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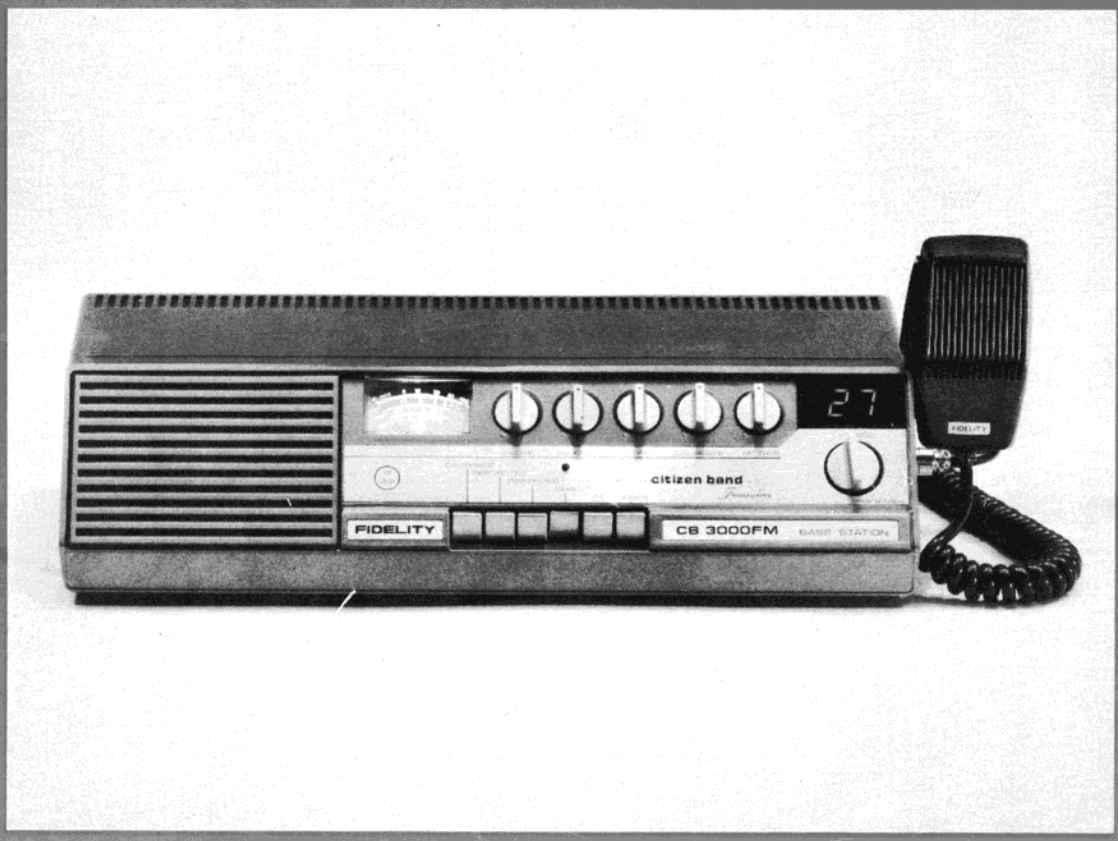
SERVICE MANUAL

CB 3000FM

40 CHANNEL FM TRANSCEIVER BASE STATION



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Service Department
FIDELITY RADIO PLC
St. Leonards Road, London, NW10 6ST
Telephone: 01-965 9235 (6 lines)

PART NO. 44656

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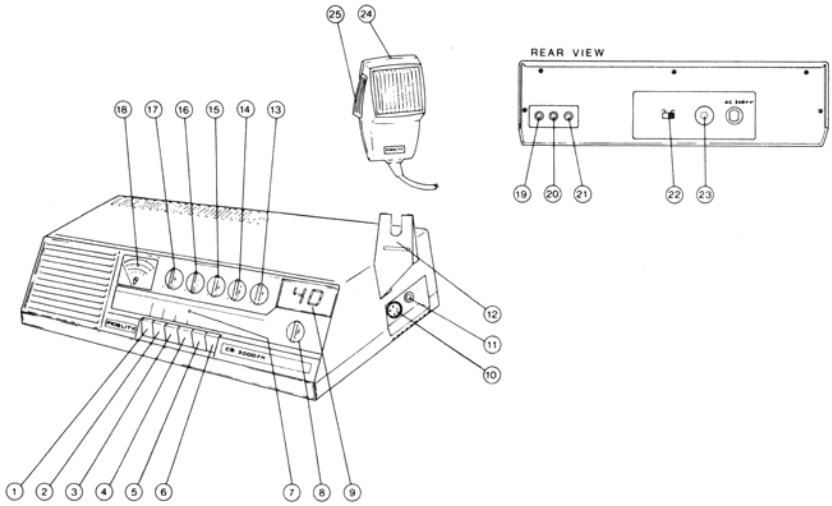

CONTROL IDENTIFICATION

1. Calibrate Button
2. Reflected Button
3. Power/Signal Button
4. Channel 9 Button
5. P.A. Button
6. Phones Button
7. Channel 9 Indicator
8. Channel Selector
9. Channel Indicator
10. Microphone Socket
11. Headphone Socket
12. Microphone Holder
13. R.F. Gain Control
14. Calibrate Control
15. Tone Control
16. Squelch Control
17. Volume, On/Off Control
18. S/RF Meter
19. External Speaker Socket
20. P.A. Speaker Socket
21. Tape Recorder Socket
22. −10dB ATT. Switch.
23. Antenna Socket
24. Microphone
25. Microphone Transmit Key

SPECIFICATION

SEMICONDUCTORS

IC's 3
Transistors 25
Diodes 32
LED Display

General
Channels: 40 digital PLL synthesised
Frequency range: See last page
Operating temperature range: −5 degree C to + 45 degree C
Power Source: 220−250 V A.C 50 Hz
Dimensions:
Depth: 185m/m (7-9/32")
Height: 89m/m (3½")
Width: 394m/m (15½")

Receiver.
Conversion system: Dual conversion superheterodyne
IF: 10.7 mHz 1st and 455 kHz 2nd
Channel display: Digital 7 segment LED's
Audio output power: $>$1.5W into 8 Ohm
Sensitivity: $<$1 microvolt @ 20 dB NQ
Adjacent channel rejection: $>$50 dB
Spurious emission: $<$20nW
Squelch sensitivity: 1 to 10 microvolt

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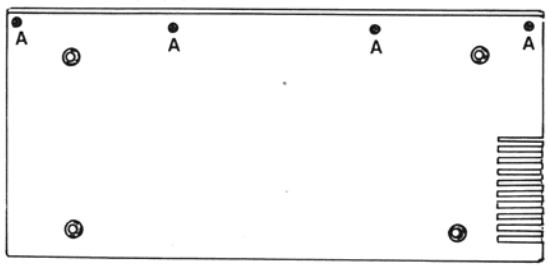
Transmitter.
Modulation: FM
RF power output: 4W
Frequency tolerance: <±1.5 kHz
RF power attenuator: >10 dB
Frequency rseponse: 500 to 2,500 Hz
+ 4/- 12 dB
Frequency deviation: >±1.5kHz
@ 1,250 Hz audio
Adjacent channel power: <10 microwatt
Spurious emission: (1) <50nW within
the following frequency bands –
80 MHz – 85 MHz
87.5 MHz – 118 MHz
135 MHz – 118 MHz
174 MHz – 230 MHz
470 MHz – 862 MHz
(2) <0.25 microwatt at any other frequency.

OTHER FACILITIES.
1) S.W.R. (Standing Wave Radio) measurement capability
2) Headphone socket
3) Channel 9 LED indicator
4) External speaker socket
5) P.A. speaker socket.
6) Tape recorder socket

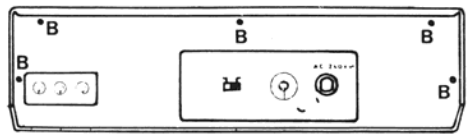
CHANGES TO SPECIFICATION

The aim of Fidelity Radio is continually to improve their products and therefore reserve the right to alter specifications.

BOTTOM VIEW



REAR VIEW



DISMANTLING PROCEDURE

TOP CABINET

Remove four screws marked 'A' (above diagram) and five screws marked 'B'. Then remove control knobs and the channel selector knob. Slide the top towards the front to unslot from the push button knobs.

NOTE: If the control knobs are tight, then we suggest that a piece of string be hooked from underneath the knobs and pulled so as to remove the knobs.

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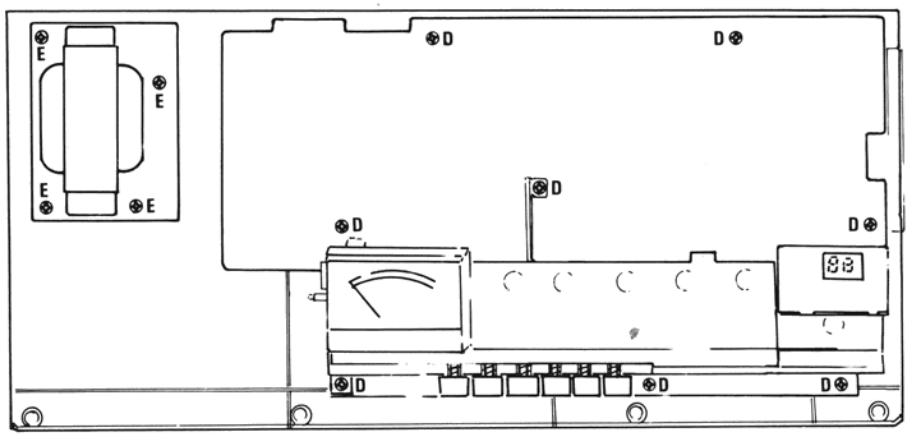
CHASSIS

To remove chassis from the base, remove eight screws marked 'D' on below diagram. Unsolder the link and the capacitor from the aerial socket and the relevant leads from the microphone socket. Then carefully unslot the chassis from the base.

Screws 'E' denote mains transformer bracket fixing screws.

INSIDE TOP VIEW



ALIGNMENT PROCEDURE

A. LOCAL OSCILLATION SECTION (P.L.L. SECTION)

1. Set the channel selector to channel 20.
2. Set CB to receiving condition, then connect an oscilloscope to pin 14 of IC2 to check for high level, i.e. logic '1' (+7·5V).
3. Set CB to transmitting condition and adjust TC1 to give +7·5V on pin 14, i.e. high level.
   Check: Pin 20 upon transmitting should be at low level, i.e. logic '0'.

B. TRANSMITTER

1. Set channel at CH −20, connect a frequency counter and RF VTVM to C110 and adjust L6, L8, L9, and L10 to give maximum reading of RF VTVM and frequency of 27·791XX. Then adjust TC2 to correct the frequency to 27·79125.
2. Connect an RF wattmeter and a 50 ohm dummy load across the antenna connector and adjust L6, L8, L9, L10, L11 and L13 to maximum output. Then adjust L15 so as to give an output power of 3·7 watts.
3. Adjust SVR3 so that the needle of S/RF meter is at the position of 3·5 of RF power indication.
4. Modulation level adjustment:
   Feed a 1KHz audio signal at 5mV to the Mic. input and adjust SVR2 so that the deviation is ± 1·5 KHz.

C. RECEIVER

1. **IF Section**
   a) Connect a sweep signal generator to base of Q3.
   b) Connect an oscilloscope to R29.
   c) Set sweep generator to 455 KHz and adjust T3 and T4 for maximum output.
   d) Adjust T5 and T6 for maximum output and an 'S' curve.

2. **Mixer Section**
   a) Connect the SSG to the antenna connector. Set SSG to 27·79125 MHz (CH20) and adjust the output so that the modulation signal is at 1 KHz and Dev. ± 1·5 KHz.
   b) Connect an oscilloscope and VTVM to the speaker.
   c) Set the tested unit to CH −20 and adjust L1, L2, L3 and T2 so that the reading on VTVM is at maximum position. When making this alignment the output of the SSG should be adjusted accordingly so that the output on VTVM is at a reference level.
   d) Repeat the above for CH −1 and CH −40. The output level of SSG at CH1 to CH −40 should be within ±3db as compared to that at CH −20.
   e) Repeat the above process to check the sensitivity of all other channels.

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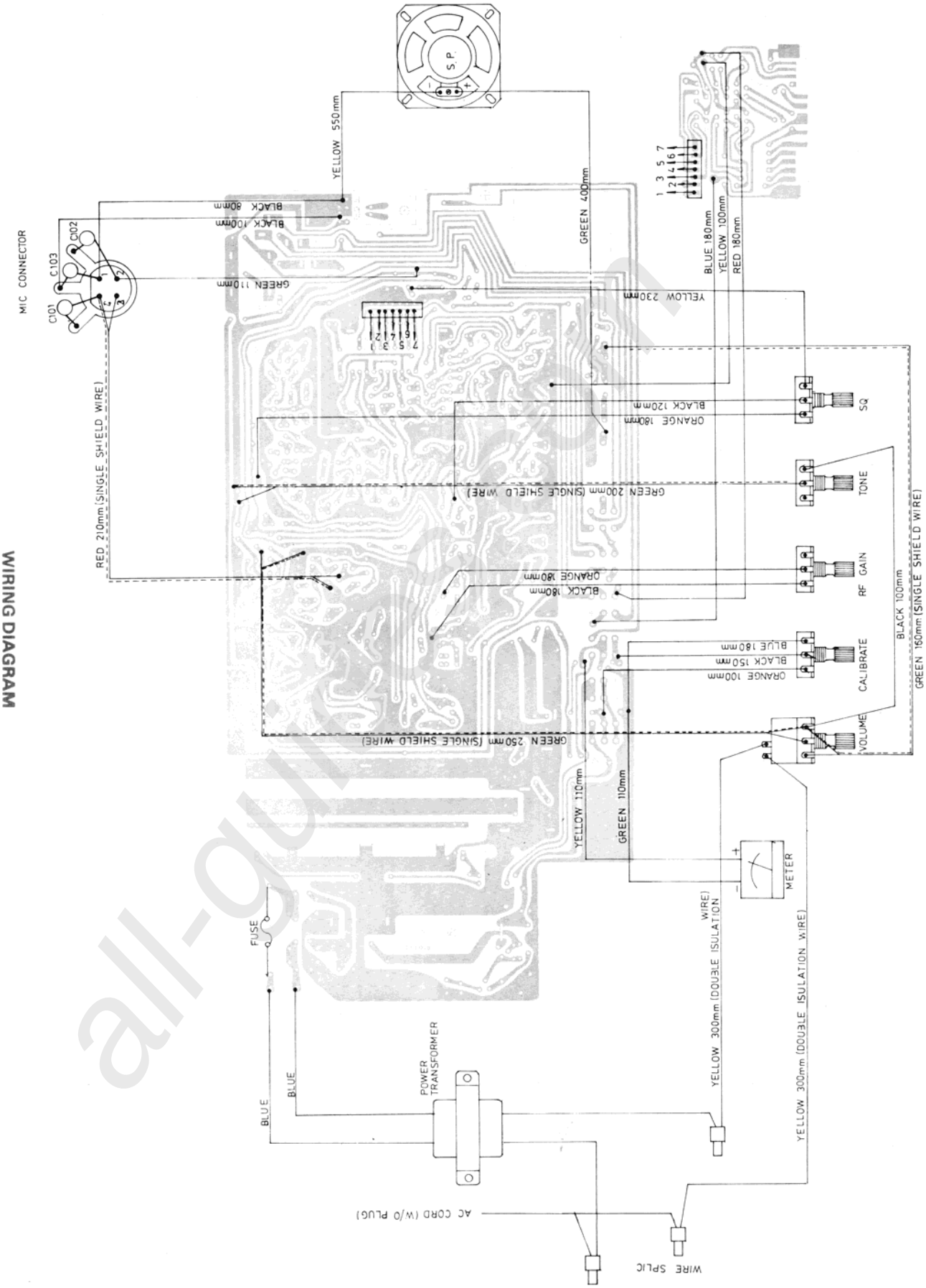
WIRING DIAGRAM



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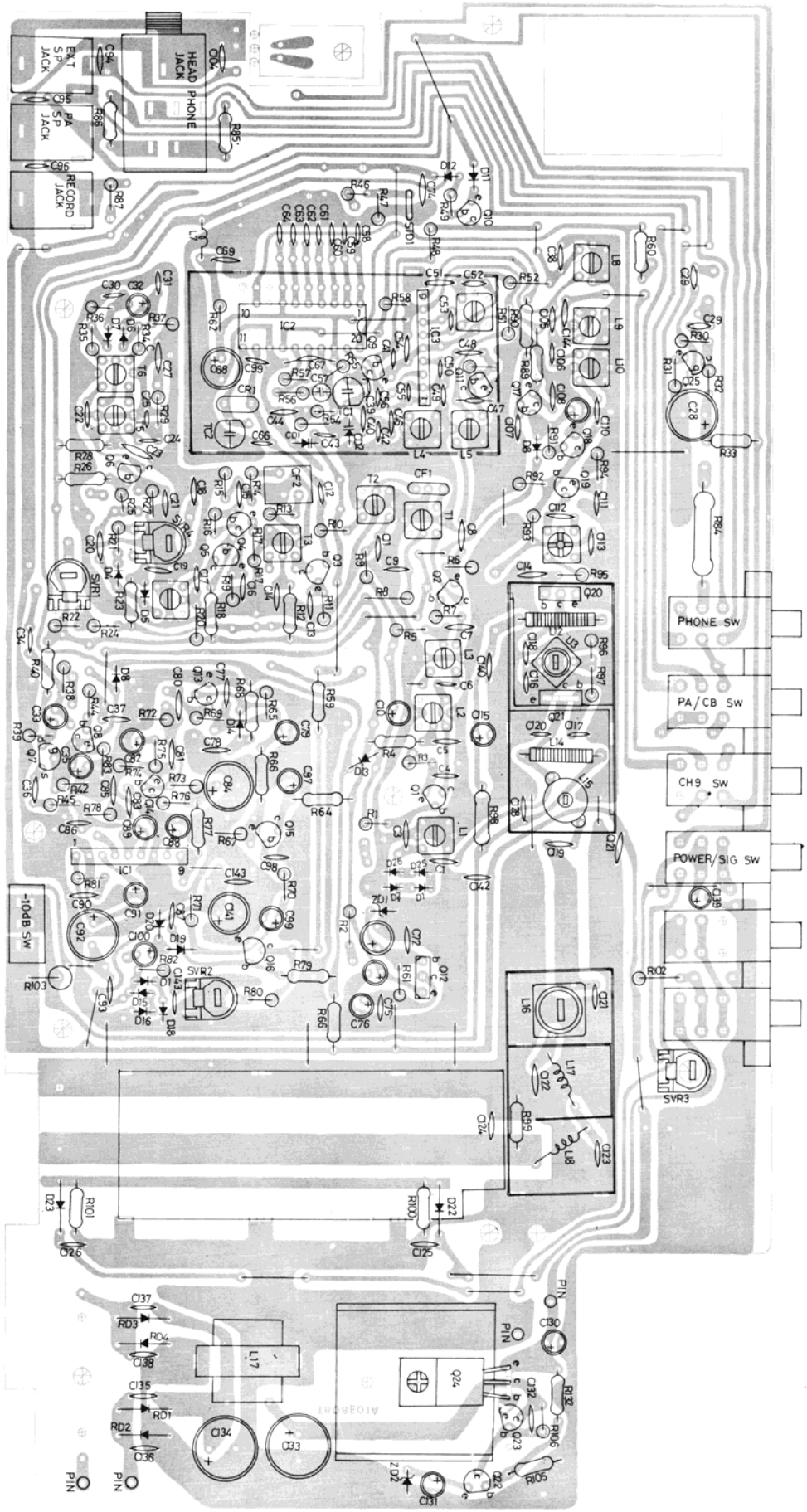

COMPONENT LAYOUT

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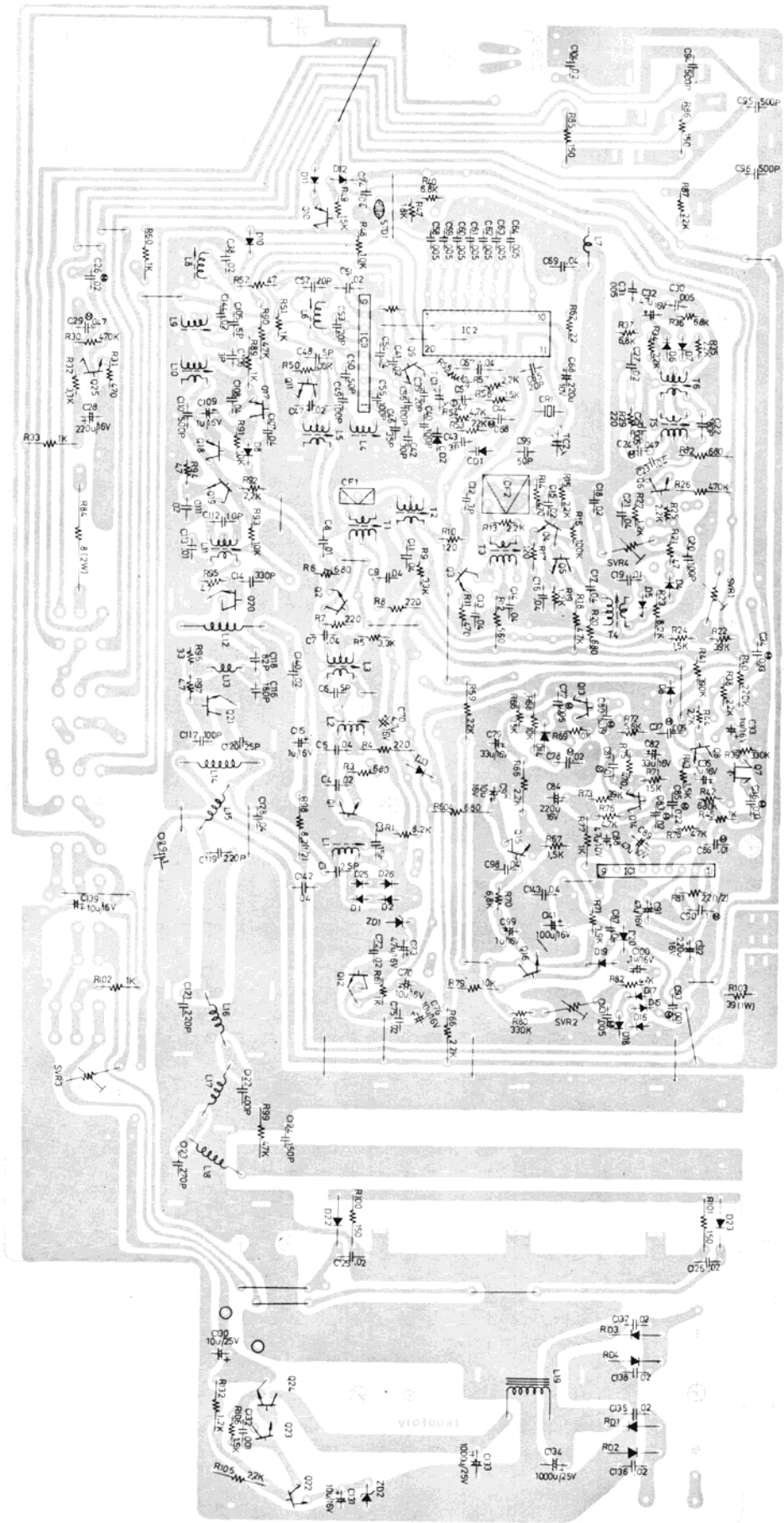

PRINTED CIRCUIT LAYOUT

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CB 3000FM SELECTED PARTS LIST

Part No.	Chassis Parts	Ref. Nos. (if any)
	SEMI CONDUCTORS	
100-00828-018-3	Transistor 2SC828R	Q8, Q13, Q14, Q15, Q16, Q18, Q22, Q23
100-00564-018-6	Transistor 2SA564R	Q10, Q17
100-01359-003-3	Transistor 2SC1359C	Q3, Q9, Q11, Q19
100-01047-002-4	Transistor 2SC1047B	Q1, Q2
100-01502-003-9	Transistor ED1502C	Q4, Q5, Q6
100-00241-000-9	Transistor BD241	
100-00495-015-0	Transistor 2SC495	
100-00030-001-0	Transistor 2SK30A	Q7
100-02166-000-3	Transistor 2SC2166	
102-07130-OTA-3	IC TA7310P	
102-07131-OAN-6	IC AN7131	IC1
102-07137-OLC-2	IC LC7137	IC2
	DIODES	
101-00317-OBA-5	BA317	D1, D2, D5, D8—D20, D25, D26
101-00188-AIS-8	IS188AM	D4
101-00188-FIS-3	IS188FM	D6, D7, D22, D23
101-00085-OWZ-7	BZY8V5	ZD1, ZD2
101-00553-TIS-8	IS553T	CD1, CD2
101-04002-OIN-3	IN4002	RD1, RD2, RD3, RD4
	FILTERS, COILS, CHOKES & TRIMMERS	
003-00848-001-5	Coil C10-100-638	T6
003-00848-002-8	Coil C10-100-637	T5
003-00818-007-2	Coil 003-818-007	T4
003-00818-006-9	Coil 003-818-006	T3
003-00818-005-6	Coil 003-818-005	T2
003-00818-004-3	Coil 003-818-004	T1
003-00818-003-0	Coil 003-818-003	L3
003-00818-002-7	Coil 003-818-002	L2
003-00818-001-4	Coil 003-818-001	L1
003-00818-011-1	Coil 003-818-011	L8, L9
003-00818-012-4	Coil 003-818-012	L10
003-00818-013-7	Coil 003-818-013	L11
002-00818-003-9	Coil 003-818-014	L13
002-00818-004-2	Coil 003-818-015	L15
002-00818-018-1	Coil 003-818-018	L12, L14
003-00818-010-1	Coil 003-818-010	L5
002-00818-002-6	Coil 003-818-009	L6
002-00848-002-7	Coil 199CN-CPO38Z	L4
002-00812-005-7	Coil 70-08-59	L7
002-00858-001-1	Coil EO5-221-356	L16
002-00808-002-9	Coil EO5-221-318 (6½T)	L17
002-00808-003-2	Coil EO5-221-317 (8½T)	L18
053-00010-00E-9	Ceramic Filter OE10·7S	
053-00455-CFU-8	Ceramic Filter CFU 455H	
052-00848-001-9	Trimmer 25pF	
	PRESETS & POTENTIOMETERS	
007-00818-011-5	Preset 5K ohm	SVR3, SVR4
007-00818-012-8	Preset 50K ohm	SVR1, SVR2
005-00808-001-9	Pot. V24L5S 15KC-15A-50K	ON/OFF & VOLUME
005-00808-002-2	Pot. 50KB	CAL, TONE
005-00818-029-4	Pot. 5KB	R.F. GAIN
005-00818-030-4	Pot. 20KB	SQ

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CB 3000FM SELECTED PARTS LIST

Part Nos.	Chassis Parts	Ref. Nos. (if any)
	SPECIAL CAPACITORS	
048-03001-050-6	3pF 50V	C12, C43, C106
048-82002-050-2	82pF 50V	C118
	SPECIAL RESISTORS	
030-00820-002-6	8R2 ½W	R98
030-00820-020-4	8R2 2W	R84
030-00391-020-1	39R 2W	R103
	GENERAL	
039-00818-002-2	Transformer 039-818-002	L19
055-00818-002-4	Thermistor SDT-1000	
017-00801-001-3	L.E.D. QEC-209A Red	
028-08880-001-4	Mica Film	For Transistor
017-00808-002-7	Fuse T1A	
028-09312-001-9	Fuse Holder	
015-00808-001-2	Earphone Jack	
015-00815-001-0	Mic. Ear Jack	
014-00766-022-3	Slide Switch	
014-00808-002-4	Push Button Switch	
103-05240-010-1	Crystal 10·240MHz	
017-00808-003-0	Lamp 12V 50mA	
028-00818-001-5	Mica Film	For I.C.
011-00808-001-8	AC Power Cord	
013-00808-001-0	Mains Transformer	
017-00808-001-4	L.E.D. Display LN526RA	
014-00808-001-1	Channel Switch	
047-00808-001-3	Meter	
015-00418-011-2	Mic. Socket	
028-00848-001-6	Plug Holder	Mic. Plug Assembly
063-00418-003-4	Microphone	
067-00808-008-0	Speaker 4 ohm 1·5W	
028-08060-002-5	L.E.D. Holder	
	BOXING & FINISHING PARTS	
023-00808-001-3	Front Cabinet	
023-00808-802-8	Bottom Cabinet	
024-00808-001-4	Rubber Foot	
019-00808-001-6	Acrylic Window	
042-00808-001-8	Name Plate 'FIDELITY'	
042-00808-002-1	Model Plate CB 3000FM	
042-00808-003-4	Function Plate	
042-00808-004-7	Jack Plate	
020-00808-001-0	Push Button Knob	
020-00808-B02-5	Rotary Switch Knob	
020-00808-B03-8	Channel Selector Knob	
062-00808-001-4	Speaker Grill	
035-00808-002-1	Caution Label	
043-00812-B03-6	Polystyrene Bag	
034-00808-001-7	Poly Foam	
038-00808-001-1	Instruction Book	
040-00808-001-6	Gift Box	
028-00808-002-1	Microphone Holder	
042-00848-004-5	Microphone Plate	
035-00418-002-4	Caution Label	
041-00848-001-5	Warranty Card	