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Royce 1-650, 653B, 655, 658, Module information for
Service Manuals

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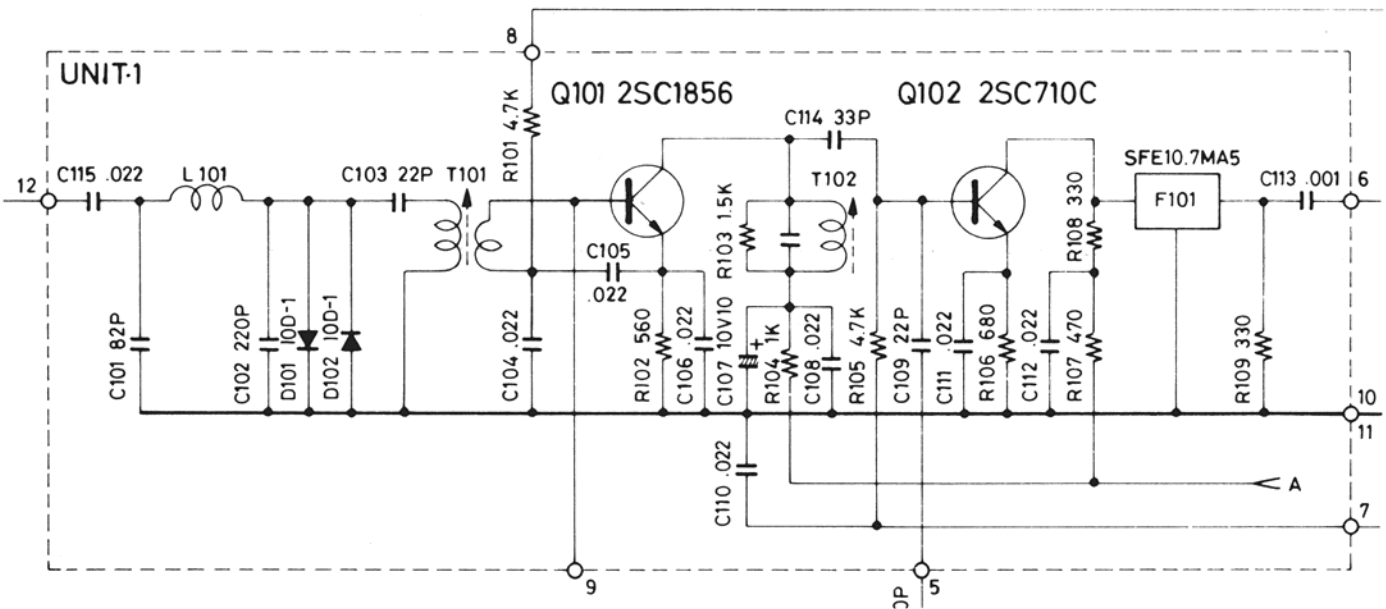
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U1 MODULE

The module comprises the r. f. amplifier, 2SC1856 (Q101), the first mixer stage; 2SC710 (Q102); and the 10.7 MHz bandpass filter, the output of which feeds the second mixer. The r. f. input is diode protected against transients. The board includes a nine volt source, zener regulated for the A+ supply. The pin-out functions are as follows:

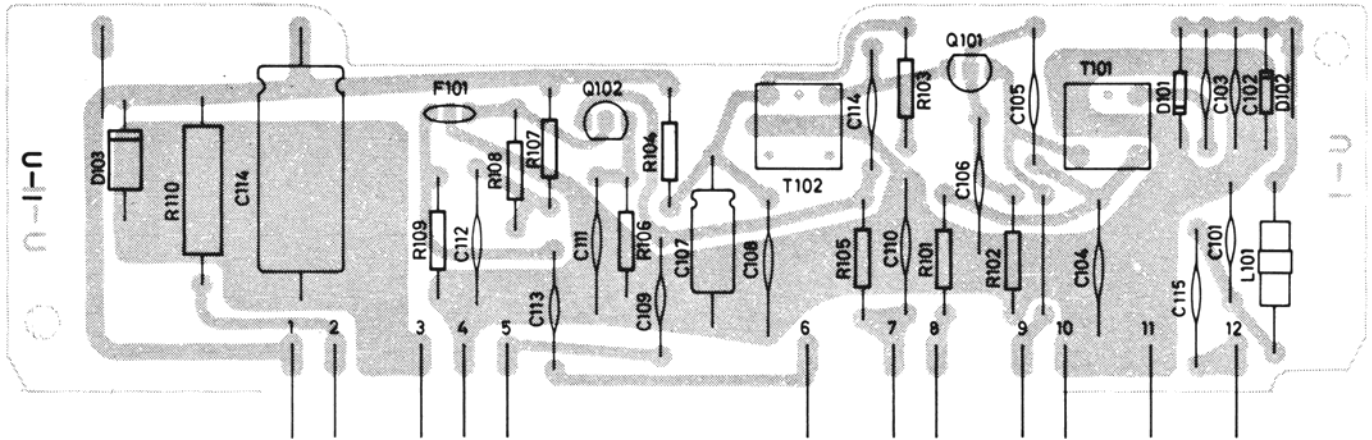
Pin #	Functional Description
1	9V source (see 1-650 schematic)
2	13.8V input
3, 4, 10, 11	Ground
5	First mixer input (from local osc. 37MHz)
6	10.7 MHz output from bandpass, to second mixer on board U2.
7	Amplified A.G.C. line
8	A.G.C. and bias source for Q101
9	r. f. input (provision for adjustable r. f. gain; not used in 1-650)
12	r. f. input



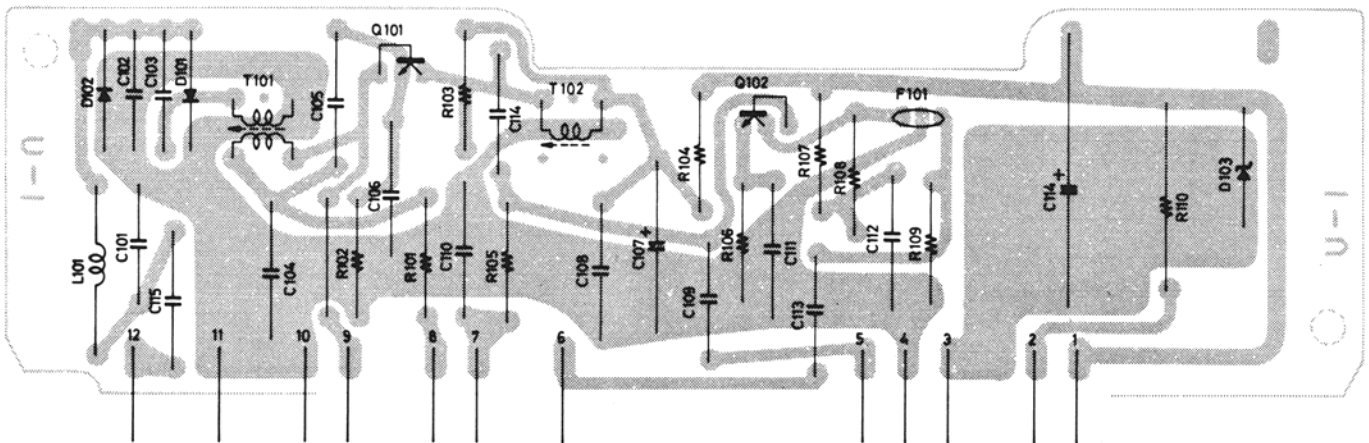
VOLTAGES

	Vb		Vc		Ve	
	Rx	Tx	Rx	Tx	Rx	Tx
Q101	1.6	0	7.0	0	.9	0 (w/pin 7 open)
Q102	1.2	0	7.9	0	.7	0

TOP VIEW



BOTTOM VIEW



U1 PARTS LIST

Semiconductors

Q101	2SC1856
Q102	2SC710
D101, 102	10D-1
D103	EQB01-09

Coils—Inductors

T101	ETC15089
T102	ETC15061
L101	ETC49169

Capacitors

C101	82pF Disc
C102	220pF Disc
C103	22pF Disc
C104	.022uF Disc
C105	.022uF Disc
C106	.022uF Disc
C107	10uF 16V
C108	.022uF Disc
C109	22pF Disc
C110	.022uF Disc
C111	.022uF Disc
C112	.022uF Disc

Capacitors (Cont.)

C113	.001uF Disc
C114	33pF Disc
C114	220uF 16V
C115	.022uF Disc

Resistors

All 1/4 Watt 5% unless otherwise specified.

R101	4.7K ohm
R102	560 ohm
R103	1.5K ohm
R104	1K ohm
R105	4.7K ohm
R106	680 ohm
R107	470 ohm
R108	330 ohm
R109	330 ohm
R110	120 ohm 2W

Miscellaneous

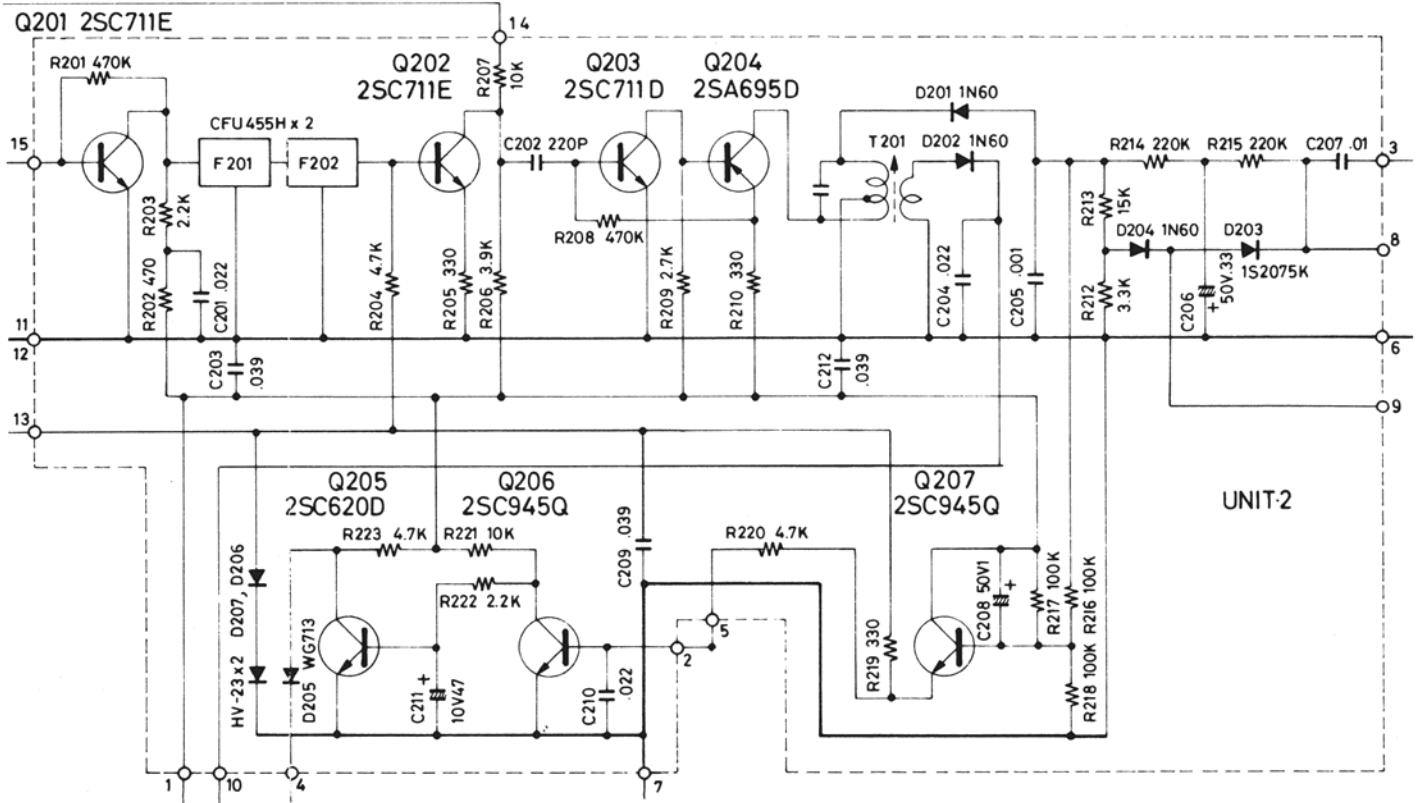
F101	10.7MHz Filter (SFE10.7MA)
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U2 MODULE

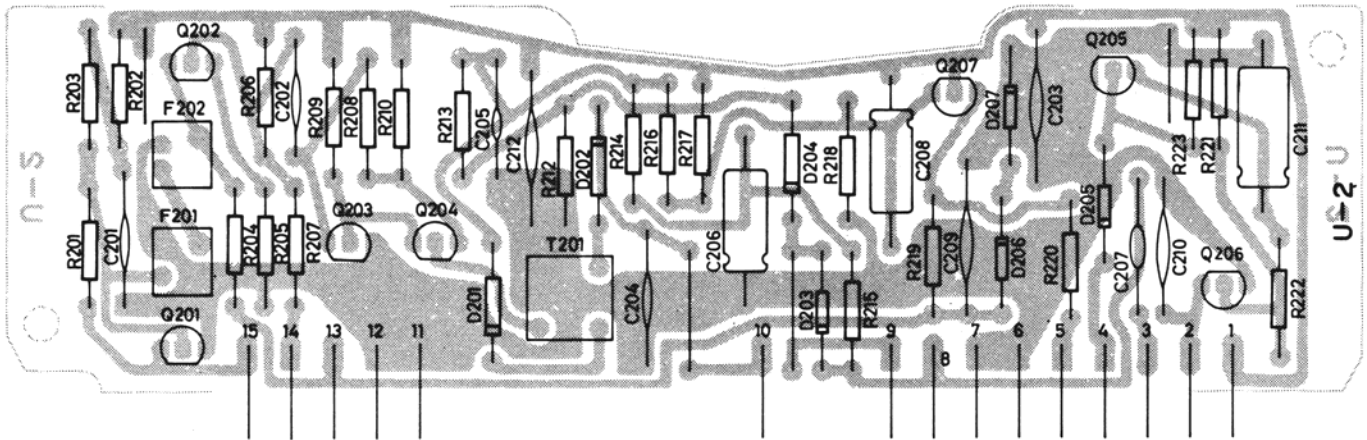
The module comprises the 2nd mixer 2SC711 (Q201) for conversion to 455KHz, two 455KHz bandpass filters, 3 stage i. f. strip 2SC711 (Q202, Q203) 2SA695 (Q204) and detector output. Included also are the squelch 2SC620 (Q205), 2SC945 (Q206), and AGC amplifier 2SC945 (Q207) circuits.

Pin out functions are as follows:

Pin #	Functional Description
1	9V source
2, 5	Squelch output from pin 5 to input pin 2 and threshold control VRM1
3	Audio output
4	Squelch output
6, 7, 11, 12	Ground
8	ANL switching (not used in 1-650)
9	ANL switching (not used in 1-650)
10	"S" meter output
13	Amplified AGC
14	AGC and bias source to Q101
15	r. f. input (to 2nd mixer) 10.7MHz



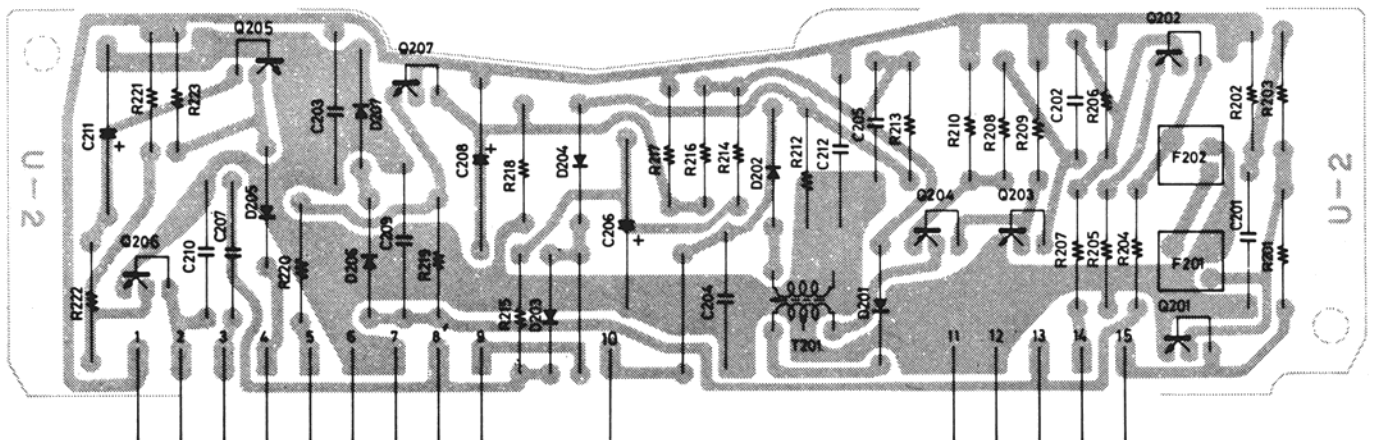
TOP VIEW



VOLTAGES

	Vb		Vc		Ve	
	Rx	Tx	Rx	Tx	Rx	Tx
Q201	.6	0	4.6	0	0	0
Q202	1.2	0	2.1	0	.6	0
Q203	.7	0	4.5	0	0	0
Q204	4.5	0	0	0	5.1	0
Q205	.7	0	0	0	0	0 No Squelch
	.1	0	2.1	0	0	0 Squelch
Q206	.1	0	2.1	0	0	0 No Squelch
	.7	0	.1	0	0	0 Squelch
Q207	2.5	0	8.6	0	1.9	0

BOTTOM VIEW



U2 PARTS LIST

Semiconductors

Q201	2SC711
Q202	2SC711
Q203	2SC711
Q204	2SA695
Q205	2SC620
Q206	2SC945
Q207	2SC945
D201	IN60
D202	IN60
D203	IS2075K
D204	IN60
D205	W6713
D206	HV-23
D207	HV-23

Coils—Inductors

T201	ETC15090
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Capacitors

C201	.022uF
C202	220pF
C203	.039uF
C204	.022uF
C205	.001uF
C206	.33uF 50v
C207	.01 Mylar 50v
C208	1uF 50v
C209	.039uF
C210	.022uF
C211	47uF 10v
C212	.039uF

Resistors

(All 1/4 Watt 5%)

R201	470K
R202	470 ohm
R203	2.2K
R204	4.7K
R205	330 ohm
R206	3.9K
R207	10K
R208	47K
R209	2.7K
R210	330 ohm
R212	3.3K
R213	15K
R214	220K
R215	220K
R216	100K
R217	100K
R218	100K
R219	330 ohm
R220	4.7K
R221	10K
R222	2.2K
R223	4.7K

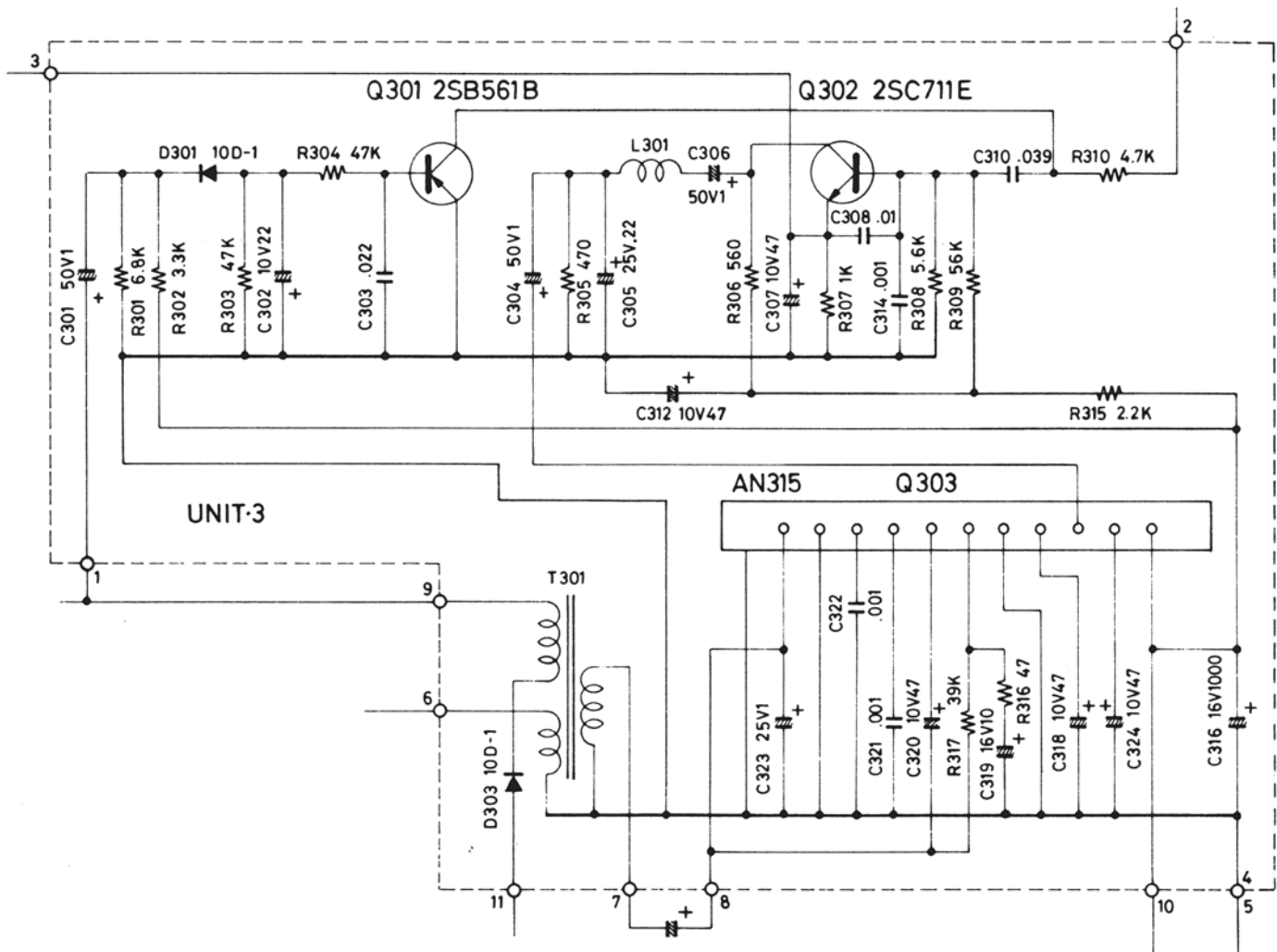
Miscellaneous

F101, 102	CFU455H (Ceramic Filter)
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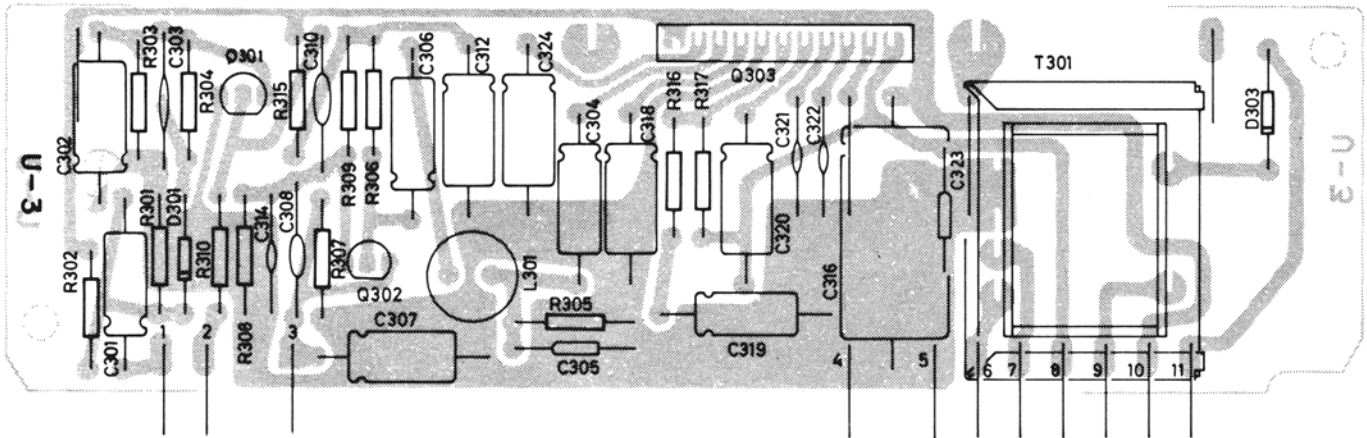
U3 MODULE

The module comprises the audio preamp 2SC711 (Q302), audio output (AN315 I.C.) and modulator, and "modugard" circuit 2SB561 (Q301). Pin out functions are as follows:

Pin #	Functional Description
1	"Modugard" input from modulator output
2	Audio input
3	Squelch circuit input (from U2)
4, 5	Ground
6	Audio output (speaker and speaker jack)
7	Audio input to modulation transformer primary (from external coupling capacitor)
8	Audio I.C. output to external coupling capacitor
9	Modulator winding output
10	I.C. B+ source (13.8V)
11	Modulator B+ source (13.8V)



TOP VIEW



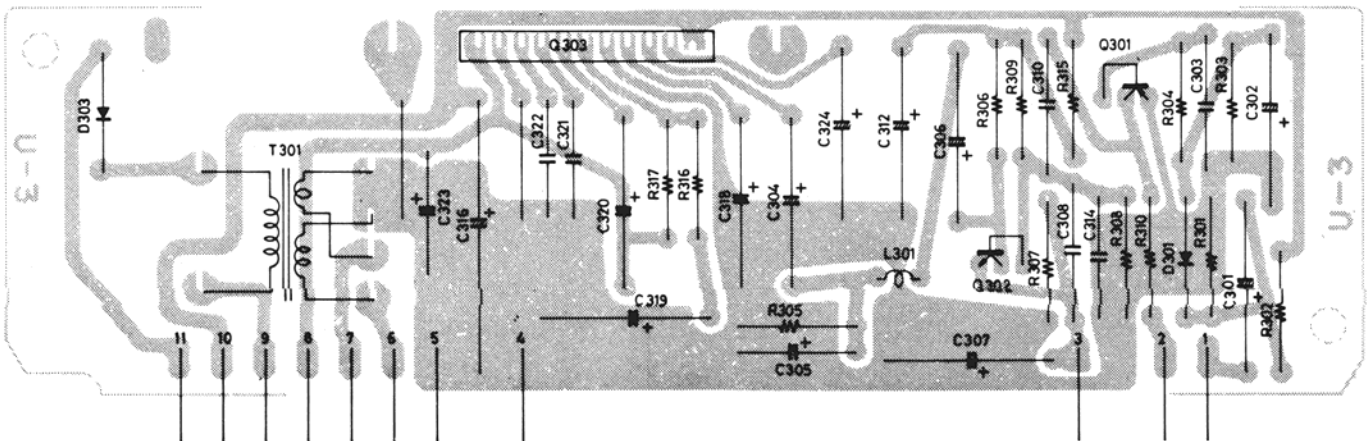
VOLTAGES

	Vb		Vc		Ve	
	Rx	Tx	Rx	Tx	Rx	Tx
Q301	—	0/- .5*	—	—	—	—
Q302	1.2	1.2	11.9	11.9	.5	.5 No Squelch
	1.1	1.2	13.3	11.9	1.4	.5 Squelch

*Mic level 0-100mv/600 ohm

	1	2	3	4	5	6	7	8	9	10	11
AN315	5.7	0	1.2	6.9	10.7	5.7	0	5.7	5.7	13.0	13.6

BOTTOM VIEW



U3 PARTS LIST

Semiconductors

Q301	2SC856
Q302	2SC711
Q303	AN315 IC
D301	10D-1
D303	10D-1

Coils—Inductors

T301	Modulation Transformer
L301	22mH (2-0080)

Capacitors

C301	1uF 50v
C302	22uF 10v
C303	.022uF
C304	1uF 50v
C305	.22uF 25v
C306	1uF 50v
C307	47uF 10v
C308	.01uF Mylar
C310	.039uF Mylar
C312	47uF 10v
C314	.001
C316	1000uF 16v
C318	47uF 10v

Capacitors (Cont.)

C319	10uF 16v
C320	47uF 10v
C321	.001uF
C322	.001uF
C323	1uF 25v
C324	47uF 10v

Resistors

(All 1/4 Watt 5%)

R301	6.8K
R302	3.3K
R303	47K
R304	47K
R305	470 ohm
R306	560 ohm
R307	1K
R308	5.6K
R309	56K
R310	4.7K
R315	2.2K
R316	47 ohm
R317	39K

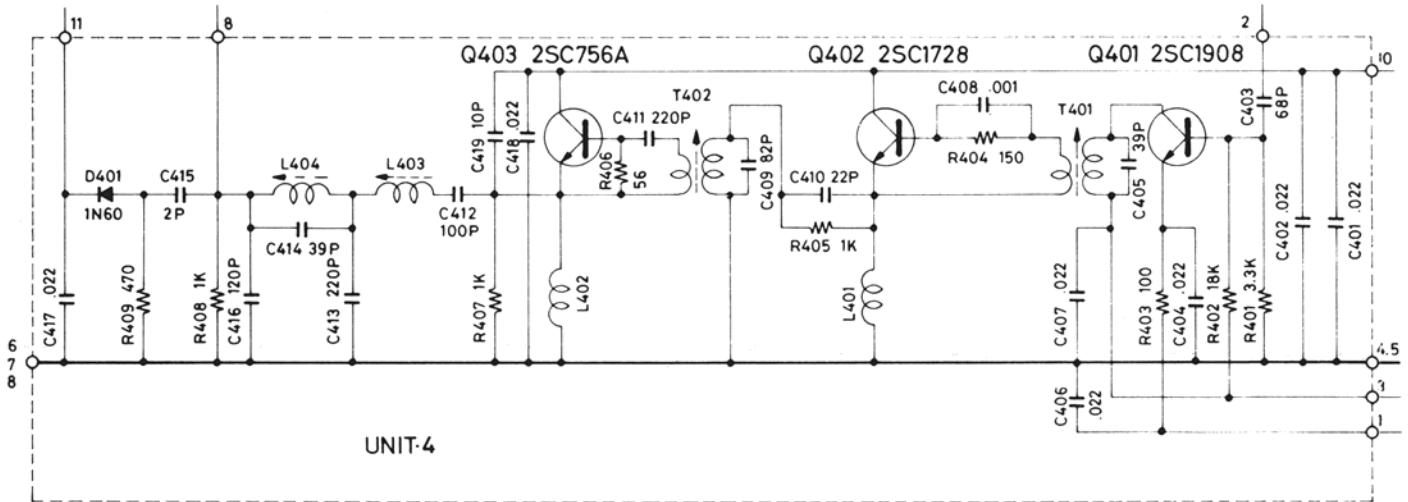
Miscellaneous

Heatsink for AN315 I.C.
(7-001)

U4 MODULE

The module comprises the tx predriver 2SC1908 (Q401), the driver 2SC1728 (Q402) and r. f. final 2SC756 (Q403). The output circuit also consists of the loading network and T.V.I. trap circuitry. Pinout functions are as follows:

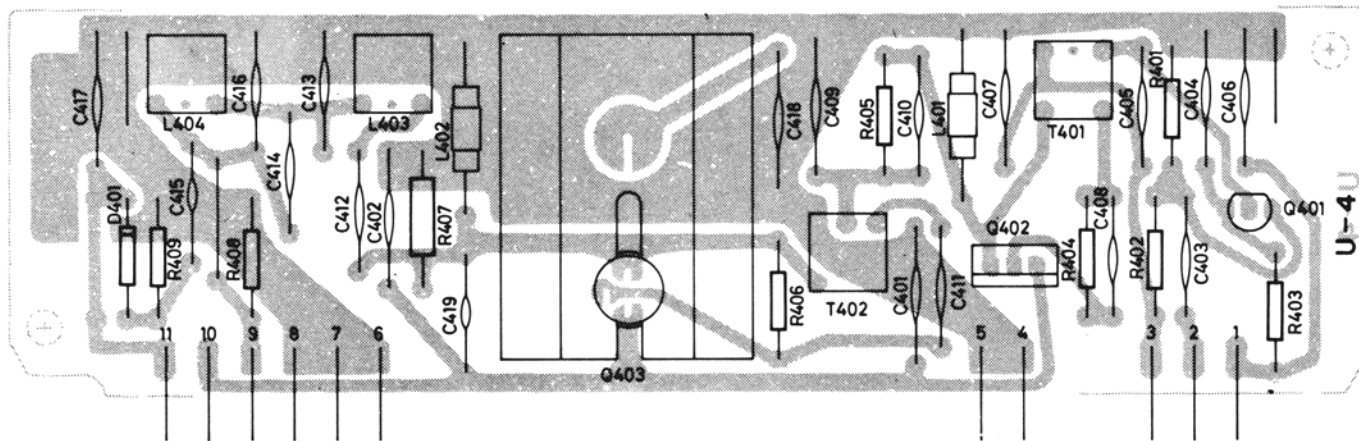
Pin #	Functional Description
1	9V source
2	r. f. input to predriver from BPF output on U6 (27MHz)
3	B+ source (13.8V) for Q401
4, 5, 6, 7, 8	Ground
9	r. f. output
10	B+ source (modulator output) for Q402, Q403
11	Meter output



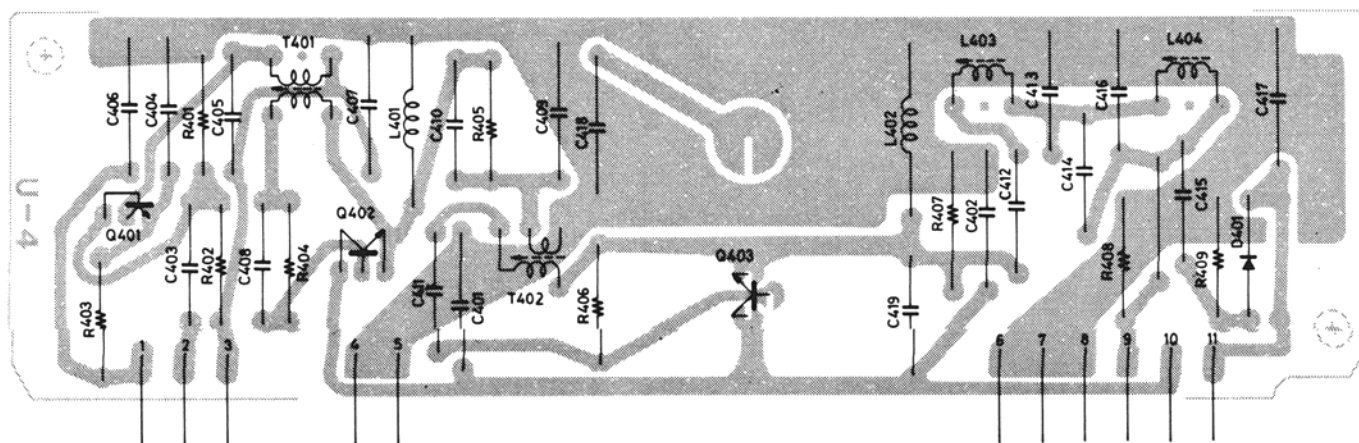
VOLTAGES

	Vb		Vc		Ve	
	Rx	Tx	Rx	Tx	Rx	Tx
Q401	2.1	1.8	13.8	13.8	8.6	1.3
Q402	—	—	12.7	12.7	—	—
Q403	—	—	12.7	12.7	—	—

TOP VIEW



BOTTOM VIEW



U4 PARTS LIST

Semiconductors

Q401	2SC1908
Q402	2SC1728
Q403	2SC756
D401	1N60

Coils—Inductors

T401	ETC20105
T402	ETC49167
T403	ETC49168
T404	ETC49166
L401	ETC49170
L402	ETC4056

Capacitors

C401	.022uF
C402	.022uF
C403	68pF
C404	.022uF
C405	39pF
C406	.022uF
C407	.022uF
C408	.001uF
C409	82pF
C410	22pF

Capacitors (Cont.)

C411	220pF
C412	100pF
C413	220pF
C414	39pF
C415	2pF
C416	120pF
C417	.022
C418	.022
C419	10pF

Resistors

All 1/4 Watt 5% Unless
Otherwise Specified

R401	3.3K ohm
R402	18K ohm
R403	100 ohm
R404	150 ohm
R405	1K ohm
R406	68 ohm
R407	1K ohm 1/2 Watt
R408	1K ohm
R409	470 ohm

Miscellaneous

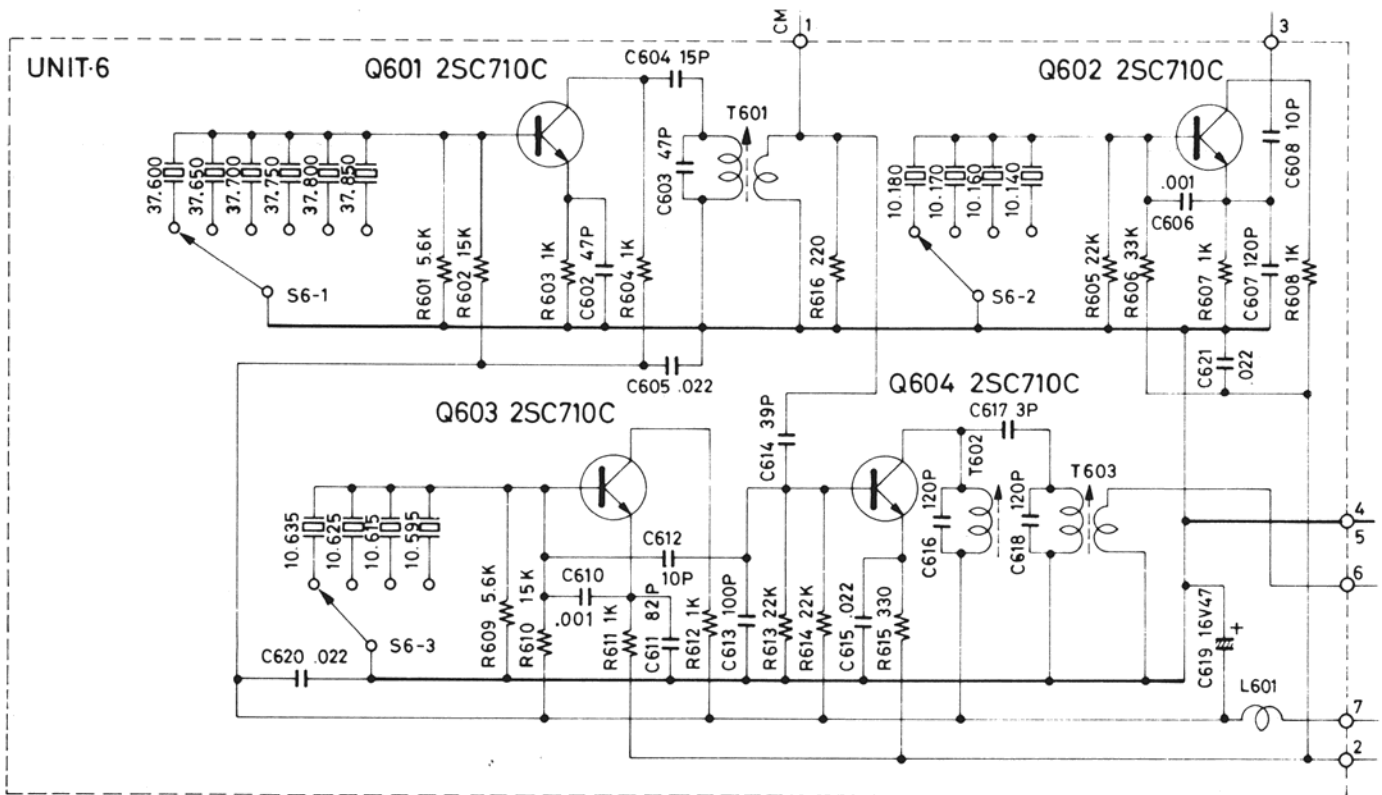
Heatsink for 2SC756 (7-002)

U6 MODULE

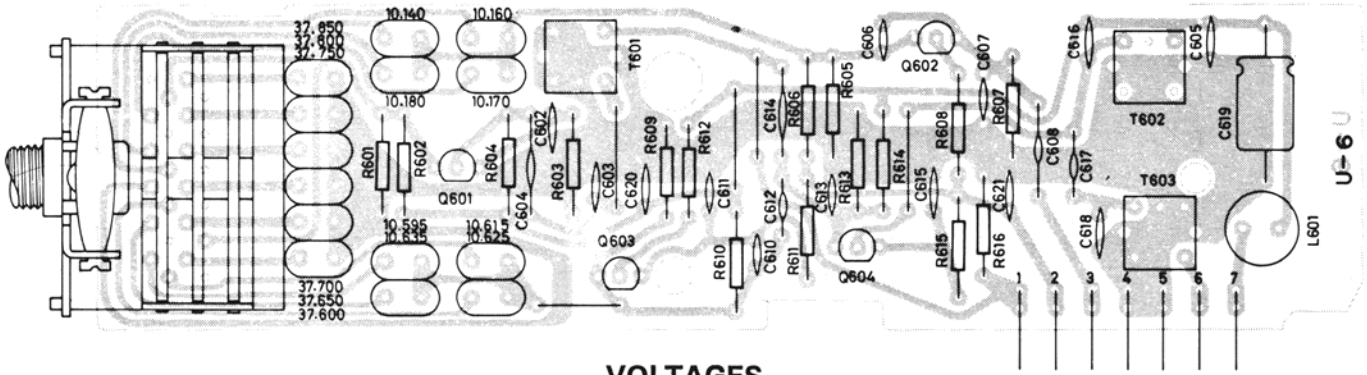
The module comprises the entire synthesizer oscillator unit, less the 1st and 2nd mixers for the receiver which are located on boards U1 and U2, respectively.

The 37 MHz master oscillator 2SC710C (Q601) simultaneously provides an output to the 1st mixer (Q102) on board U1 for receiver conversion, and to the transmit mixer 2SC710C (Q604) for transmit frequency synthesis (27MHz). The output of the 10.6MHz local oscillator 2SC710C (Q603) also mixes with the 37MHz at Q604 to complete the 27MHz synthesis. Local oscillator 2SC710C (Q602) provides an output at 10.1MHz to the second mixer, (Q201 on board U2), to complete the receiver conversion to 455KHz. Pin out functions are as follows:

Pin #	Functional Description
1	Master oscillator output to first mixer (rx) (37MHz)
2	9V source
3	Local oscillator output to second mixer (10.1MHz)
4, 5	Ground
6	Band-pass filter output to transmitter predriver (27MHz)



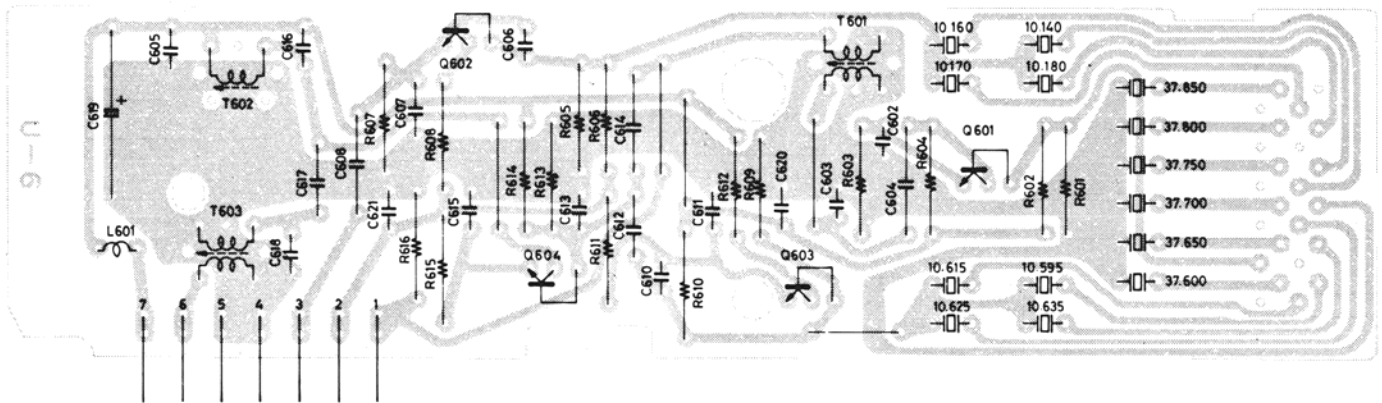
TOP VIEW



VOLTAGES

	Vb		Vc		Ve	
	Rx	Tx	Rx	Tx	Rx	Tx
Q601	3.6	3.4	10.1	9.6	3.0	2.8
Q602	3.0	0	6.2	0	2.4	0
Q603	3.7	3.3	13.5	10.1	8.6	2.7
Q604	6.8	4.7	13.5	12.2	8.6	4.2

BACK VIEW



U6 PARTS LIST

Semiconductors

Q601	2SC710
Q602	2SC710
Q603	2SC710
Q604	2SC710

Coils—Inductors

T601	ETC15063
T602	ETC15064
T603	ETC15063
L601	22mH (2-0080)

Resistors

(All 1/4 Watt 5%)

R601	5.6K
R602	15K
R603	1K
R604	1K
R605	22K
R606	33K
R607	1K

Resistors (Cont.)

R608	1K
R609	1.5K
R610	15K
R611	1K
R612	1K
R613	22K
R614	22K
R615	330 ohm
R616	220 ohm

Capacitors

C602	47pF
C603	47pF
C604	15pF
C605	.022
C606	100pF
C607	120pF
C608	10pF
C610	.001
C611	82pF
C612	10pF
C613	100pF

Capacitors (Cont.)

C614	39pF
C615	.022
C616	120pF
C617	3pF
C618	120pF
C619	47uF 16V
C620	.022uF
C621	.022

Crystals

(Frequency in MHz)

37.600	10.14	10.595
37.650	10.16	10.615
37.700	10.17	10.625
37.750	10.18	10.635
37.800		
37.850		

Miscellaneous

Channel Selector Switch
(4-405)