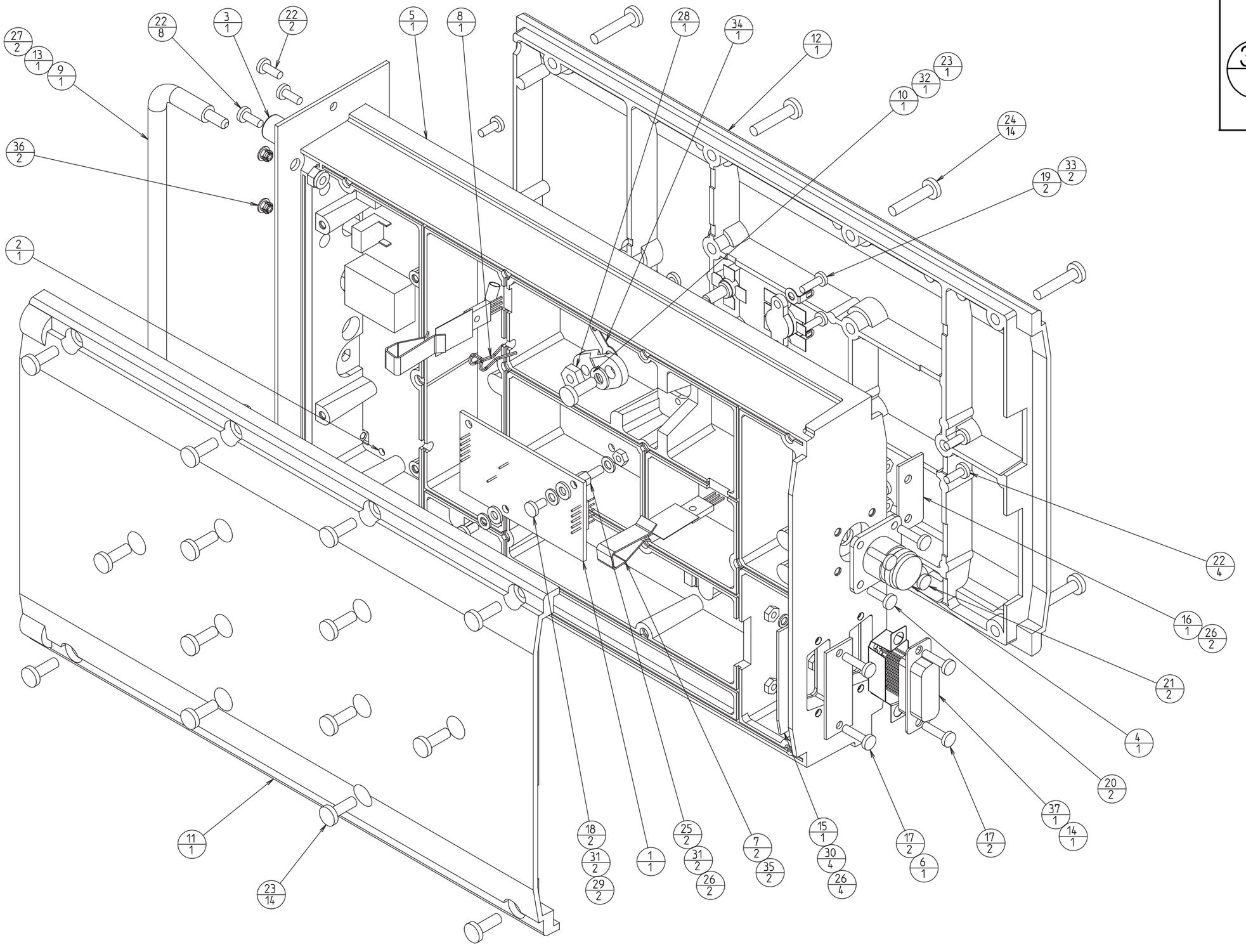
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Key

33/2

The upper number is the component identification number which appears in the “Legend” column of the Mechanical & Miscellaneous Parts on the facing page.

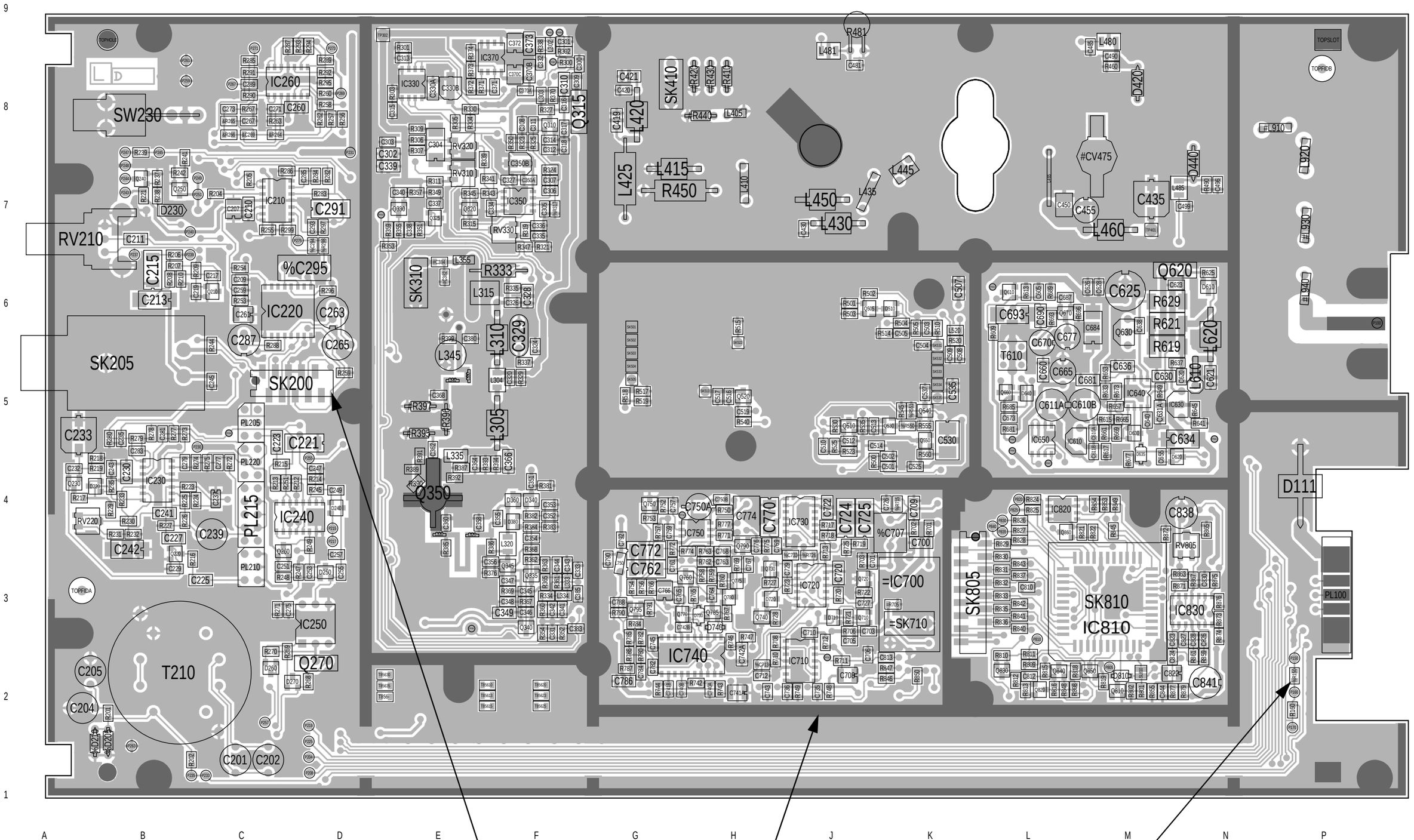
The lower number indicates how many of this component are used in this location or function.



T856 Mechanical Assembly
220-01397-01

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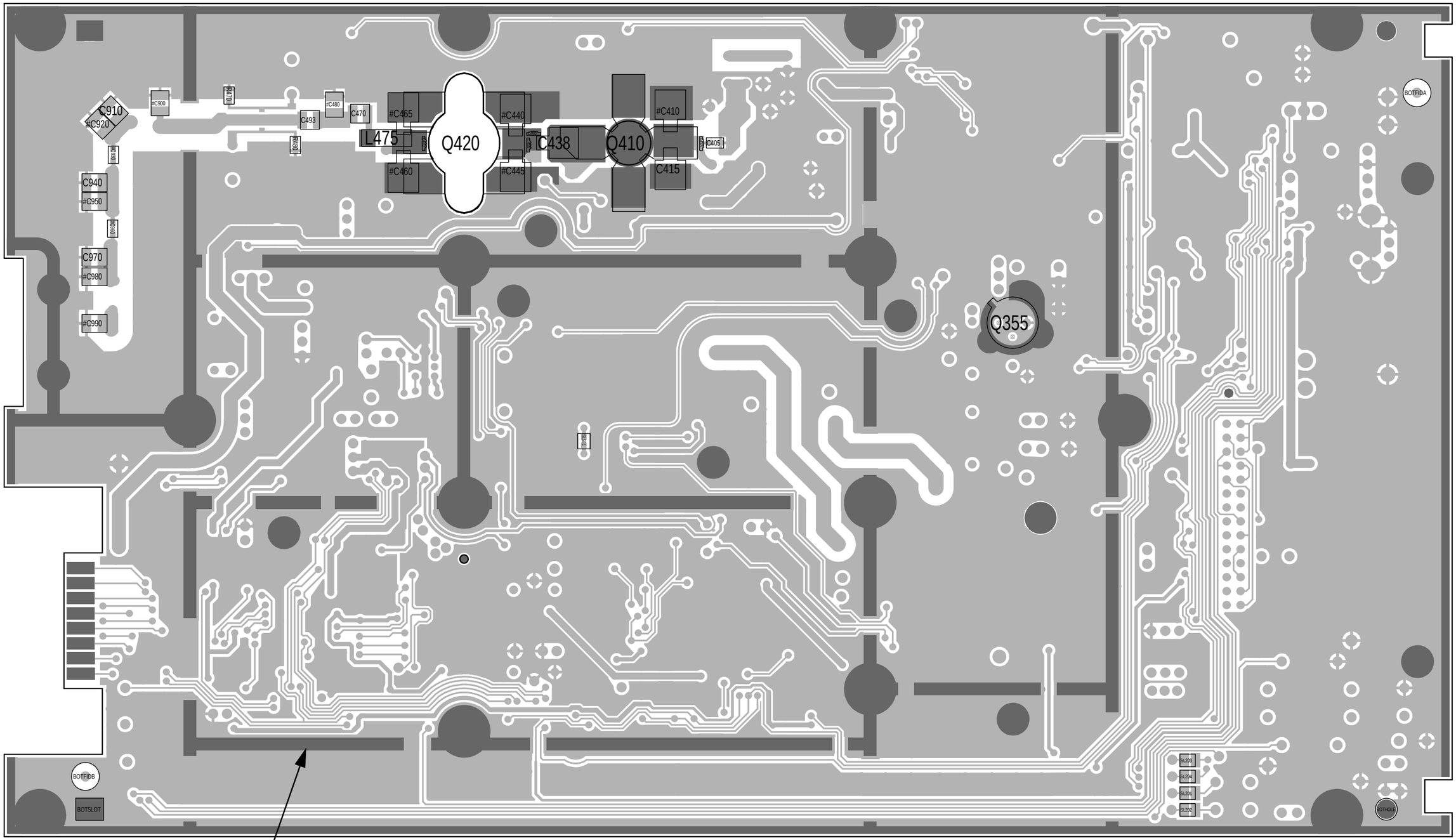
SK200 is currently not fitted as standard.
It will be fitted for future options.

The darker shading shows the outline of the chassis.

%R150 (10Ω) is fitted only when the T856 is used in a Series I rack frame (refer to Part I for full details).

T856 PCB Layout - Top Side
220-01397-01

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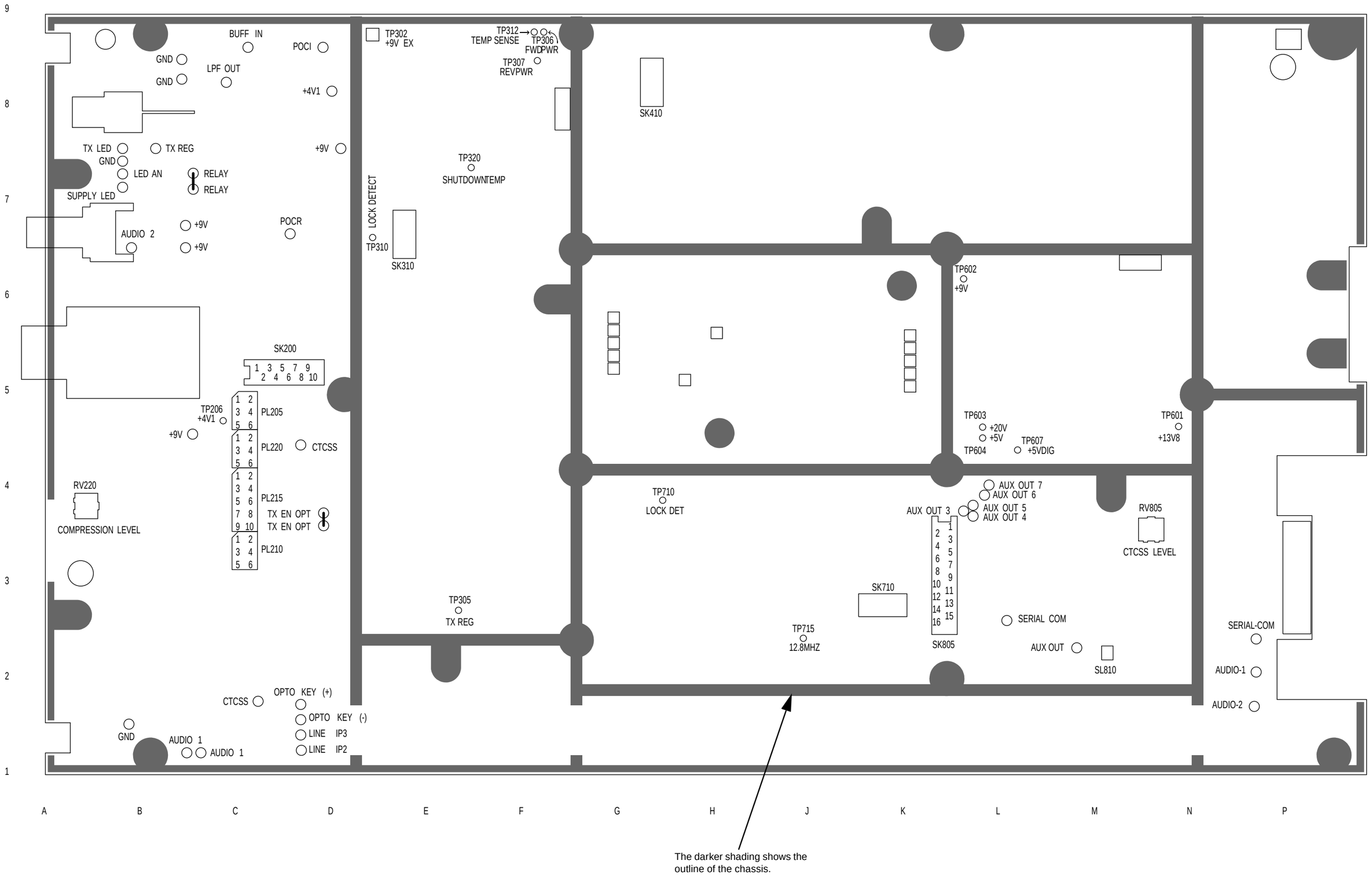


The darker shading shows the footprint of the bottom cover.

T856 PCB Layout - Bottom Side
220-01397-01

31/09/98

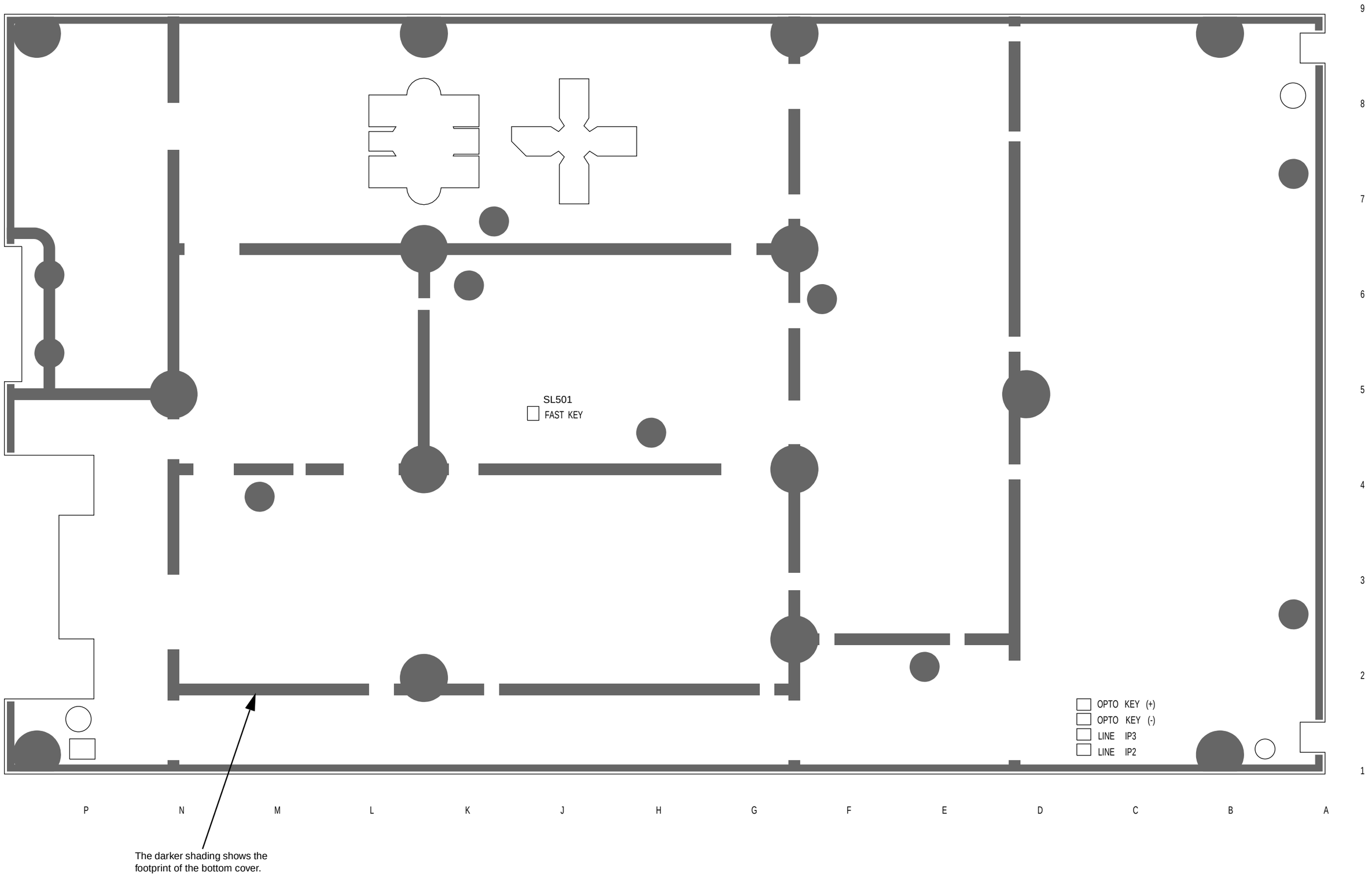
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The darker shading shows the outline of the chassis.

T856 Test Points & Options Connections - Top Side
220-01397-01

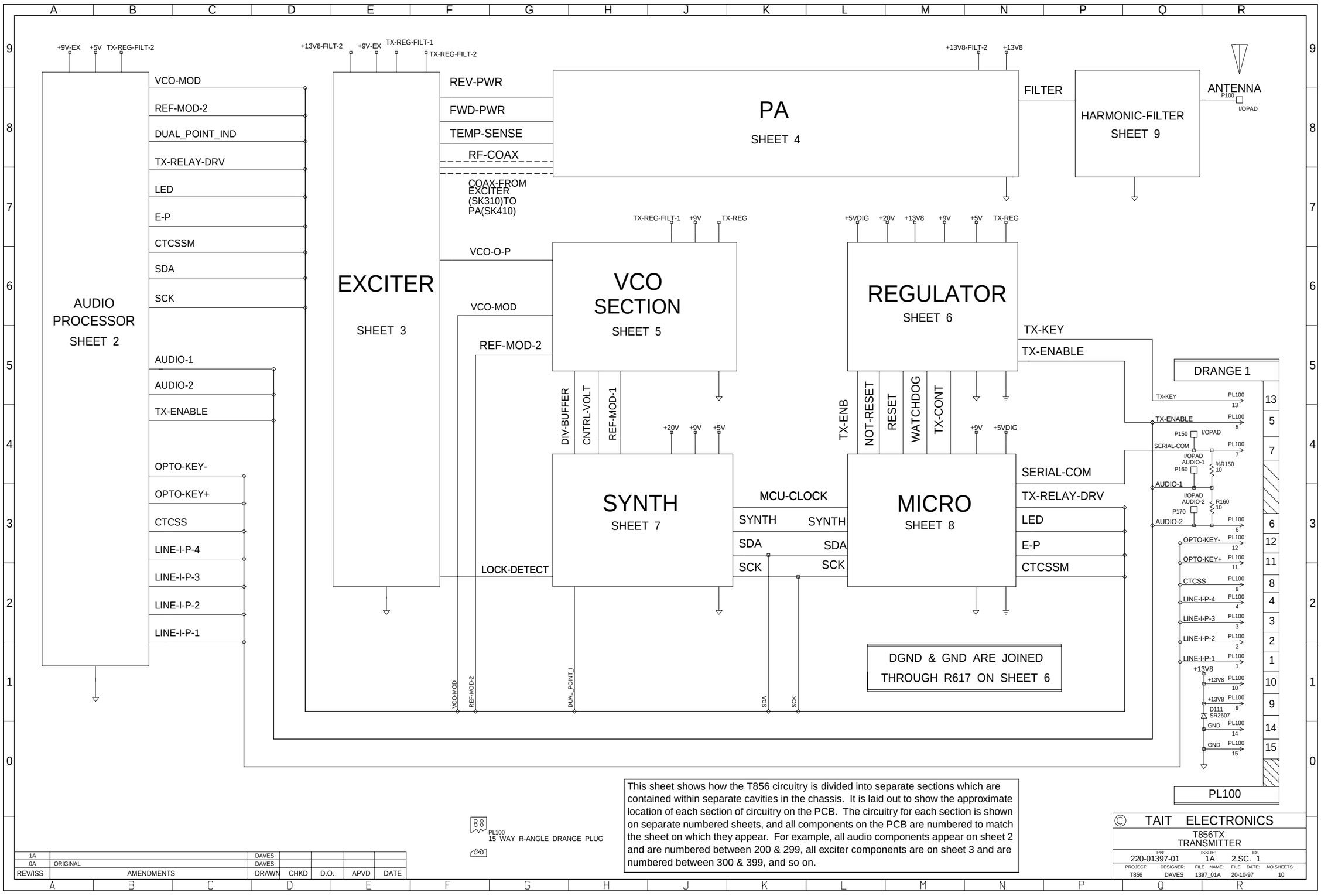
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T856 Test Points & Options Connections - Bottom Side
220-01397-01

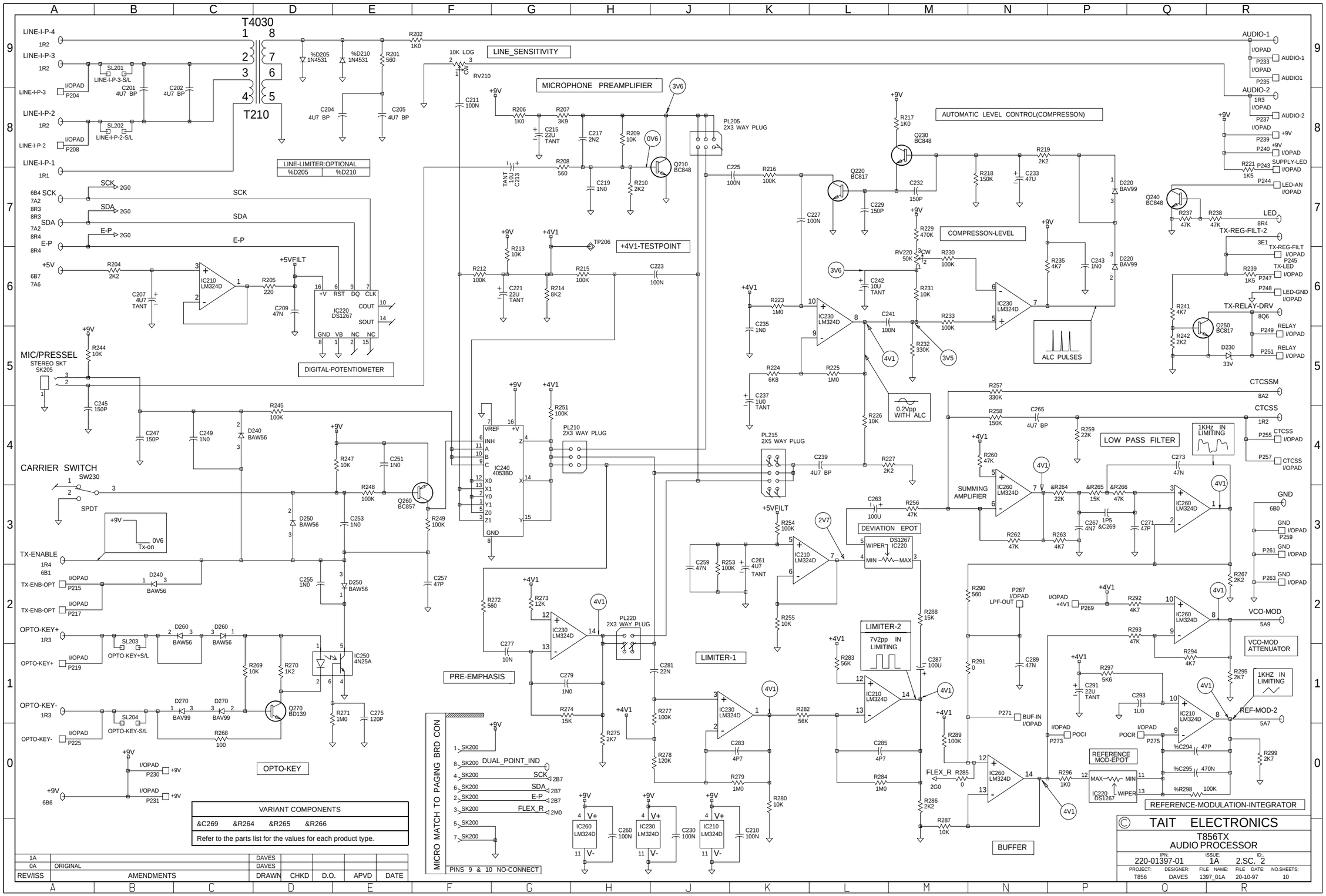
31/09/98

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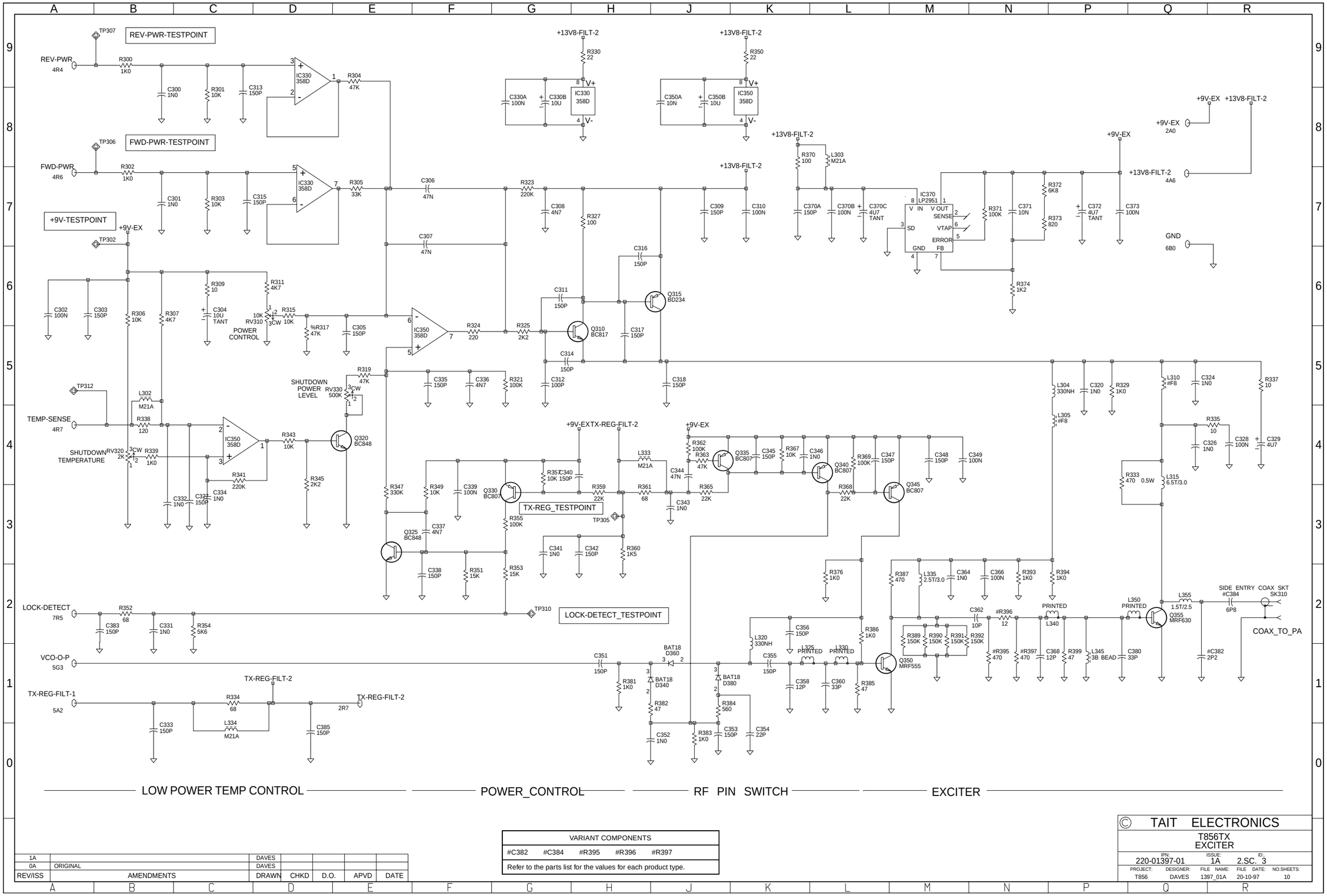
Sheet 1 - T856 Transmitter Overview
220-01397-01

Copyright TEL



Sheet 2 - T856 Audio Processor
220-01397-01

Copyright TEL



VARIANT COMPONENTS
#C382 #C384 #R395 #R396 #R397
Refer to the parts list for the values for each product type.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

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T856TX EXCITER

IPN:	ISSUE:	ID:
220-01397-01	1A	2.SC. 3

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T856	DAVES	1397_01A	20-10-97	10

Sheet 3 - T856 Exciter
220-01397-01

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+13V8

+13V8
6B5

TEMP-SENSE

L481
330NH
TEMP-SENSE
3A4
R481
4K7
C481
150P

+13V8-FILT-2

+13V8-FILT-2
3Q7

+13V8-FILTERED-2 SUPPLY

+13V8
+13V8-FILT-2
L425
330N
L420
#F8
C419
100N
C420
150P
C421
100N

+13V8 TESTPOINT

+13V8
TP401

L430
#F8
C430
1N0
C435
47U
L460
#F8
L435
1.5T/6.0
L465
10MM COIL
C450
100P
C455
4U7
FWD-PWR
3A7
L480
330NH
C485
150P
C490
150P
D420
1SS97
R460
4K7
R470
100

L470
PRINTED
L475
#556
C470
100P
C493
100P
COUPLER
FILTER
9B8

SK410
SIDE ENTRY COAX SKT
#R410
10
#R430
10
#R420
820
#R440
820
C405
12P
L405
1.5T/2.5
L410
1.5T/6.0
R450
22
L415
#F8
#C410
39P
C415
33P
L418
PRINTED
Q410
SD1433
C438
68P
L440
PRINTED
L445
3.5T/3.0
L450
#F8
#C440
39P
L455
PRINTED
#C445
33P
Q420
SD1488
#C460
27P
#C465
27P
#CV475
2/10P
#C480
4P7
R480
100
D440
1SS97
L485
330NH
REV-PWR
3A9
R490
4K7
C496
150P
C499
150P

POWER AMPLIFIER

DIRECTIONAL COUPLER

VARIANT COMPONENTS					
#C410	#C445	#C465	#CV475	#R410	#R430
#C440	#C460	#C480		#R420	#R440
Refer to the parts list for the values for each product type.					

GND
6B0

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

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T856TX
PA

IPN:	ISSUE:	ID:
220-01397-01	1A	2.SC. 4

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T856	DAVES	1397_01A	20-10-97	10

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VCO-MOD
2R2
CNTRL-VOLT
7R3
REF-MOD-2
2R1
REF-MOD-1
7C7
+9V
6B6
GND
6B0
TX-REG-FILT-1
3A1
TX-REG
6E8
VCO-O-P
3A1
DIV-BUFFER
7R0
CV-OUT
VCO SUPPLY
SK501 1 WAY SOCKET
SK502 1 WAY SOCKET
SK503 1 WAY SOCKET
SK504 1 WAY SOCKET
SK505 1 WAY SOCKET
SK513 1 WAY SOCKET
SK522 1 WAY SOCKET
SK531 1 WAY SOCKET
SK532 1 WAY SOCKET
SK533 1 WAY SOCKET
SK534 1 WAY SOCKET
SK535 1 WAY SOCKET
R504 330
C503 4N7
D510 BAV70
D510 BAV70
Q505 BC848
R501 10K
R502 10K
R503 5K6
R505 15K
R510 1K5
R500 68
C501 150P
C502 150P
C507 100N
R523 120K
C512 150P
R525 47K
C510 47N
L520 M21A
R520 150
C508 150P
C509 150P
Q510 BC807
R535 10K
SL501 FAST-KEY-OPTION/B
C513 150P
C514 150P
Q530 BC807
R545 4K7
#R518 39
#R517 150
#R519 150
Tx-on
Tx-off
+9V
C519 150P
BC807 Q520
C516 10N
C517 150P
R540 2K2
R515 56
C504 150P
C505 47N
R514 33
C525 150P
R560 470
Q550 BC848
8V4
C530 22U TANT
R555 4K7
Q540 BC807
%R550 1K2
%R551 4K7
C535 100N
C537 150P
+8V Tx-on
Tx-off

VARIANT COMPONENTS
#R517 #R518 #R519
Refer to the parts list for the values for each product type.

The circuit diagram for the VCO PCB is in Part E.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

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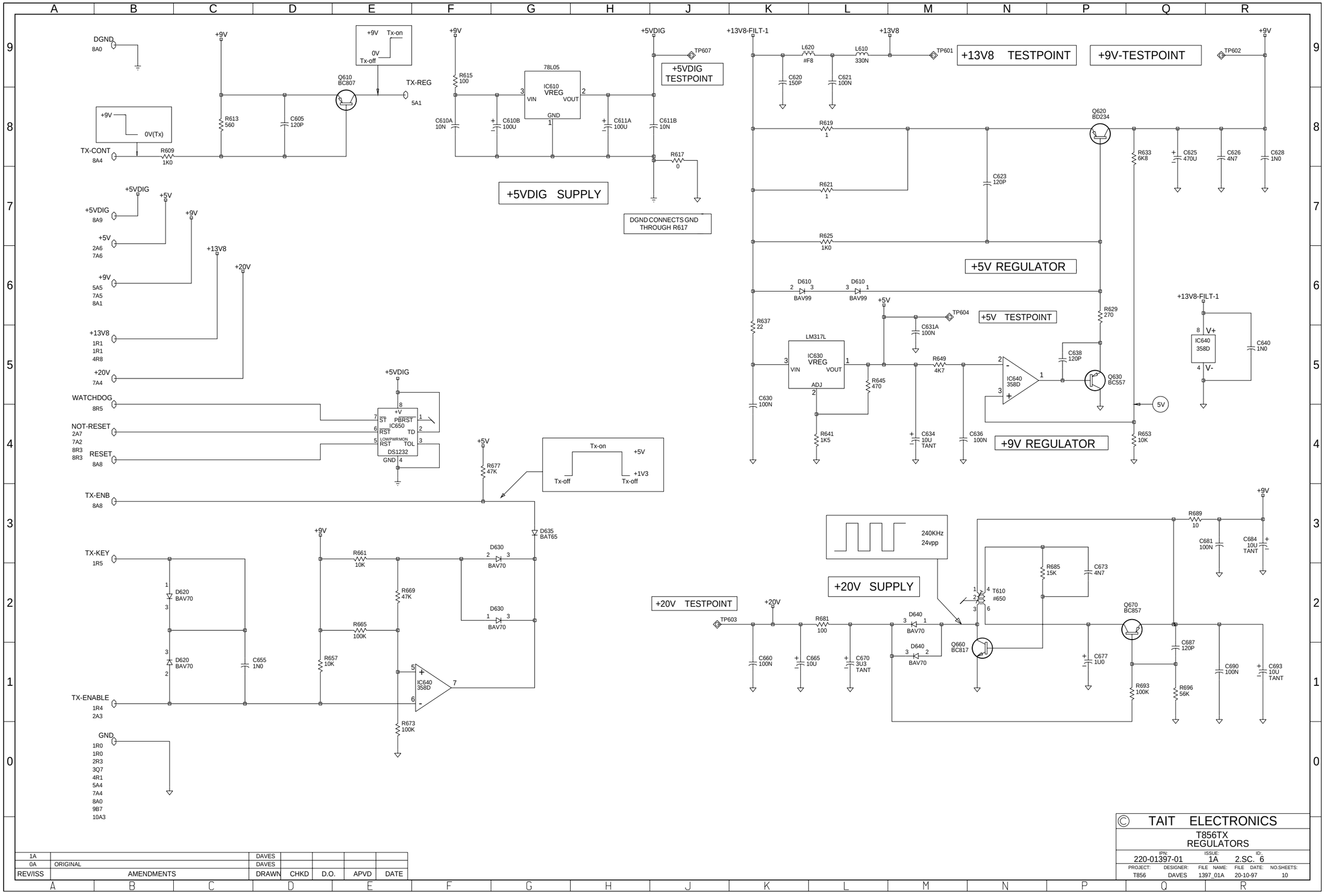
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VCO-SECTION

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T856	DAVES	1397_01A	20-10-97	10

Sheet 5 - T856 VCO Section
220-01397-01

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Sheet 6 - T856 Regulators
220-01397-01

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PHASE-MODULATOR

LOOP-FILTER

CHARGE-PUMP

LOCK-DETECT TESTPOINT

12.8MHz TESTPOINT

REF-MOD-1

SIDE ENTRY COAX SKT

EXTERNAL REFERENCE OPTION

MCU-CLOCK

200KHz

LOCKED-LOW

LOCK-DETECT

+5V TO +15V LOCKED

CNTRL-VOLT

DUAL_POINT_IND

DIV-BUFFER

DIVIDER BUFFER

50ns WHEN LOCKED

SPARE GATES

IC710	IC720

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

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T856TX
SYNTHESISER

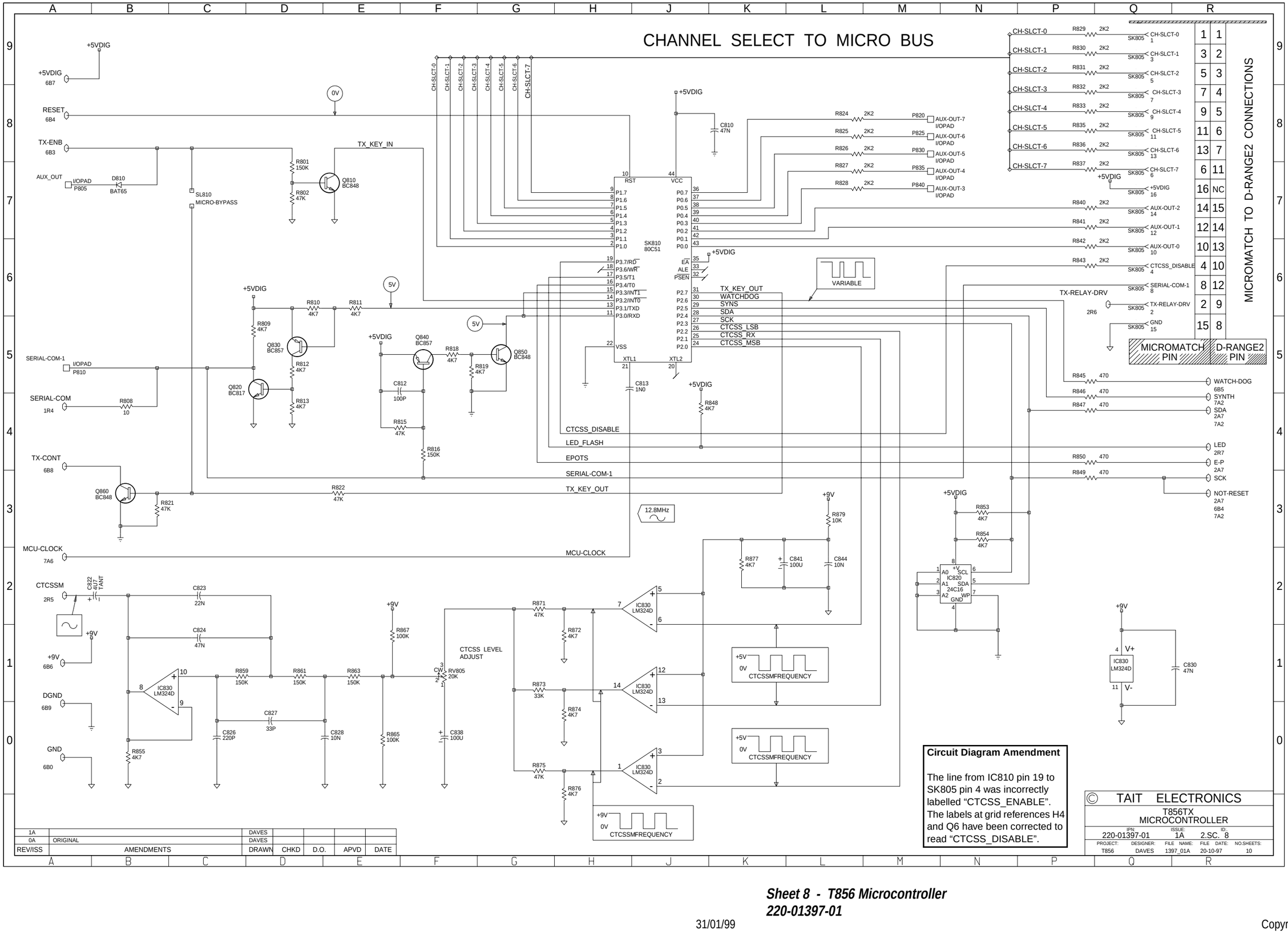
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220-01397-01	1A	2.SC. 7

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T856	DAVES	1397_01A	20-10-97	10

Sheet 7 - T856 Synthesiser
220-01397-01

Copyright TEL

CHANNEL SELECT TO MICRO BUS



Circuit Diagram Amendment

The line from IC810 pin 19 to SK805 pin 4 was incorrectly labelled “CTCSS_ENABLE”. The labels at grid references H4 and Q6 have been corrected to read “CTCSS_DISABLE”.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

© TAIT ELECTRONICS

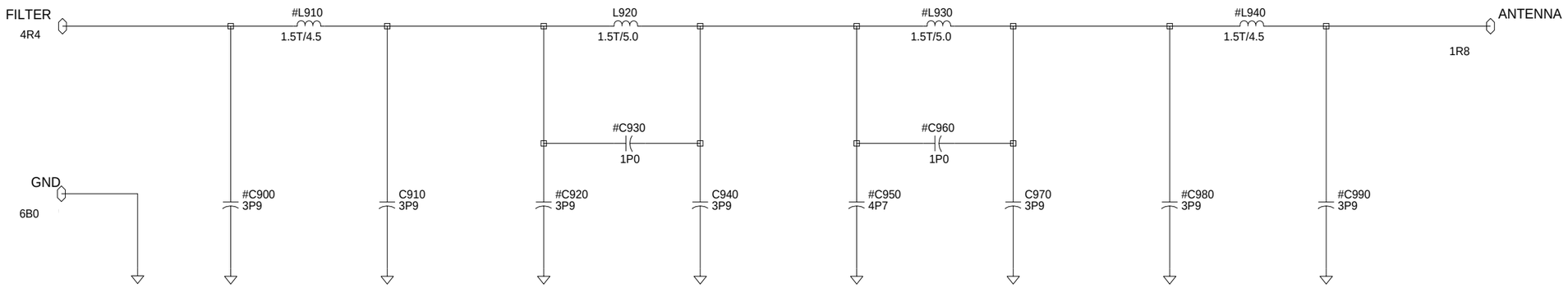
T856TX
MICROCONTROLLER

IPN:	ISSUE:	ID:
220-01397-01	1A	2.SC. 8

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T856	DAVES	1397_01A	20-10-97	10

Sheet 8 - T856 Microcontroller
220-01397-01

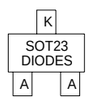
Copyright TEL



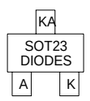
HARMONIC-FILTER

VARIANT COMPONENTS					
#C900 #C920	#C930 #C950	#C960 #C980	#C990	#L910 #L930	#L940
Refer to the parts list for the values for each product type.					

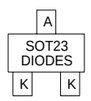
DIODE PHYSICAL PIN OUTS



BAV70

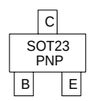


BAV99
BAT17DS

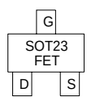


BAW56

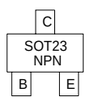
TRANSISTOR PHYSICAL PIN OUTS



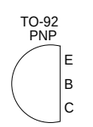
BC857
BC807



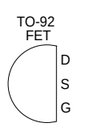
BFR31



BC848
BC817
MMBR571
MMBR951L



BC557

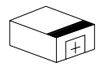


BF247



BD234

TANTALUMS



CHIP
TANTALUMS

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A		DAVES				
0A	ORIGINAL	DAVES				

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T856TX
HARMONIC-FILTER

IPN:	ISSUE:	ID:		
220-01397-01	1A	2.SC. 9		
PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T856	DAVES	1397_01A	20-10-97	10

Sheet 9 - T856 Harmonic Filter
220-01397-01

Copyright TEL

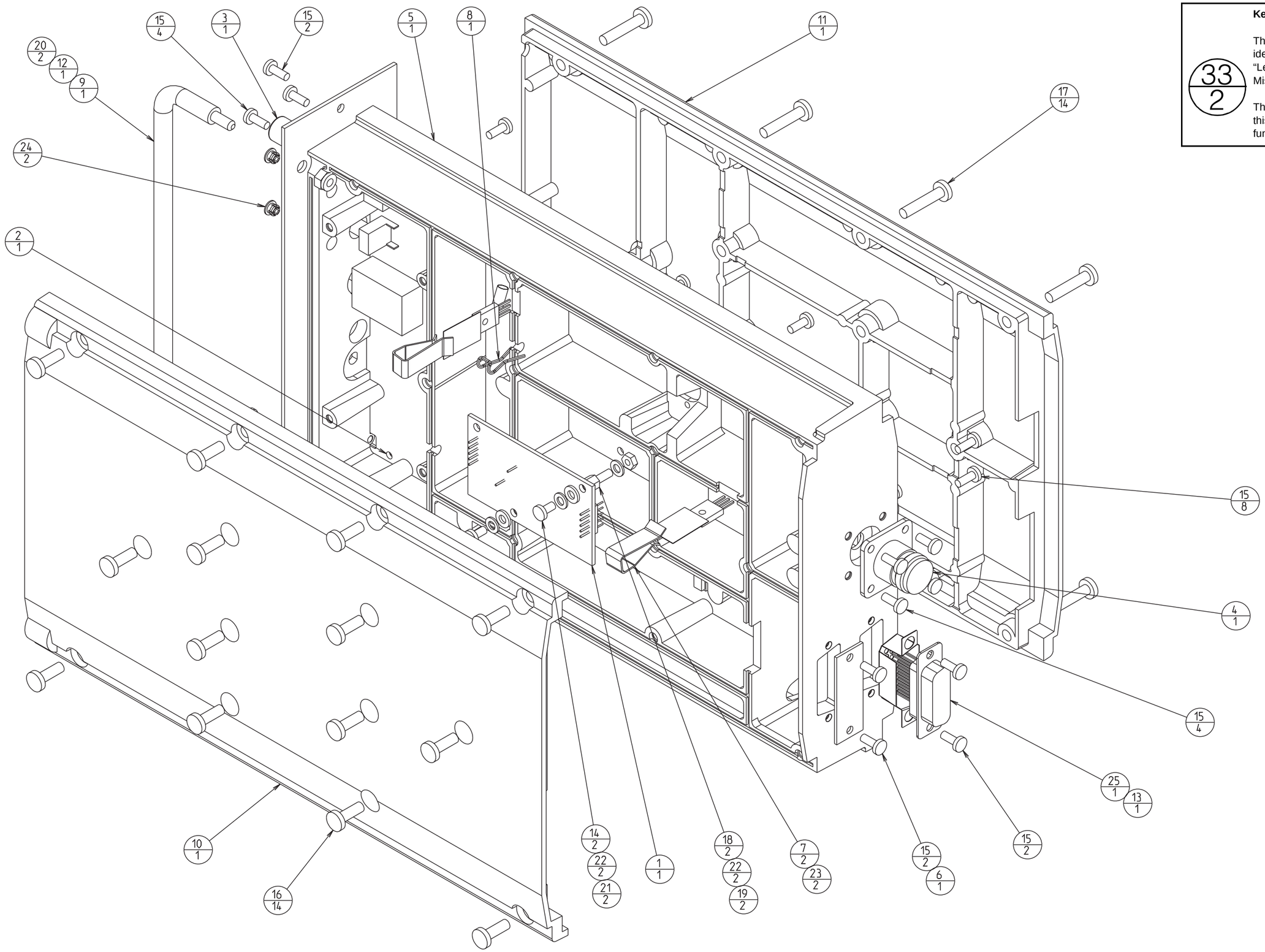
Copyright TEL

Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

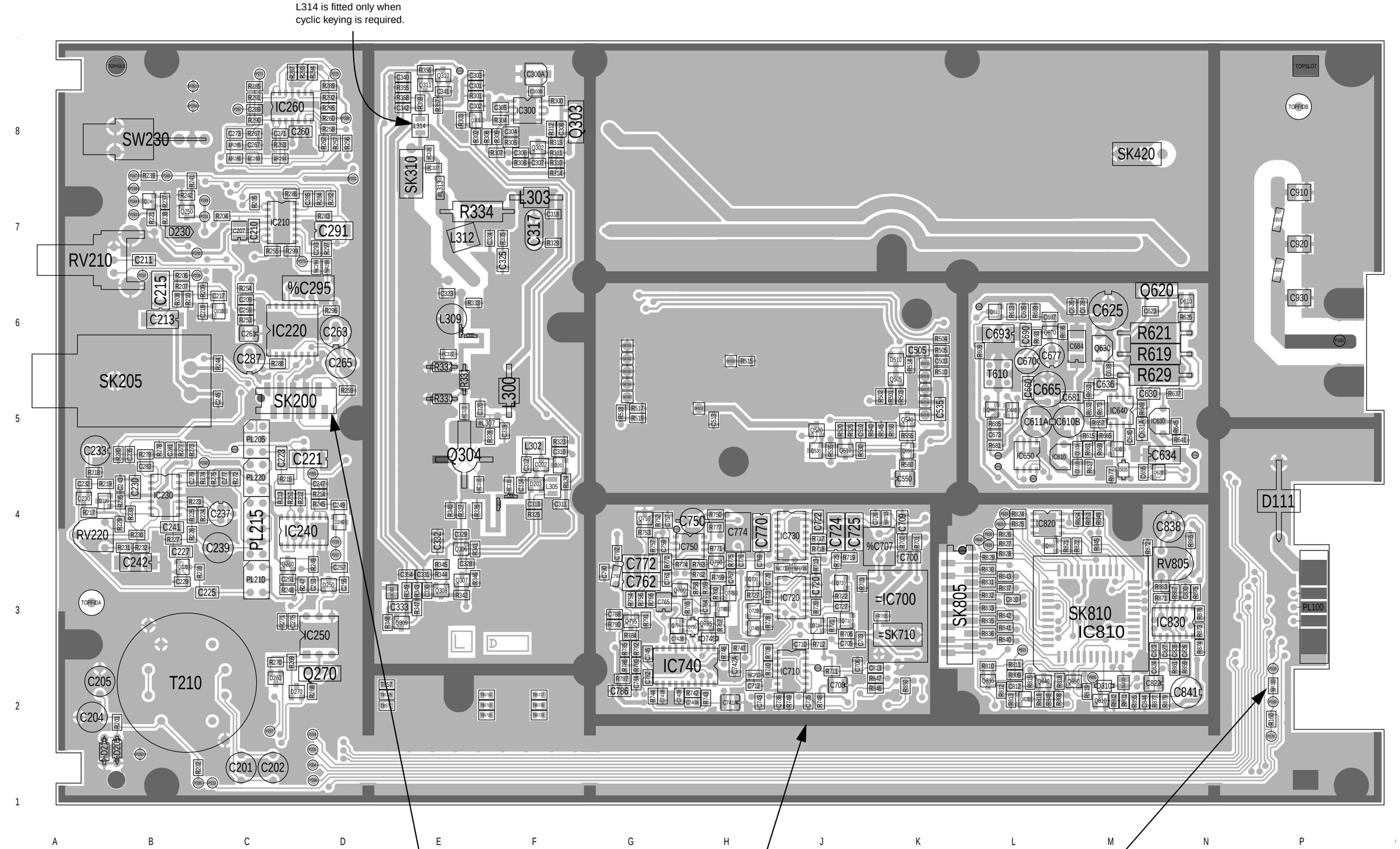
The lower number indicates how many of this component are used in this location or function.



T857 Mechanical Assembly
220-01398-02

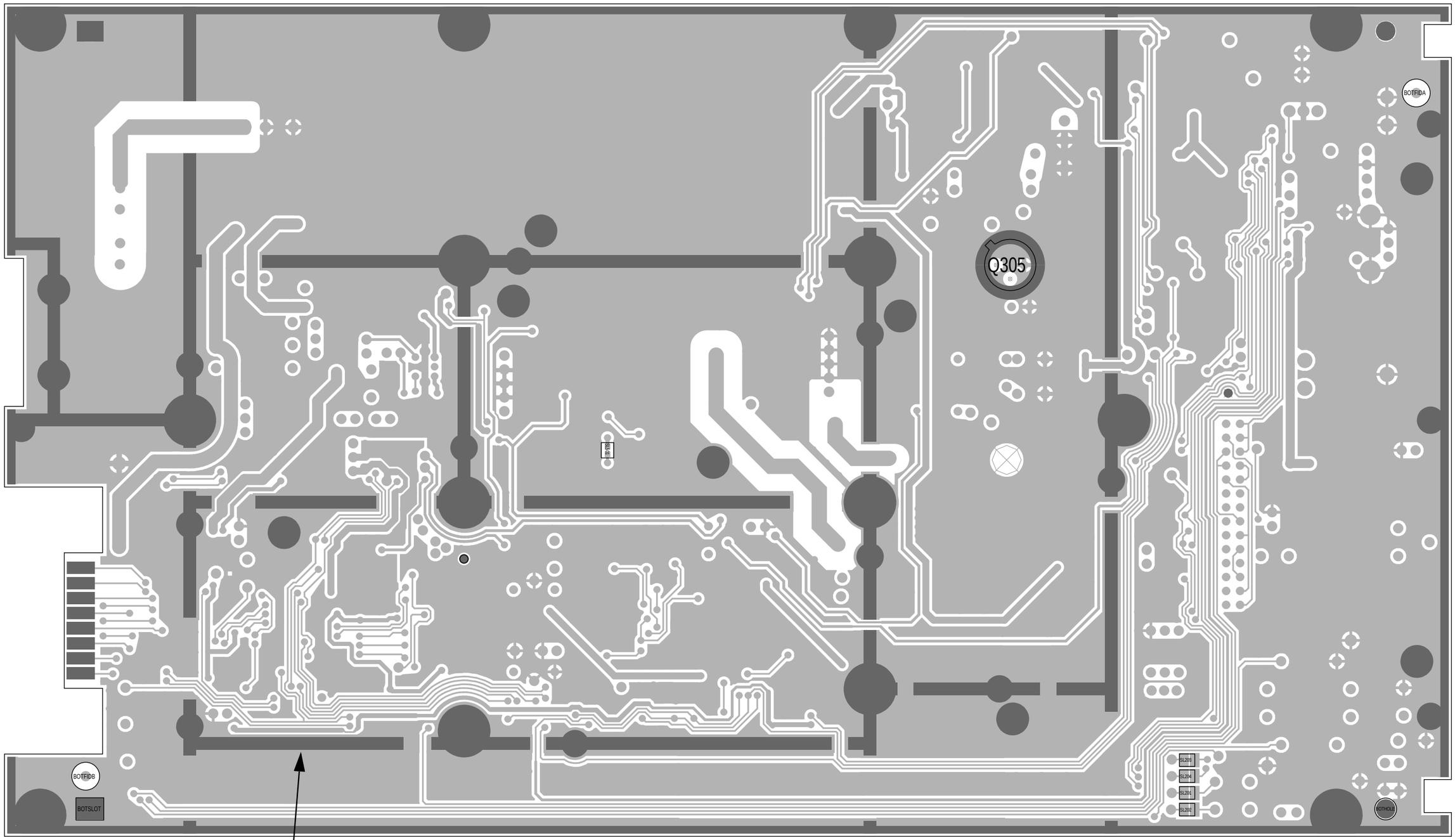
Copyright TEL

Copyright TEL



T857 PCB Layout - Top Side
220-01398-02

Copyright TEL

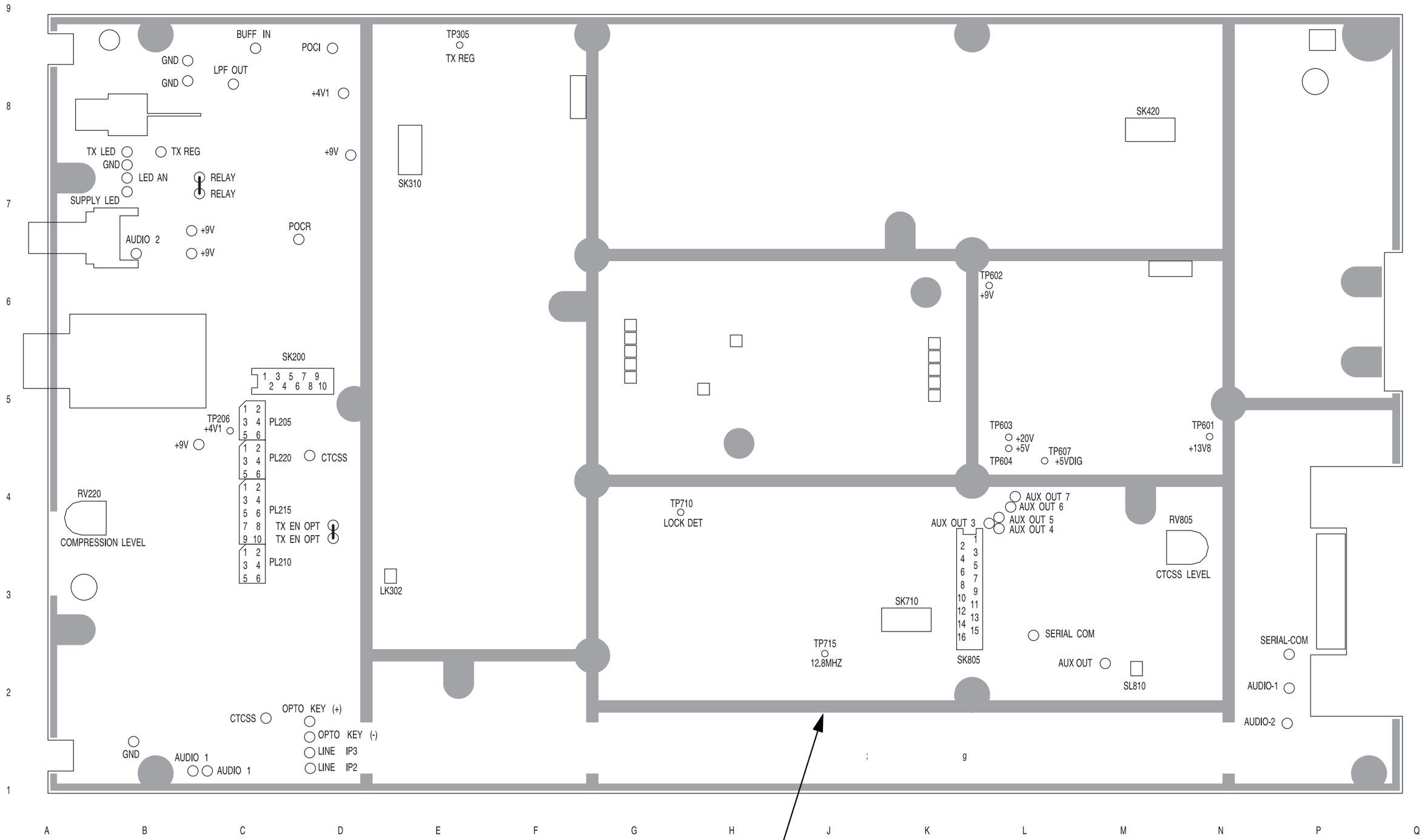


The darker shading shows the footprint of the bottom cover.

T857 PCB Layout - Bottom Side
220-01398-02

31/09/98

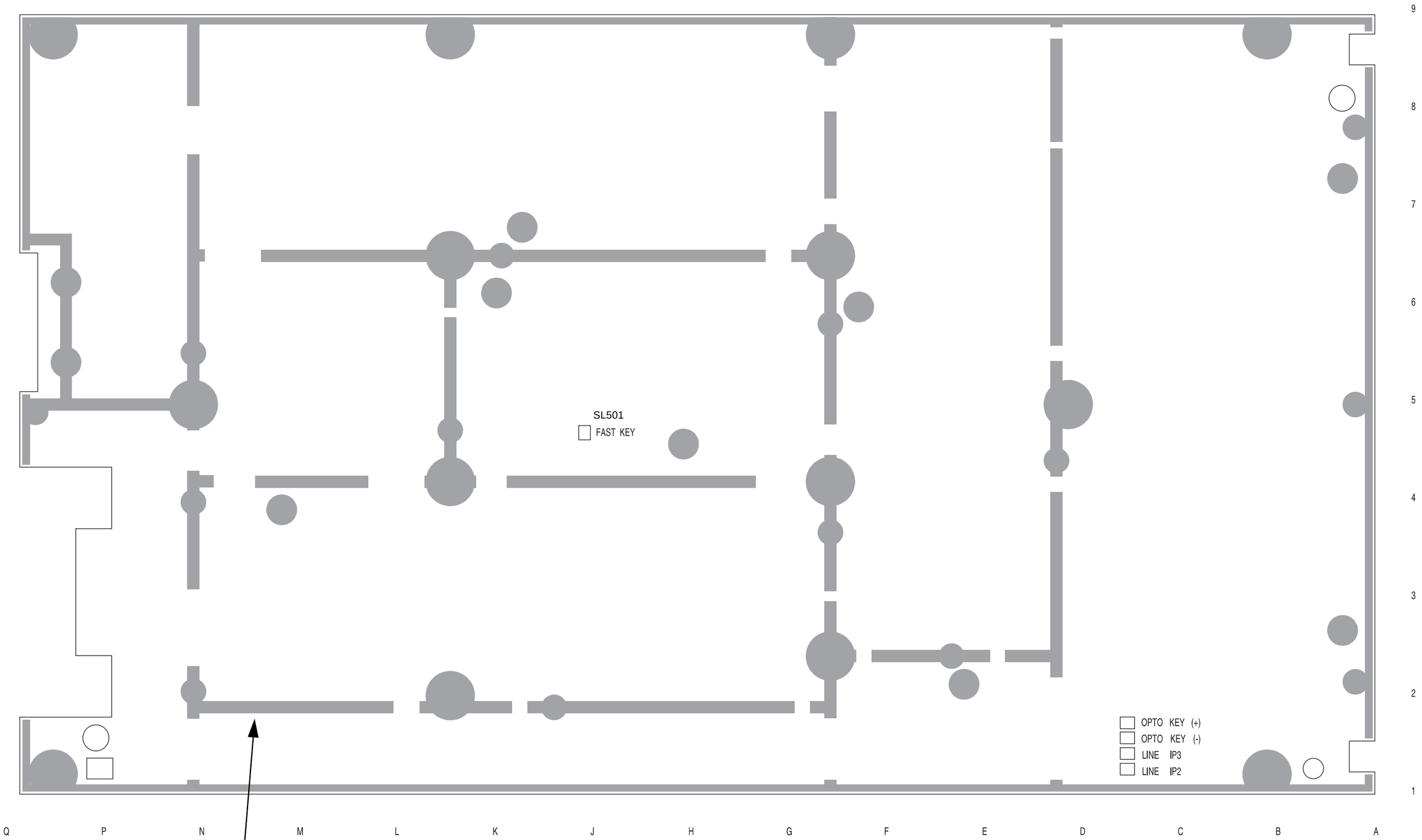
Copyright TEL



The darker shading shows the outline of the chassis.

T857 Test Points & Options Connections - Top Side
220-01398-02

Copyright TEL



T857 Test Points & Options Connections - Bottom Side
220-01398-02

Copyright TEL

AUDIO PROCESSOR
SHEET 2

+9V +5V TX-REG

VCO-MOD
REF-MOD
DUAL_POINT_IND
TX-RELAY-DRV
LED
E-P
CTCSSM
SDA
SCK
AUDIO-1
AUDIO-2
TX-ENABLE
OPTO-KEY-
OPTO-KEY+
CTCSS
LINE-I-P-4
LINE-I-P-3
LINE-I-P-2
LINE-I-P-1

EXCITER
SHEET 3

+13V8 +9V TX-REG

GND

RF-COAX
COAX-FROM EXCITER (SK310)TO PA(SK420)

PA
SHEET 4

SHEET 4 IS EMPTY - SOCKET IN PA AREA IS SHOWN ON PAGE 1

SK420
SIDE ENTRY COAX SKT

HARMONIC-FILTER
SHEET 9

ANTENNA
P100
I/OPAD

VCO-O-P
VCO-MOD
LOCK-DETECT

VCO SECTION
SHEET 5

+9V TX-REG

DIV-BUFFER
CNTRL-VOLT

+20V +9V +5V

SYNTH
SHEET 7

REF-MOD
DUAL_POINT_IND
VCO-MOD

MCU-CLOCK
SYNTH SYNTH
SDA SDA
SCK SCK

REGULATOR
SHEET 6

+5VDIG +20V +13V8 +9V +5V TX-REG

TX-ENB
NOT-RESET
RESET
WATCHDOG
TX-CONT

+9V +5VDIG

MICRO
SHEET 8

SERIAL-COM
TX-RELAY-DRV
LED
E-P
CTCSSM

TX-KEY
TX-ENABLE

DGND & GND ARE JOINED THROUGH R617 ON SHEET 6

DRANGE 1

TX-KEY PL100 13
TX-ENABLE PL100 5
P150 I/OPAD
SERIAL-COM PL100 7
I/OPAD AUDIO-1 %R150 10
P160
AUDIO-1
I/OPAD AUDIO-2 R160 10
P170
AUDIO-2 PL100 6
OPTO-KEY- PL100 12
OPTO-KEY+ PL100 11
CTCSS PL100 8
LINE-I-P-4 PL100 4
LINE-I-P-3 PL100 3
LINE-I-P-2 PL100 2
LINE-I-P-1 PL100 1
+13V8
+13V8 PL100 10
+13V8 PL100 9
D111 SR2607
GND PL100 14
GND PL100 15

PL100

PL100
15 WAY R-ANGLE DRANGE PLUG

This sheet shows how the T857 circuitry is divided into separate sections which are contained within separate cavities in the chassis. It is laid out to show the approximate location of each section of circuitry on the PCB. The circuitry for each section is shown on separate numbered sheets, and all components on the PCB are numbered to match the sheet on which they appear. For example, all audio components appear on sheet 2 and are numbered between 200 & 299, all exciter components are on sheet 3 and are numbered between 300 & 399, and so on.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

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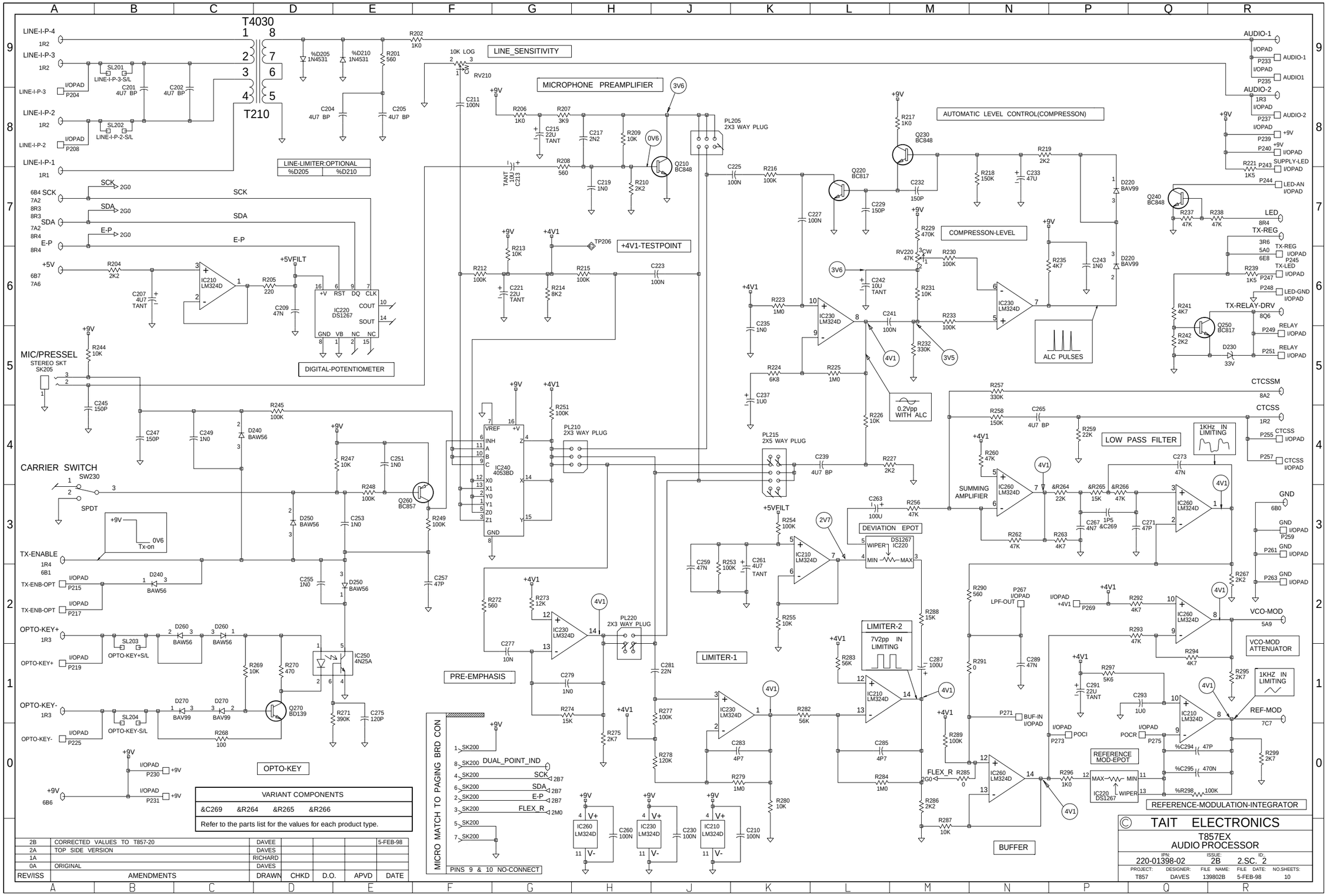
T857 Exciter

IPN:	ISSUE:	ID:
220-01398-02	2B	2.SC. 1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DAVES	139802B	5-FEB-98	10

Sheet 1 - T857 Exciter Overview
220-01398-02

Copyright TEL



Sheet 2 - T857 Audio Processor
220-01398-02

Copyright TEL

VARIANT COMPONENTS					
#C315	#C321	#C326	#L307	#R330	#R332
#C316	#C322	#C327	#L313	#R331	

Refer to the parts list for the values for each product type.

SPARE GATE
IC300

DC VOLTAGES

RF LEVEL MEASURED WITH RF PROBE

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A						

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T857EX
EXCITER

IPN:	ISSUE:	ID:
220-01398-02	2B	2.SC. 3

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DS/RBM	139802B	5-FEB-98	10

Sheet 3 - T857 Exciter
220-01398-02

Copyright TEL

SK420 is the only component in this section
of the T857 circuitry and is shown on sheet 1.

Sheet 4 - Not Used In The T857
220-01398-02

Copyright TEL

VCO-MOD
2R2

CNTRL-VOLT
7R3

R504 330
C503 4N7
Q505 BC848
BAV70 D510
BAV70 D510
R501 10K
R502 10K
R503 5K6
R505 15K
R510 1K5

1 SK501 1 WAY SOCKET
2 SK502 1 WAY SOCKET
3 SK503 1 WAY SOCKET
4 SK504 1 WAY SOCKET
5 SK505 1 WAY SOCKET

CV-OUT
SK531 1 WAY SOCKET
SK532 1 WAY SOCKET
SK533 1 WAY SOCKET
SK534 1 WAY SOCKET
SK535 1 WAY SOCKET
C505 47N
R514 33

DIV-BUFFER
7R0
SK522 1 WAY SOCKET
R515 56

GND
6B0

+9V Tx-on
Tx-off
SK513 1 WAY SOCKET

+8V Tx-on
Tx-off
VCO SUPPLY

VCO-O-P
R518 18
R517 330
R519 330
3B4

C513 10N
Q520 BC807
R540 2K2
R550 4K7
Q540 BC807
R545 4K7
R555 4K7
C535 100N

+9V
6B6

TX-REG
2R7
3R6
6E8

R520 120K
R525 47K
Q510 BC807
C510 15N
R530 22K
R535 10K
SL501 FAST-KEY-OPTION/B
Q530 BC807

8V4
Q550 BC848
R560 2K7
C550 4U7 TANT

The circuit diagram for the VCO PCB is in Part E.

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

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T857EX
VCO-SUB-ASSY

IPN:	ISSUE:	ID:
220-01398-02	2B	2.SC. 5

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DAVES	139802B	5-FEB-98	10

Sheet 5 - T857 VCO Section
220-01398-02

Copyright TEL

+9V
DGND
8A0
+9V
0V(Tx)
TX-CONT
8A4
R609
1K0
R613
560
C605
120P
Q610
BC807
+9V-Tx on
0V
TX-REG
2R7
3R6
5A0

+9V
R615
100
C610A
10N
C610B
100U
78L05
IC610
VREG
VIN
VOUT
GND
C611A
100U
C611B
10N
+5VDIG
TP607
+5VDIG
TESTPOINT
R617
0
+5VDIG SUPPLY
DGND CONNECTS GND
THROUGH R617

+5VDIG
+5V
+9V
+13V8
+20V
+5VDIG
8A9
+5V
2A6
7A6
+9V
2A0
3R8
5A1
7A5
8A1
+13V8
1R1
1R1
3R7
+20V
7A4

+5VDIG
WATCHDOG
8R5
NOT-RESET
2A7
7A2
8R3
RESET
8R3
8A8
IC650
DS1232
ST
PBRST
RST
TD
LOWPWRMON
RST
TOL
GND

+5V
R677
47K
Tx-on
+5V
Tx-off
Tx-off
+1V3
TX-ENB
8A8
D635
BAT65

+9V
TX-KEY
1R5
D620
BAV70
D620
BAV70
C655
1N0
R661
10K
R669
47K
R665
100K
R657
10K
D630
BAV70
D630
BAV70
IC640
358D
R673
100K
TX-ENABLE
1R4
2A3
GND
1R0
1R0
2R3
3R5
5A3
7A4
8A0
9C7
10A3

+13V8
TP601
+13V8 TESTPOINT
+9V-TESTPOINT
+9V
TP602
R619
1E0
R621
1E0
R625
1K0
C623
120P
Q620
BD234
R633
6K8
C625
470U
C626
4N7
C628
1N0
+5V REGULATOR
D610
BAV99
D610
BAV99
+5V
TP604
+5V TESTPOINT
R629
270
R637
22
LM317L
IC630
VREG
VIN
VOUT
ADJ
C631A
100N
R649
4K7
C638
120P
Q630
BC557
R645
470
C630
100N
R641
1K5
C634
10U
TANT
C636
100N
5V
+9V REGULATOR
R653
10K
+13V8
IC640
358D
V+
V-
C640
1N0

240KHz
24vpp
+20V SUPPLY
+20V TESTPOINT
TP603
+20V
R681
100
D640
BAV70
D640
BAV70
T610
#650
R685
15K
C673
4N7
Q660
BC817
Q670
BC857
C660
100N
C665
10U
C670
3U3
TANT
C677
1U0
C687
120P
R689
10
C681
100N
C684
10U
TANT
+9V
C690
100N
C693
10U
TANT
R693
100K
R696
56K

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

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T857EX
REGULATORS

IPN:	ISSUE:	ID:
220-01398-02	2B	2.SC. 6

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DAVES	139802B	5-FEB-98	10

Copyright TEL

PHASE-MODULATOR

LOOP-FILTER

CHARGE-PUMP

LOCK-DETECT TESTPOINT

12.8MHz TESTPOINT

REF-MOD

SIDE ENTRY COAX SKT

EXTERNAL REFERENCE OPTION

MCU-CLOCK

200KHz

12.8MHz

LOCKED-LOW

LOCK-DETECT

CNTRL-VOLT

DUAL_POINT_IND

DIV-BUFFER

+5V TO +15V LOCKED

50ns WHEN LOCKED

50ns WHEN LOCKED

SPARE GATES

IC710	IC720

DIVIDER BUFFER

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T857EX
SYNTHESISER

IPN:	ISSUE:	ID:.
220-01398-02	2B	2.SC. 7

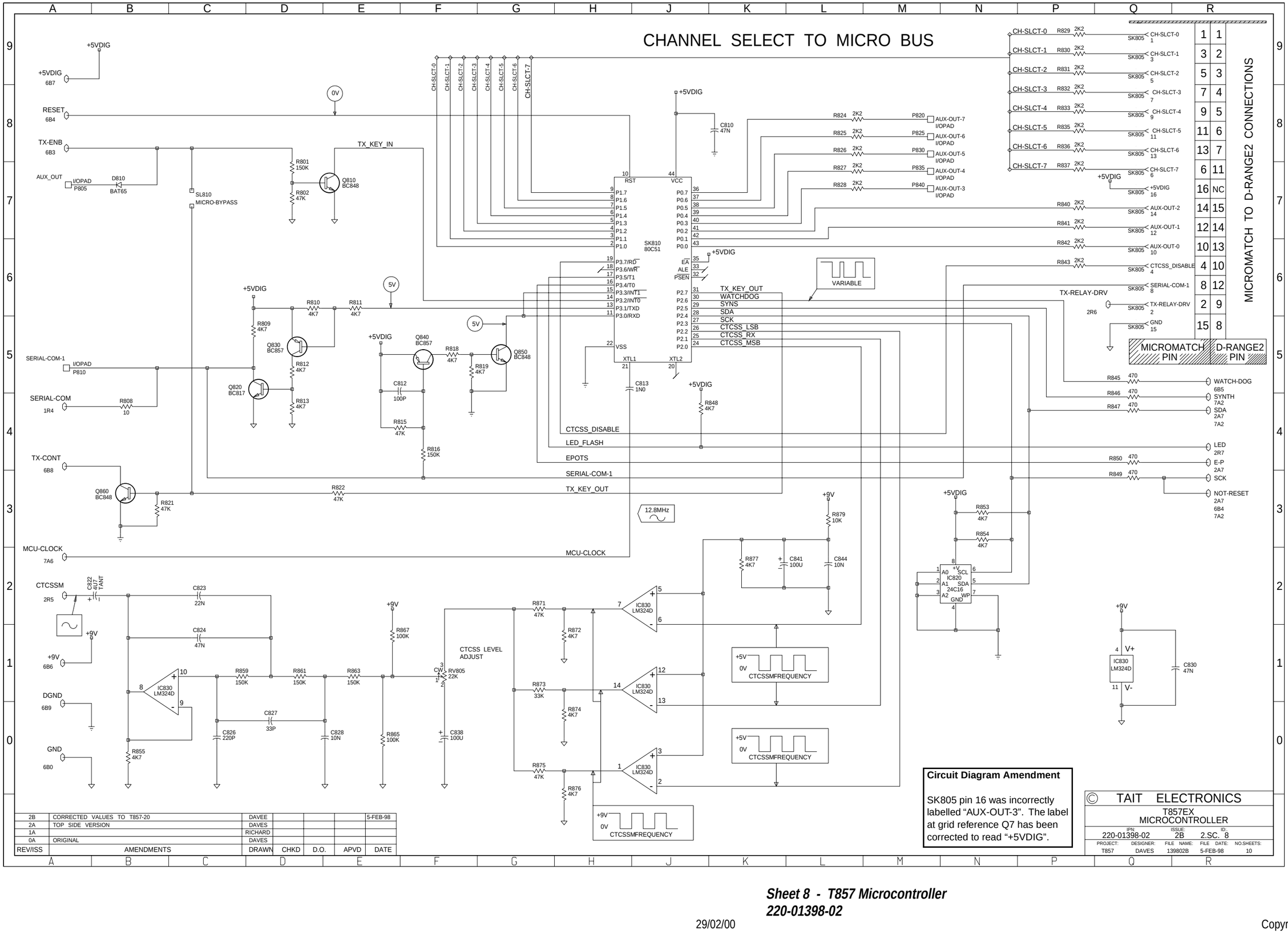
PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DAVES	139802B	5-FEB-98	10

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

Sheet 7 - T857 Synthesiser
220-01398-02

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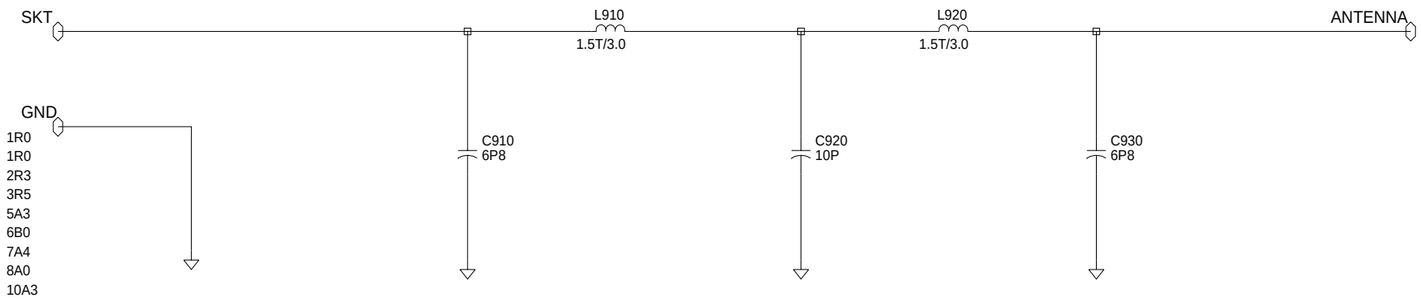
CHANNEL SELECT TO MICRO BUS



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

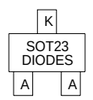
Sheet 8 - T857 Microcontroller
220-01398-02

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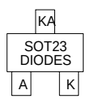


HARMONIC-FILTER

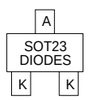
DIODE PHYSICAL PIN OUTS



BAV70

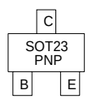


BAV99

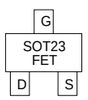


BAW56

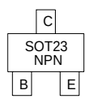
TRANSISTOR PHYSICAL PIN OUTS



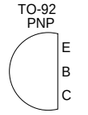
BC857
BC807



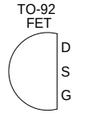
BFR31



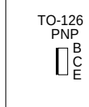
BC848
BC817
MMBR571
MMBR951L



BC557

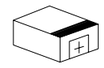


BF247



BD234

TANTALUMS



CHIP
TANTALUMS

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

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T857EX
HARMONIC-FILTER

IPN:	ISSUE:	ID:.
220-01398-02	2B	2.SC. 9

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	DS/RBM	139802B	5-FEB-98	10

Sheet 9 - T857 Harmonic Filter
220-01398-02

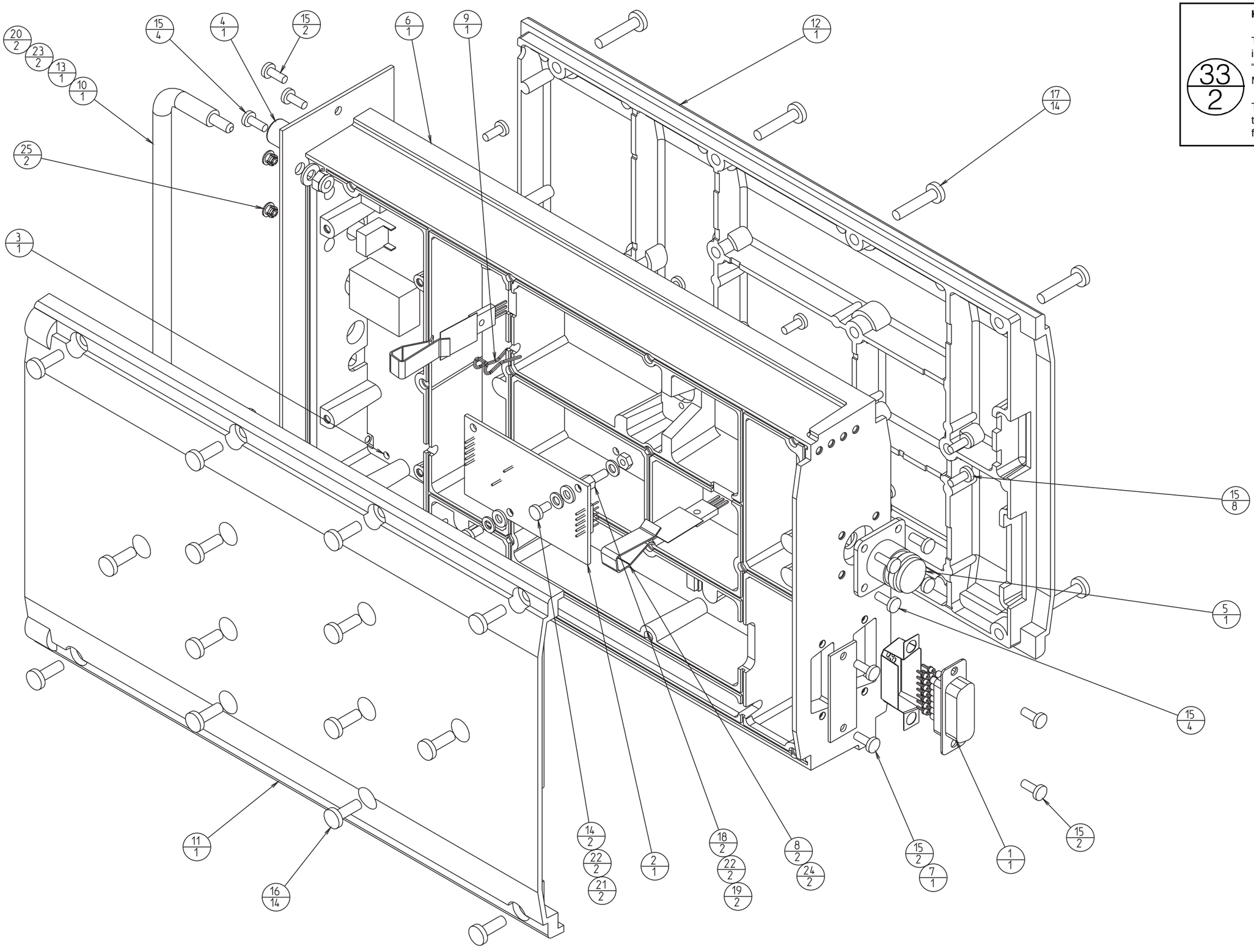
Copyright TEL

Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

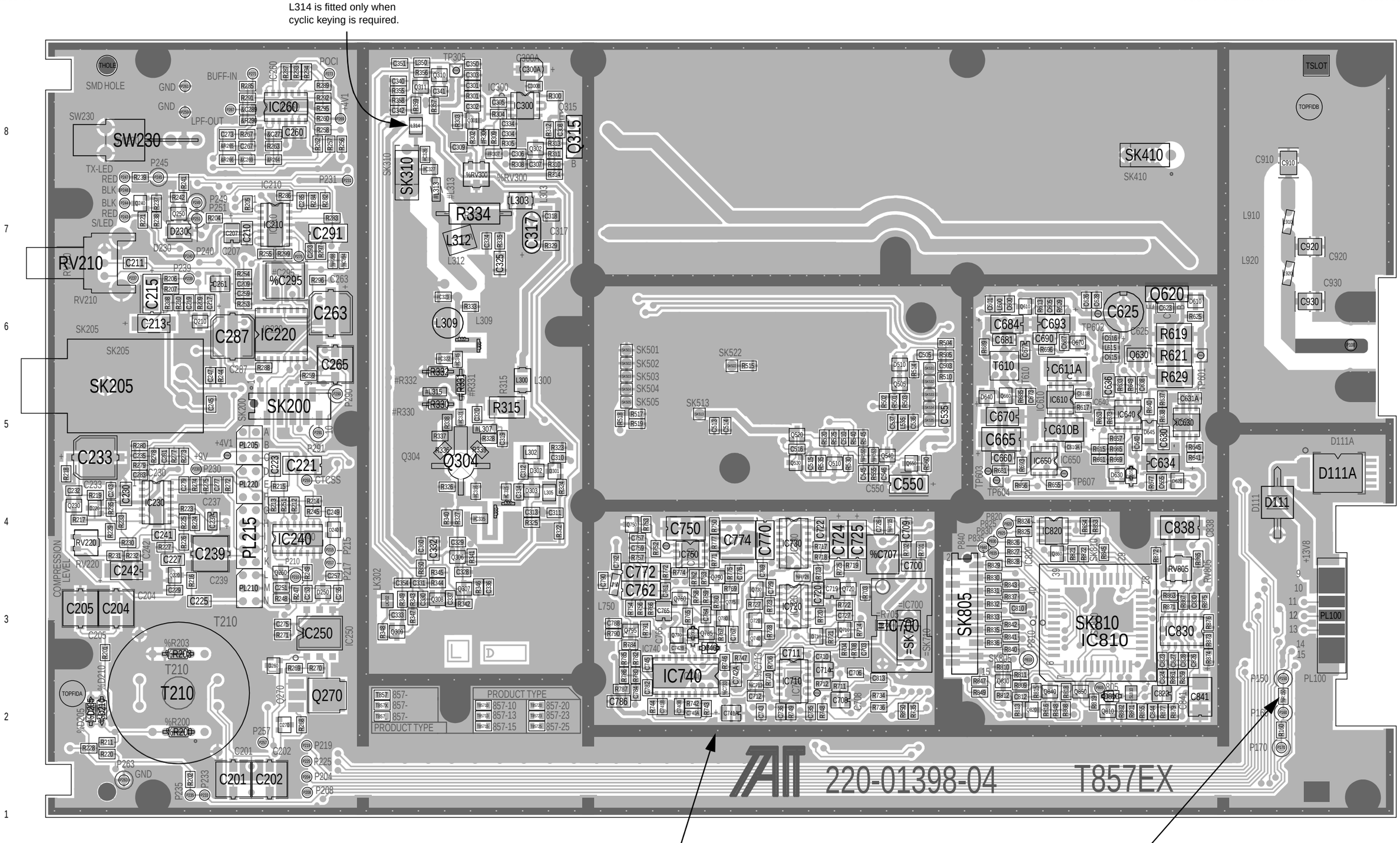
The lower number indicates how many of this component are used in this location or function.



T857 Mechanical Assembly
220-01398-04

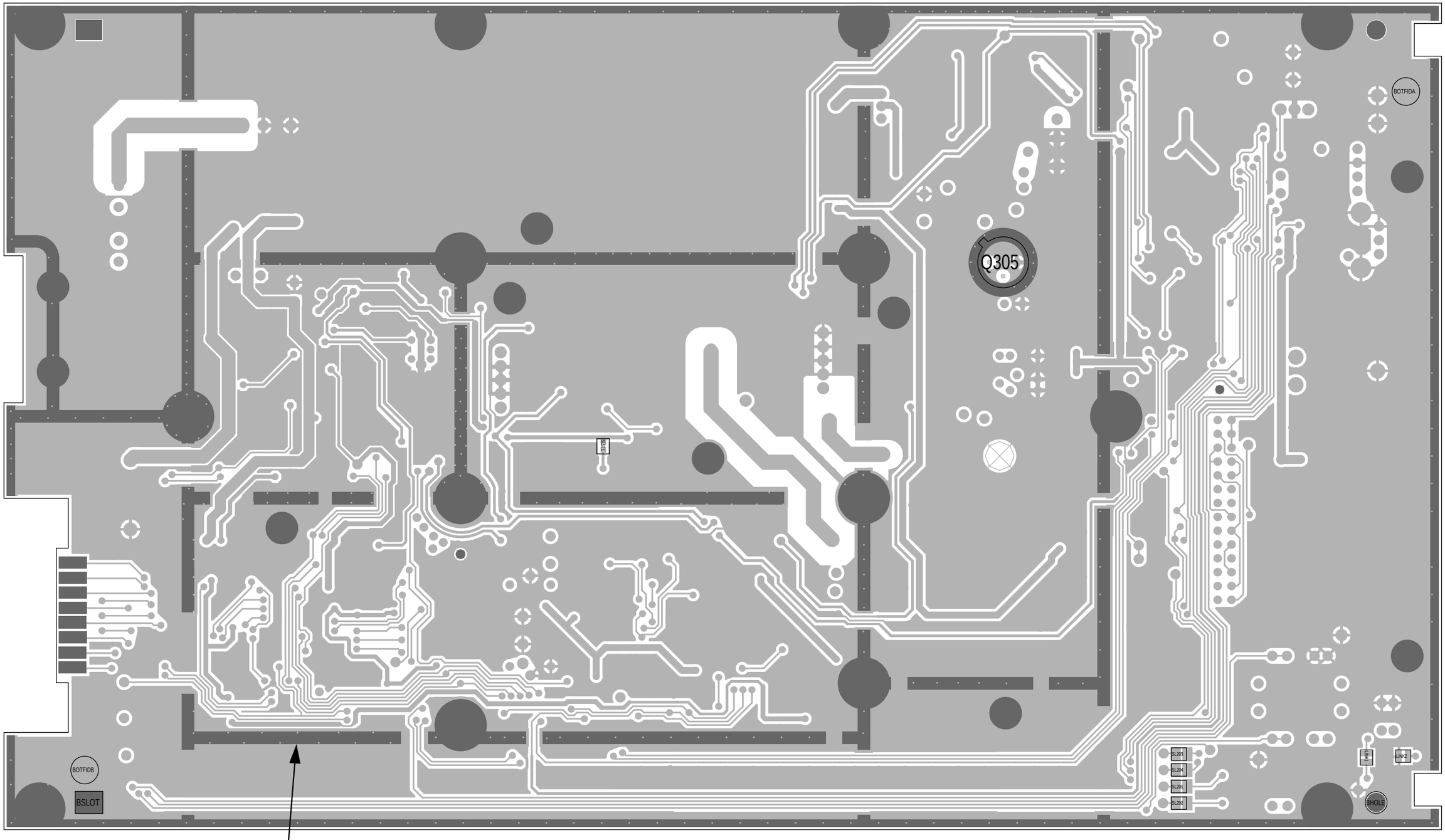
Copyright TEL

Copyright TEL



T857 PCB Layout - Top Side
220-01398-04

Copyright TEL

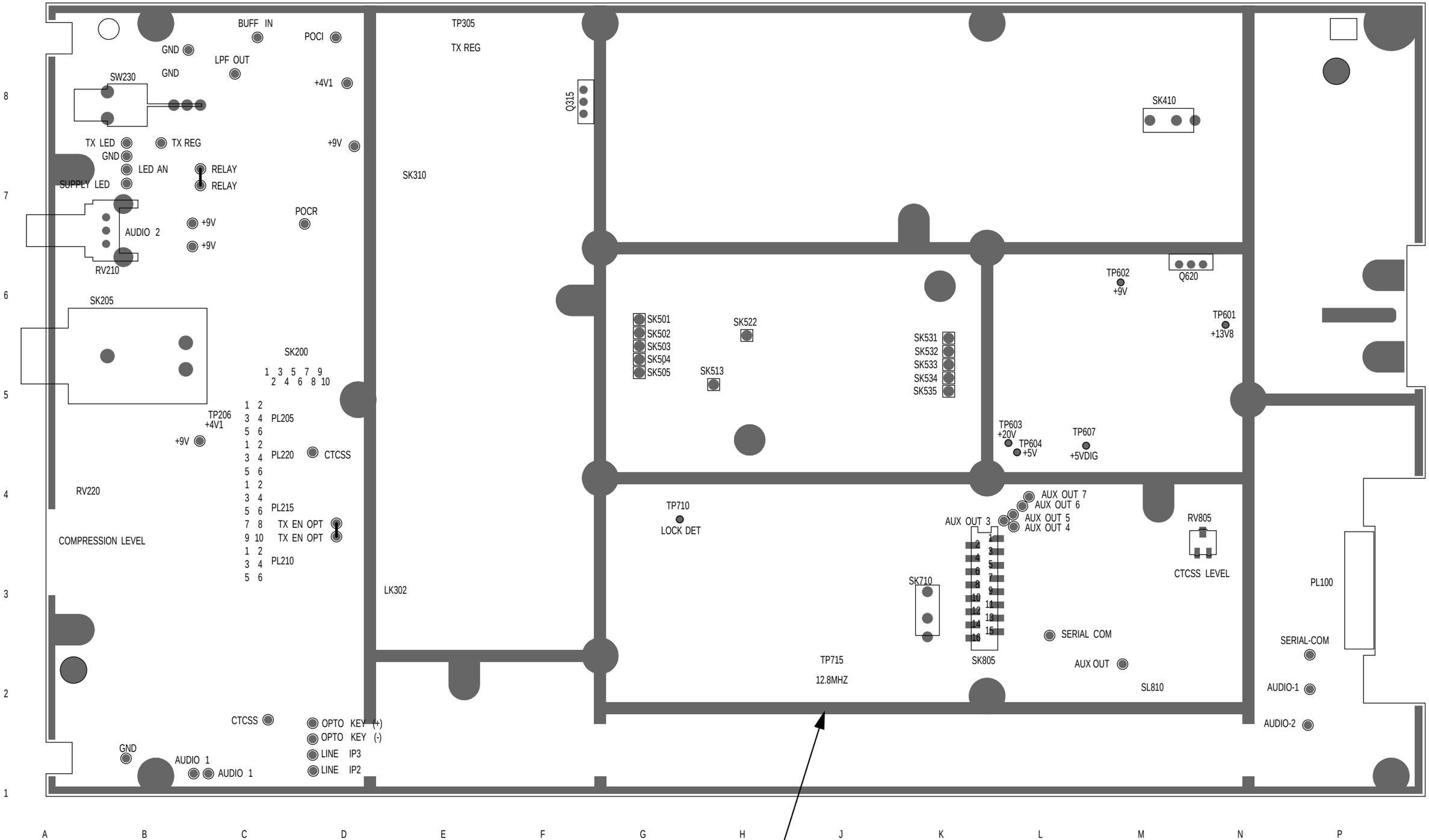


The darker shading shows the footprint of the bottom cover.

T857 PCB Layout - Bottom Side
220-01398-04

29/02/00

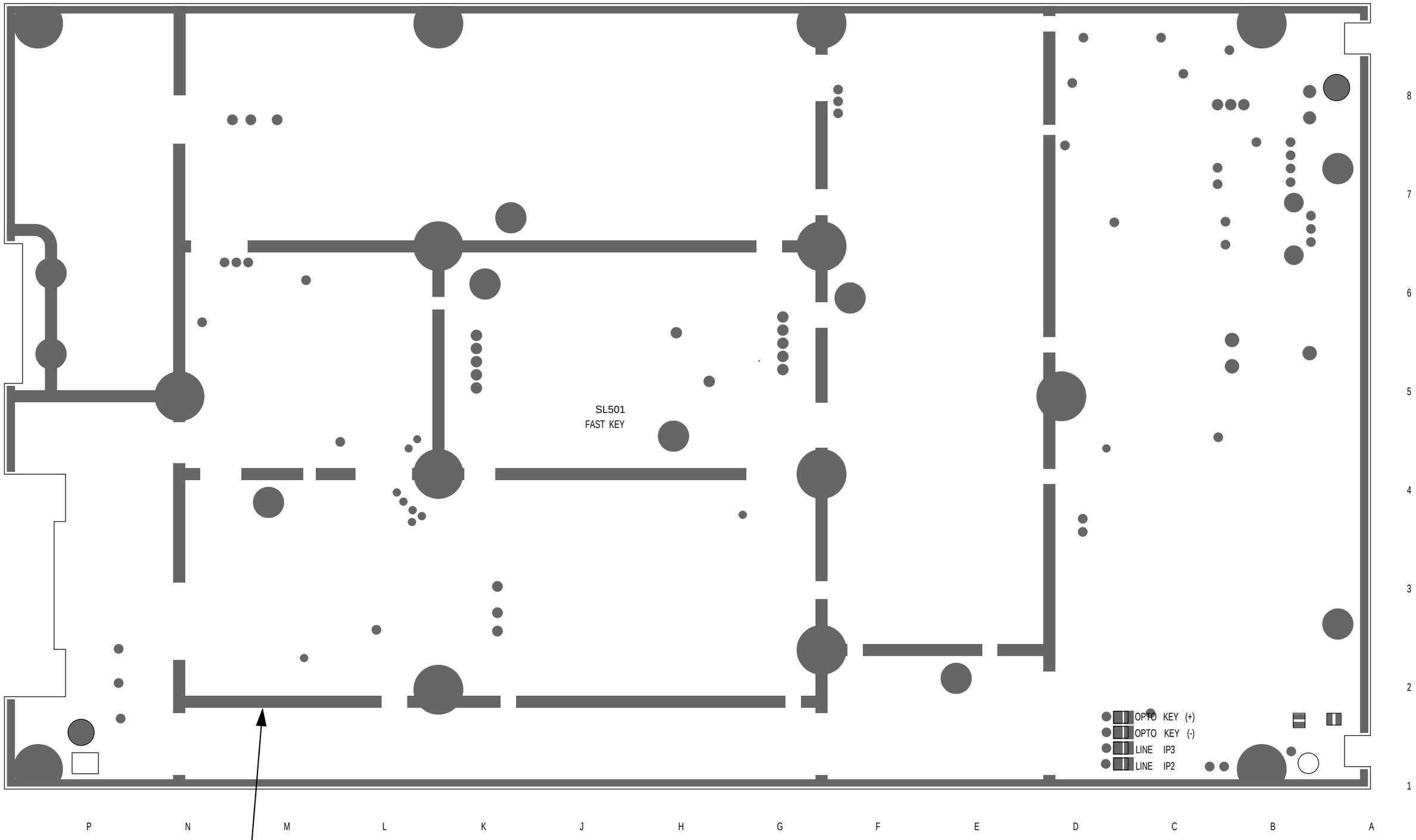
Copyright TEL



The darker shading shows the outline of the chassis.

T857 Test Points & Options Connections - Top Side
220-01398-04

Copyright TEL



The darker shading shows the footprint of the bottom cover.

T857 Test Points & Options Connections - Bottom Side
220-01398-04

29/02/00

Copyright TEL

AUDIO PROCESSOR
SHEET 2

EXCITER
SHEET 3

PA
SHEET 4

SHEET 4 IS EMPTY-SOCKET IN PA AREA IS SHOWN ON PAGE 1

HARMONIC-FILTER
SHEET 9

ANTENNA

VCO SECTION
SHEET 5

REGULATOR
SHEET 6

SYNTH
SHEET 7

MICRO
SHEET 8

DGND & GND ARE JOINED
THROUGH R617 ON SHEET 6

DRANGE 1

PL100

This sheet shows how the T857 circuitry is divided into separate sections which are contained within separate cavities in the chassis. It is laid out to show the approximate location of each section of circuitry on the PCB. The circuitry for each section is shown on separate numbered sheets, and all components on the PCB are numbered to match the sheet on which they appear. For example, all audio components appear on sheet 2 and are numbered between 200 & 299, all exciter components are on sheet 3 and are numbered between 300 & 399, and so on.

PL100
15 WAY R-ANGLE DRANGE PLUG

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
04B	VALUE CHANGES ONLY	MAJ				21-05-99
04A	CYCLIC KEYING CHANGES	MAJ				25-04-99
03A	UPDATED	MAJ				22-12-98
2B	CORRECTED VALUES TO T857-20	DAVEE				5-FEB-98
2A	TOP SIDE VERSION	DAVES				
1A		RICHARD				
0A	ORIGINAL	DAVES				

© TAIT ELECTRONICS

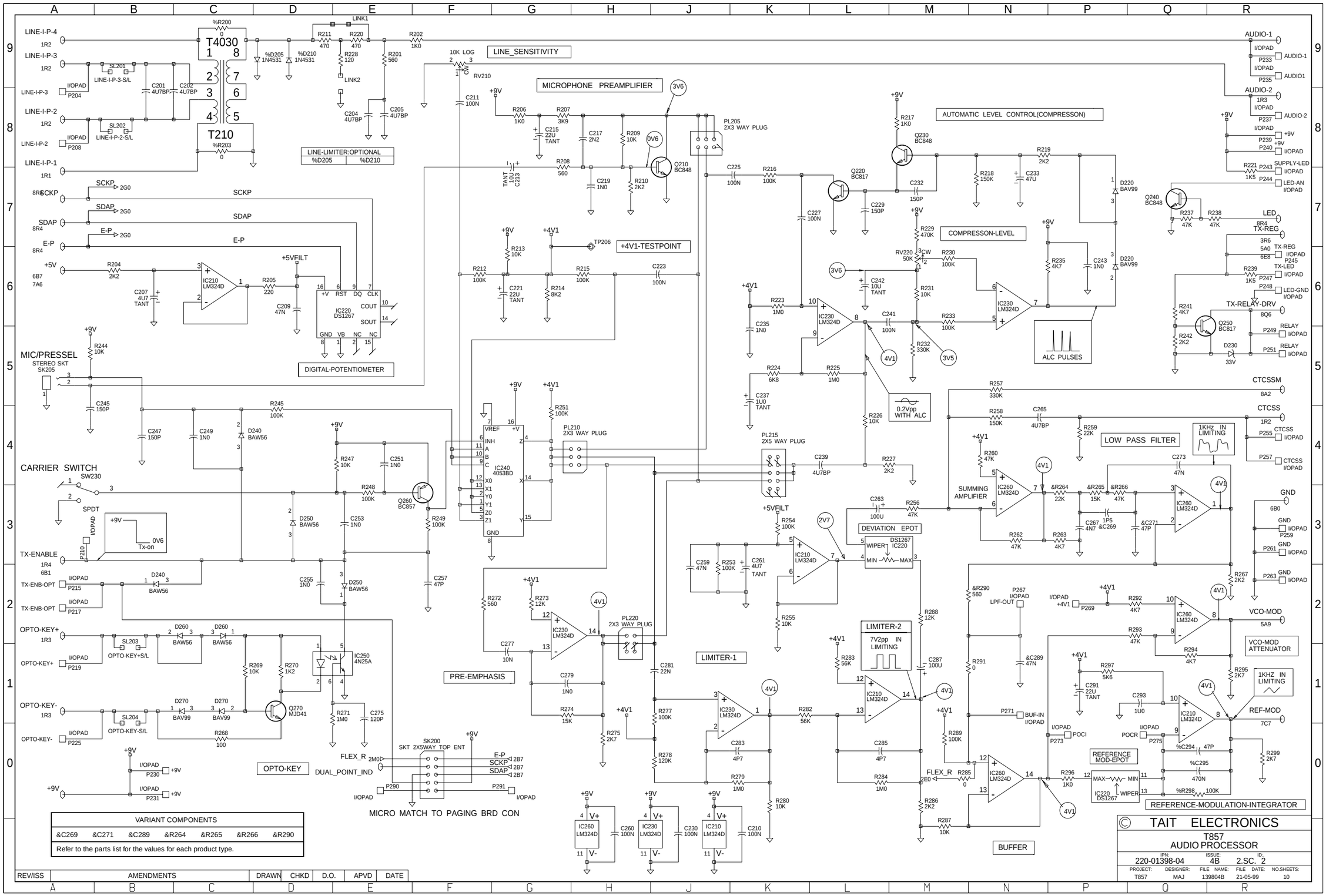
T857
EXCITER

IPN:	ISSUE:	ID.:
220-01398-04	4B	2.SC. 1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	MAJ	139804B	21-05-99	10

Sheet 1 - T857 Exciter Overview
220-01398-04

Copyright TEL



Sheet 2 - T857 Audio Processor
220-01398-04

Copyright TEL

VARIANT COMPONENTS					
#C315	#C322	#C327	#L307	#R306	#R331
#C316	#C323	#C345	#L313	#R307	#R332
#C321	#C326			#R330	

Refer to the parts list for the values for each product type.

SPARE GATE
IC300

SIDE ENTRY COAX SKT

DC VOLTAGES

RF LEVEL MEASURED WITH RF PROBE

TX-REG TESTPOINT

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

© TAIT ELECTRONICS

T857
EXCITER

IPN:	ISSUE:	ID:.
220-01398-04	4B	2.SC. 3

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	MAJ	139804B	21-05-99	10

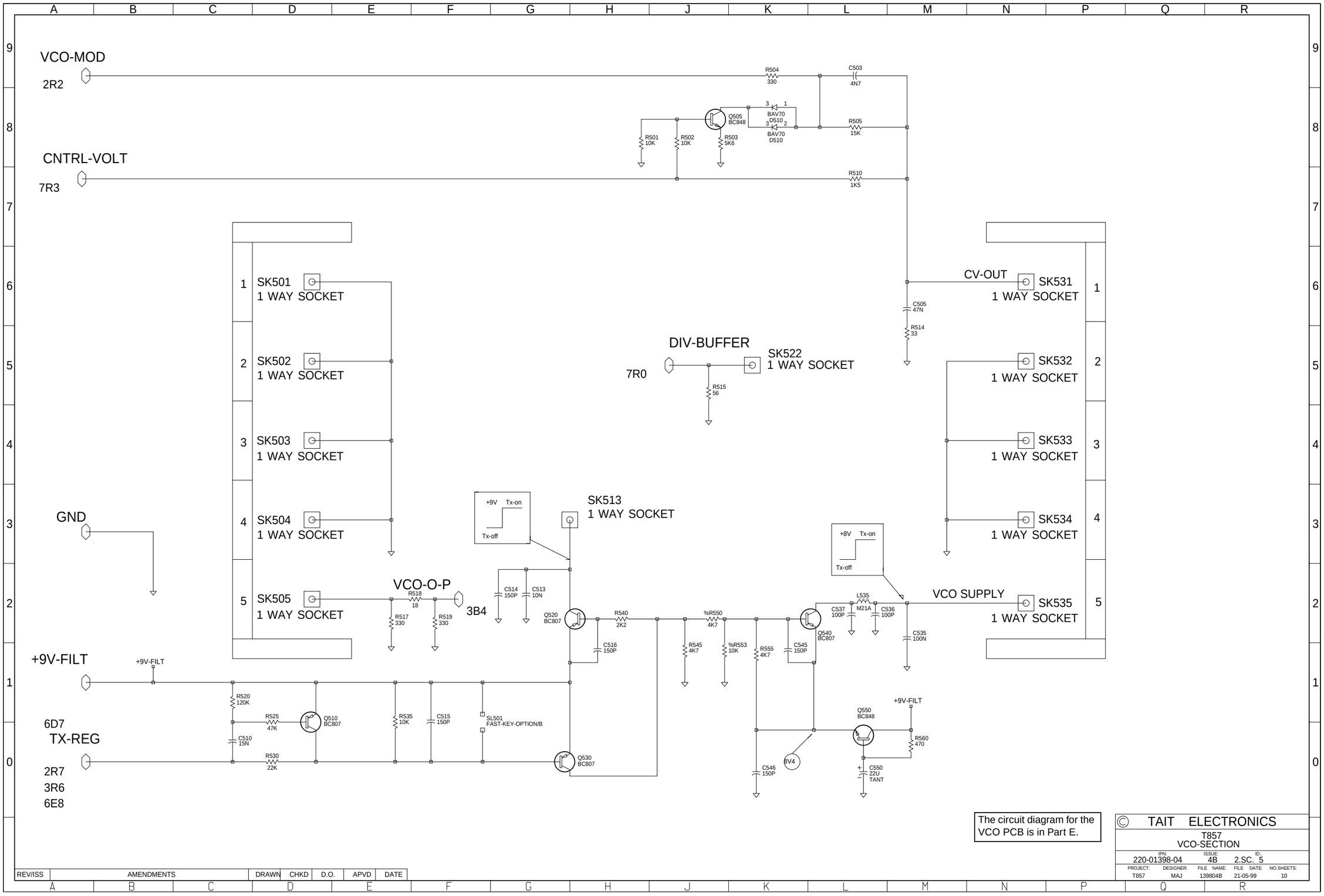
Sheet 3 - T857 Exciter
220-01398-04

Copyright TEL

SK410 is the only component in this section
of the T857 circuitry and is shown on sheet 1.

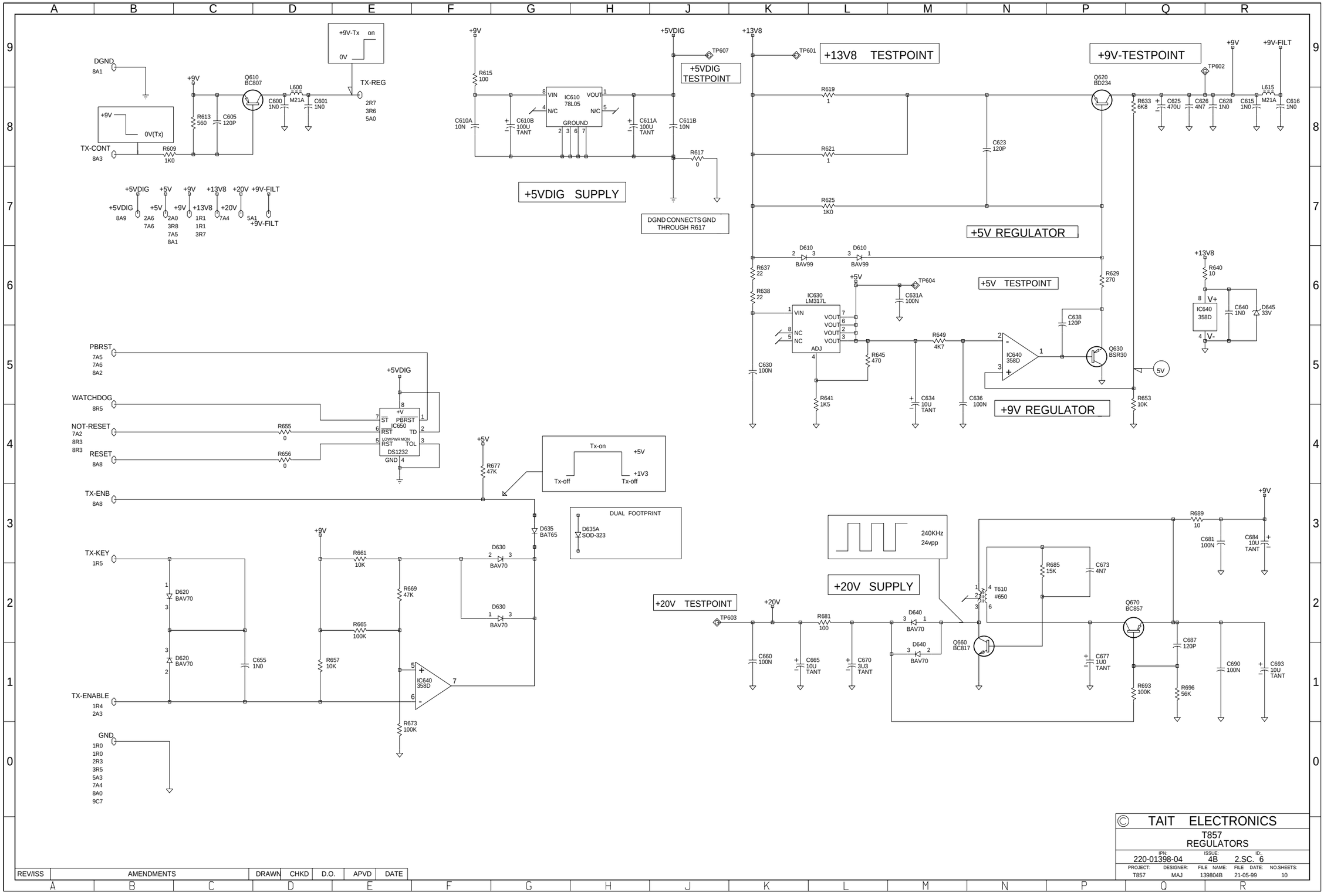
Sheet 4 - Not Used In The T857
220-01398-04

Copyright TEL



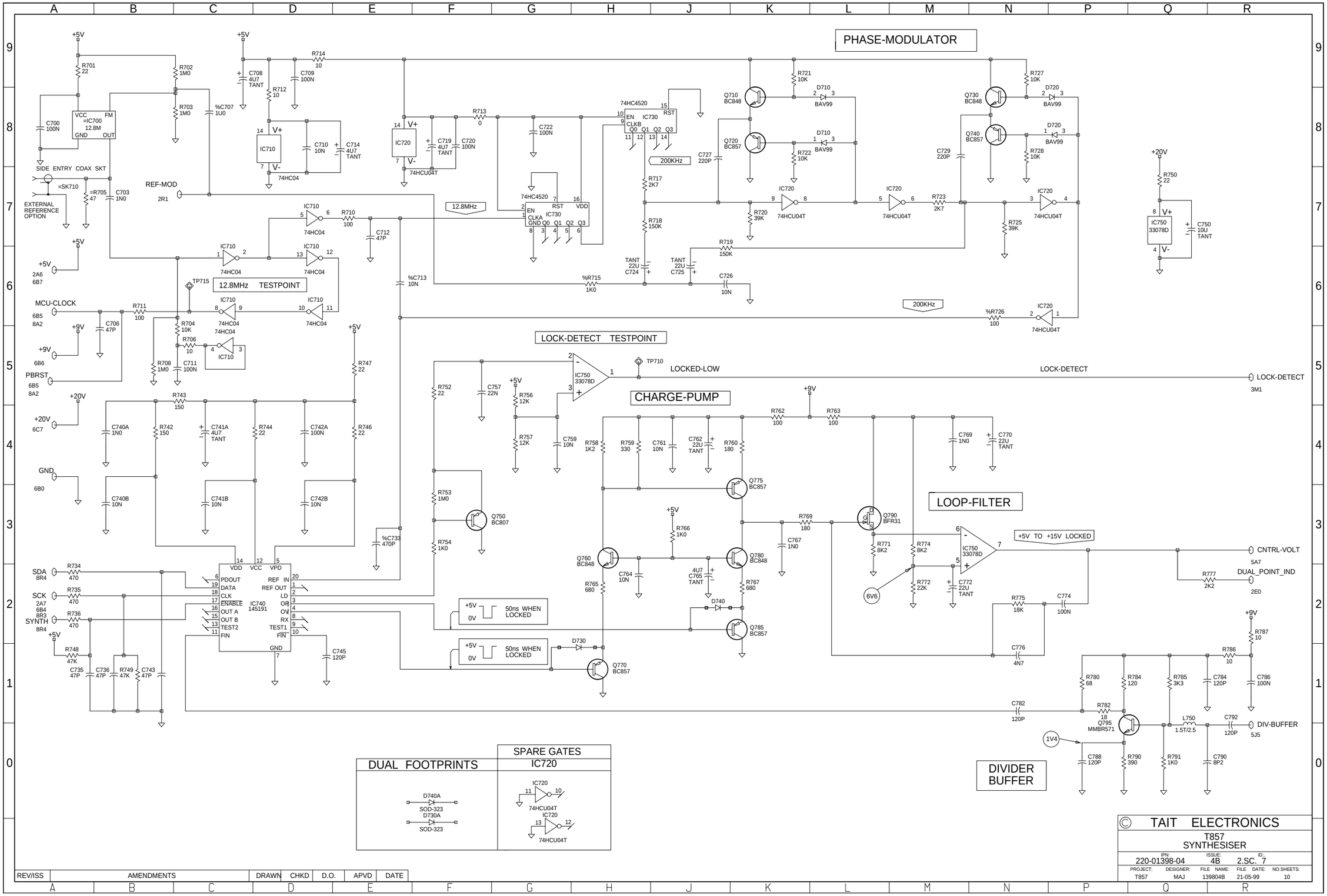
Sheet 5 - T857 VCO Section
220-01398-04

Copyright TEL



Sheet 6 - T857 Regulators
220-01398-04

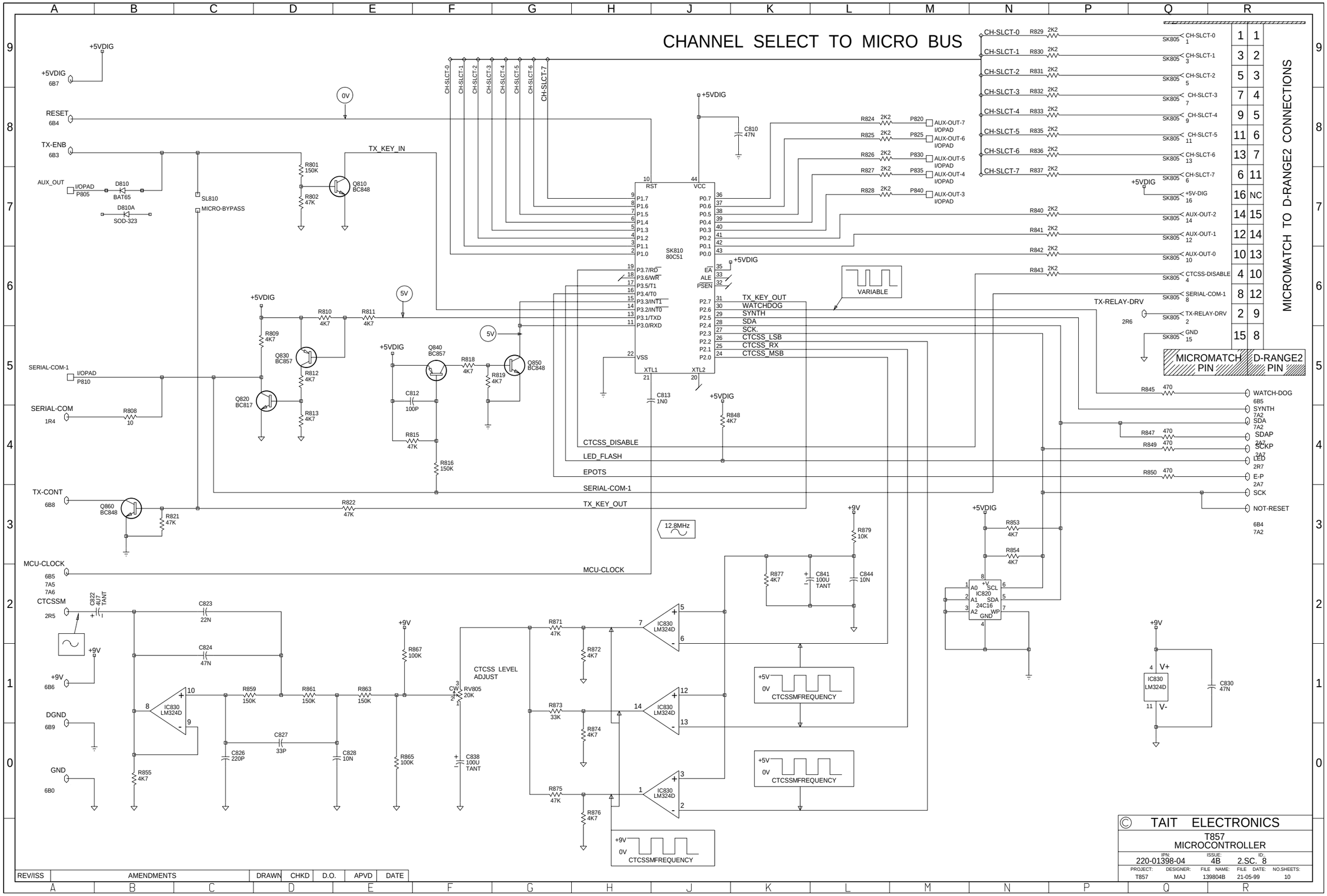
Copyright TEL



Sheet 7 - T857 Synthesiser
220-01398-04

Copyright TEL

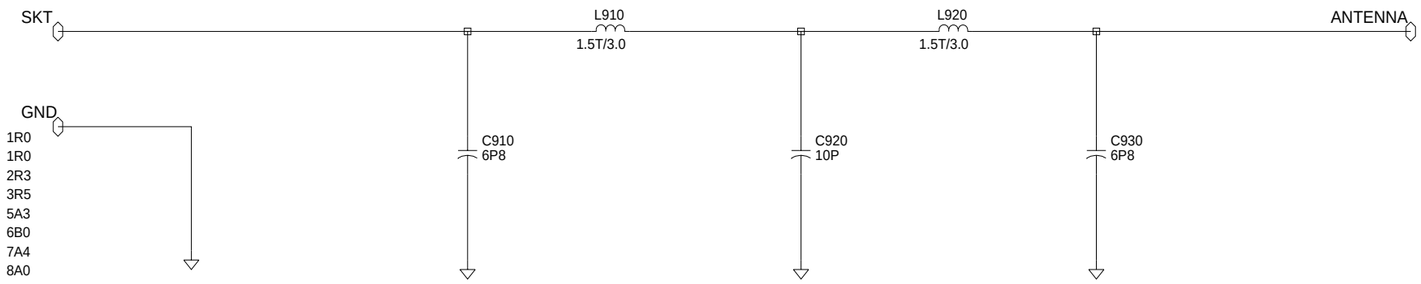
CHANNEL SELECT TO MICRO BUS



Sheet 8 - T857 Microcontroller
220-01398-04

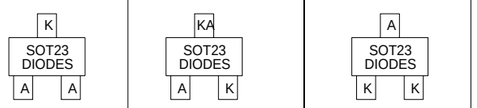
29/02/00

Copyright TEL

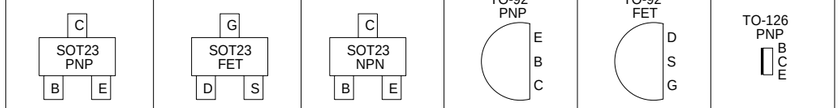


HARMONIC-FILTER

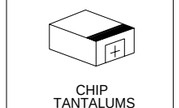
DIODE PHYSICAL PIN OUTS



TRANSISTOR PHYSICAL PIN OUTS



TANTALUMS



REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

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T857
HARMONIC-FILTER

IPN:	ISSUE:	ID:.
220-01398-04	4B	2.SC. 9

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T857	MAJ	139804B	21-05-99	10

Sheet 9 - T857 Harmonic Filter
220-01398-04

Copyright TEL

Copyright TEL

The photograph in Figure 1.2 on the next page will help you to identify the main circuit blocks in the T858 without RF power module.

There is a similar photograph in Figure 3.4 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

Copyright TEL

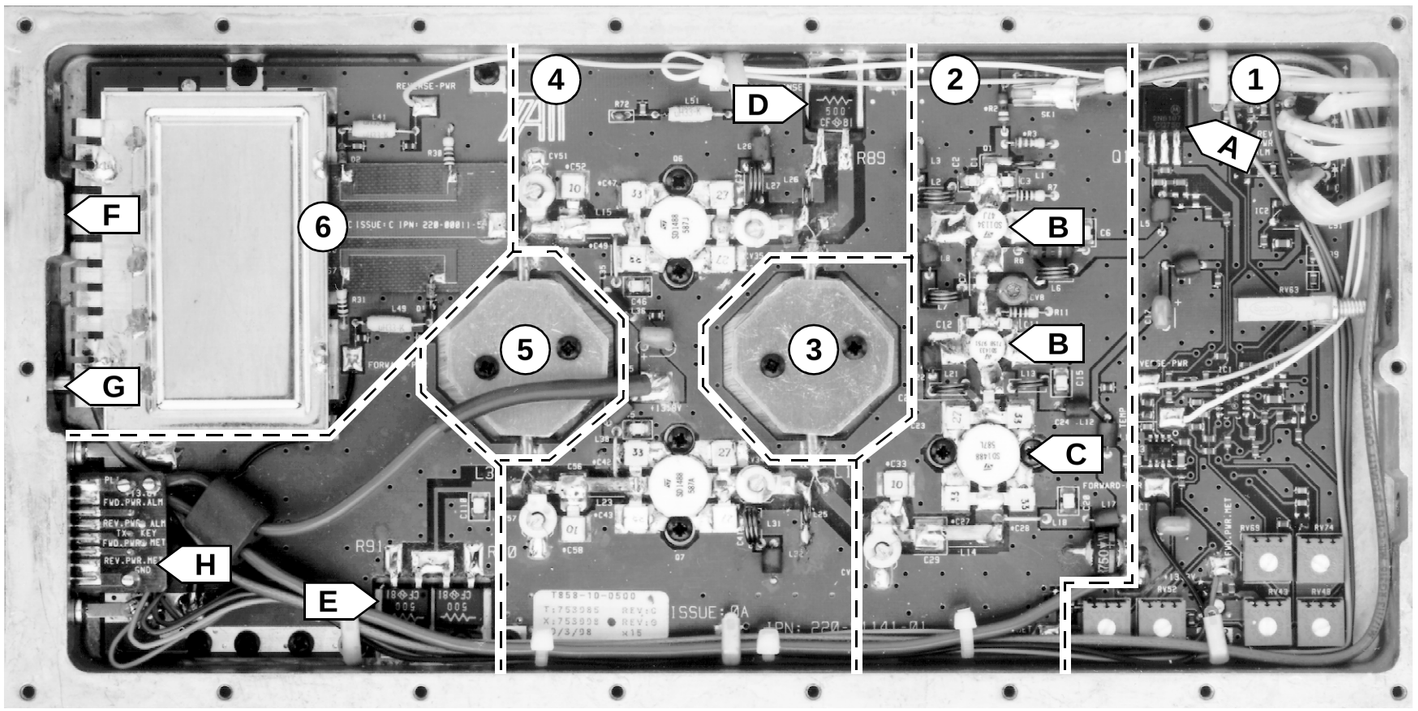


Figure 1.2 T858 Main Circuit Block Identification (Without RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifiers
5 output power combiner
6 low pass filter & directional coupler

A power control transistor (Q16)
B pre-driver
C driver
D input combiner termination (R89)
E output combiner termination (R90/R91)
F RF output
G RF input
H D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)

Copyright TEL

The photograph in Figure 1.3 on the next page will help you to identify the main circuit blocks in the T858 with RF power module.

There is a similar photograph in Figure 3.5 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

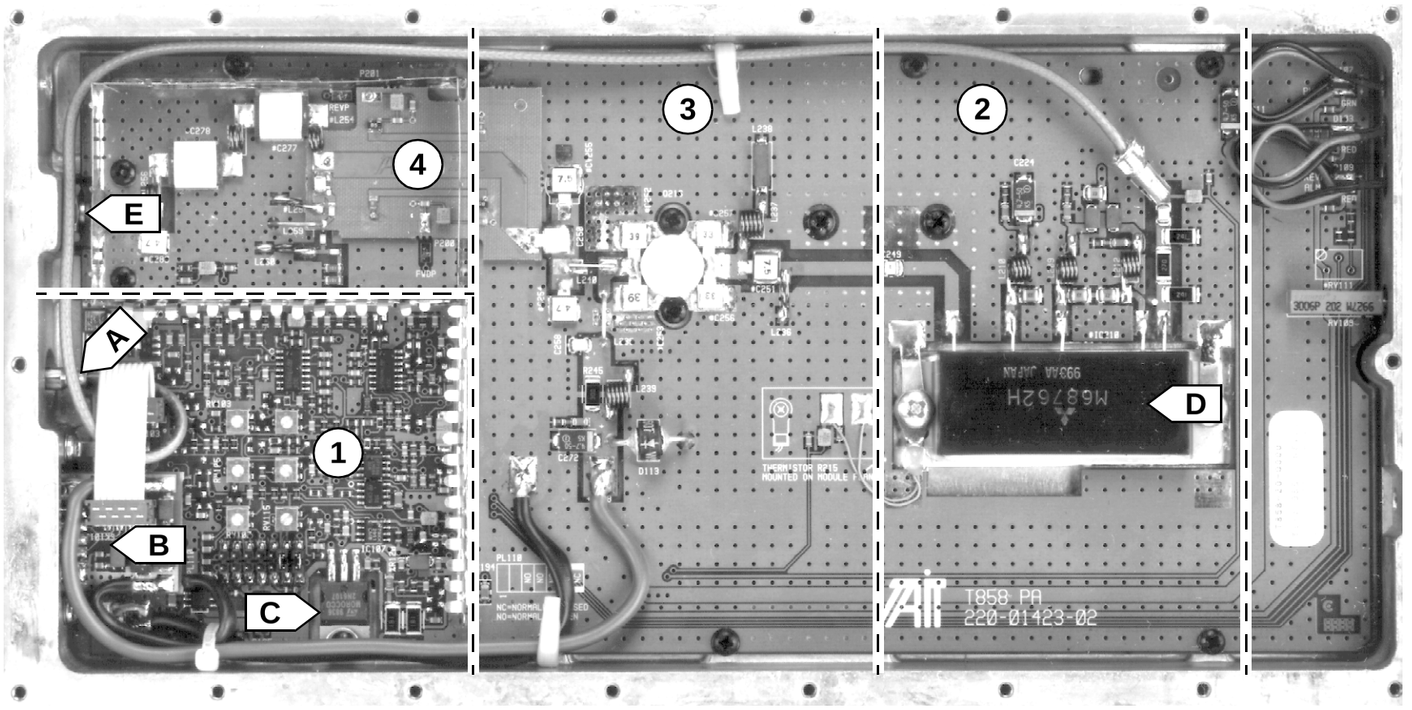


Figure 1.3 T858 Main Circuit Block Identification (With RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 final amplifier
4 low pass filter & directional coupler

A RF input
B D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)
C power control transistor (Q137)
D RF power module (#IC210)
E RF output

Copyright TEL

The photograph in Figure 1.4 on the next page will help you to identify the main circuit blocks in the T859 without RF power module.

There is a similar photograph in Figure 3.6 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 shows the T858/859 front panel controls.

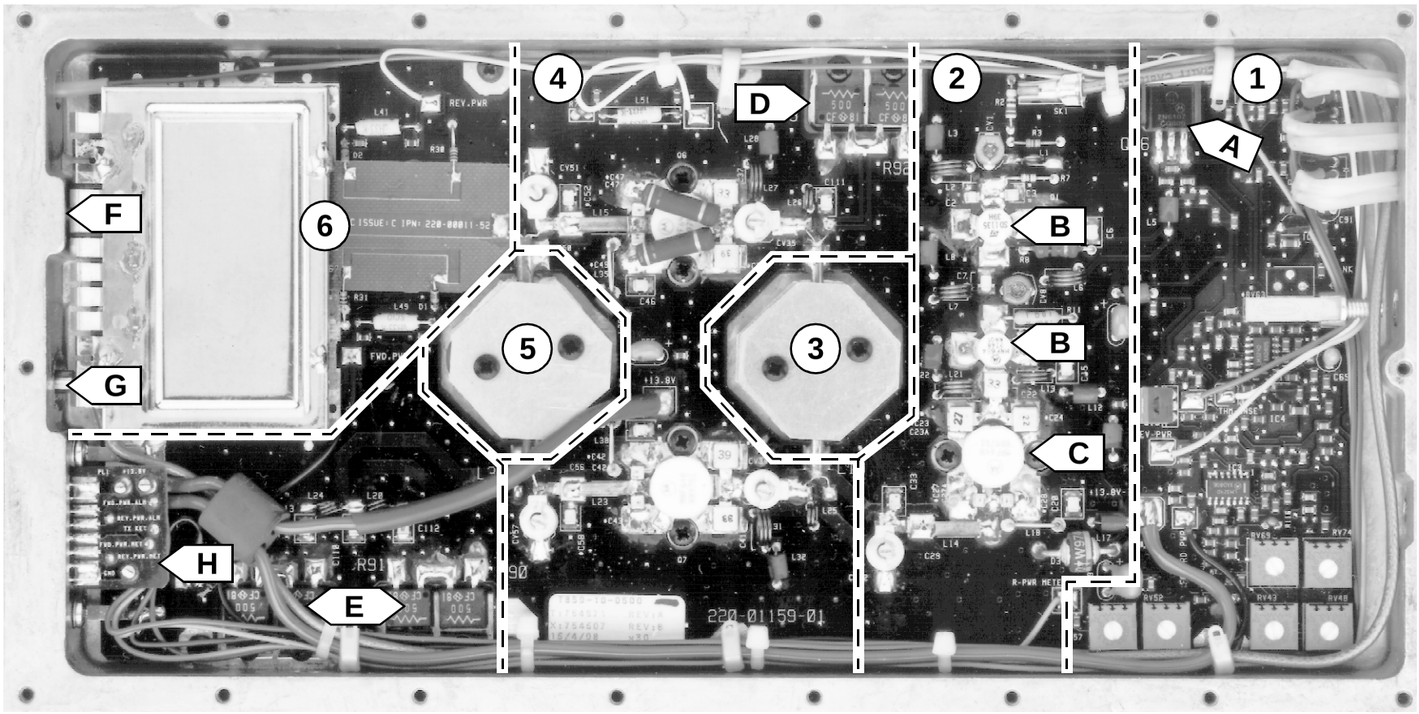


Figure 1.4 T859 Main Circuit Block Identification (Without RF Power Module)

Key:

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifiers
5 output power combiner
6 low pass filter & directional coupler

A power control transistor (Q16)
B pre-driver
C driver
D input combiner termination (R89/R92)
E output combiner termination (R90/R91/R93/R94)
F RF output
G RF input
H D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)

Copyright TEL

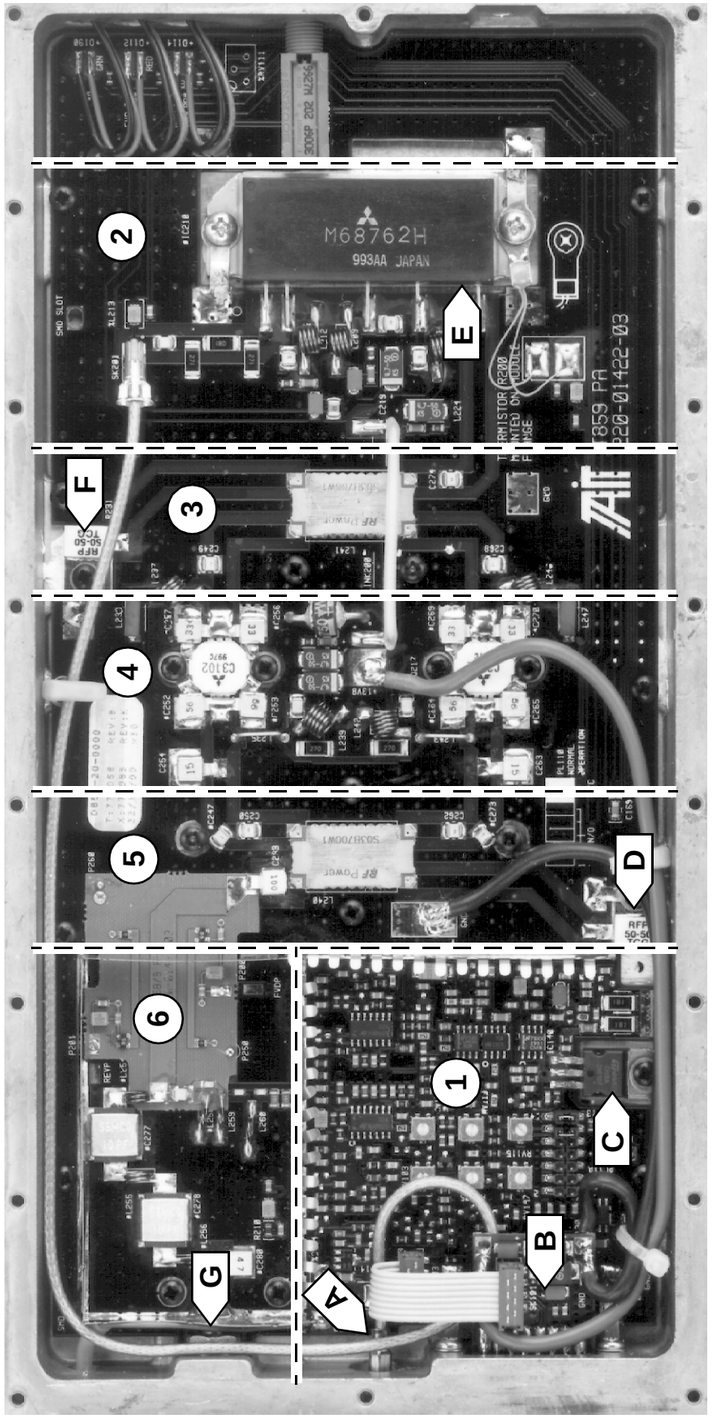
The photograph in Figure 1.5 on the next page will help you to identify the main circuit blocks in the T859 with RF power module.

There is a similar photograph in Figure 3.7 which shows the main adjustment controls.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

The photograph in Figure 1.6 on the next page shows the T858/859 front panel controls.

Copyright TEL



Key:

A RF input
B D-range connector (incl. DC in, alarm & metering outputs - refer to Section 3.2 in Part F)
C power control transistor (Q128)
D output combiner termination (R240)
E RF power module (#IC210)
F input splitter termination (R231)
G RF output

1 power control & alarms circuitry
2 drive amplifier
3 input power splitter
4 final amplifier
5 output power combiner
6 low pass filter & directional coupler

Figure 1.5 T859 Main Circuit Block Identification (With RF Power Module)



Figure 1.6 T858/859 Front Panel Controls - T858 Shown With T857 Exciter
(The T859 has the same controls as the T858 but has a double-width front panel.)

Copyright TEL

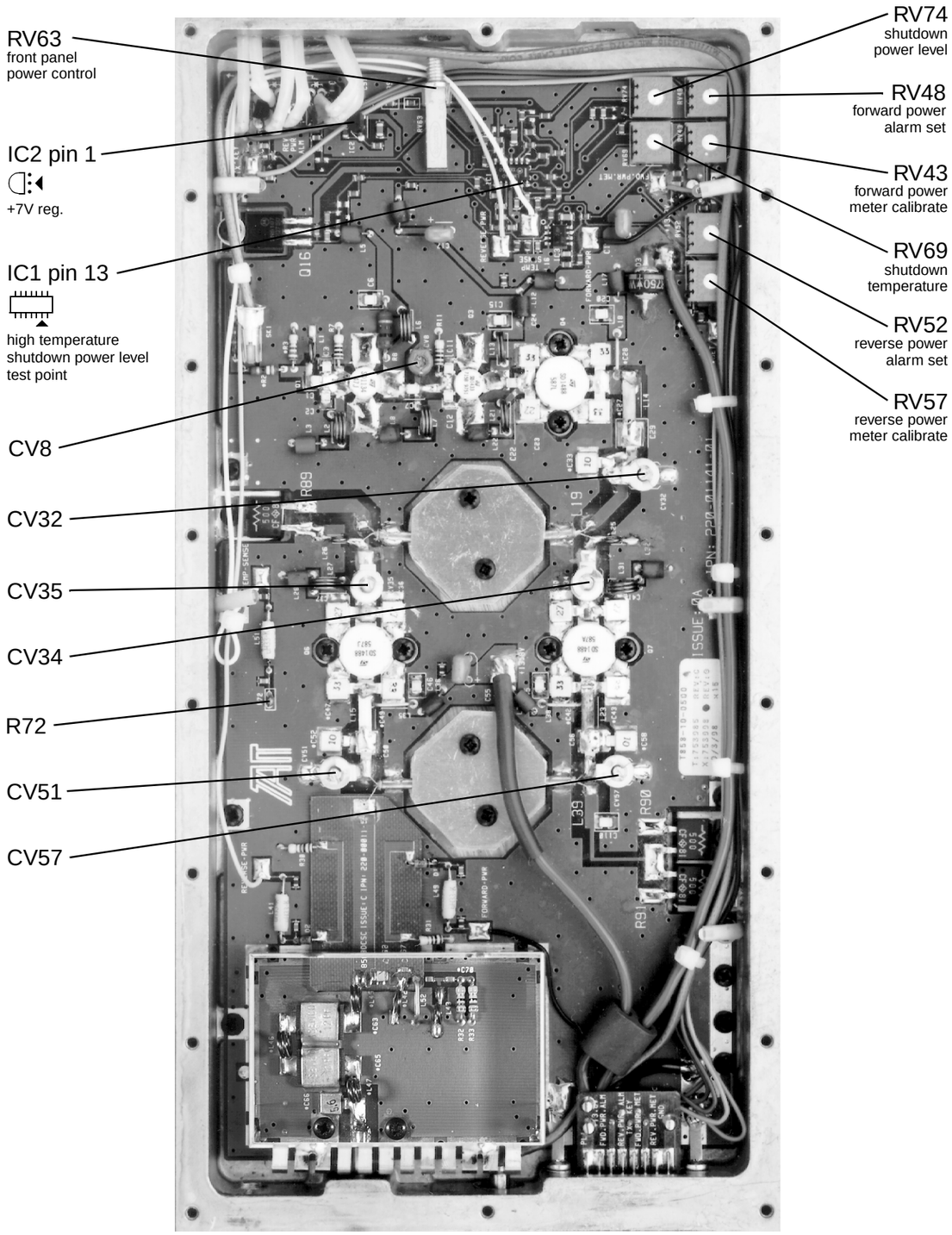


Figure 3.4 T858 Main Adjustment Controls (Without RF Power Module)

The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T858 without RF power module.

There is a similar photograph in Figure 1.2 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

Copyright TEL

The photograph printed at right will help you to identify the main controls used in adjusting the T858 with RF power module.

There is a similar photograph in Figure 1.3 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

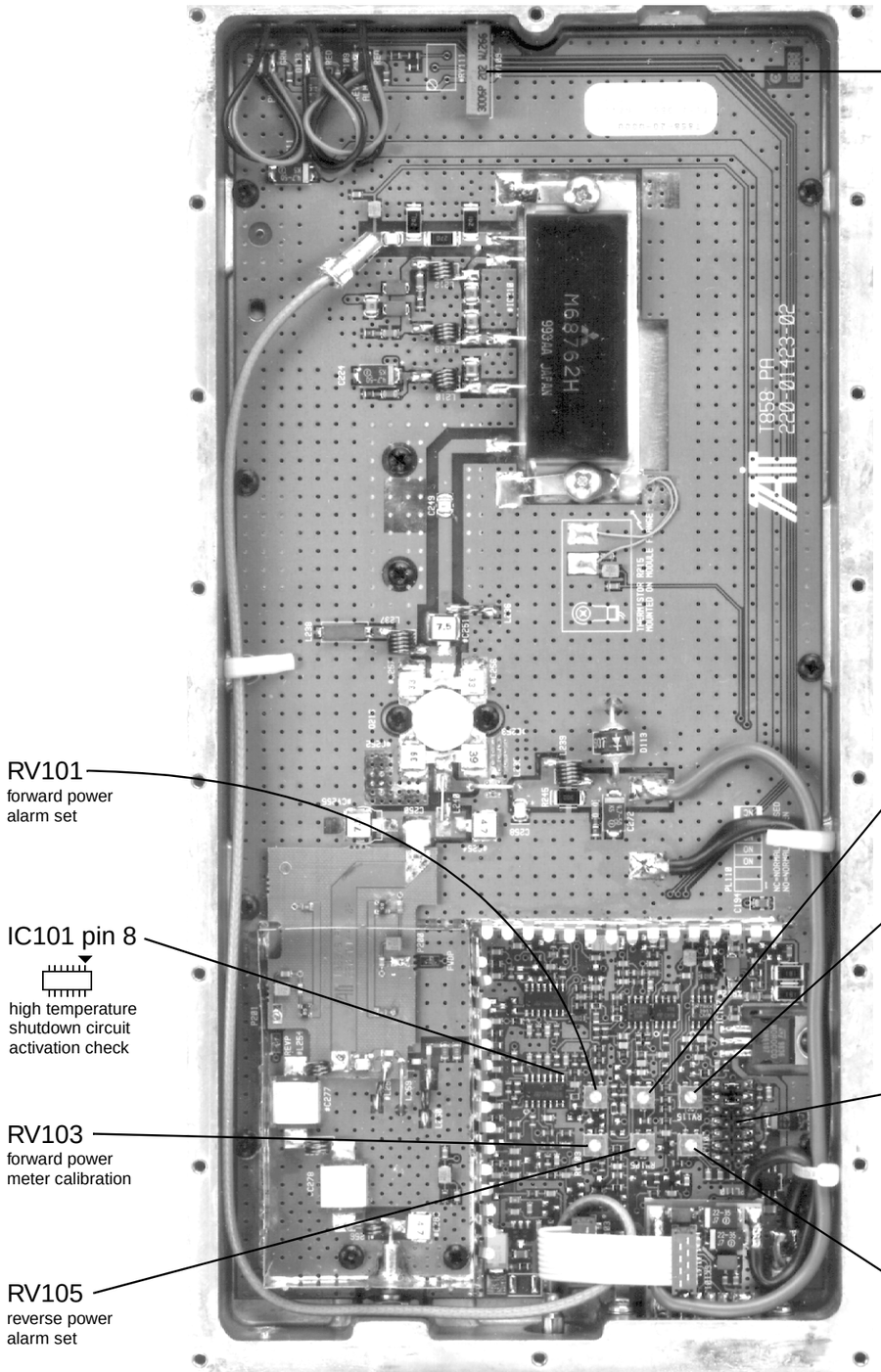


Figure 3.5 T858 Main Adjustment Controls (With RF Power Module)

Copyright TEL

The photograph printed at right will help you to identify the main controls used in tuning and adjusting the T859 without RF power module.

There is a similar photograph in Figure 1.4 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

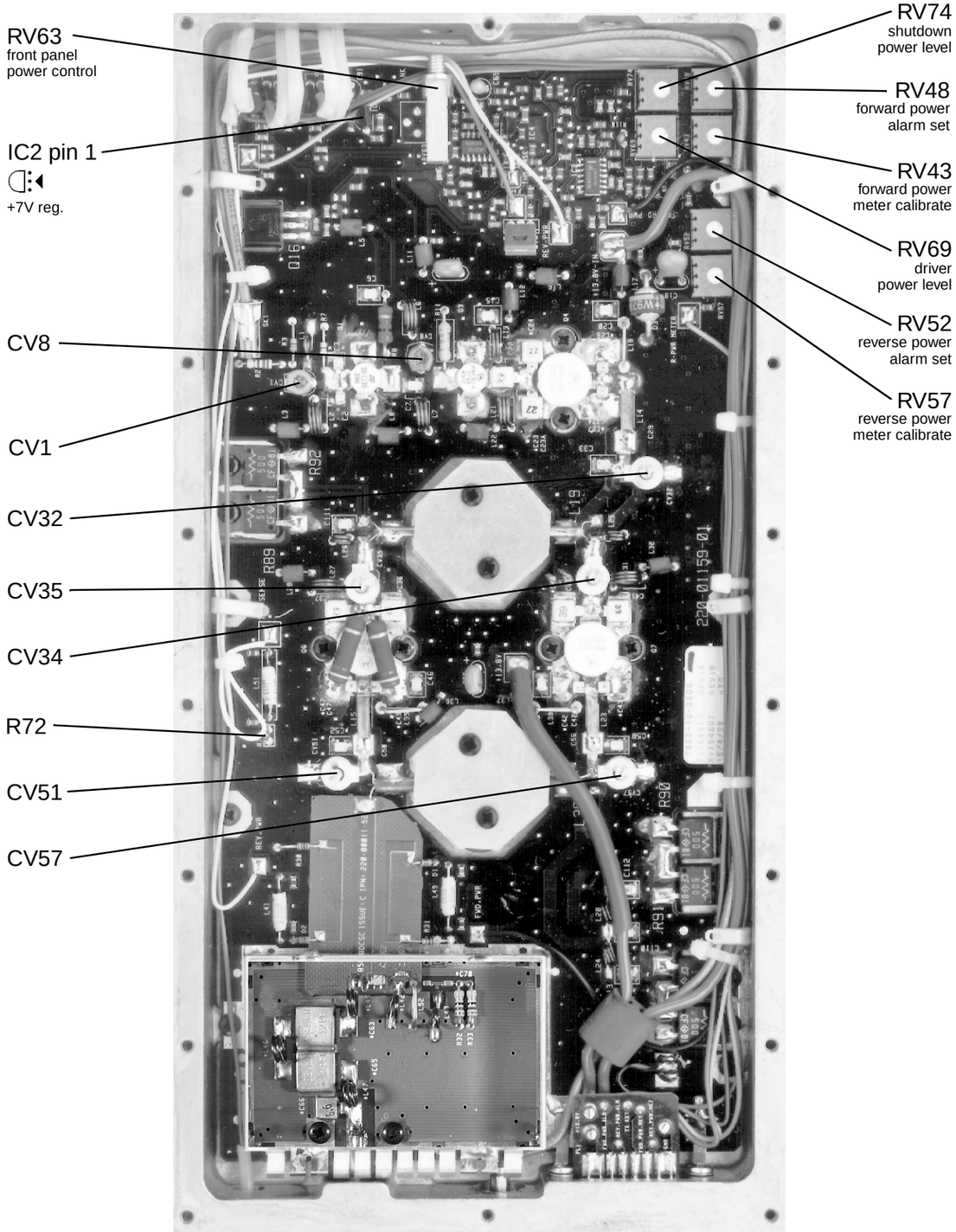


Figure 3.6 T859 Main Adjustment Controls (Without RF Power Module)

Copyright TEL

The photograph printed at right will help you to identify the main controls used in adjusting the T859 with RF power module.

There is a similar photograph in Figure 1.5 which shows the main circuit blocks.

Extending both these fold-outs will allow you to refer to both photographs while using the manual.

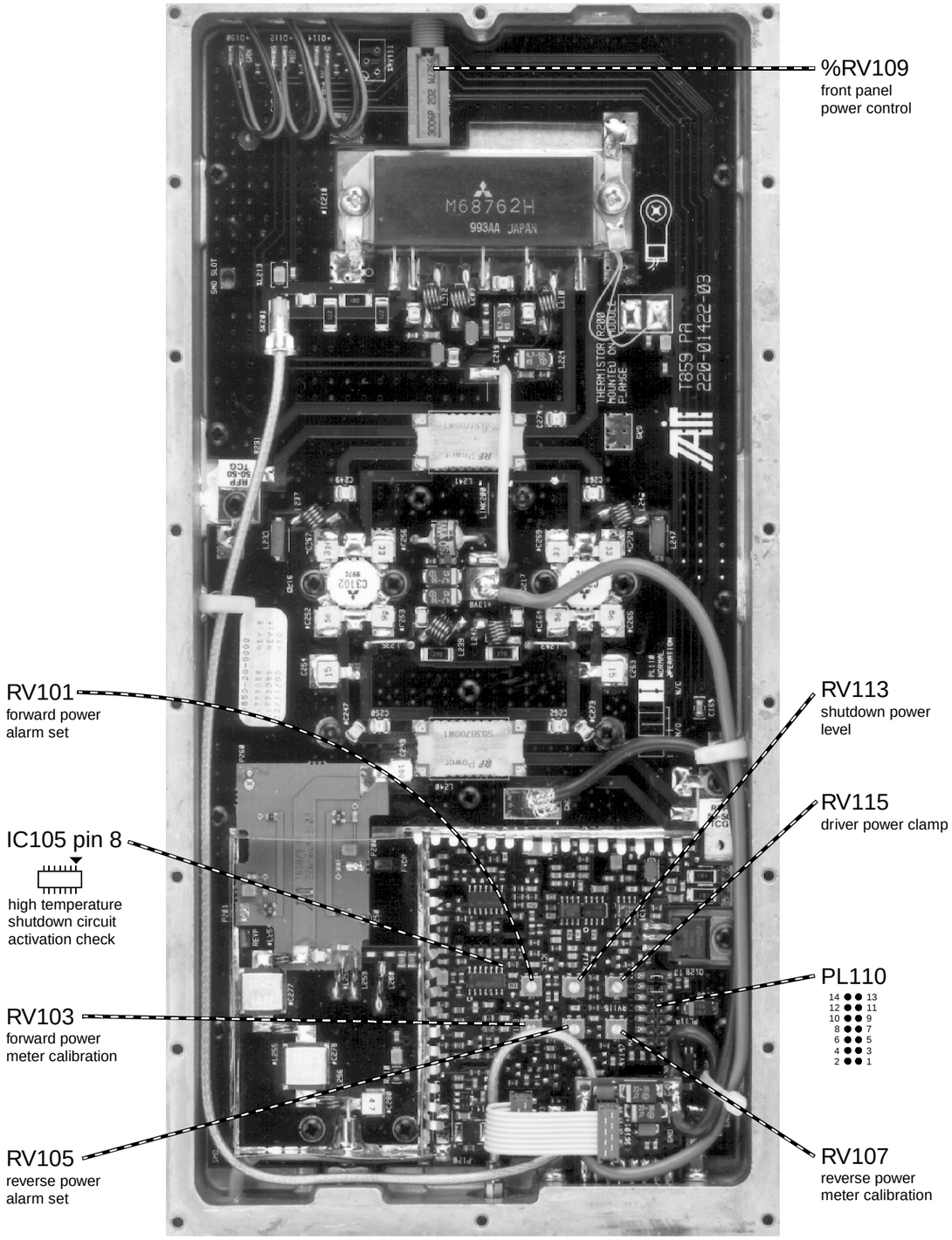
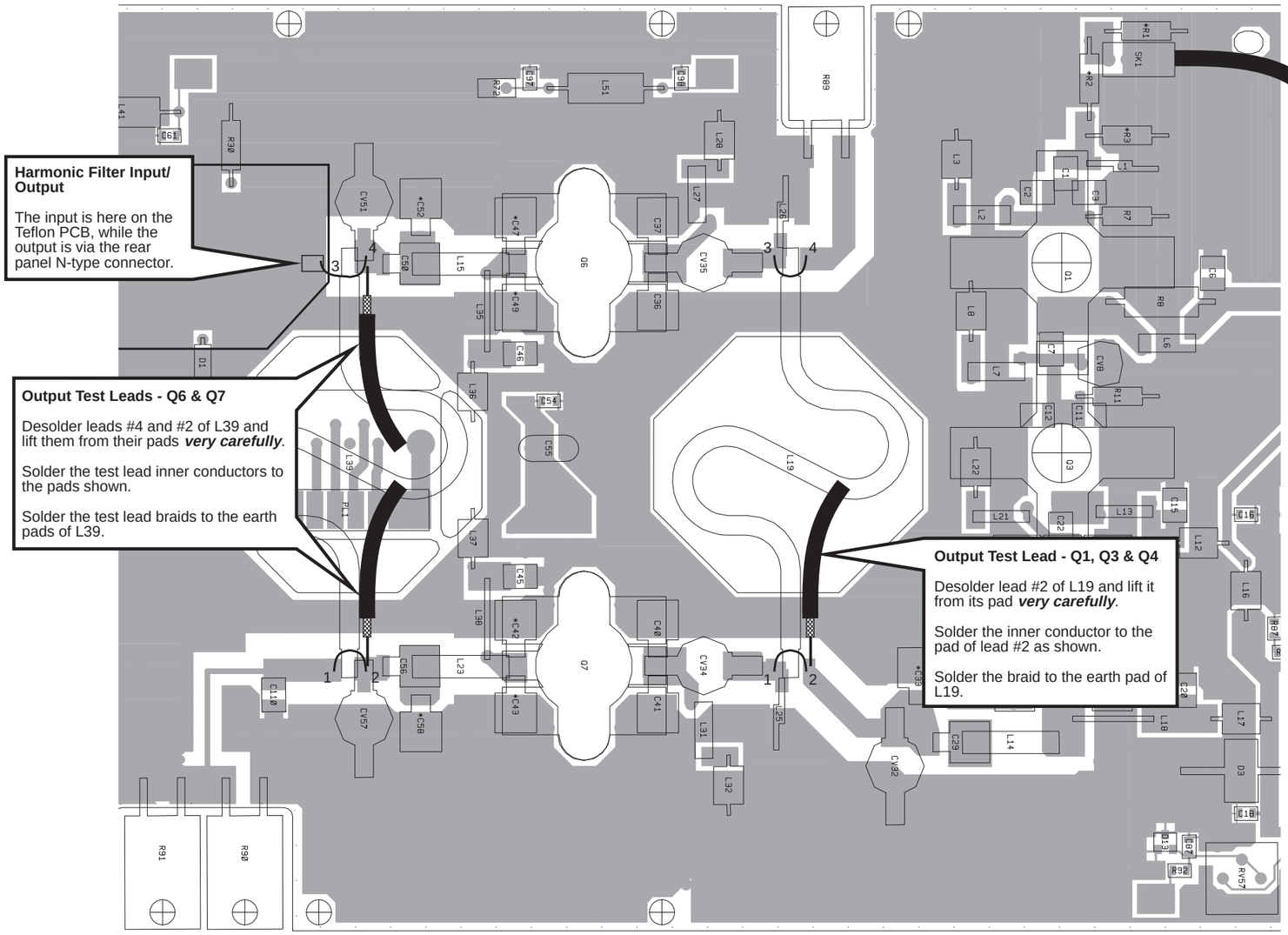


Figure 3.7 T859 Main Adjustment Controls (With RF Power Module)

Copyright TEL



Caution: L19/L39 Inner Conductors

The inner conductors of L19 and L39 are silver wire and are very fragile. Take care not to damage them when desoldering and lifting them off the pads.

When resoldering, make sure each inner conductor curves onto the pad (as shown in the drawing) to protect it from thermal stress or shorts. Do not pull the wire tight.

Figure 4.1 T858/859 Test Break Point Location

Copyright TEL

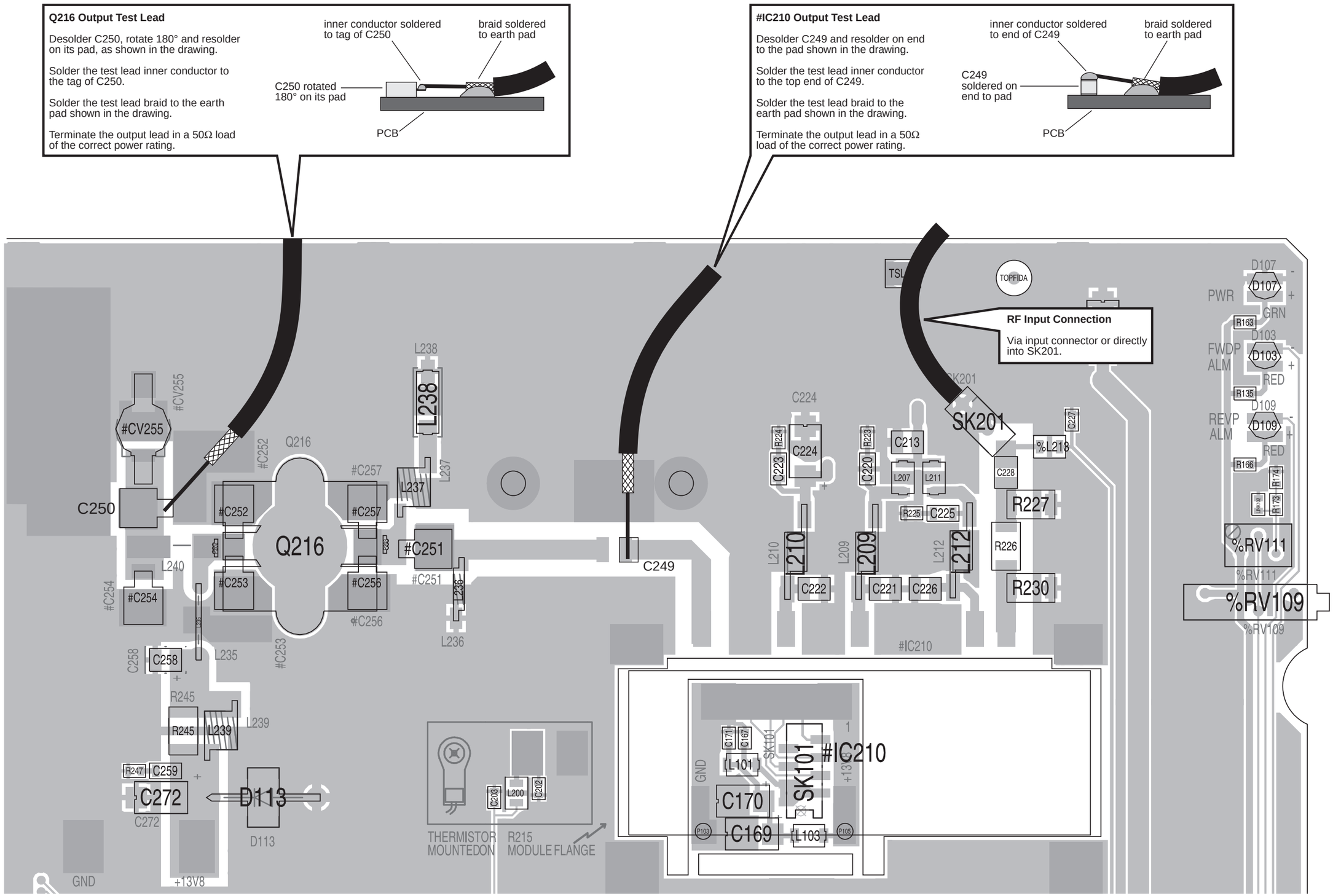


Figure 4.3 T858 Test Break Point Location

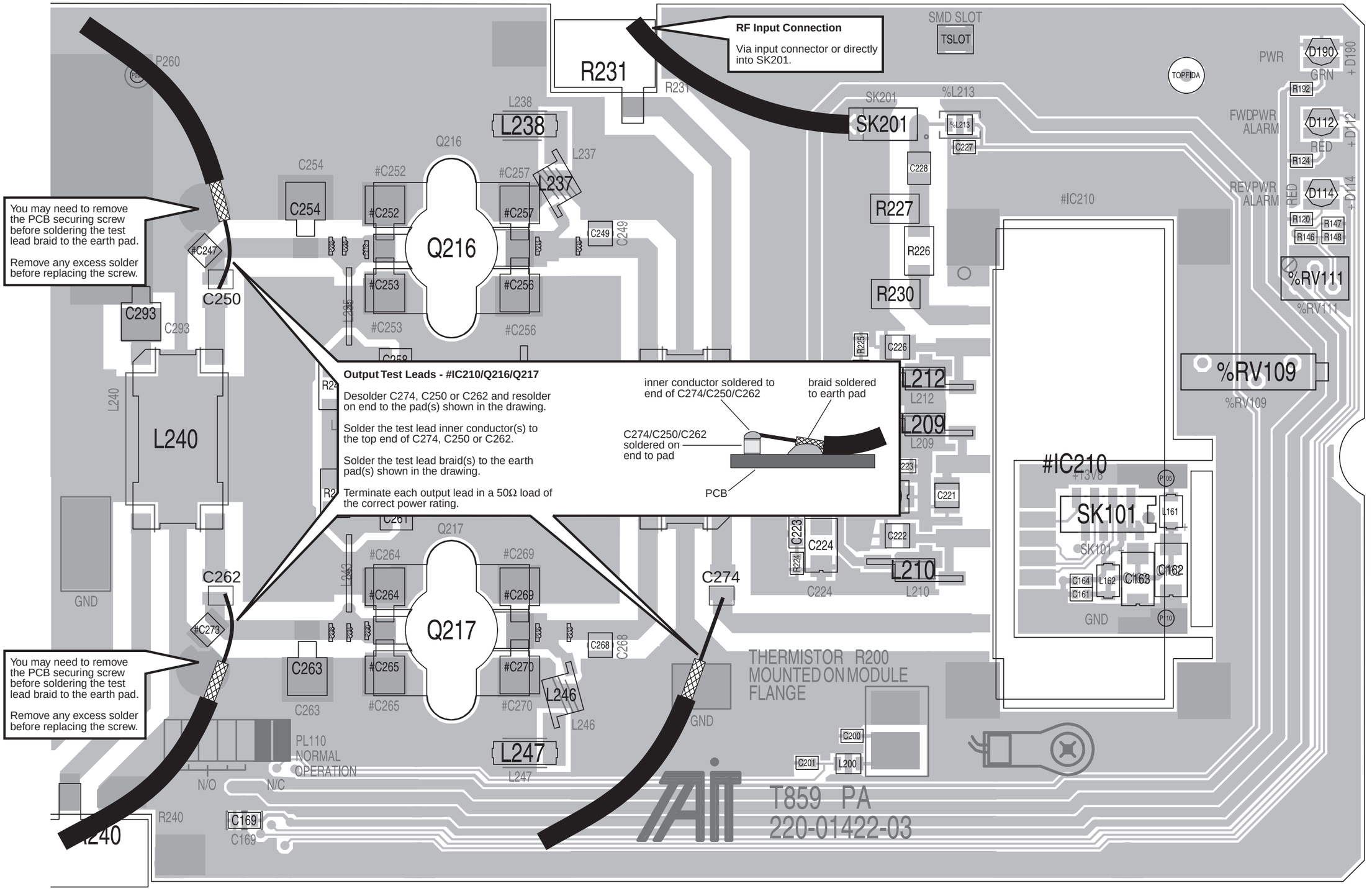


Figure 4.4 T859 Test Break Point Location

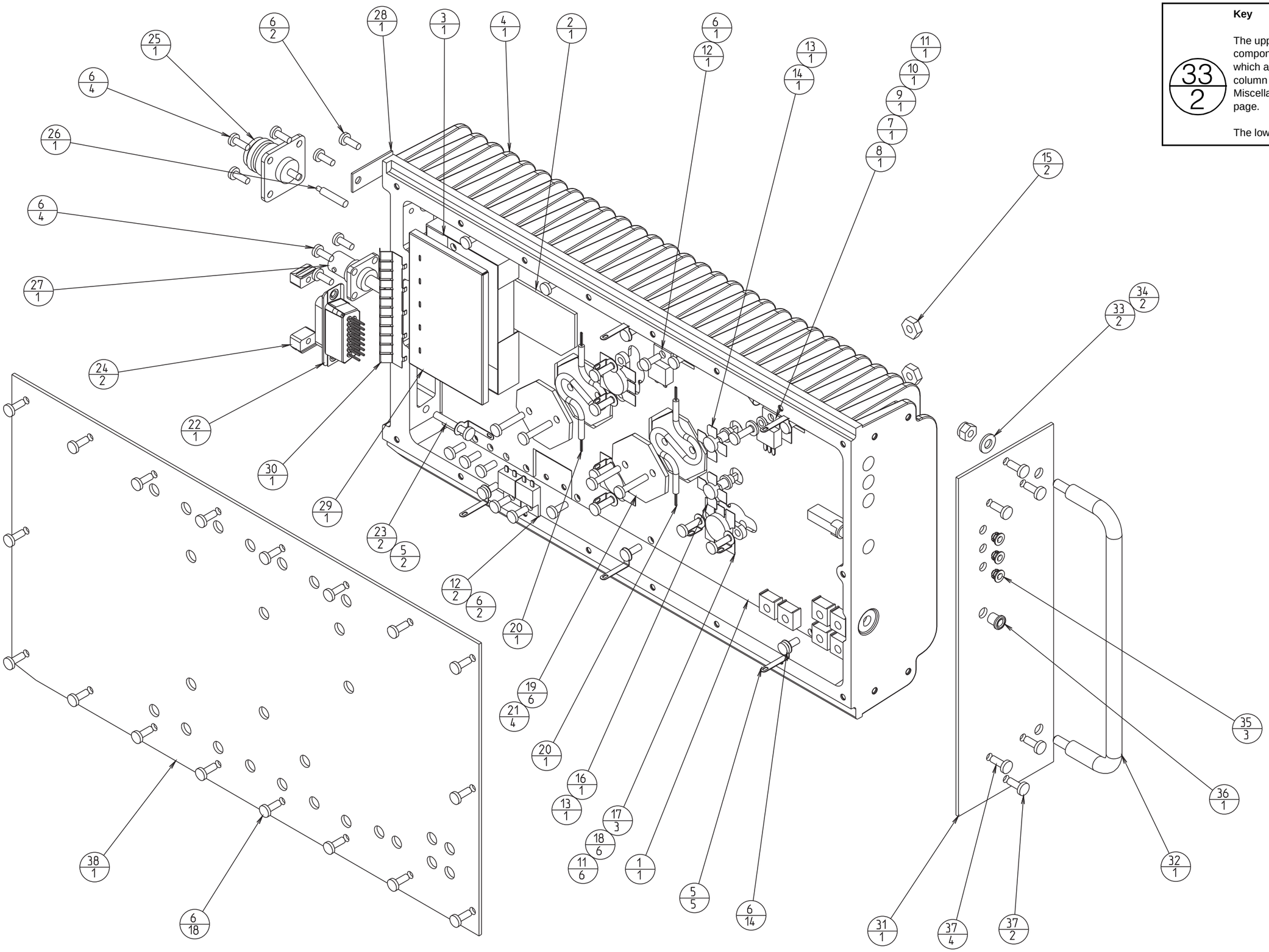
Copyright TEL

Key

33/2

The upper number is the component identification number which appears in the “Legend” column of the Mechanical & Miscellaneous Parts on the facing page.

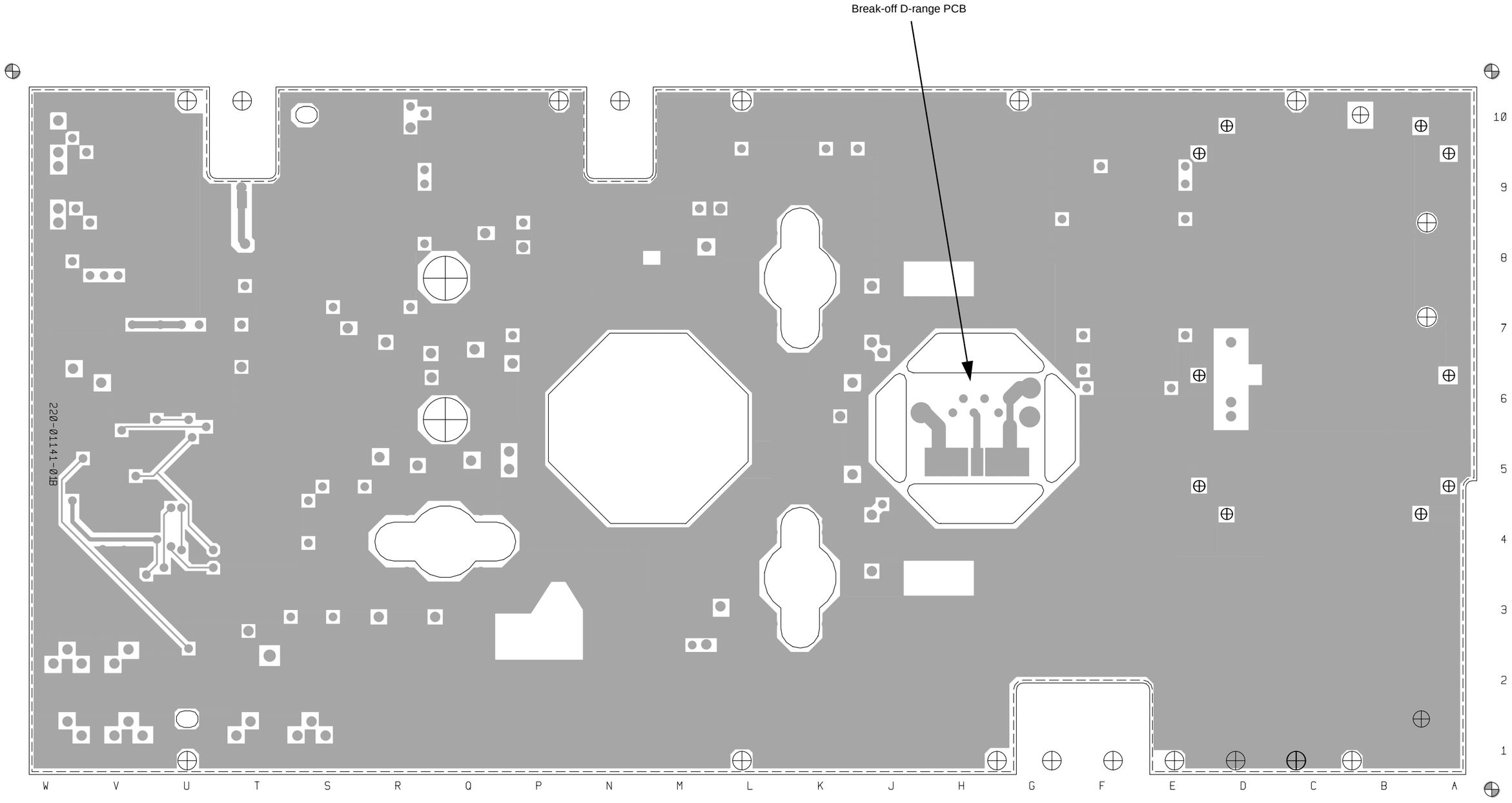
The lower number indicates how



T858 Mechanical Assembly
220-01141-01

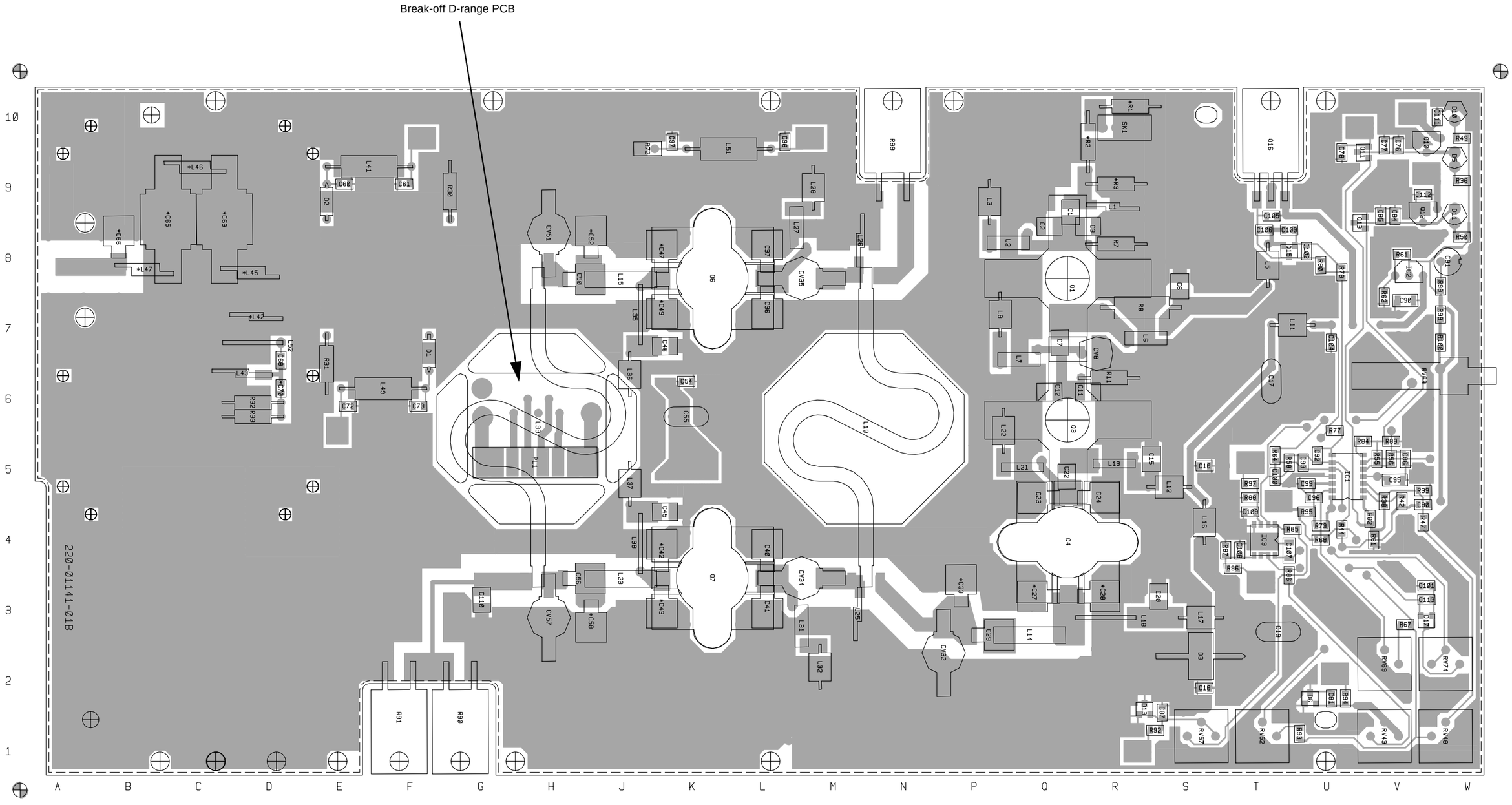
Copyright TEL

Copyright TEL



T858 PCB Layout - Bottom Side
220-01141-01

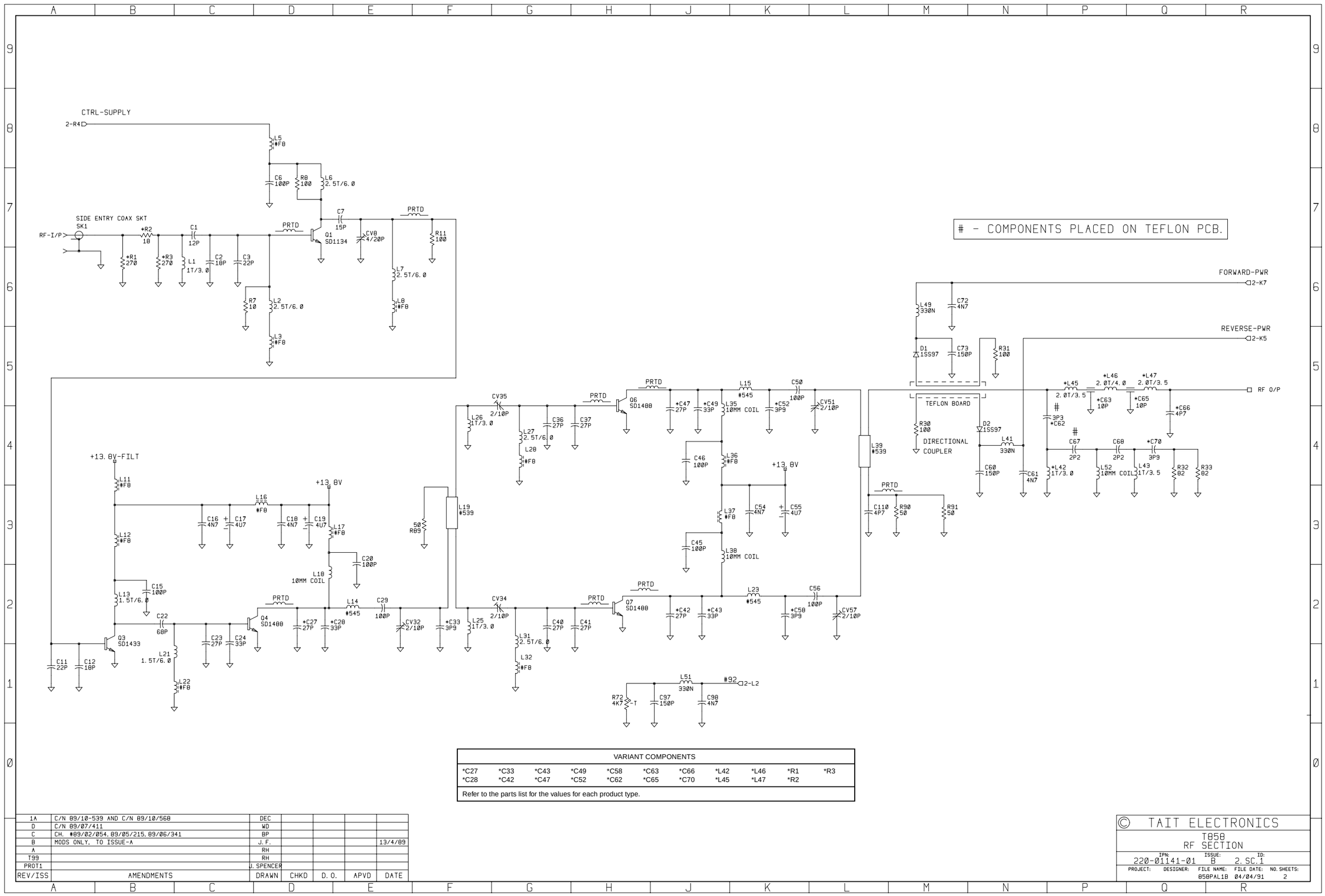
Copyright TEL



T858 PCB Layout - Top Side
220-01141-01

31/09/98

Copyright TEL



VARIANT COMPONENTS										
*C27	*C33	*C43	*C49	*C58	*C63	*C66	*L42	*L46	*R1	*R3
*C28	*C42	*C47	*C52	*C62	*C65	*C70	*L45	*L47	*R2	
Refer to the parts list for the values for each product type.										

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A	C/N 89/10-539 AND C/N 89/10/568	DEC				
D	C/N 89/07/411	WD				
C	CH. #89/02/054, 89/05/215, 89/06/341	BP				
B	MODS ONLY. TO ISSUE-A	J.F.				13/4/89
A		RH				
T99		RH				
PROT1		J.SPENCER				

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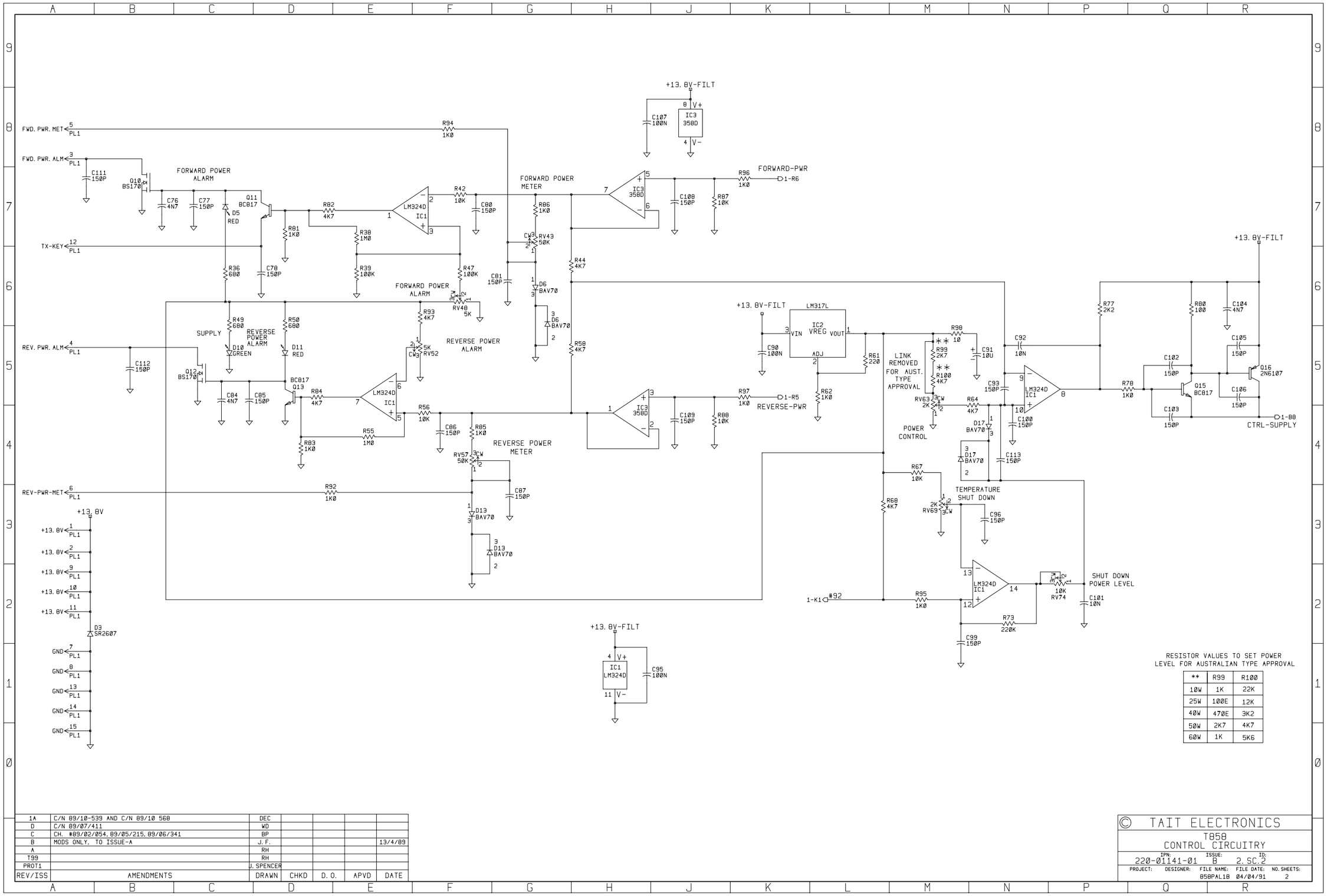
T858
RF SECTION

IPN:	ISSUE:	ID:
220-01141-01	B	2.SC.1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO. SHEETS:
		858PAL1B	04/04/91	2

Sheet 1 - T858 RF Section
220-01141-01

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Sheet 2 - T858 Control Section
220-01141-01

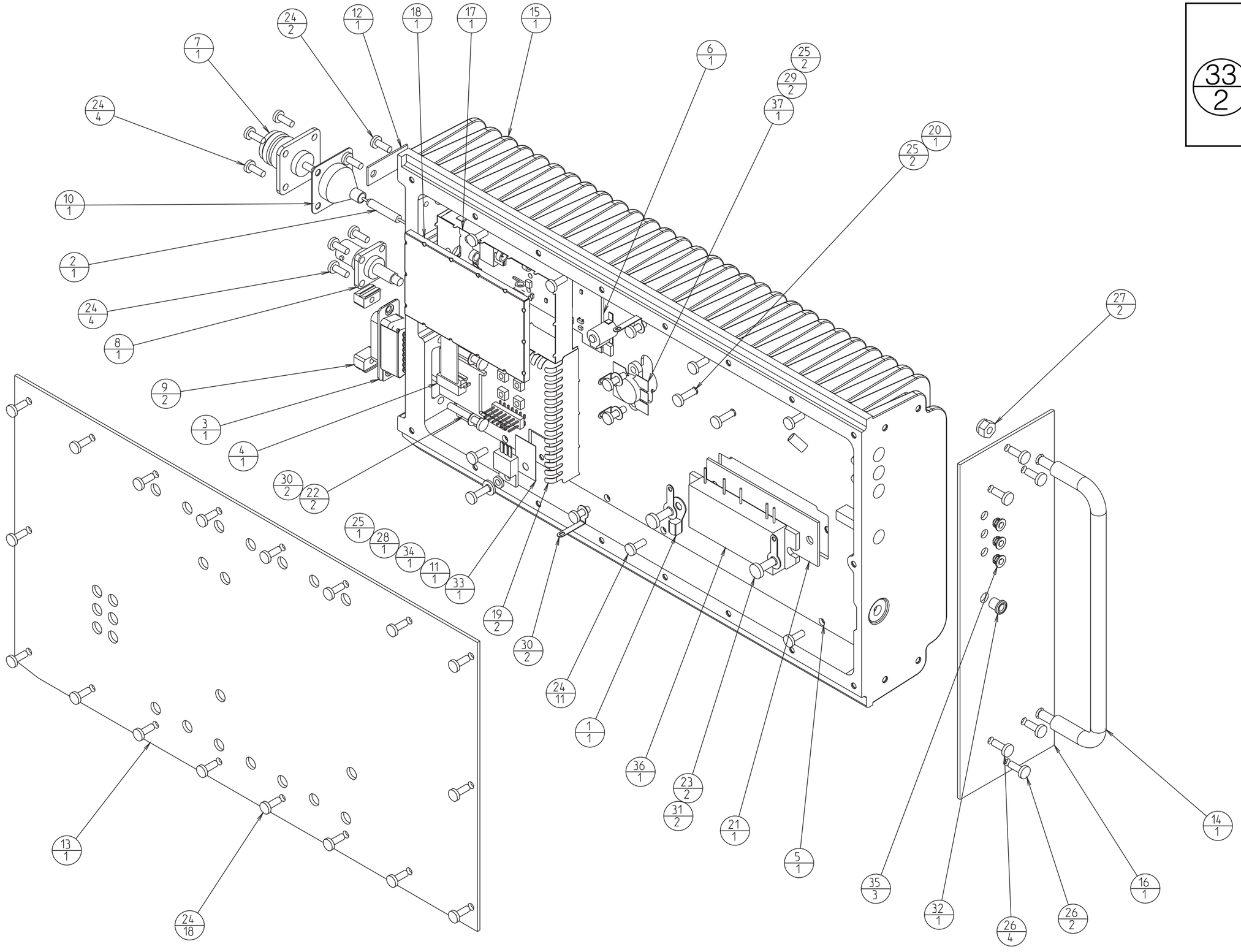
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Key

33/2

The upper number is the component identification number which appears in the "Legend" column of the Mechanical & Miscellaneous Parts on the facing page.

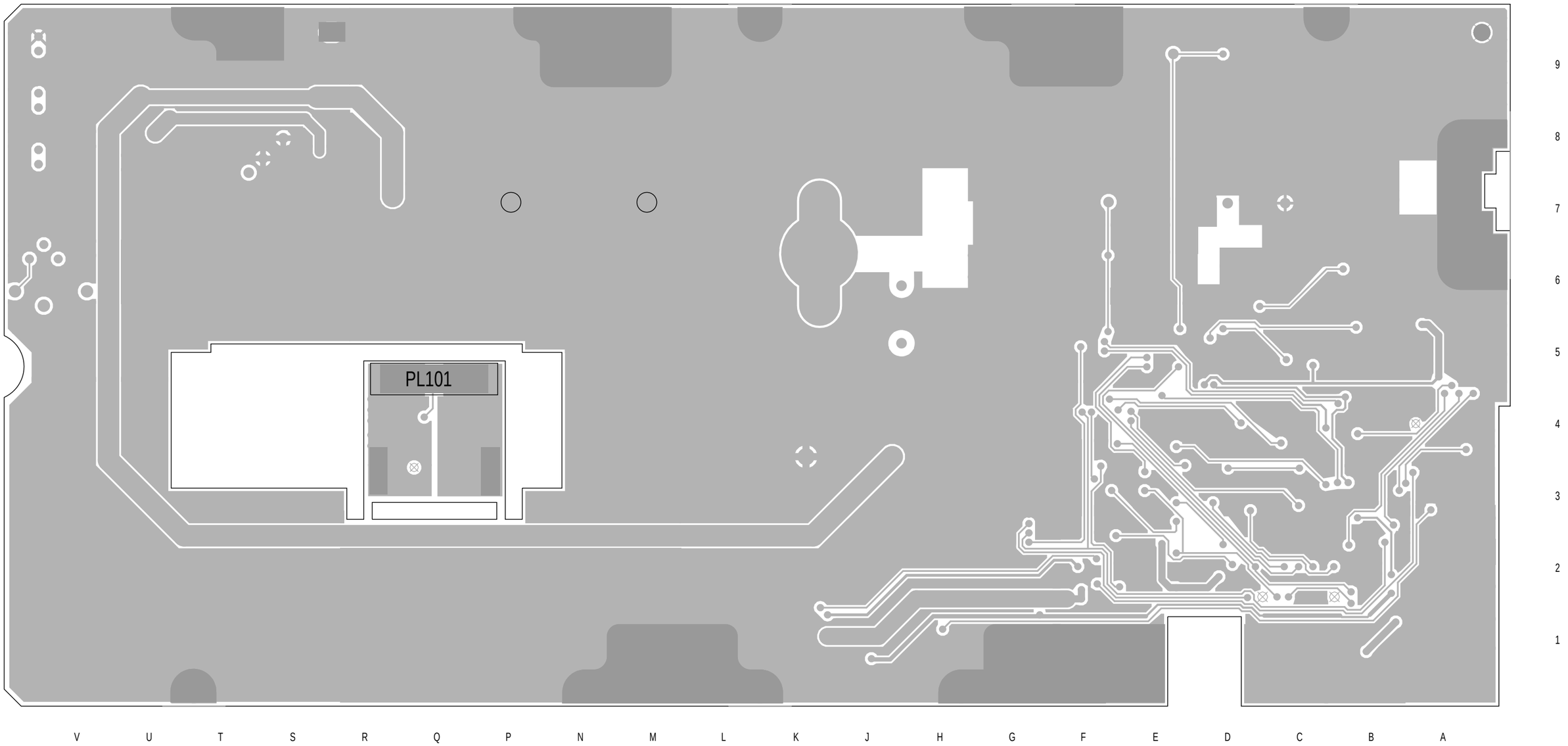
The lower number indicates how many of this component are used in this location or function.



T858 Mechanical Assembly
220-01423-02

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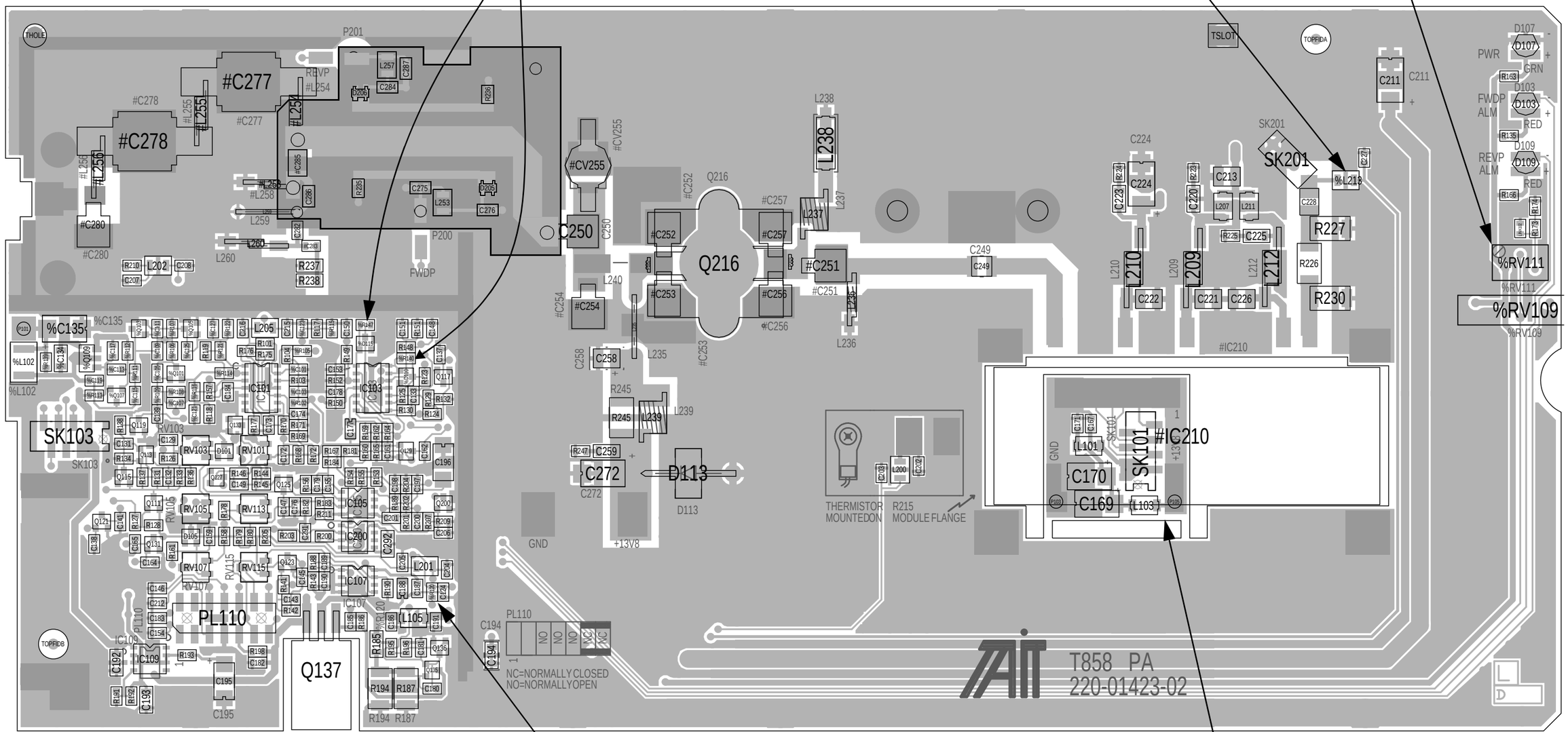
T858 PCB Layout - Bottom Side
220-01423-02

Copyright TEL

%R140 and %R147 are fitted to Series I compatible PAs only.

%L213 is fitted only when cyclic keying is required

%RV111 may be fitted instead of %RV109 to convert the output power adjustment to internal access only. Note that %RV111 and %RV109 may be incorrectly identified on the PCB as *RV111 and RV109 respectively.



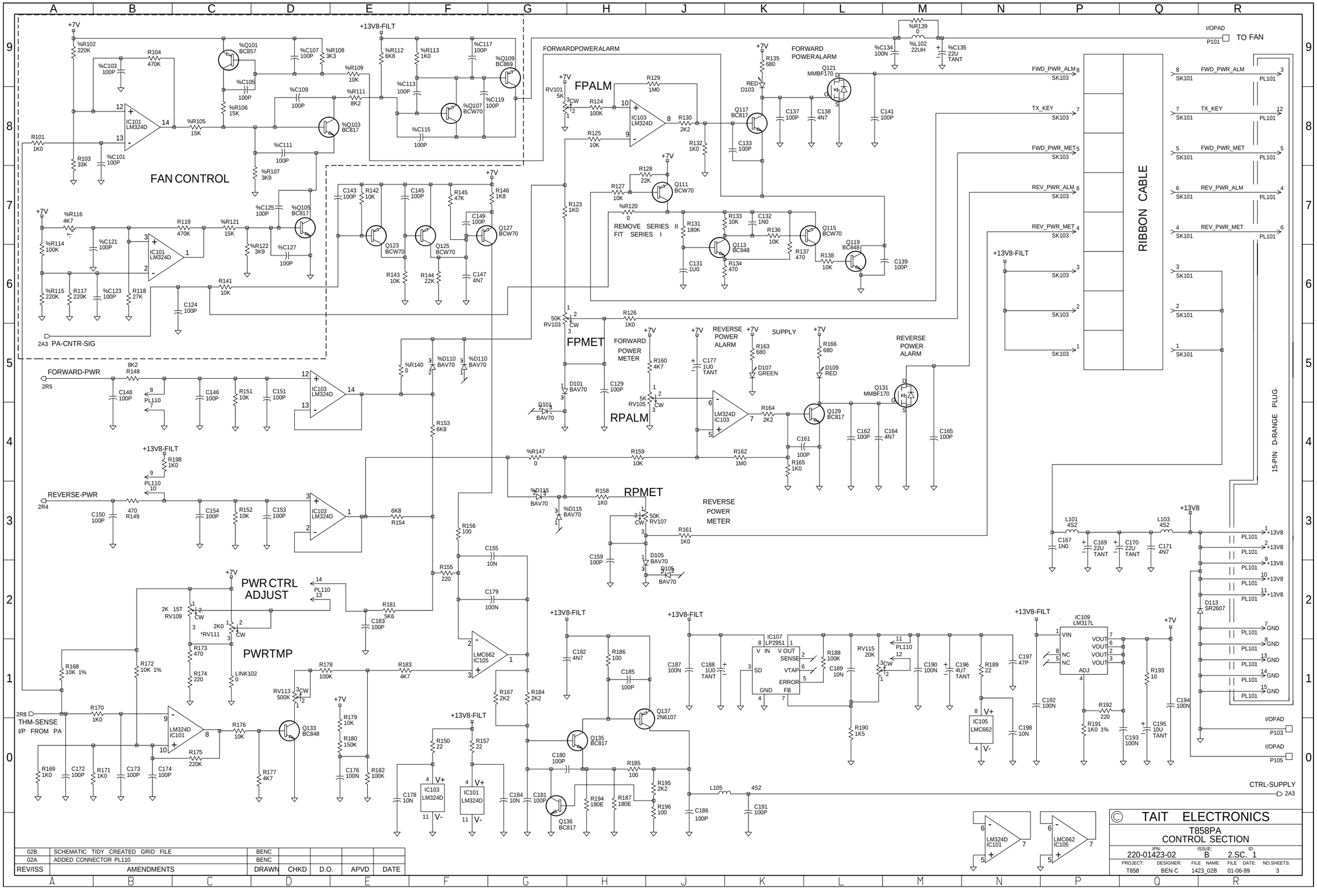
%R120 is fitted to Series I compatible PAs only.

The circuitry for the break-off D-range PCB is shown on the control section circuit diagram.

T858 PCB Layout - Top Side
220-01423-02

29/02/00

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REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
02A	ADDED CONNECTOR PL110	BENC				
02B	SCHEMATIC TIDY CREATED GRID FILE	BENC				

Sheet 1 - T858 Control Section
220-01423-02

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+7V
R200 4K7 1%
C200 100P
C201 1N0
R201 6K8 1%
R202 390
R204 390
R203 4K7 1%
IC200 358D
L200 330NH
L201 330NH
R205 100
R215 10K
C202 4N7
C203 100P
C204 100P
C205 4N7
PL110
C212 100P
R211 560
R207 10K
R209 4K7
C206 100P
Q200 BC848
THM-SENSE 1A1
L202 330NH
L205 330NH
R210 4K7
C207 100P
C208 4N7
C215 100P
C216 1N0
FILTER TEMP SENSE

+13V8
L207 4S2
L209 4.0T/4.0
C220 100N
C221 100P
R223 3R3
L210 4.0T/4.0
C222 100P
C223 100N
C224 4U7 TANT
C249 100P
#C251 6P8
#L236 1.0T/4.5
L237 5.0T/4.0
L238 4S2-3T
#C256 33P
#C257 33P
P203 PRINTED
P202 PRINTED
Q216 MRF658
#C252 39P
#C253 47P
L240 #545
L235 10MM COIL
#C254 4P7
#CV255 2/10P
100P C250
C258 100P
R245 30E
L239 5.0T/4.0
+13V8
C259 100N
C272 4U7 TANT
R247 3R3
FORWARD-PWR 1A5
REVERSE-PWR 1A3
TRACK-PIN P200
TEFLON BOARD
TRACK-PIN P201
#L254 2.0T/3.5
#C277 12P
#L255 2.0T/4.0
#C278 10P
#L256 2.0T/3.5
RF O/P
3P3 #C285
#C280 4P7
C286 2P2
C282 2P2
#C283 3P9
#L258 1T/2.0
L259 10MM COIL
L260 1T/3.5
R237 100
R238 100

CTRL-SUPPLY 1R0
L211 4S2
L212 4.0T/4.0
C211 4U7 TANT
C213 100P
C225 100N
C226 100P
R225 3R3
PA-CNTR-SIG 1A5
%L213 330NH
C227 100P
C228 100P
R226 30E
R227 180E
R230 180E
SK201
SIDE ENTRY COAX SKT
VCONT
VS1
VS2
RF IN
RF OUT
M68706 #IC210

Directional Coupler PCB Circuit Diagram
P100 I/O PAD
L253 330NH
C275 4N7
D205 HSMS2815
D205 RF2815
C276 150P
R235 100
I/O PAD
P101
TEFLON BOARD
P102 I/O PAD
#C285 3P3
C286 2P2
P103 I/O PAD
D206 RF2815
D206 HSMS2815
R236 100
DIRECTIONAL COUPLER
P104 I/O PAD
L257 330NH
P105 I/O PAD
C284 150P
C287 4N7

PLATE SHIELD
+7V
IC200 358D
C291 100P
C292 100N

RF Power Module
12 3 4

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE

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T858PA
PA

IPN:	ISSUE:	ID:
220-01423-02	B	2.SC. 2

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
T858	BEN C	1423_02B	01-06-99	3

Sheet 2 - T858 RF & Thermistor Control Sections
220-01423-02

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Key

33/2

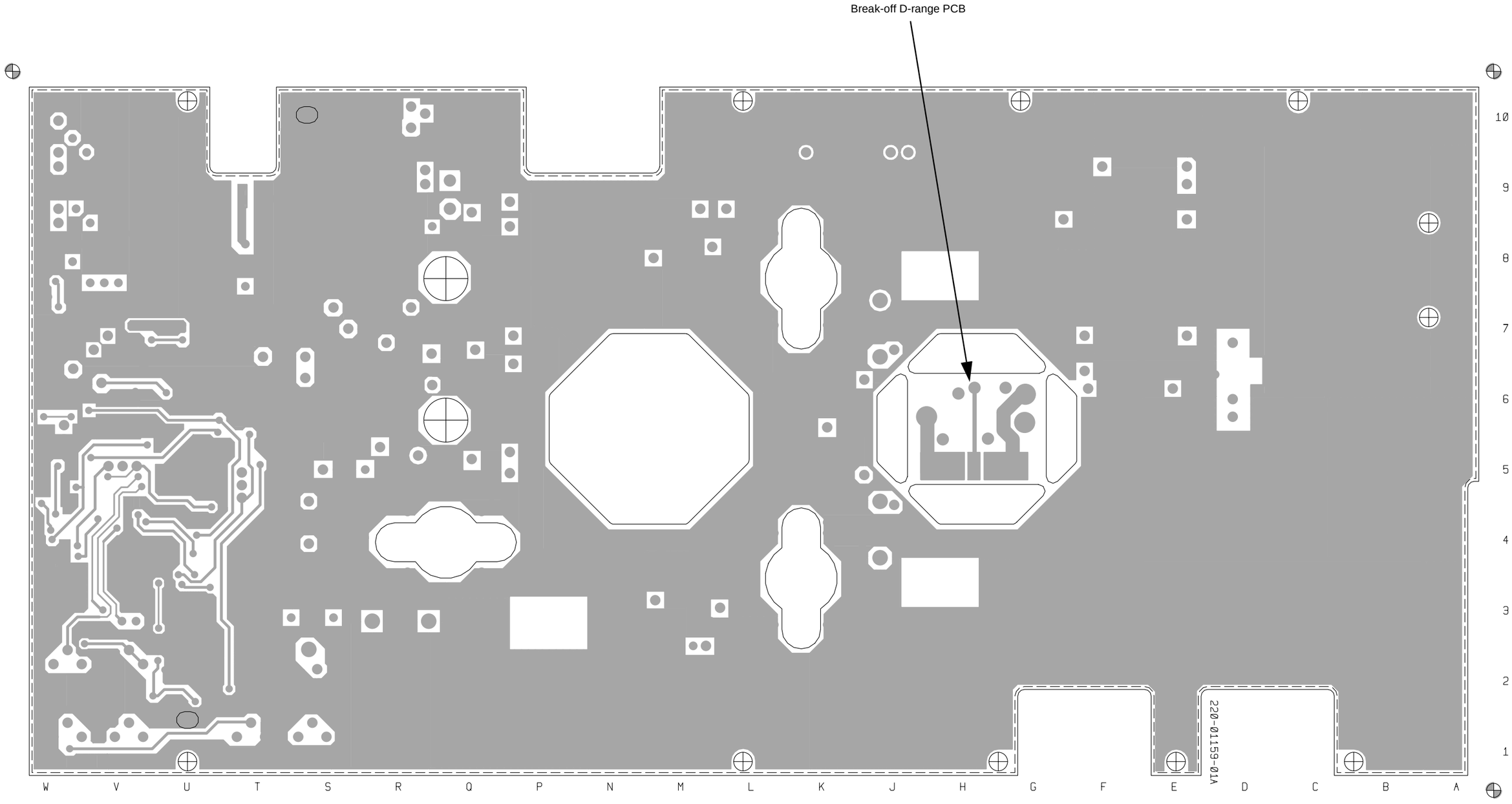
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The lower number indicates how many of this component are used in this location or function.

T859 Mechanical Assembly
220-01159-01

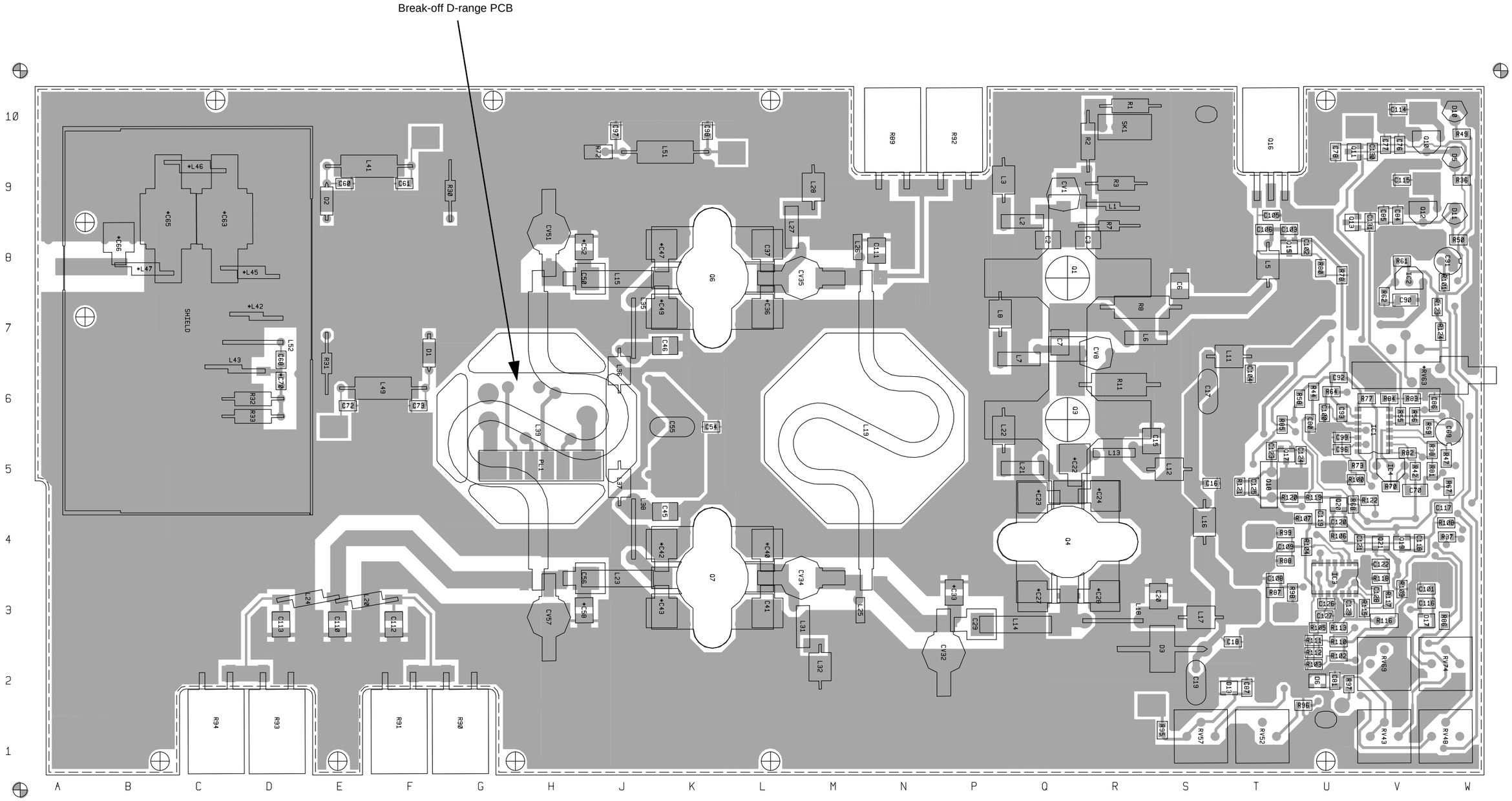
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T859 PCB Layout - Bottom Side
220-01159-01

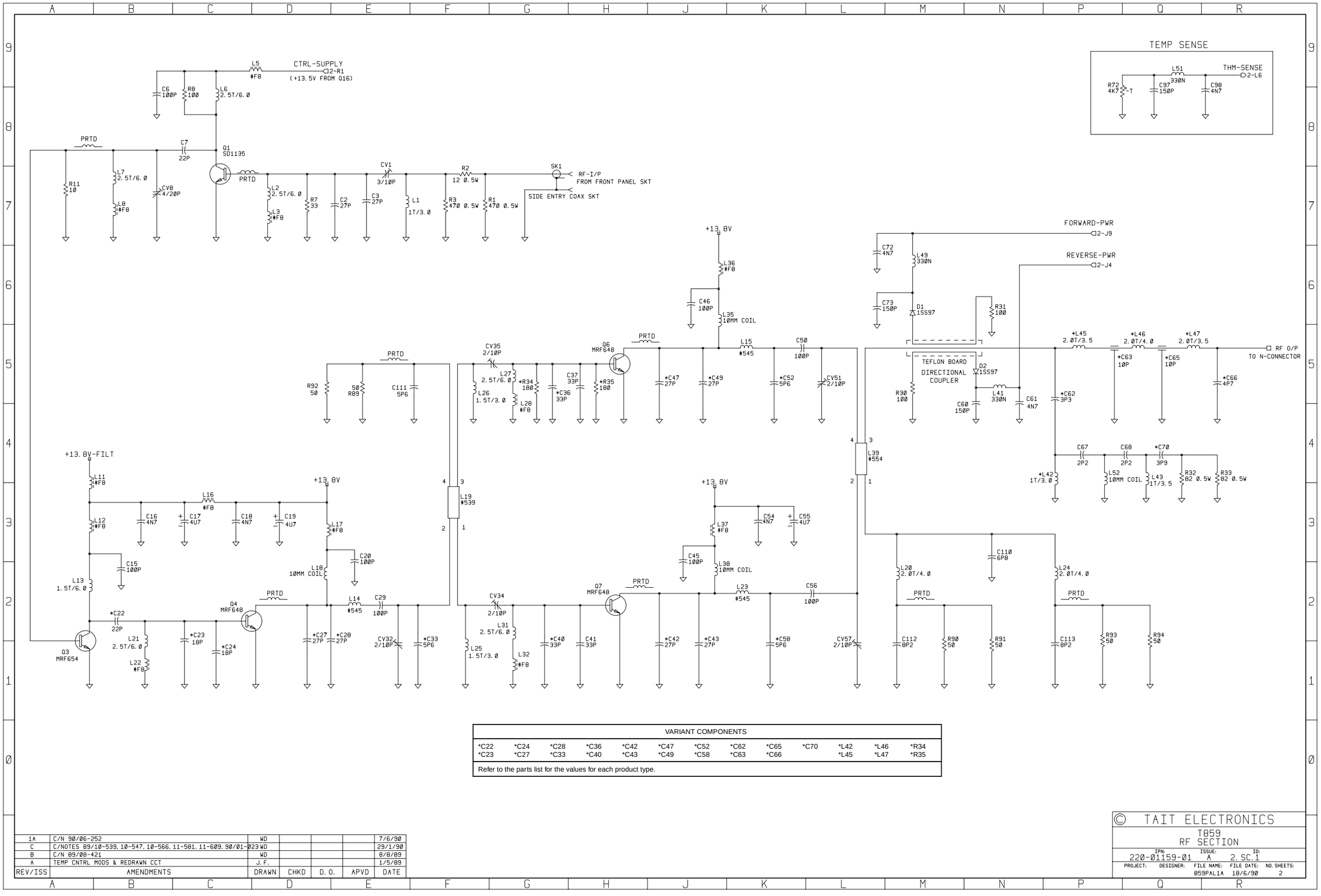
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T859 PCB Layout - Top Side
220-01159-01

31/09/98

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VARIANT COMPONENTS												
*C22	*C24	*C28	*C36	*C42	*C47	*C52	*C62	*C65	*C70	*L42	*L46	*R34
*C23	*C27	*C33	*C40	*C43	*C49	*C58	*C63	*C66		*L45	*L47	*R35
Refer to the parts list for the values for each product type.												

REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
1A	C/N 90/06-252	WD				7/6/90
C	C/NOTES 89/10-539.10-547.10-566.11-581.11-609.90/01-023	WD				29/1/90
B	C/N 89/08-421	WD				8/8/89
A	TEMP CNTRL MODS & REDRAWN CCT	J.F.				1/5/89

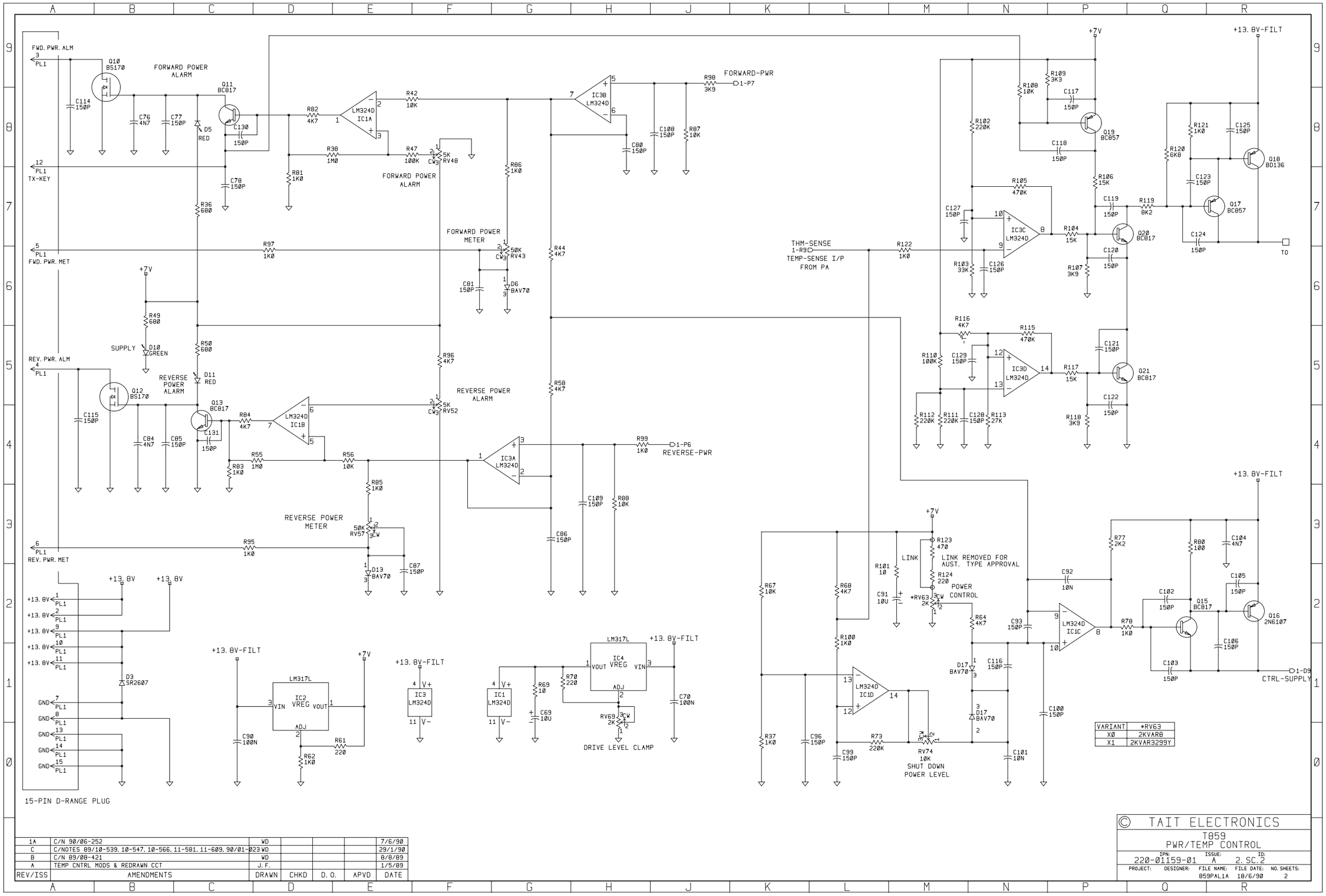
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T859
RF SECTION

IPN:	ISSUE:	ID:
220-01159-01	A	2.SC.1

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO. SHEETS:
		859PAL1A	18/6/90	2

Sheet 1 - T859 RF Section
220-01159-01



Sheet 2 - T859 Control Section
220-01159-01

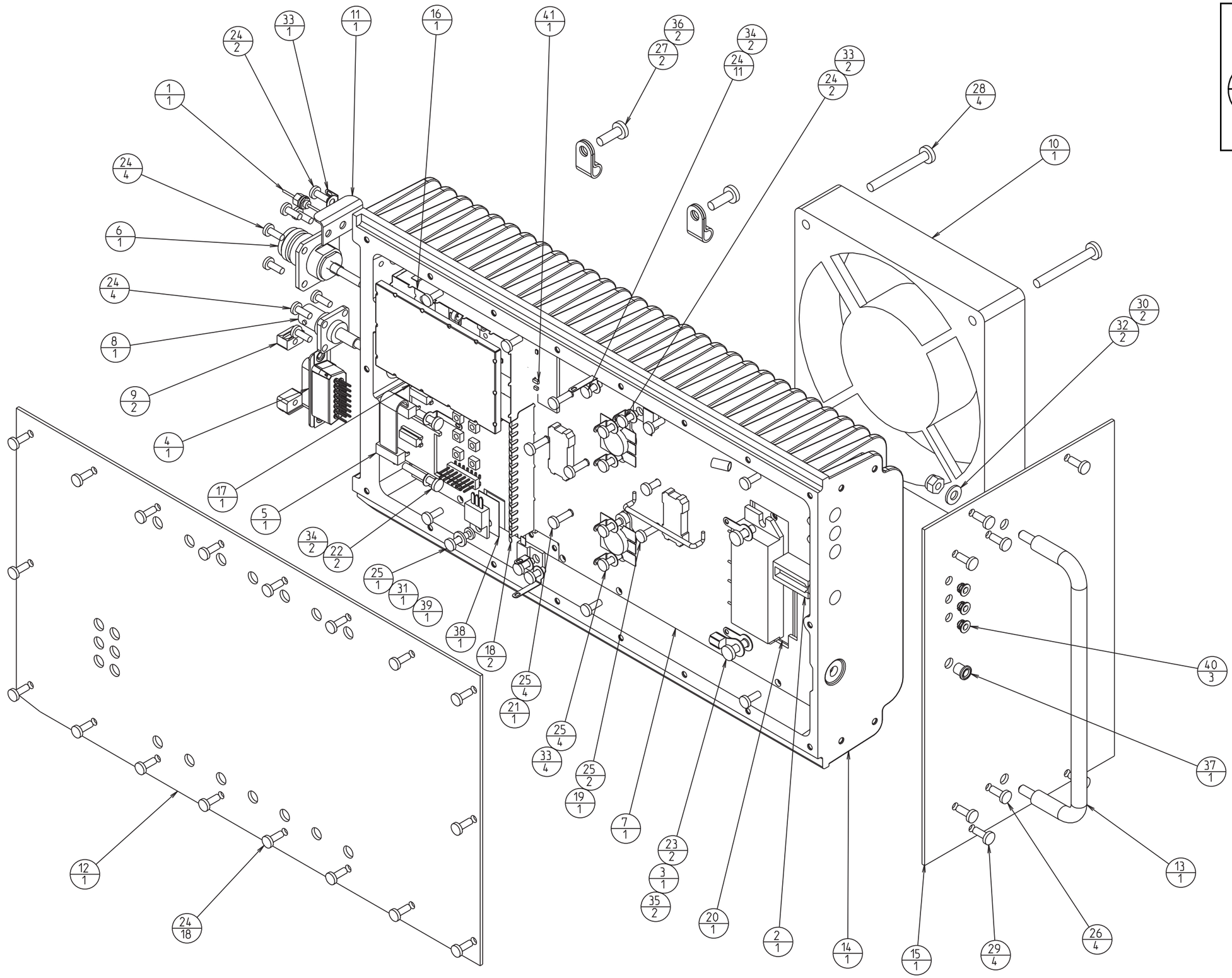
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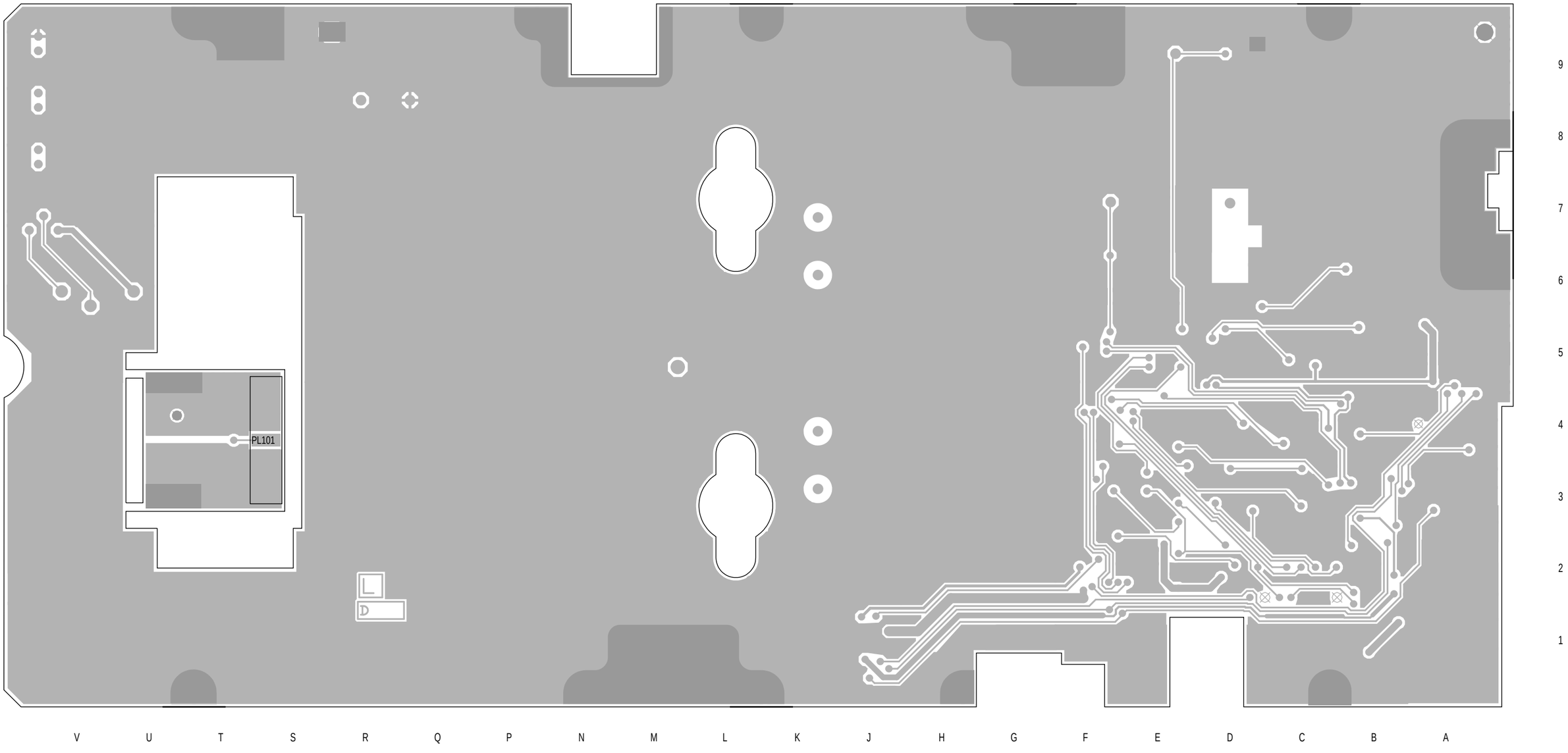
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T859 Mechanical Assembly
220-01422-03

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T859 PCB Layout - Bottom Side
220-01422-03

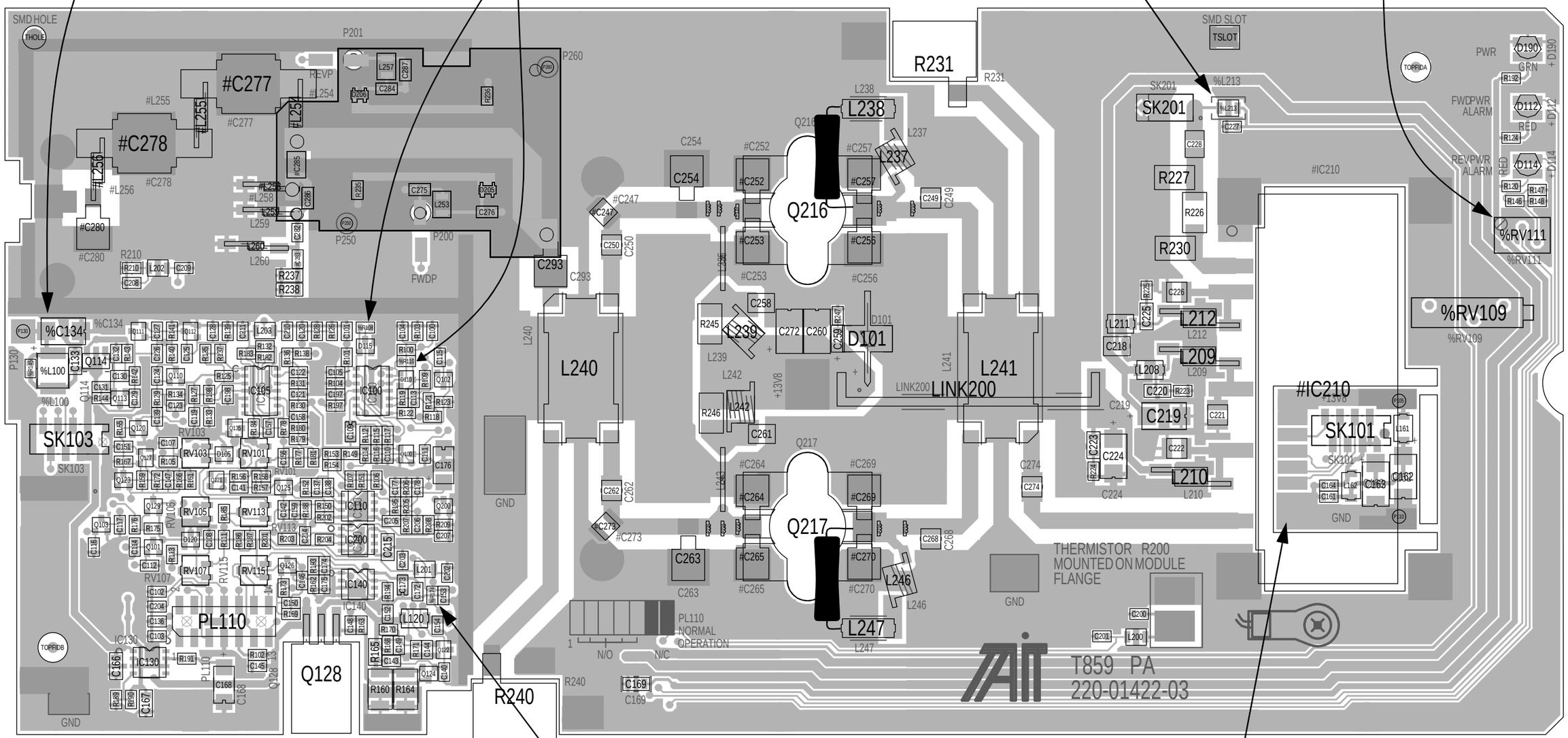
Copyright TEL

%C134 and %L100 are for the fan filter circuit and are fitted (in place of %R145) only if required.

%R108 and %R110 are fitted to Series I compatible PAs only.

%L213 is fitted to Series II compatible PAs only.

%RV111 may be fitted instead of %RV109 to convert the output power adjustment to internal access only.



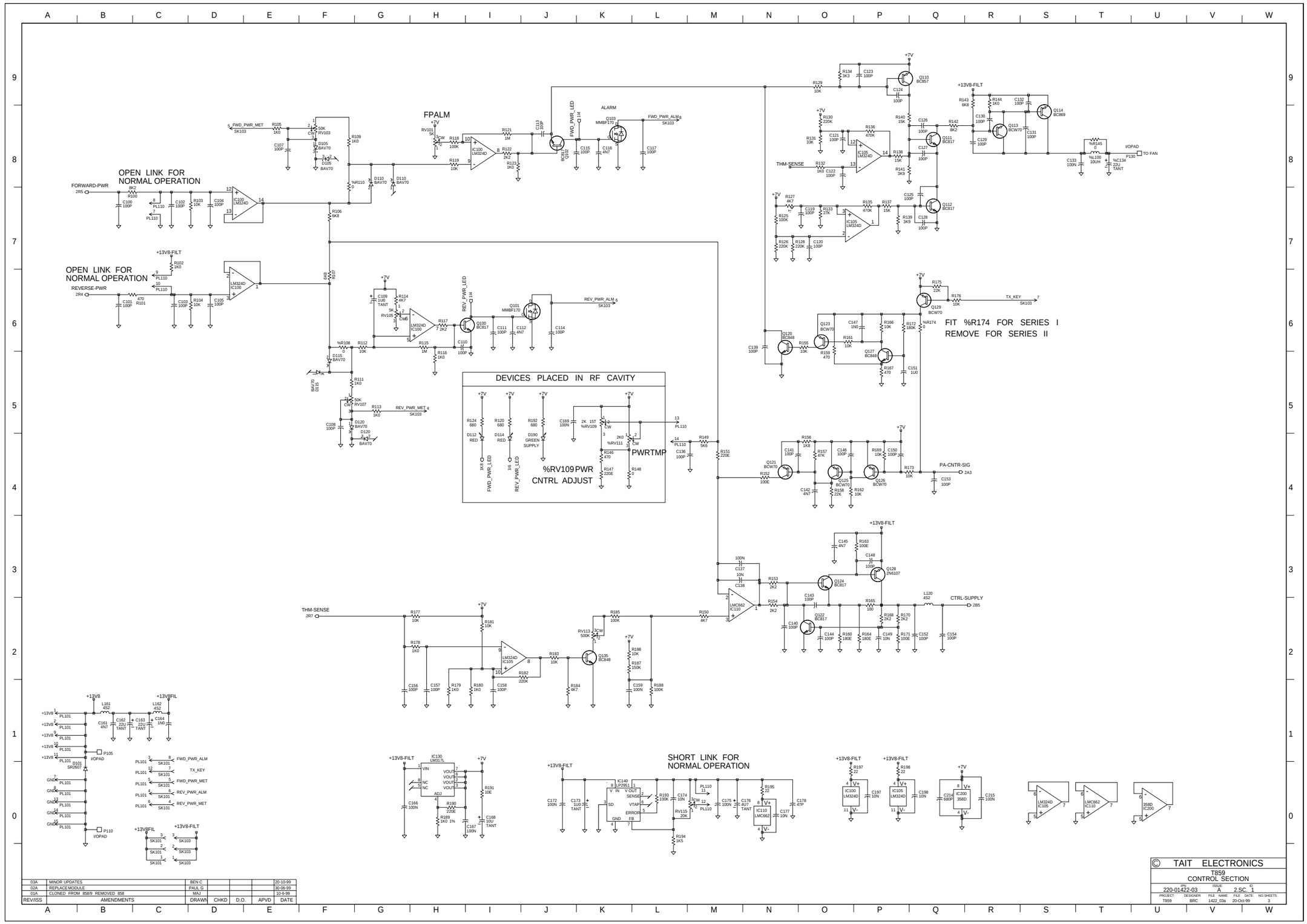
%R174 is fitted to Series I compatible PAs only.

The circuitry for the break-off D-range PCB is shown on the control section circuit diagram.

T859 PCB Layout - Top Side
220-01422-03

29/02/00

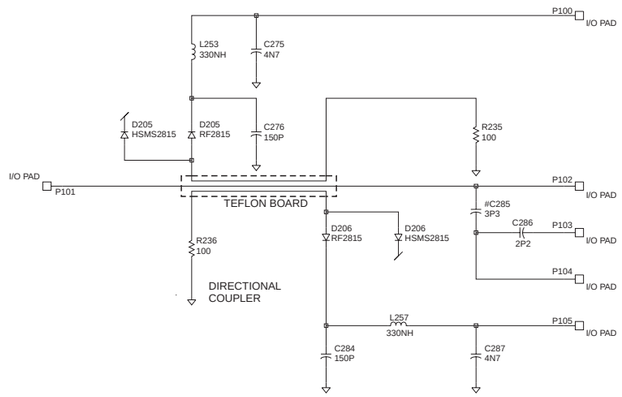
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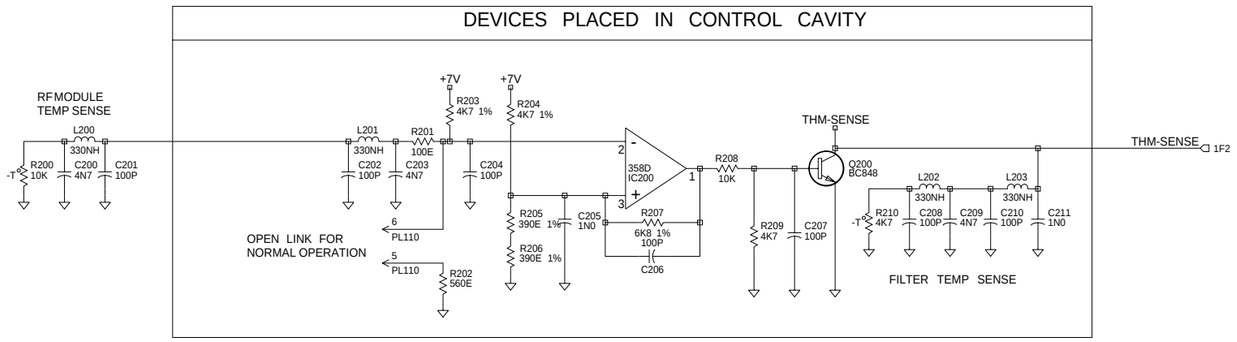
Sheet 1 - T859 Control Section
220-01422-03

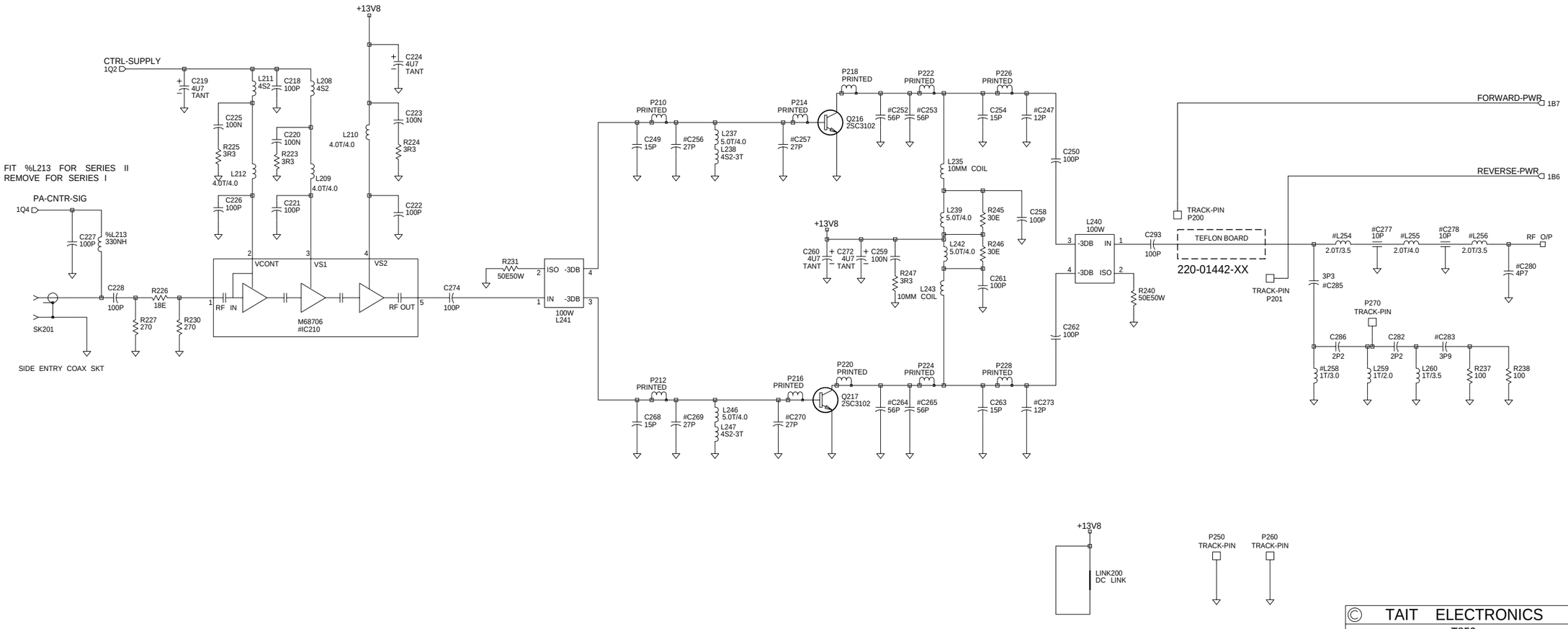
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Directional Coupler PCB Circuit Diagram



DEVICES PLACED IN CONTROL CAVITY





REV/ISS	AMENDMENTS	DRAWN	CHKD	D.O.	APVD	DATE
03A	MINOR UPDATES	BEN C				20-10-99
02A	REPLACE MODULE	PAUL G				30-06-99
01A	CLONED FROM 858/9 REMOVED 858	MAJ				10-6-99

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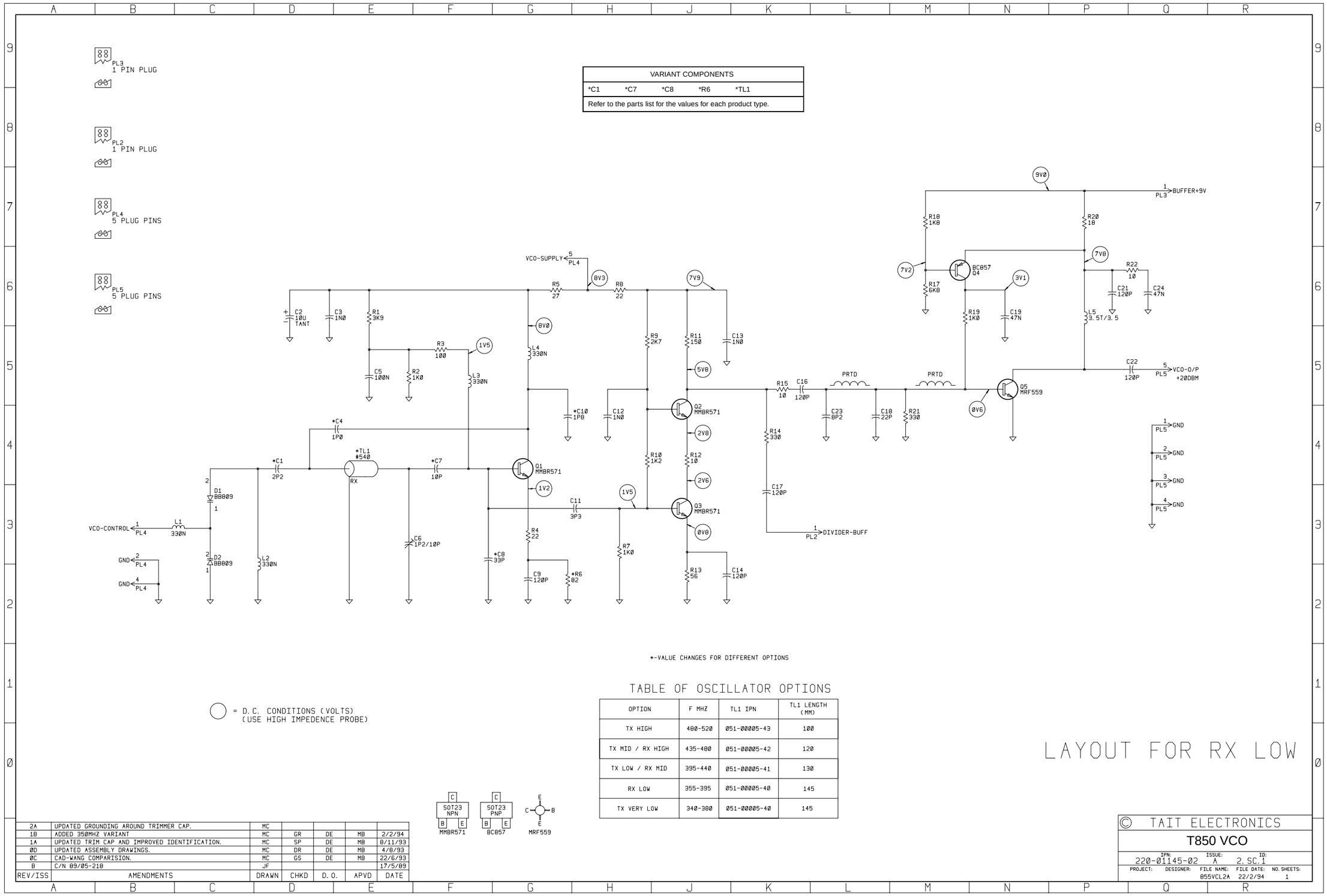
T859
PA

IPN:	ISSUE:	ID:
220-01422-03	A	2.SC. 2

PROJECT:	DESIGNER:	FILE NAME:	FILE DATE:	NO.SHEETS:
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Sheet 2 - T859 RF & Thermistor Control Sections
220-01422-03

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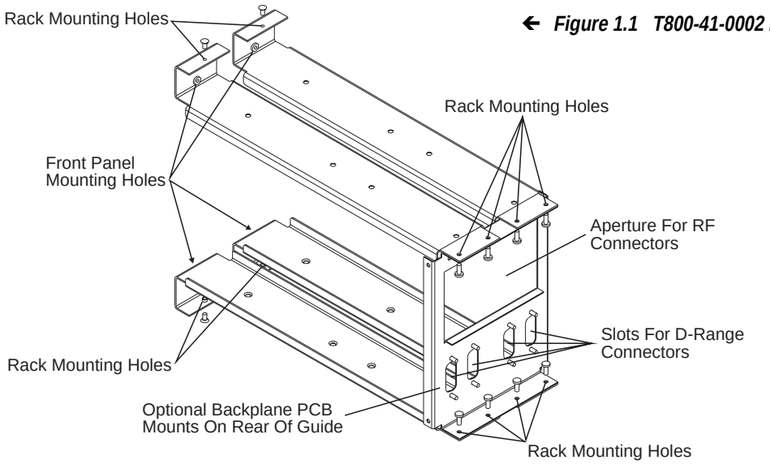
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1 T855 Installation

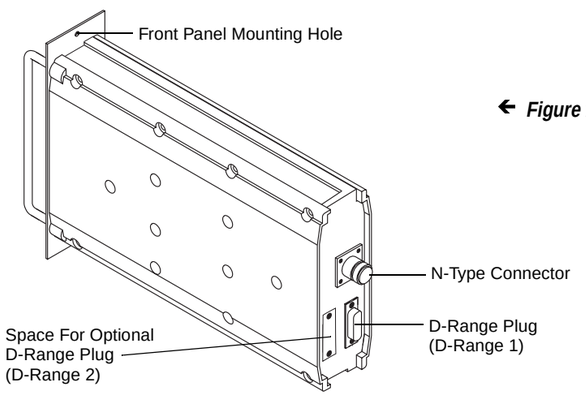
1.1 Rack Mounting

The T855 receiver is designed for use in a standard 483mm rack frame using a Tait T800 Series II guide. The guide is securely mounted to the rack frame with front and rear retaining screws, and the T855 is secured into the guide with two front panel mounting screws. Figure 1.1 shows a standard, double module guide which can also be fitted with an optional backplane PCB to locate and mate the rear D-range connector(s). For more information on available guide kits, refer to the T800 Ancillary Equipment Service Manual or your nearest Tait Dealer or Customer Service Organisation.

A rear mounted N-type connector is used for RF input on the T855, while all DC, audio and control connections are via the rear mounted D-range connector, D-range 1 (PL100). An additional rear D-range connector (T800-03-0000) can be fitted when remote multichannel operation, or additional control or low frequency lines are required (refer to Figure 1.2).



← *Figure 1.1 T800-41-0002 Double Guide Kit*



← *Figure 1.2 T855 Chassis Connectors*

1.2 Rack Wiring

The D-range input and output connections are shown in Figure 1.3 and Figure 1.4. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

Make sure the RF coax cable to the N-type connector is free from sharp bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to allow the chassis to be fully withdrawn from the guide.

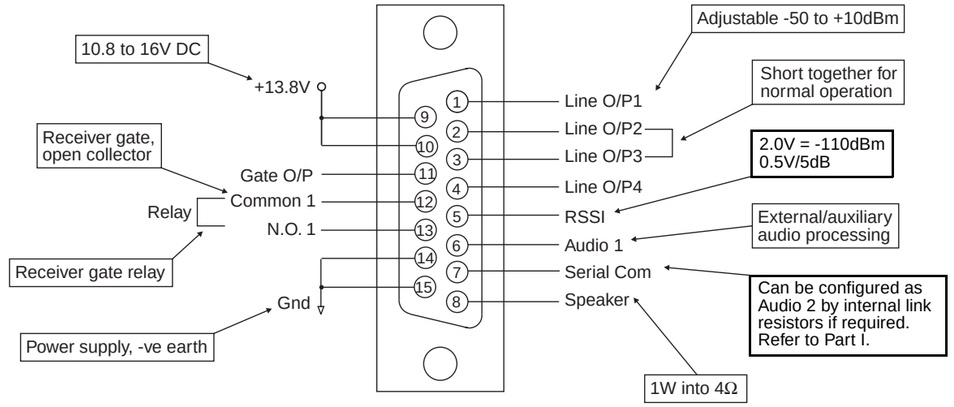


Figure 1.3 T855 D-Range 1 Wiring - Rear View

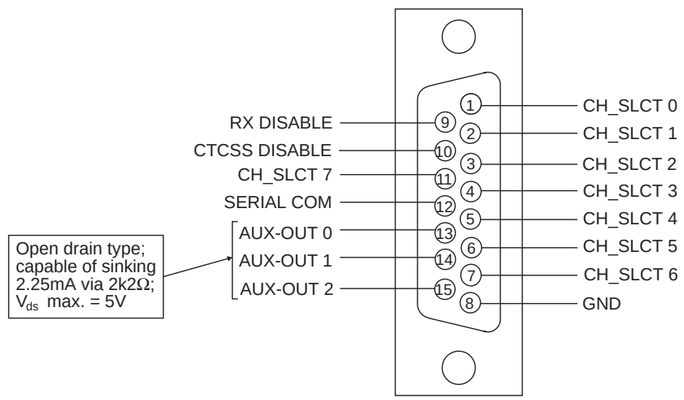


Figure 1.4 T855 D-Range 2 Wiring - Rear View (standard T800-03-0000 kit)

Note: Figure 1.4 above shows the standard pin allocations for the T800-03-0000 auxiliary D-range kit. A T800-03 auxiliary D-range kit is also available for special applications requiring custom internal wiring.

1.3 Power Supply

If a power supply other than an appropriate Tait model is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

The system should be protected by the use of appropriately rated fuses in the power supply.

Note: It is particularly important when the prime power source is a battery that fuses be employed in all supply lines.

1.4 Reverse Polarity & Overvoltage Protection

A crowbar diode is fitted to all T855 receivers for protection against connection to a power supply of incorrect polarity. It also provides overvoltage protection from voltage transients caused by lightning strikes.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

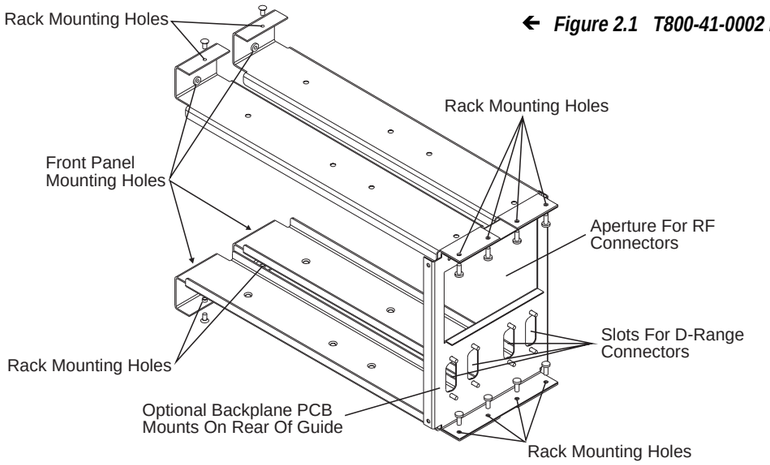
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2 T856/857 Installation

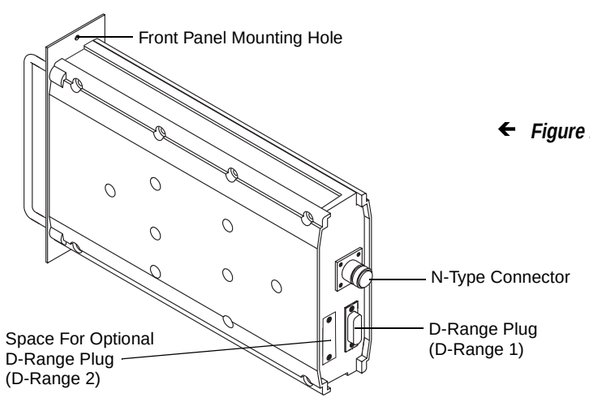
2.1 Rack Mounting

The T856 transmitter and T857 exciter are designed for use in a standard 483mm rack frame using a Tait T800 Series II guide. The guide is securely mounted to the rack frame with front and rear retaining screws, and the T856/857 is secured into the guide with two front panel mounting screws. Figure 2.1 shows a standard, double module guide which can also be fitted with an optional backplane PCB to locate and mate the rear D-range connector(s). For more information on available guide kits, refer to the T800 Ancillary Equipment Service Manual or your nearest Tait Dealer or Customer Service Organisation.

A rear mounted N-type connector is used for RF output on the T856/857, while all DC, audio and control connections are via the rear mounted D-range connector, D-range 1 (PL100). An additional rear D-range connector (T800-03-0000) can be fitted when remote multichannel operation, or additional control or low frequency lines are required (refer to Figure 2.2).



← *Figure 2.1 T800-41-0002 Double Guide Kit*



← *Figure 2.2 T856/857 Chassis Connectors*

2.2 Rack Wiring

The D-range input and output connections are shown in Figure 2.3 and Figure 2.4. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

Make sure the RF coax cable to the N-type connector is free from sharp bends or twists. If access to the rear of the rack frame is restricted, the cable should be long enough to allow the chassis to be fully withdrawn from the guide.

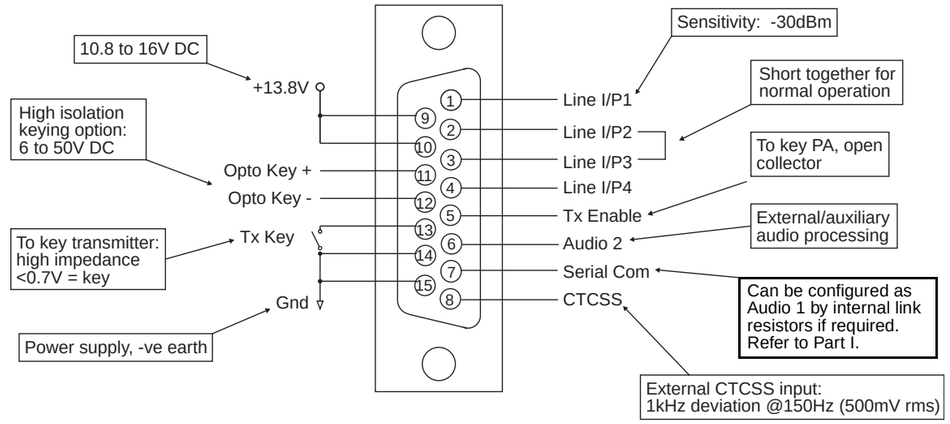


Figure 2.3 T856/857 D-Range 1 Wiring - Rear View

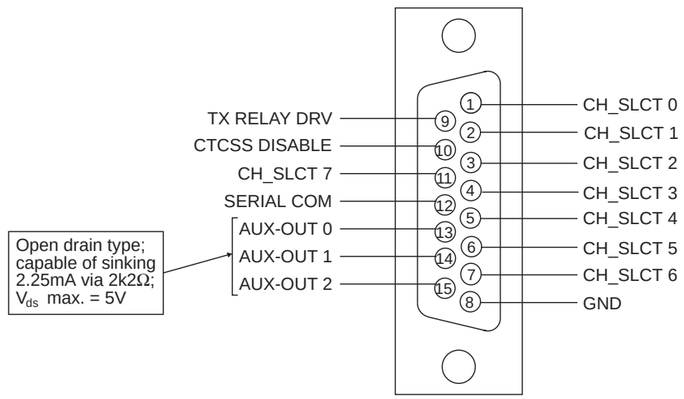


Figure 2.4 T856/857 D-Range 2 Wiring - Rear View (standard T800-03-0000 kit)

Note: Figure 2.4 above shows the standard pin allocations for the T800-03-0000 auxiliary D-range kit. A T800-03 auxiliary D-range kit is also available for special applications requiring custom internal wiring.

2.3 Power Supply

If a power supply other than an appropriate Tait model is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

The system should be protected by the use of appropriately rated fuses in the power supply.

Note: It is particularly important when the prime power source is a battery that fuses be employed in all supply lines.

2.4 Reverse Polarity & Overvoltage Protection

A crowbar diode is fitted to all T856 transmitters and T857 exciters for protection against connection to a power supply of incorrect polarity. It also provides overvoltage protection from voltage transients caused by lightning strikes.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

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3 T858/859 Installation

3.1 Rack Mounting

Caution: **If you require continuous operation of the T858, leave the rack module position immediately adjacent to the finned heatsink empty. There should be adequate airflow over the fins at all times. Extra airflow can be provided by fitting an auxiliary fan kit such as the T800-19-0010 (refer to the T800 Ancillary Equipment Service Manual or your nearest Tait Dealer or Customer Service Organisation for more details).**

The T858 and T859 PAs are designed for use in a standard 483mm rack frame using Tait T800 Series II guide rails. The guide rails are securely mounted to the rack frame with front and rear retaining screws, and the PA is secured into the guide with two (T858) or four (T859) front panel mounting screws. Figure 3.1 shows the standard, double width guide designed for use with the T859, while Figure 3.3 shows how the PA can be latched in the extended position. For more information on available guide kits, refer to the T800 Ancillary Equipment Service Manual or your nearest Tait Dealer or Customer Service Organisation.

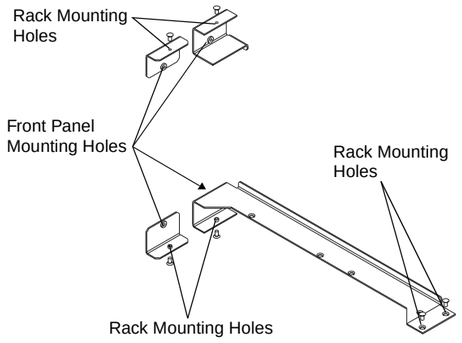


Figure 3.1 T800-45-0001 PA Guide Kit

The PA rear panel has three connectors: a BNC for RF input (from an adjacent T857 exciter), an N-type for RF output and a D-range for all DC, audio and control connections (refer to Figure 3.2).

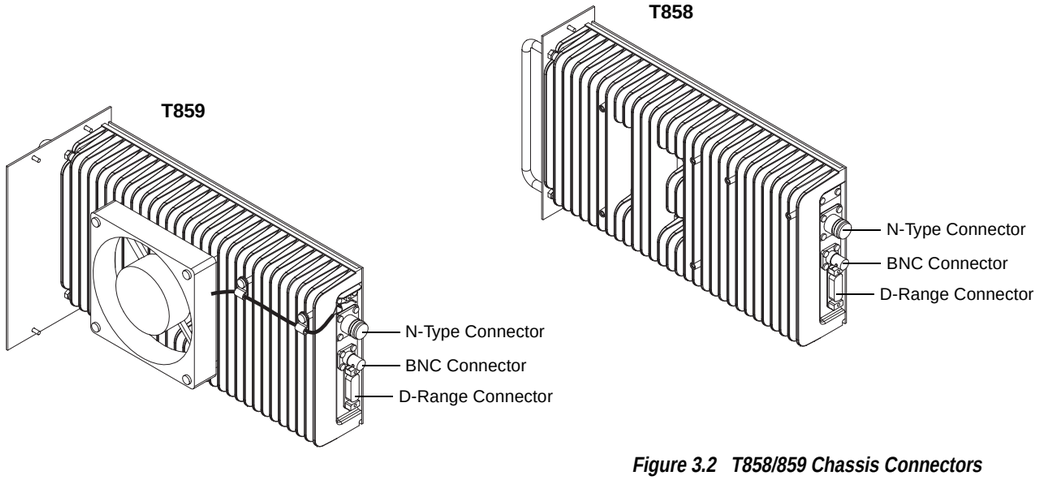


Figure 3.2 T858/859 Chassis Connectors

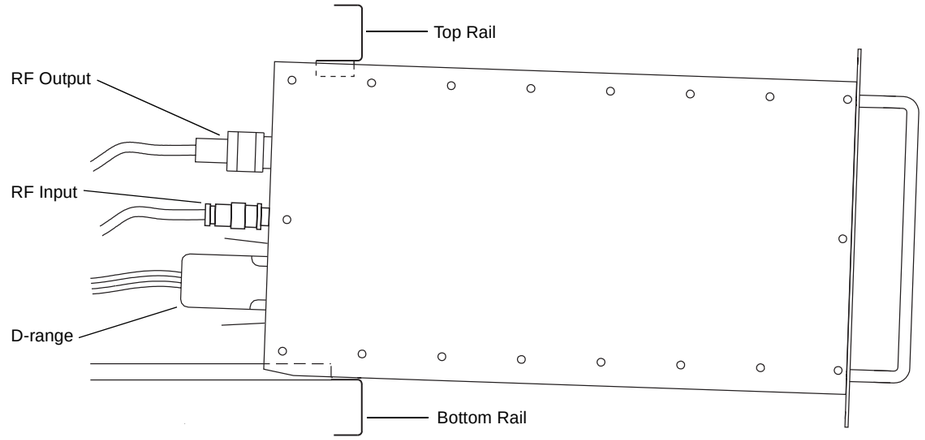


Figure 3.3 T858/859 PA In Latched Position

Note: You will need appropriate extension leads if you wish to carry out any adjustment procedures with the PA withdrawn from the rack in the latched position. Alternatively, disconnect and withdraw the PA and reconnect it behind the rack.

3.2 Rack Wiring

The D-range input and output connections are shown in Figure 3.4. Ensure that the cables are not subjected to any stresses due to tight bends or incorrect lengths.

Make sure the RF coax cables to the N-type and BNC connectors are free from sharp bends or twists. If access to the rear of the rack frame is restricted, the cables should be long enough to allow the chassis to be fully withdrawn from the guide.

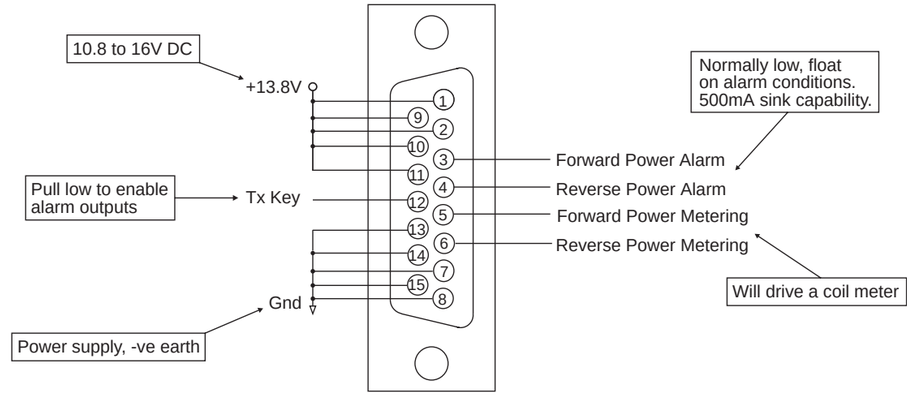


Figure 3.4 T858/859 D-Range Wiring - Rear View

3.3 Power Supply

If a power supply other than an appropriate Tait model is used, ensure that it is capable of providing enough current to drive the T800 system and is also free from excessive ripple or noise.

The system should be protected by the use of appropriately rated fuses in the power supply.

Note: It is particularly important when the prime power source is a battery that fuses be employed in all supply lines.



Caution: **Connect the power supply *directly* to the PA, and *not* via connector blocks. This will avoid overheating of connector blocks that are not of the correct current rating.**

3.4 Reverse Polarity & Overvoltage Protection

A crowbar diode is fitted to all T858/859 PAs for protection against connection to a power supply of incorrect polarity. It also provides overvoltage protection from voltage transients caused by lightning strikes.

Note: A fuse must be fitted in the power supply line for the diode to provide effective protection.

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