

For Service Manuals
MAURITRON SERV/ICES
8 Cherry Tree Road, Chinnor
Oxfordshire, OX9 4QY
Tel: (01844) 361694
Fax: (01844) 352554
email: mauritron@btconnect.com

KENWOOD

SERVICE MANUAL

**TR-2400 ST-1, BC-5
SC-3, PB-24**

SC-3:EXCEPT U.S.A MARKET

2m FM SYNTHESIZED HAND-HELD TRANSCEIVER

SPECIFICATIONS

[K type]

GENERAL

Semiconductors	Transistors 28
FET	1
ICs	16
Diodes	50
Display	LCD (Liquid Crystal Display)
Frequency Range	144.00 to 147.995 MHz
Frequency Synthesizer	Digital control of phase locked VCO
Synthesizer Stability	Less than ± 750 Hz at 25°C
Mode	FM
Channels	800
Memory Channels	10
Operating Temperature	-20 to 50°C
Power Voltage	9.6V DC $\pm 15\%$
Grounding	Negative grounding
Antenna Impedance	50Ω
DC Current	Approx. 30 mA in receive with no input signal Approx. 500 mA in transmit (at 1.5 W RF output) Approx. 2 mA in memory backup with power switch off
Dimensions	71 mm (2-13/16") wide 192 mm (7-9/16") high 47 mm (1-7/8") deep
Weight	740 gr (1.62 lbs.)

TRANSMITTER SECTION

RF Output Power	1.5 Watts
Modulation	Variable reactance direct shift
Max. Frequency Deviation	± 5 kHz
Spurious Radiation	Less than -60 dB
Microphone	Condenser microphone

RECEIVER SECTION

Circuitry	Double superheterodyne
Intermediate Frequency	1st IF.....10.7 MHz 2nd IF.....455 kHz
Sensitivity	Less than 0.2μV for 12 dB SINAD (Less than 1μV for 30 dB S/N)
Squelch Sensitivity	Less than 0.25μV
Pass Band Width	More than 12 kHz at 6 dB down
Audio Output	More than 200 m watts across 8Ω load (10% distortion)

NOTE: Circuit and ratings may change without notice due to developments in technology.

[W, T type]

GENERAL

Semiconductors	Transistors 28 (W), 29 (T)
FET	1
ICs	16
Diodes	50
Display	LCD (Liquid Crystal Display)
Frequency Range	144.00 to 145.995 MHz
Frequency Synthesizer	Digital control of phase locked VCO
Synthesizer Stability	Less than ± 750 Hz at 25°C
Mode	FM
Channels	400
Memory Channels	10
Operating Temperature	-20 to 50°C
Power Voltage	9.6V DC $\pm 15\%$
Grounding	Negative grounding
Antenna Impedance	50Ω
DC Current	Approx. 30 mA in receive with no input signal Approx. 500 mA in transmit (at 1.5 W RF output) Approx. 2 mA in memory backup with power switch off
Dimensions	71 mm (2-13/16") wide 192 mm (7-9/16") high 47 mm (1-7/8") deep
Weight	740 gr (1.62 lbs.)

TRANSMITTER SECTION

RF Output Power	1.5 Watts
Modulation	Variable reactance direct shift
Max. Frequency Deviation	± 5 kHz
Spurious Radiation	Less than -60 dB
Microphone	Condenser microphone

RECEIVER SECTION

Circuitry	Double superheterodyne
Intermediate Frequency	1st IF.....10.7 MHz 2nd IF.....455 kHz
Sensitivity	Less than 0.2μV for 12 dB SINAD (Less than 1μV for 30 dB S/N)
Squelch Sensitivity	Less than 0.25μV
Pass Band Width	More than 12 kHz at 6 dB down
Audio Output	More than 200 m watts across 8Ω load (10% distortion)

**FOR SERVICE MANUALS
CONTACT:**

MAURITRON TECHNICAL SERVICE

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

CONTENTS

SPECIFICATIONS	Front Cover
CIRCUIT DESCRIPTION	2
SEMICONDUCTOR/FILTER DATA	3,22
PRINTED CIRCUIT BOARD	6
PARTS LIST	13
PACKING	20
DISASSEMBLY	21
LEVEL DIAGRAM	23
ADJUSTMENT	23
WIRING DIAGRAM	27
SCHEMATIC DIAGRAM	28
ST-1	36
BC-5	37
BLOCK DIAGRAM	Back Cover

CIRCUIT DESCRIPTION

RECEIVING UNIT

The receiving unit employs a double superheterodyne circuit with 3 hybrid IC's. The RF stage is tuned by variable capacitance diodes. The receive signal is RF amplified by Q1 and mixed with VCO outlet by Q2 to produce an IF signal at 10.7 MHz. This signal passes through a Monolithic Crystal filter and is fed to Q4 a hybrid IC containing at the 2nd oscillator and 2nd mixer. Output is the 2nd IF signal 455 kHz. The IF signal is amplified by Q5 a hybrid and becomes an AF signal through the ceramic discriminator. In the receive mode, standby current is about 35 mA, squelch closed (no signal).

Transmitting Unit

The transmitter is a simple 3-stage circuit using direct modulation of the VCO operating at the signal transmit frequency. Since this circuit has no MIXER stage, excellent transmit signal characteristics are obtained.

Operating time:

Normal operating time of TR-2400 is 2 hours and 30 minutes for 1 minute transmission and 3 minutes reception. Fig. 1 shows the voltage/power versus time characteristics.

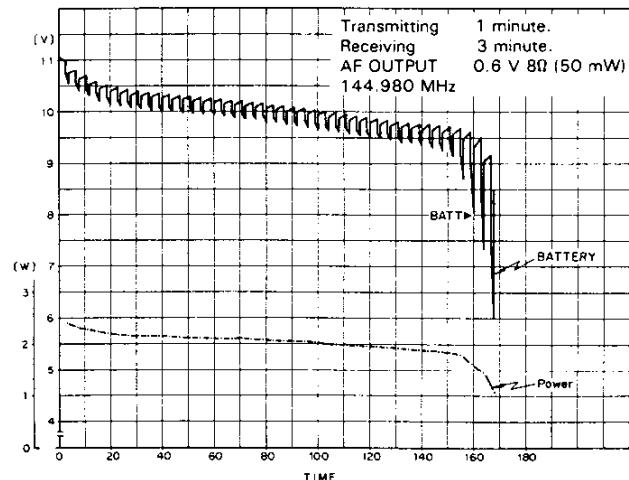


Fig. 1 Voltage/Power vs time

PLL CONTROL UNIT (X50-1640-XX)

Fig. 2 shows the PLL unit. An important feature of the PLL circuit is that the VCO output frequency during transmission operates between 144.00 ~ 147.99 MHz. This directly feeds the driver and PA sections. In the receive mode, the VCO frequency operates between 133.3 ~ 137.29 MHz. Thus, the VCO output in transmit mode is different from that in receive mode. This PLL unit is compact and its current consumption is very low.

Individual local oscillator triplet circuits are used for transmission and reception. The local oscillator output frequency for transmission is 138.5 MHz and for reception is

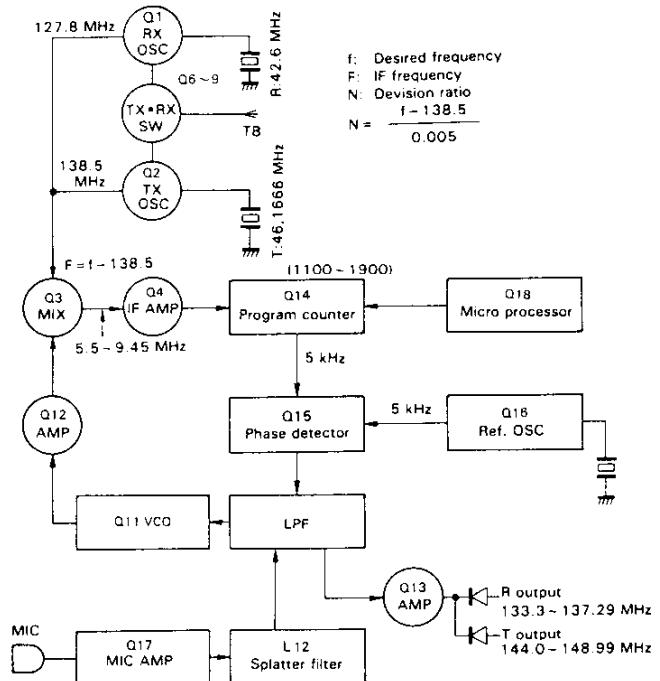


Fig. 2 PLL unit (X50-1640-XX)

CIRCUIT DESCRIPTION

127.8 MHz. The VCO output is amplified by Q12. This circuit has a variable tuning circuit which varies the transmit and receive bandpass by 10.7 MHz.

The output mixed by Q3 is an IF signal of 5.5~9.45 MHz which is fed to a low-pass filter and is amplified by Q4. This signal is then applied to the programmable divider.

The programmable divider is controlled by a microprocessor. The signal is frequency divided by the program counter (frequency division: 1100~1900) to obtain the output frequency in 5 kHz steps. The 10.240 MHz signal from the reference oscillator is compared with the reference frequency (5 kHz) by the phase comparator Q15 and its output is applied through a low-pass filter to the VCO.

The VCO is an FET oscillator circuit. The vari-cap diode D3 (1S2208) is used for controlling frequencies, D5 (1SV50S) for modulation, and D4 (1S2588) for switching transmit and receive modes.

For direct modulation of the VCO, a sharp splatter filter is used after the MIC amplifier. A condenser microphone assures good sensitivity and high quality tone. The control unit is composed of a 4-bit micro-processor having both the frequency control and memory functions required for the TR-2400. The micro-processor is C MOS, and employs a 500 kHz ceramic element as the clock oscillator. Current drain for memory backup is about 2mA. The microprocessor is controlled by a 16 key (4x4) pad to provide fre-

quency selection, UP/DOWN channel selection, memory channel and memory scan channel selection.

DISPLAY UNIT

The display unit is composed of an oscillator (Q2), LCD driver unit, and display driver unit as shown. The LCD is lighted by a 36 Hz oscillator pulse. This pulse is delivered to the LCD backplane.

The display BCD code and digit output from the micro-processor are latched by the LCD drivers Q3~6 (TC4243BP) to produce output for lighting the LCD. This output is simultaneously delivered at the 36 Hz pulse rate to the LCD backplane with a 180° phase difference.

The 36 Hz pulse is also applied to Q1 (TC4030BP), thereby lighting the display lamps for transmission, battery alarm and MR. Q2 (TC4011BP) is the 36 Hz oscillator.

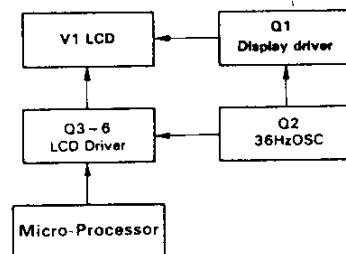


Fig. 3 Display unit

SEMICONDUCTOR DATA

H8D1154E (TX.RX unit Q4) 2ND MIX

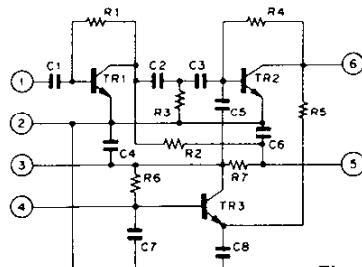


Fig. 4

H8D1152E (TX.RX unit Q5) IF

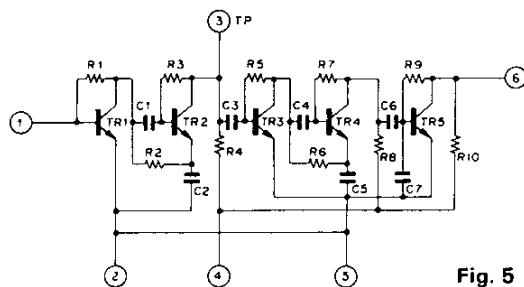


Fig. 5

H8D1252 (TX.RX unit Q6) AMP

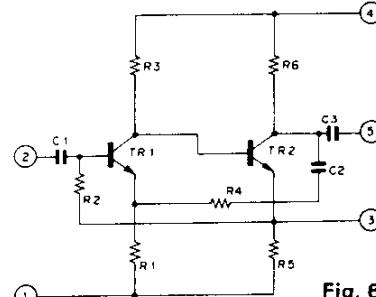


Fig. 6

Monolithic filter L71-0217-05 (TX+RX unit L24)

Item	Rating
Nominal center frequency (f_0)	10.7 MHz
Pass bandwidth	$f_0 \pm 7.5$ kHz or more at 3 dB
Attenuation bandwidth	$f_0 \pm 25$ kHz or less at 18 dB
Ripple	0.5 dB or less
Insertion loss	2.0 dB or less
Guaranteed attenuation	30 dB or more within $f_0 \pm 1$ MHz Spurious: 18 dB or more
Terminal impedance	3 kΩ/2 pF

SEMICONDUCTOR DATA

M51182L
(TX.RX unit Q9) AF PA

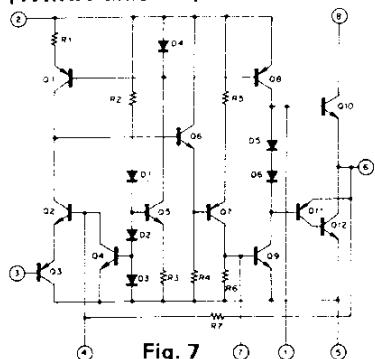


Fig. 7

2SC 2329 (TX•RX unit Q13)

Usage	High-Frequency power amplifier
Type	NPN epitaxial silicon transistor
Collector voltage	V _{CEO} 38 V
Emitter voltage	V _{EBO} 3.0 V
Collector-emitter voltage	V _{CEO} 18 V
Collector current	I _C 0.75 mA
Total loss	P _T (T _c = 25°C) 7.5 W (R _{th(j-c)} = 20°C/W)
Junction temperature	T _j 175°C
Storage temperature	T _{stg} -65 ~ +175°C

Ceramic filter L72-0318-05
(TX•RX unit L9)

Item	Rating
Nominal center frequency	455 kHz
3 dB bandwidth	± 4.2 kHz or more
6 dB bandwidth	± 6 kHz or more
60 dB bandwidth	± 12 kHz or less
Guaranteed attenuation (within ± 100kHz)	50 dB or more
Spurious (within 0.1 ~ 1 MHz)	25 dB or more
Ripple (within ± 4.2 KHz)	3 dB or less
Insertion loss	6 dB or less
Input impedance	2.0 kΩ

MK5087 (N) (PLL unit Q12 or Q21 K type only)
TONE ENCODER

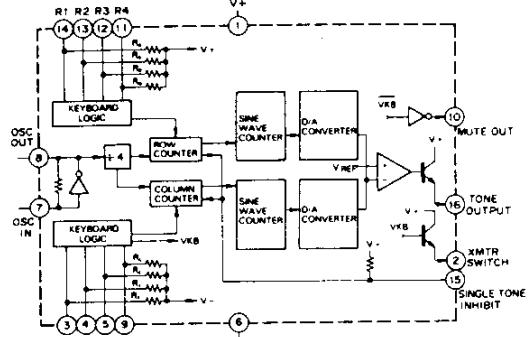


Fig. 8

Monolithic filter L71-0226-05 (TX-RX unit L24)

Item	Rating
Nominal center frequency (f ₀)	10.7 MHz
Pass bandwidth	f ₀ ± 7.5 kHz or more at 3 dB
Attenuation bandwidth	f ₀ ± 25 kHz or less at 40 dB f ₀ ± 45 kHz or less at 60 dB
Ripple	1.0 dB or less
Insertion loss	1.5 dB or less
Guaranteed attenuation	70 dB or more within f ₀ ± 1MHz. Spurious: 40 dB or more at f ₀ ~ f ₀ + 500 kHz. 80 dB or more at f ₀ ~ (910kHz ± 10kHz).
Terminal impedance	3kΩ

TC5081P (PLL unit Q15 or Q21) Phase detector TC5081P (PLL unit Q15 or Q21) Timing Chart

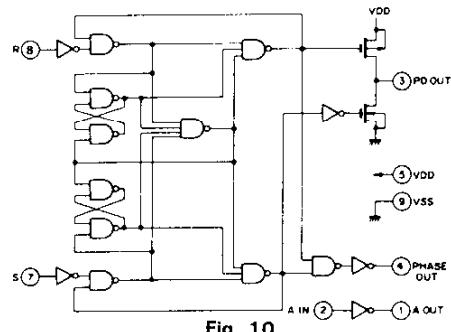
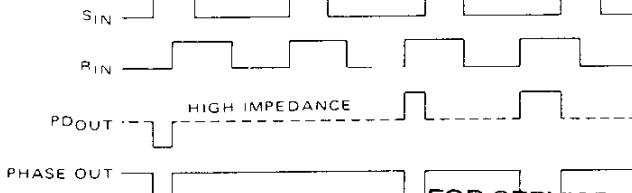


Fig. 10



FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

TC9122P (PLL unit Q14 or Q20) Program counter
Function explanation

Symbol	Name	Content and operation	Remarks
Pin	Programmable counter input terminal	Programmable counter input terminal to which the signal to be divided is input.	Build-in bias circuit
Pout	Programmable counter output terminal	Programmable counter output terminal. Output is 1/N of the input frequency. The output pulse width equals 5 bit of the input.	
A ₁ ~ A ₄ B ₁ ~ B ₄ C ₁ ~ C ₄ D ₁ ~ D ₄	x 1 x 10 x 100 x 1000	Program input terminals Terminal to set the dividing ratio. The following input combination is prohibited: A ₁ : A ₂ : A ₃ : A ₄ , B ₁ : B ₂ : B ₃ : B ₄ , C ₁ : C ₂ : C ₃ : C ₄ , D ₁ : D ₂ : D ₃ : D ₄ 0: 0: 0: 0, 0: 1: 0: 0, 1: 0: 0: 0, 0: 0: 1: 0, 0: 0: 0: 1, 1: 0: 0: 0, 0: 0: 0: 1, 0: 1: 0: 0, 0: 0: 1: 0, 0: 0: 0: 1, 0: 0: 1: 0, 0: 1: 0: 0, 0: 0: 0: 1, 1: 1: 0: 0, 0: 0: 0: 1, 0: 1: 1: 0, 0: 0: 0: 1, 0: 0: 1: 1, 0: 1: 0: 1, 0: 0: 0: 1, 1: 0: 1: 0, 0: 0: 0: 1, 0: 1: 0: 1, 0: 0: 1: 1, 1: 0: 0: 1, 0: 0: 1: 1, 0: 1: 1: 0, 1: 0: 0: 1, 0: 1: 1: 1, 1: 0: 0: 1, 0: 1: 1: 1, 1: 0: 1: 0, 1: 1: 0: 1, 1: 0: 1: 1, 1: 1: 0: 1, 1: 1: 1: 0, 1: 1: 1: 1	Built-in pull-down resistor

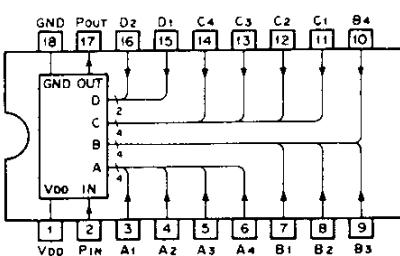


Fig. 12

SEMICONDUCTOR DATA

TC4543BP (DISPLAY unit Q3~6)

Truth table

LD	BI	PHASE	INPUT				OUTPUT				DISPLAY	
			A	B	C	D	a	b	c	d	e	
*	H	H	*	*	*	*	H	H	H	H	H	BLANK
*	H	L	*	*	*	*	L	L	L	L	L	BLANK
L	L	H	*	*	*	*	LATCH				LATCH	
L	L	L	*	*	*	*	L	L	L	L	L	0
H	L	H	L	L	L	L	H	L	L	H	H	1
H	L	H	L	H	L	L	L	H	L	H	L	2
H	L	H	H	H	L	L	L	L	H	H	L	3
H	L	H	L	L	H	L	H	L	L	H	L	4
H	L	H	L	H	L	H	L	H	L	L	L	5
H	L	H	L	H	L	H	L	L	L	L	L	6
H	L	H	H	H	L	L	L	L	H	H	H	7
H	L	H	L	L	L	L	L	L	L	L	L	8
H	L	H	H	L	L	L	H	L	L	H	H	9
H	L	H	L	H	L	L	L	H	L	H	L	BLANK
H	L	H	H	L	H	H	H	H	H	H	H	BLANK
H	L	H	L	H	H	H	H	H	H	H	H	BLANK
H	L	H	H	L	H	H	H	H	H	H	H	BLANK
H	L	H	L	H	H	H	H	H	H	H	H	BLANK
H	L	H	H	H	H	H	H	H	H	H	H	BLANK
H	L	H	L	H	H	H	H	H	H	H	H	BLANK
H	L	H	H	H	H	H	H	H	H	H	H	BLANK
H	L	L	L	L	L	L	H	H	H	H	H	0
H	L	L	H	L	L	L	H	H	L	L	L	1
H	L	L	L	H	L	L	H	H	H	L	H	2
H	L	L	H	H	L	L	H	H	H	L	L	3
H	L	L	L	L	H	L	H	H	H	L	H	4
H	L	L	H	L	H	L	H	H	H	L	H	5
H	L	L	L	H	H	L	H	H	H	L	H	6
H	L	L	H	H	H	L	H	H	H	L	L	7
H	L	L	L	L	H	H	H	H	H	H	H	8
H	L	L	H	L	H	H	H	H	H	L	H	9
H	L	L	L	H	H	L	L	L	L	L	L	BLANK
H	L	L	H	H	L	H	L	L	L	L	L	BLANK
H	L	L	L	H	H	L	L	L	L	L	L	BLANK
H	L	L	H	L	H	L	L	L	L	L	L	BLANK
H	L	L	L	H	H	L	L	L	L	L	L	BLANK
H	L	L	H	H	H	L	L	L	L	L	L	BLANK
H	L	L	L	H	L	H	L	L	L	L	L	BLANK
H	L	L	H	H	H	H	L	L	L	L	L	BLANK

* Don't care.



Display indicator mode

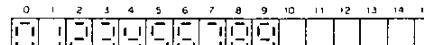


Fig. 15

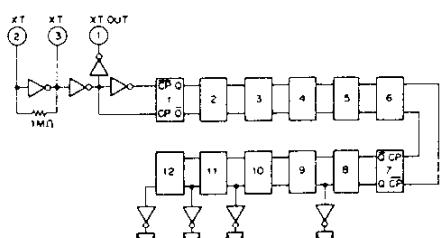
Fig. 14

 μ PD651C-013 Terminal function (PLL unit X50-1640-XX, Q25)

Pin No.	Terminal Name	Input signal	Output signal	Description
1	CL1			
2	PC0	○	X100 program data output	
3	PC1	○	X100 program data output	
4	PC2	○	X100 program data output	
5	PC3	○	X100 program data output	
6	JNT	○		H when receiving L when transmitting or back-up
7	RES	○		Normally (without operating the keyboard) L
8	PDO	○	X10 Program data output	
9	PD1	○	X10 Program data output	
10	PD2	○	X10 Program data output	
11	PD3	○	X10 Program data output	
12	PE0	○	X1 Program data output	
13	PE1	○	X1 Program data output	
14	PE2	○	X1 Program data output	
15	PE3	○	X1 Program data output	
16	PFO	○	Indication BCD output	
17	PF1	○	Indication BCD output	
18	PF2	○	Indication BCD output	
19	PF3	○	Indication BCD output	
20	TEST	○	5V Power supply	
21	VCC	○	5V Power supply	

Pin No.	Terminal Name	Input signal	Output signal	Description
22	PG0	○	Keyboard output	
23	PG1	○	Keyboard output	
24	PG2	○	Keyboard output	
25	PG3	○	Keyboard output	
26	PH0	○	Indication digit output	
27	PH1	○	Indication digit output	
28	PH2	○	Indication digit output	
29	PH3	○	Indication digit output	
30	PIO	○		
31	PI1	○	Pulse output at MR output	
32	PI2	○	Vacant terminal	
33	PA0	○	Always H (K)	
34	PA1	○	Always H (K)	
35	PA2	○	L when receiving H when transmitting	
36	PA3	○	Squelch Suppression input. Stops at L	
37	PB0	○	Keyboard input	
38	PB1	○	Keyboard input	
39	PB2	○	Keyboard input	
40	PB3	○	Keyboard input	
41	VSS		Ground	
42	CLO		Oscillation output 39.7kHz	

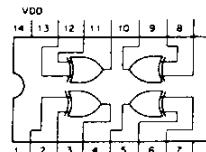
TC5082P (PLL unit Q16 or Q22) OSC, DEV.



PIN NO	8	7	6	4	1
PIN NAME	Q8	Q10	Q12	XTout	
Dividing ratio	1/256	1/1024	1/2048	1/4096	1/1
Output frequency	X-tal 10.24 MHz	40 kHz	10 kHz	5 kHz	2.5 kHz
Vdd					10.24 MHz

Fig. 13

TC4030BP (DISPLAY unit Q1)



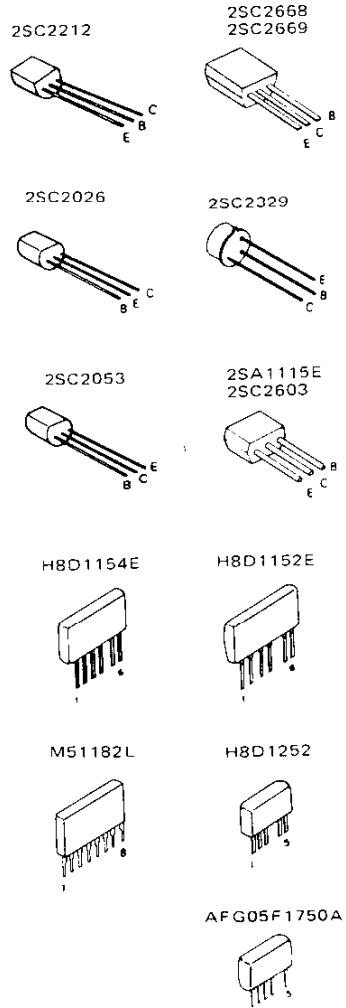
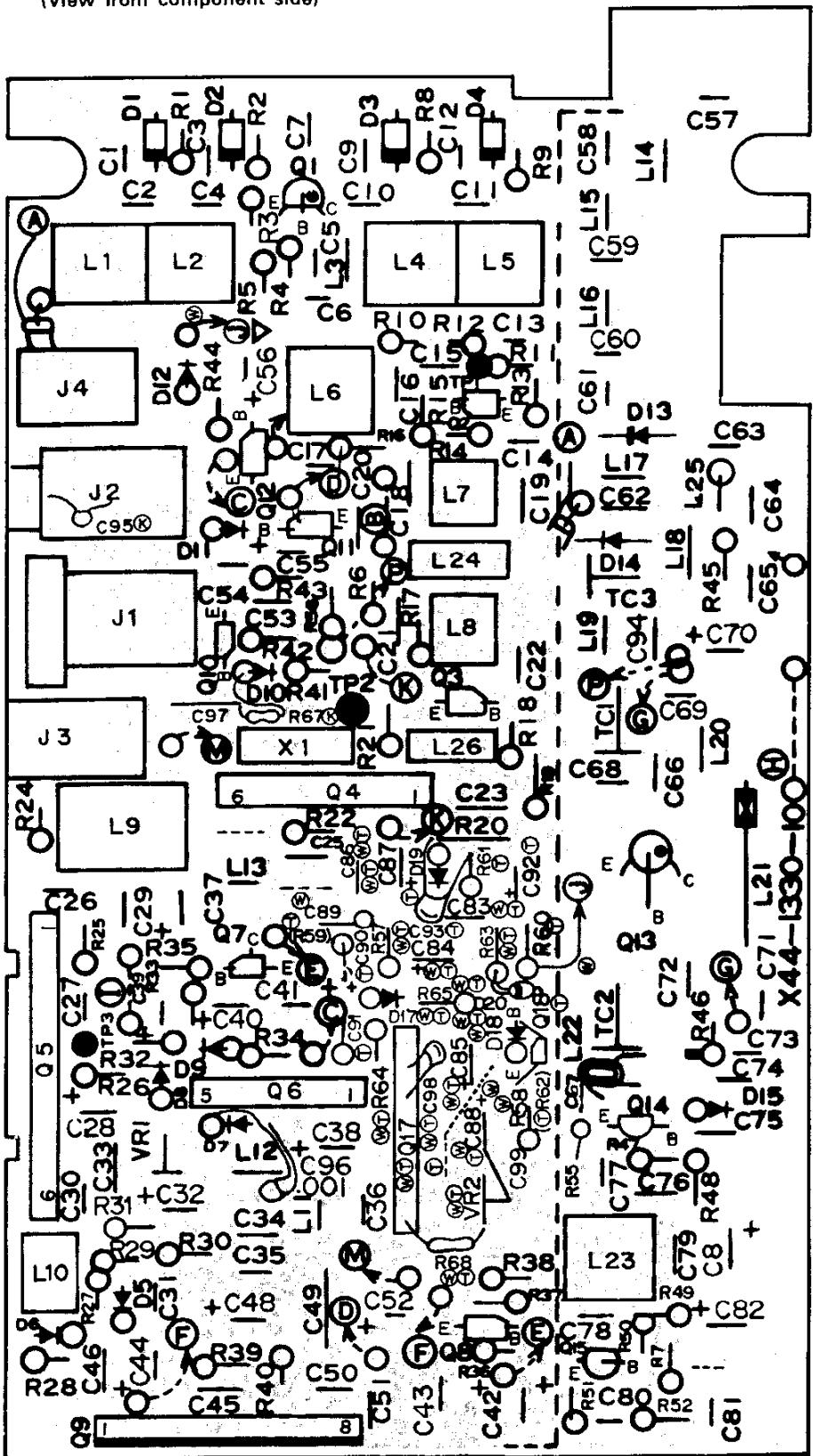
Truth table

INPUTS	OUTPUTS
A	X
L	L
L	H
H	L
H	H

Fig. 14

PRINTED CIRCUIT BOARD

▼ TX-RX unit (X44-1330-XX) XX: 10 (K), 51 (T), 61 (W)
 from S/N 006XXXX ~ 010XXXX
 (View from component side)



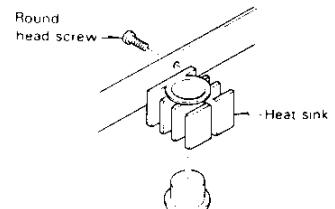
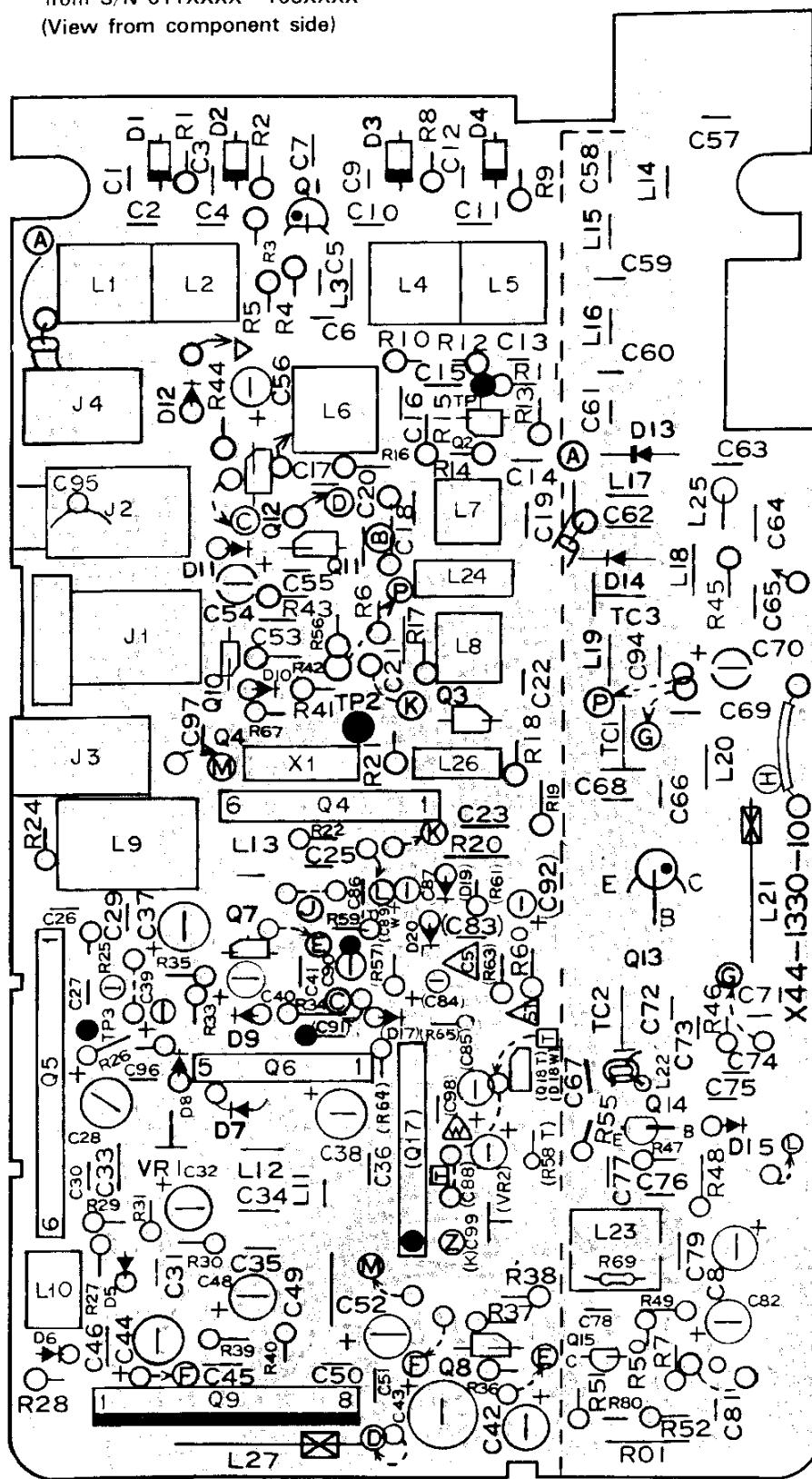
Q1	: 2SC2212
Q2	: 2SC2668(Y)
Q3	: 2SC2669(Y)
Q4	: H8D1154E
Q5	: H8D1152E
Q6	: H8D1252
Q7,8,10,11	: 2SC2603(E)
Q9	: M51182L
Q12	: 2SA562TM(Y)
Q13	: 2SC2329(K)
Q14	: 2SC2053
Q15	: 2SC2026(K)
Q16	: 2SA1115(E)
Q17	: AFG05F1750A1 (W.T.)
Q18	: 2SC2603(E)(T)
D1~4	: 1S2208
D5~8	: 1N60
D9,12,15	: 1S1555
D10	: XZ-080
D11	: WZ-071
D13	: MI301
D14	: 1S2588
D16	: 1N60
D17	: 1S1555 (W)(T)
D18	: 1S1555 (W)
D19	: 1S1555 (T)
D20	: XZ-080 (W)(T)

PRINTED CIRCUIT BOARD

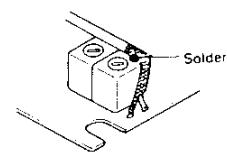
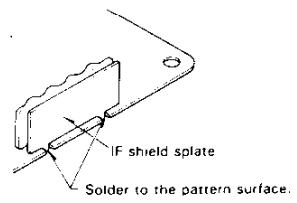
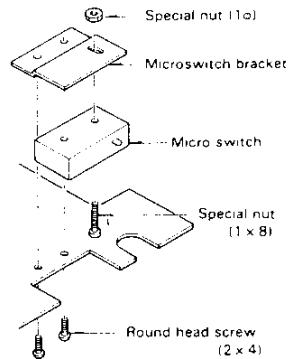
▼ TX-RX unit (X44-1330-XX) XX: 10 (K), 51 (T), 61 (W)

from S/N 011XXXX~108XXXX

(View from component side)



Apply heat sinker to the contact surfaces
of heat sink, shielding plate and transistor.



Q1	: 2SC2212
Q2	: 2SC2668(Y)
Q3	: 2SC2669(Y)
Q4	: H8D1154E
Q5	: H8D1152E
Q6	: H8D1252
Q7,8,10,11	: 2SC2603(E)
Q9	: M51182F
Q12	: 2SA562TM(Y)
Q13	: 2SC2329(K)
Q14	: 2SC2053
Q15	: 2SC2026(K)
Q17	: AFG05F1750A1 (W,T)
Q18	: 2SC2603(E) (T)

D1~4	1S2208
D5~8	1N60
D9,12,15	
	1S1555
D10	XZ-080
D11	WZ-071
D13	M1301
D14	1S2588
D17	1S1555 (W) (T)
D18	1S1555 (W)
D19	1S1555 (T)
D20	XZ-080 (W) (T)

FOR SERVICE MANUALS
CONTACT:

MAURITRON TECHNICAL SERVICES

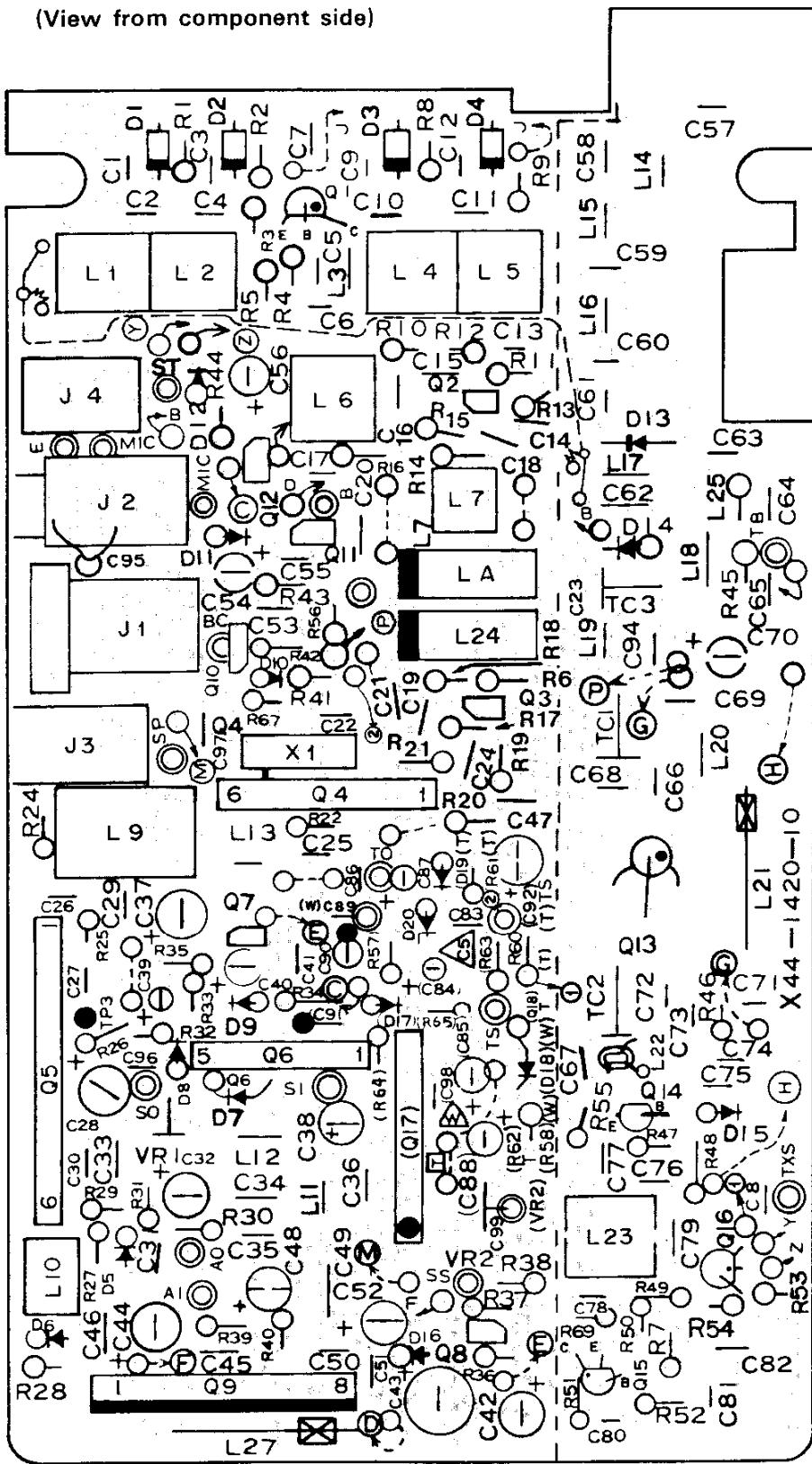
www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

PRINTED CIRCUIT BOARD

▼ TX-RX unit (X44-1420-XX) XX: 10(K), 51(T), 61(W)
 from S/N 109XXXX ~
 (View from component side)



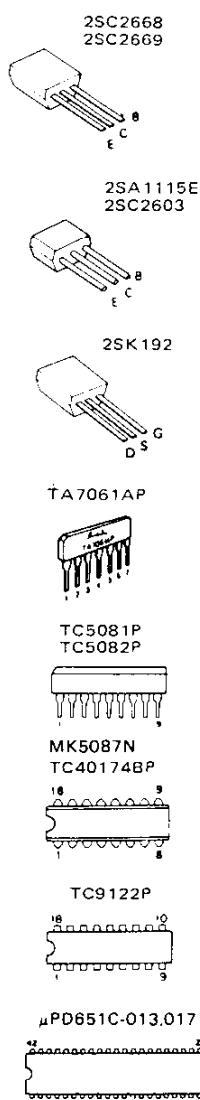
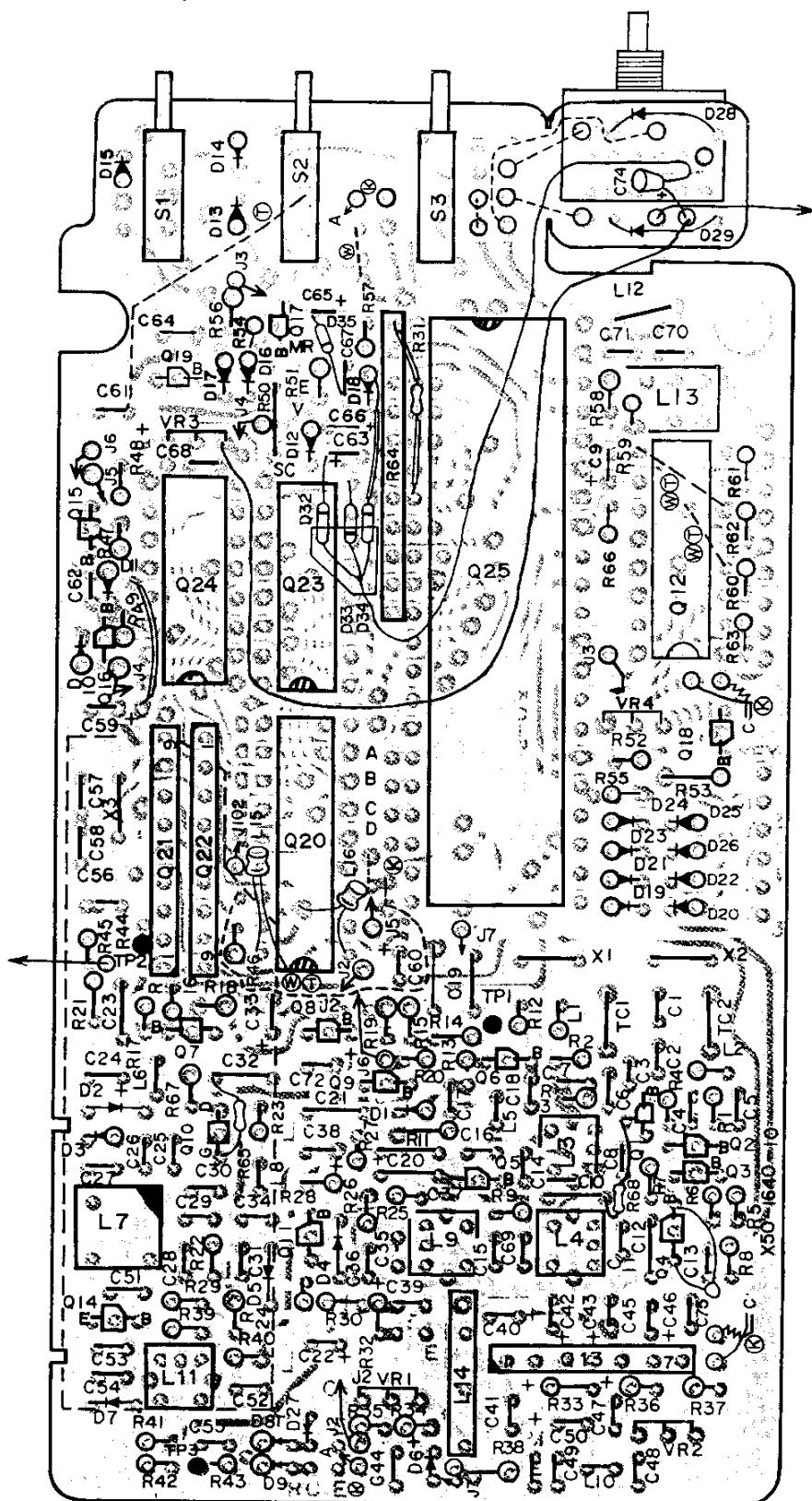
www.mauritron.co.uk
 TEL: 01844 - 351694
 FAX: 01844 - 352554

Q1	: 2SC2212
Q2	: 2SC2668 (Y)
Q3	: 2SC2669 (Y)
Q4	: H8D1154E
Q5	: H8D1152E
Q6	: H8D1252
Q7, 8, 10, 11, 16	: 2SC2603 (E)
Q9	: M51182L
Q12	: 2SA562TM (Y)
Q13	: 2SC2329 (K)
Q14	: 2SC2053
Q15	: 2SC2026 (K)
Q17	: AFG05F1750A1 (W) (T)
Q18	: 2SC2603 (E) (T)

D1~4	: 1S2208
D5~8	: 1N60
D9,12,15,	
	: 1S1555
	: XZ-086
D10	: WZ-071
D11	: MI301
D13	: 1S2588
D14	: 1S1555 (W) (T)
D17	: 1S1555 (W)
D18	: 1S1555 (T)
D19	: XZ-080 (W) (T)
D20	

PRINTED CIRCUIT BOARD

▼ PLL unit (X50-1640-XX) XX: 10(K), 51(T), 61(W)
 (View from component side) from S/N 006XXXX~010XXXX

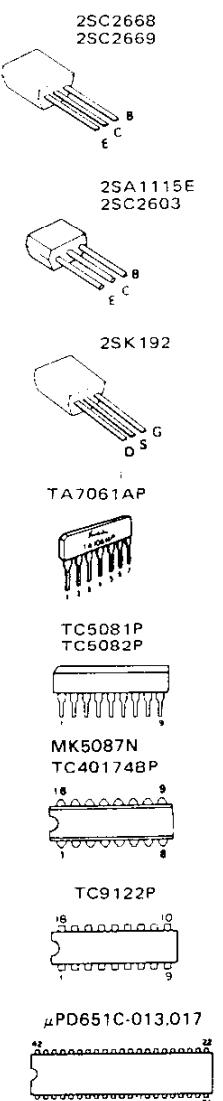
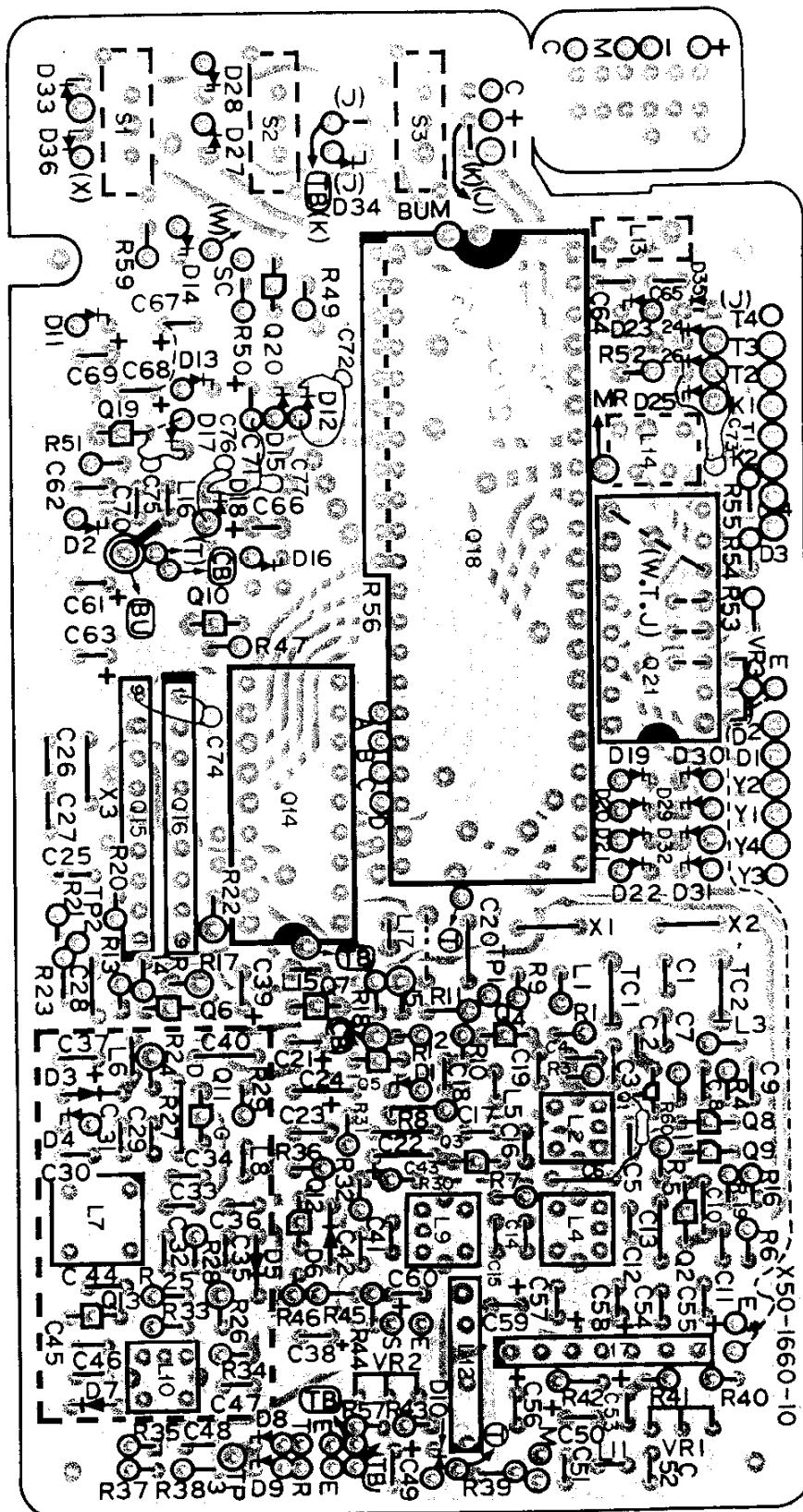


Q1,4 : 2SC2669(Y)
 Q2,3,6~9,16~19 : 2SC2603(E)
 Q5,11,14 : 2SC2668(Y)
 Q10 : 2SK192(GR)
 Q12 : MK5087N
 Q13 : TA7061AP
 Q15 : 2SA1115(E)
 Q20 : TC9122P
 Q21 : TC5081P
 Q22 : TC5082P
 Q23,24 : TC40174BP
 Q25 : μPD651C-013

D1,11 : XZ-066
 D2,4,7 : 1S2208
 D3,8,9,27 : 1S2588
 D5 : 1SV50S
 D6 : XZ-070(W,T)
 D6 : XZ-088(K)
 D10,13~17,19~26,28,29 : 1N60
 D12,18,32~35 : 1S1555

PRINTED CIRCUIT BOARD

▼ PLL unit (X50-1660-XX) XX: 10(K), 51(T), 61(W) from S/N 011XXXX ~ 108XXXX
 (View from component side)



Q1,2 : 2SC2669(Y)
 Q3,12,13 : 2SC2668(Y)
 Q4~10,19,20 : 2SC2603(E)
 Q11 : 2SK192(GR)
 Q14 : TC9122P
 Q15 : TC5081P
 Q16 : TC5082P
 Q17 : TA7061AP
 Q18 : μPD651C-017
 Q21 : MK5087N (K)

D1,2 : XZ-066
 D3,6,7 : 1S2208
 D4,8,9 : 1S2588
 D5 : 1SV50S
 D10 : XZ-088(K)
 D10 : XZ-070(W.T.)
 D11 : XZ-060
 D12~16 : 1S1555
 D17~28,33 : 1N60
 D29,30~32 : 1N60

FOR SERVICE MANUALS
CONTACT:

MAURITRON TECHNICAL SERVICES

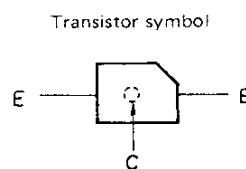
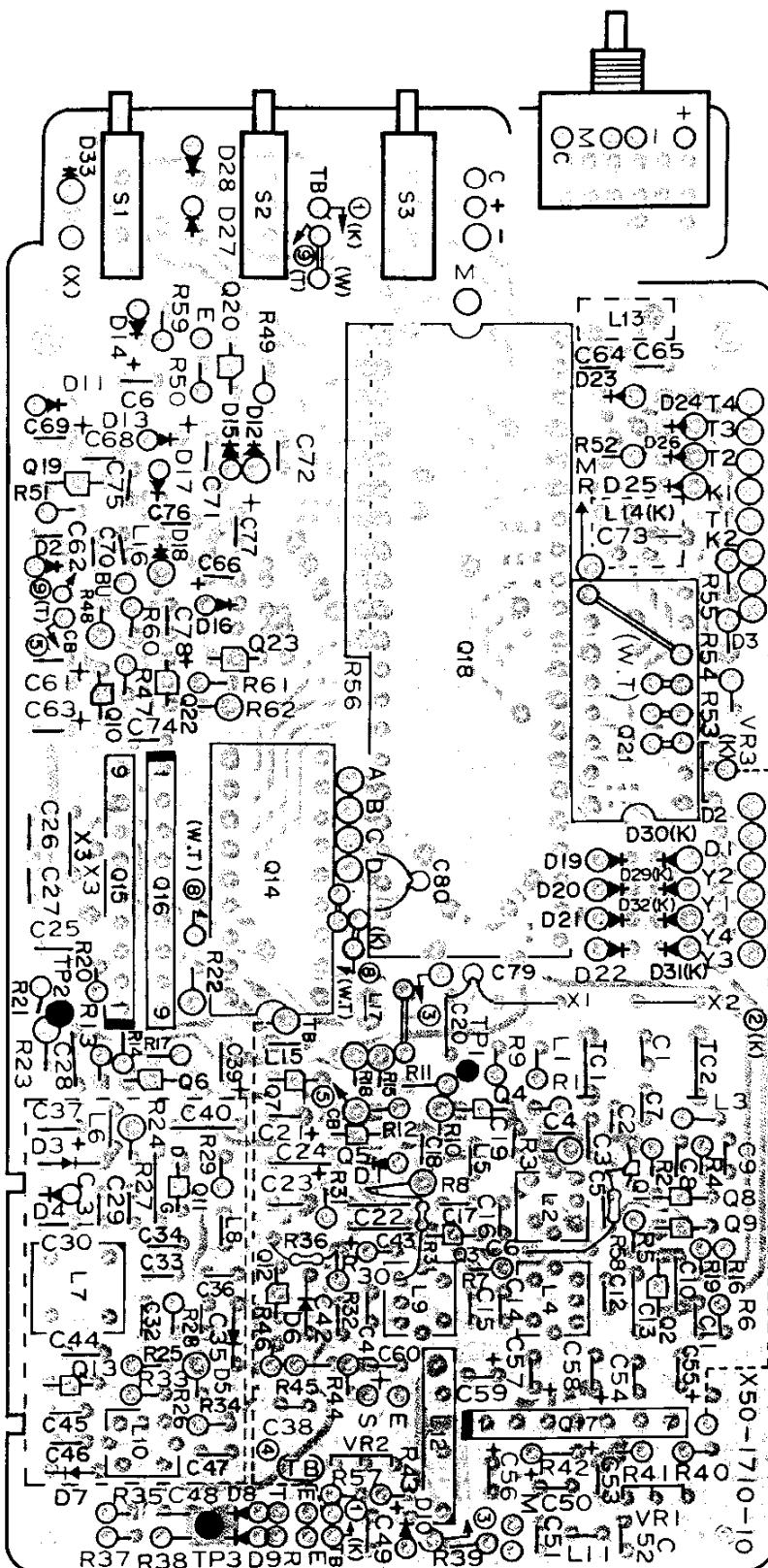
www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

PRINTED CIRCUIT BOARD

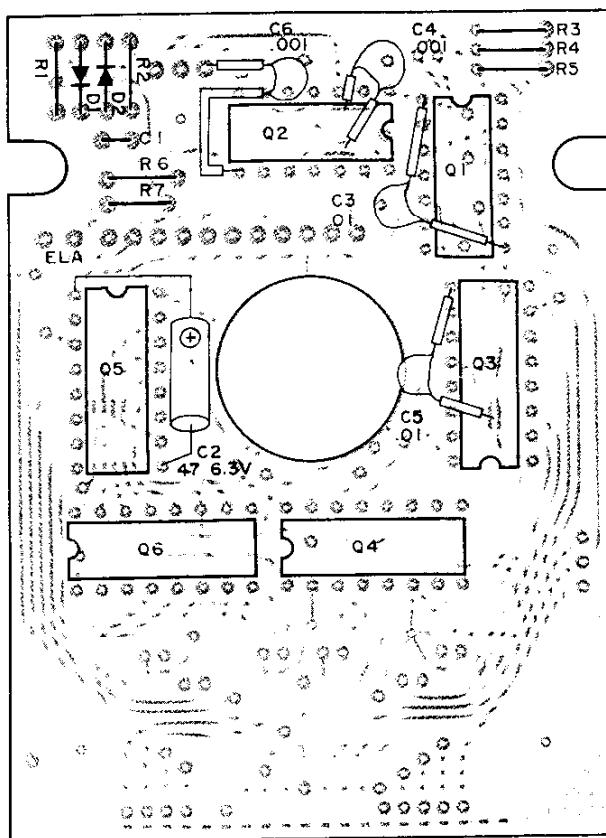
▼ PLL unit (X50-1710-XX) XX: 10(K), 51(T), 61(W)
 (View from component side) from S/N 109XXXX~



Q1,2	: 2SC2669(Y)
Q3,12,13	: 2SC2668(Y)
Q4~10,19,20,23	: 2SC2603(E)
Q11	: 2SK192(GR)
Q14	: TC9122P
Q15	: TC5081P
Q16	: TC5082P
Q17	: TA7061AP
Q18	: μPD651C-017
Q21	: MK5087N (K)
Q22	: 2SA1115 (E)
D1,2	: XZ-066
D3,6,7	: 1S2208
D4,8,9	: 1S2588
D5	: 1SV50S
D10	: XZ-088 (K)
D10	: XZ-070 (W)(T)
D11	: XZ-060
D12~16	: 1S1555
D17~28,33	: 1N60
D29~32	: 1N60 (K)

PRINTED CIRCUIT BOARD / LCD DATA

▼ DISPLAY unit (X54-1480-10) (View from foil side)



LCD F2025-30 (Display unit V1)

Max rating (Absolute max. rating)

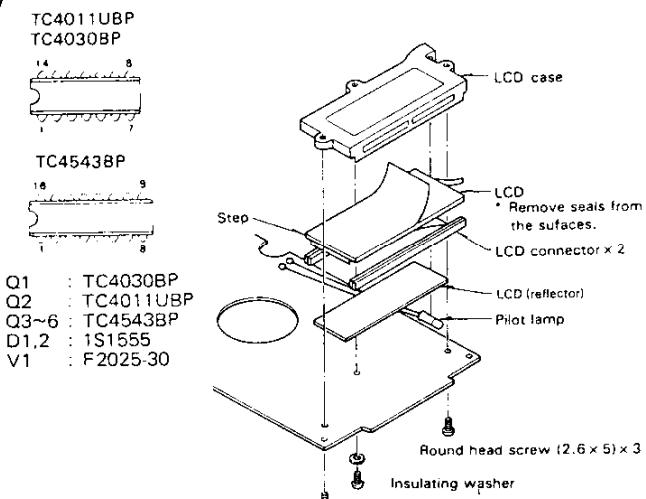
Item	Symbol	Min.	Max.	Unit
Storage temperature	T_{stg}	-20	60	°C
Operation temperature	T_{op}	-20	50	°C
Applied voltage	V_{op}		10	V
Allowable DC voltage			25	mV

Recommendable operating condition

Item	Symbol	Min.	Norm.	Max.	Unit
Operating voltage	V_{op}	3	5	5.5	V
Operating frequency	f_{op}	30	32	35	Hz
Operating temperature	T_{op}	-5	25	50	°C

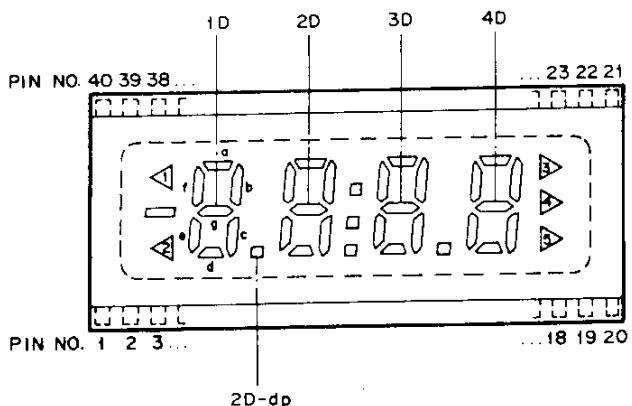
Notes on operation

- Excessive force will damage the package.
If the liquid crystal leaks due to damage to the package, do not touch it. If the liquid crystal gets on your skin, wipe it off with alcohol and wash with water.
- Do not store or operate at high temperature or humidity.
- If it is exposed to direct sunlight, use the ultraviolet ray cut filter (cut-off frequency: approx. 460 mm).
- Do not apply a DC voltage as far as possible. (A DC voltage can be applied for only 1 minute.)



Pin connection

Pin No.	Segment	Pin No.	Segment
1	Common	21	Delta-3
2	Minus	22	4D-b
3	Delta-2	23	4D-a
4	1D-e	24	4D-f
5	1D-d	25	4D-g
6	1D-c	26	3D-b
7	2D-dp.	27	3D-a
8	2D-e	28	3D-f
9	2D-d	29	3D-g
10	2D-c	30	Colon
11	3D-dp.	31	2D-b
12	3D-e	32	2D-a
13	3D-d	33	2D-f
14	3D-c	34	2D-g
15	4D-dp.	35	1D-b
16	4D-e	36	1D-a
17	4D-d	37	1D-f
18	4D-c	38	1D-g
19	Delta-5	39	Delta-1
20	Delta-4	40	Common



PARTS LIST

Note 1:
K USA T. Britain W Europe X Australia

Note 2:

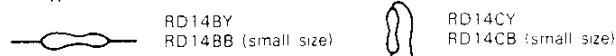
Only special type of resistors (example cement, metal film, etc) and capacitors (example electrolytic, tantalum, mylar, temp. coeff., capacitors) are detailed in the PARTS LIST. For the value of all common type components, refer to the schematic diagram of the PC board illustration. Resistors not otherwise detailed are carbon type (1/4W or 1/8W). Order carbon resistors and capacitors according to the following example.

A carbon resistor's part number is RD14BY 2E222J

A ceramic capacitor's number is CK45FH103Z. CC45TH1H220J

RESISTOR

1. Type of the carbon resistor



2. Wattage

1W → 3A 3W → 3F 5W → 3H
2W → 3D 4W → 3G

3' = CC45 ○ ○ ...

Ceramic capacitor (type II) temperature coeff. capacitor 1' 3'

1st word (Color)	C (Black)	L (Red)	P (Orange)	R (Yellow)	S (Green)	T (Blue)	U (Violet)
ppm/°C	0	-80	-150	-220	-330	-470	-750

3 = CK45 ○

Ceramic capacitor (type II) 3

Cord	B	D	E	F
Operating temperature °C	-30 +85	-30 +85	-30 +85	-10 +70

6 = Tolerance

Cord	C	D	G	J	K	M	X	Z	P	No cord
(%)	±0.25	±0.5	±2	±5	±10	±20	+40 -20	+80 -20	+100 -0	More than 10 μF -10 ~ +50 Less than 4.7 μF -10 ~ +75

Less than 10 pF

Cord	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

Abbreviation		Abbreviation	
Cap.	Capacitor	ML	Mylar
C	Ceramic	S	Styren
E	Electrolytic	T	Tantalum
MC	Mica		

3. Resistance value

② ② ② → means $22 \times 10^2 = 2200\Omega$ (2.2 kΩ)
Example 221 → 220Ω 223 → 22 kΩ 225 → 2.2 MΩ
222 → 2.2 kΩ 224 → 220 kΩ

4. Tolerance

J = ±5% (Gold) K = ±10% (Silver)

CAPACITORS

Type I

CC	45	TH	1H	220	J	CK	45	F	1H	103	Z
1'	2	3'	4	5	6	1	2	3	4	5	6

1 = Type ceramic, electrolytic, etc 4 = Voltage rating

2 = Shape round, square, etc 5 = Value

3 = Temp range 6 = Tolerance

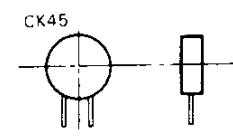
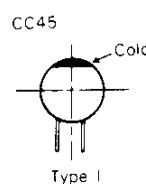
3' = Temp coefficient

Ex. CC45TH = -470 ±60 ppm/°C

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

5 = Capacitor value

Example 010 → 1 pF
100 → 10 pF
101 → 100 pF
102 → 1000 pF = 0.001 μF
103 → 0.01 μF



TR-2400 SEMICONDUCTOR

☆: New parts

Item	Name	Parts No.	Re-marks
Diode	1N60	V11-0051-05	
	1S1555	V11-0076-05	
	1S2588	V11-0414-05	
	MI301	V11-0255-05	
Vari-Cap diode	1S2208	V11-0317-05	
	1SV50S	V11-1260-36	
Zener diode	WZ-071	V11-4160-86	
	XZ-055	V11-4173-16	
	XZ-060	V11-4101-20	
	XZ-066	V11-4173-06	
	XZ-070	V11-4161-96	
	XZ-080	V11-4163-46	
	XZ-086	V11-4163-36	
	XZ-088	V11-4163-56	
LCD	F2025-30	V11-3172-86	☆

Item	Name	Parts No.	Re-marks
FET	2SA562TM(Y)	V01-0562-16	
	2SA1115(E)	V01-1115-16	☆
	2SC2026(K)	V03-2026-16	
	2SC2053	V03-2053-06	
	2SC2212	V03-2212-06	
	2SC2329(K)	V03-2329-16	
	2SC2603(E)	V03-2603-06	
	2SC2668(Y)	V03-2668-16	☆
	2SC2669(Y)	V03-2669-16	☆
	2SK192(GR)	V09-1016-06	☆
IC	AFG05F1750A1	V30-1141-06	☆
	H8D1152E	V30-1137-06	☆
	H8D1154E	V30-1138-06	☆
	H8D1252	V30-1139-06	☆

PARTS LIST

Item	Name	Parts No.	Re-marks
IC	M51182L MK5087N	V30-1140-06 V30-1074-06	
	TA7061AP	V30-0039-05	
	TC4002BP TC4011UBP TC4030BP	V30-0521-10 V30-1144-06 V30-1143-06	☆

Item	Name	Parts No.	Re-marks
	TC40174BP	V30-1145-06	
	TC4543BP	V30-1142-06	
	TC5081P	V30-1132-06	
	TC5082P	V30-1015-16	
	TC9122P	V30-1036-16	
	μPD651C-013	V30-1146-06	☆
	μPD651C-017	V30-1162-06	☆

○: from S/N 006XXXX~010XXXX

○: from S/N 011XXXX~108XXXX

●: from S/N 109XXXX~

Ref. No.	Parts No.	Description	Re-marks
GENERAL ☆: New Parts			
—	A02-0607-02	Case (Front)	☆
—	A02-0608-02	Case (Rear)	☆
—	A21-0731-14	Ornamental panel (K type)	☆
—	A21-0734-14	Ornamental panel (W type)	☆
—	A21-0735-14	Ornamental panel (T type)	☆
—	A53-0301-03	Cover ass'y (Battery case)	☆
—	B03-0514-04	Switch mask × 3 (Push switch)	☆
—	B10-0626-04	Front glass	☆
—	B40-2494-24	Name plate (K type)	☆
—	B40-2496-14	Name plate (W type)	☆
—	B40-2497-04	Name plate (T type)	☆
—	B42-1677-04	Name plate (Key board) (K type)	☆
—	B42-1678-04	Name plate (Key board) (W, T type)	☆
—	B42-1679-14	Name plate (LCD)	☆
—	B43-0631-14	Badge (K, W type)	☆
—	B43-0634-14	Badge (T type)	☆
—	B46-0058-10	Warranty card (K type)	☆
—	B50-2689-10	Operating manual (K type)	☆
—	B50-2690-10	Operating manual (W type)	☆
—	B50-2691-10	Operating manual (T type)	☆
—	B58-0622-00	Warning plate	☆
—	E04-0251-05	BNC Receptacle	
—	E12-0001-05	Plug (Microphone)	
—	E12-0401-05	Plug (Stand-by)	
—	E31-2047-05	Cable with plug (Battery)	☆
—	F10-1267-04	Magnetic shield	☆
—	F15-0628-04	Shadow mask	☆
—	F15-0629-04	Jack mask (A)	☆
—	F15-0630-04	Jack mask (B)	☆
—	F20-0513-04	Insulating sheet (PLL U.—RX-TX U.)	☆
—	G01-0810-04	Coil spring (PTT)	☆
—	G02-0514-24	Earth spring	☆
—	G02-0527-04	Earth spring (8) LCD	☆
—	G13-0625-04	Sponge A (Speaker)	☆
—	G13-0626-04	Sponge B (Microphone)	☆
—	G13-0627-04	Sponge C (Cover)	☆
—	H01-2656-03	Carton case (K, W type)	☆
—	H01-2657-03	Carton case (T type)	☆
—	H10-2530-02	Packing fixture A	☆
—	H10-2531-04	Packing fixture B	☆
—	H10-2533-04	Cushion	☆
—	H20-1416-03	Protective cover	☆
—	H25-0049-03	Accessory bag	☆
—	J19-1331-03	Battery case	
—	J32-0740-04	Boss A (large) × 4	☆
—	J32-0741-04	Boss B (Small) × 2	☆

Ref. No.	Parts No.	Description	Re-marks
—	J32-0742-04	Boss C (Hand strap)	☆
—	J32-0743-04	Boss D	☆
—	J42-0424-04	Cap for DC jack	☆
—	J69-0301-03	Hand strap ass'y	☆
—	J69-0302-04	Both-side adhesive sheet	
—	K23-0730-04	Knob A (POWER, SQ.) × 2	☆
—	K23-0731-04	Knob B (TX-OFFSET)	☆
—	K27-0411-04	Push knob (SCAN, TONE, REV.) × 3	☆
—	K29-0730-04	Lever (PTT)	☆
—	N08-0504-04	Ornamental screw (Frame)	☆
—	N09-0616-04	Flat head screw (Key board) × 4	☆
—	N16-0026-46	Spring washer × 3	
—	N30-2004-41	Round head screw (Panel) × 3	
—	N30-2604-41	Round head screw (Case A, PTT) × 7	
—	N30-3008-45	Round head screw (Case B) × 2	
—	N30-3025-45	Round head screw (Case B) × 2	
—	N87-2005-46	Tap tight screw (Display unit) × 4	
—	R05-3409-15	Variable resistor 10kΩ (B) (VOL)	☆
—	R05-4403-05	Variable resistor 50kΩ (SQ.)	
—	S59-0402-05	Key board ass'y (K type)	☆ ○
—	S59-0403-05	Key board ass'y (W, T type)	☆ ○
—	S59-0404-05	Key board ass'y (K)	☆
—	S59-0405-05	Key board ass'y (W, T)	☆
—	T07-0206-05	Speaker	☆
—	T18-0051-05	Earphone	☆
—	T90-0311-05	Helical antenna	☆
—	T91-0312-05	Condenser microphone	☆
—	W09-0306-05	Nickel-Cadmium Battery pack	☆
—	W09-0307-15	Battery charger (K type)	☆
—	W09-0308-05	Battery charger (W type)	☆
—	W09-0309-05	Battery charger (T type)	☆
—	X44-1330-10	TX-RX UNIT (K type)	○ ☆ ○
—	X44-1330-51	TX-RX UNIT (T type)	○ ☆ ○
—	X44-1330-61	TX-RX UNIT (W type)	○ ☆ ○
—	X44-1420-10	TX-RX UNIT (K type)	●
—	X44-1420-51	TX-RX UNIT (T type)	●
—	X44-1420-61	TX-RX UNIT (W type)	●
—	X50-1640-10	PLL UNIT (K type)	○ ○
—	X50-1640-51	PLL UNIT (T type)	○ ○
—	X50-1640-61	PLL UNIT (W type)	○ ○
—	X50-1660-10	PLL UNIT (K)	○ ○
—	X50-1660-51	PLL UNIT (T)	○ ○
—	X50-1660-61	PLL UNIT (W)	○ ○
—	X50-1710-10	PLL UNIT (K type)	●
—	X50-1710-51	PLL UNIT (T type)	●
—	X50-1710-61	PLL UNIT (W type)	●
—	X54-1480-10	DISPLAY UNIT	●

FOR SERVICE MANUALS

CONTACT:

MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

PARTS LIST

Ref. No.	Parts No.	Description			Re-marks	Ref. No.	Parts No.	Description			Re-marks
TX・RX UNIT (X44-1330-XX) XX: 10(K), 51(T), 61(W)											
C1	CC45TH1H0700	C	7pF	± 0.5pF		C71	C91-0462-05	Cap.	0.0047μF		☆
C2	CC45CH1H010C	C	1pF	± 0.25pF		C72	CC45CH1H220J	C	22pF	± 5%	☆
C3	CC45TH1H070D	C	7pF	± 0.5pF		C73	C91-0462-05	Cap.	0.0047μF		☆
C4	CC45SL1H101J	C	100pF	± 5%		C74, 75	CK45B1H102K	C	1000pF	± 10%	☆
C5, 6	CK45B1H102K	C	1000pF	± 10%		C76	C91-0462-05	Cap.	0.0047μF		☆
C7	C91-0462-05	Cap.	0.0047μF	☆		C77	CC45SL1H390J	C	39pF	± 5%	
C8	Not used					C78	CC45TH1H050C	C	5pF	± 0.25pF	
C9	CC45TH1H070D	C	7pF	± 0.5pF		C79	C91-0462-05	Cap.	0.0047μF	☆	
C10	CC45CH1H220J	C	22pF	± 5%		C80	CC45CH1H220J	C	27pF	± 5%	
C11	CC45CH1H0R5C	C	0.5pF	± 0.25pF		C81	CK45B1H102K	C	1000pF	± 10%	
C12	CC45TH1H070D	C	7pF	± 0.5pF		C82	CS15E1A330M	T	33μF	10V	
C13	CC45SL1H101J	C	100pF	± 5%		C83	CK45B1H102K	C	1000pF	± 10% (W,T)	
C14	C91-0462-05	Cap.	0.0047μF	☆		C84	CE04W1C220M	E	22μF	16V (W,T)	
C15	CC45CH1H0R5C	C	0.5pF	± 0.25pF		C85	CS15E1E010M	T	1μF	25V (W,T)	
C16	CC45TH1H070D	C	7pF	± 0.5pF		C86	CK45B1H102K	C	1000pF	± 10% (W,T)	
C17	CC45CH1H070D	C	7pF	± 0.5pF		C87	CS15E1E010M	T	1μF	25V (W,T)	
C18	C91-0462-05	Cap.	0.0047μF	☆		C88	CE04W1C220M	E	22μF	16V (W)	
C19	CC45CH1H070D	C	7pF	± 0.5pF		C88	CE04W1HR47M	E	0.47μF	50V (T)	
C20	C91-0462-05	Cap.	0.0047μF	☆		C89	CK45B1H102K	C	1000pF	± 10% (W)	
C21	CC45CH1H030C	C	3pF	± 0.25pF		C90	CS15E1C150M	T	15μF	16V (T)	
C22	CC45SL1H101J	C	100pF	± 5%		C91	CK45B1H102K	C	1000pF	± 10% (T)	
C23	CQ92M1H103K	ML	0.01μF	± 10%		C92	CS15E1A150M	T	15μF	10V (T)	
C24	Not used					C93	Not used				
C25	C91-0462-05	Cap.	0.0047μF	☆		C94	C91-0462-05	Cap.	0.0047μF		☆
C26	CK45B1H471K	C	470pF	± 10%		C95~97	CK45B1H102K	C	1000pF	± 10%	
C27	CK45B1H102K	C	1000pF	± 10%		C98	CC45SL1H470J	C	47pF	± 5% (W,T)	
C28	CS15E1C220M	T	22μF	16V		C99	CC45SL1H101J	C	100pF	± 5% (K)	
C29	C91-0462-05	Cap.	0.0047μF	☆		TC1	C05-0309-05	Ceramic trimmer 40pF			
C30	CQ92M1H332K	ML	3300pF	± 10%		TC2	C05-0067-05	Ceramic trimmer 25pF			
C31	CQ92M1H222K	ML	2200pF	± 10%		TC3	C05-0309-05	Ceramic trimmer 40pF			
C32	CE04W1HR47M	E	0.47μF	50V		J1	E03-0203-05	DC jack			☆
C33	CQ92M1H333K	ML	0.033μF	± 10%		J2	E11-0408-05	MIC jack			☆
C34	CQ92M1H153K	ML	0.015μF	± 10%		J3, 4	E11-0407-05	Earphone jack			☆
C35	CQ92M1H102K	ML	1000pF	± 10%		—	F01-0745-04	Heat sink			☆
C36	CQ92M1H222K	ML	2200pF	± 10%		—	F10-1242-14	RX shield plate			☆
C37	CE04W1A470M	E	47μF	10V		—	F10-1243-14	DRIVE shield plate			☆
C38	CS15E1A470M	T	47μF	10V		—	F10-1244-14	IC shield plate			☆
C39	CS15E1C4R7M	T	4.7μF	16V		—	F10-1245-04	TX shield plate			☆
C40	CS15E1E3R3M	T	3.3μF	25V		—	F10-1251-04	IF shield plate			☆
C41	CK45B1H102K	C	1000pF	± 10%		L1, 2	L31-0347-05	Tuning coil			
C42	CS15E1C4R7M	T	4.7μF	16V		L3	L40-2292-01	Ferrri-inductor 2.2μH			
C43	CE04W1C101M	E	100μF	16V		L4~6	L31-0347-05	Tuning coil			
C44	CE04W1H010M	E	1μF	50V		L7, 8	L34-0891-05	Tuning coil			
C45	CQ92M1H103K	ML	0.01μF	± 10%		L9	L72-0318-05	Ceramic filter CFG455F			☆
C46	C91-0457-05	Cap.	0.022μF			L10	L79-0446-05	Ceramic discriminator CFY455S			
C47	Not used					L11	L40-1021-03	Ferrri-inductor 1mH			
C48	CS15E1C220M	T	22μF	16V		L12	L40-6825-04	Ferrri-inductor 6.8mH			
C49	C91-0472-05	Cap.	0.1μF	± 10%		L13	L40-1021-03	Ferrri-inductor 1mH			
C50	CQ92M1H222K	ML	2200pF	± 10%		L14	L34-0894-05	Coil 3Φ5T			☆
C51	CQ92M1H392K	ML	3900pF	± 10%		L15	L34-0893-05	Coil 3Φ4T			☆
C52	CS15E1A470M	T	47μF	10V		L16	L34-0894-05	Coil 3Φ5T			☆
C53	CK45B1H102K	C	1000pF	± 10%		L17	L34-0892-05	Coil 2Φ10T			☆
C54	CE04W1C100M	E	10μF	16V		L18	L34-0893-05	Coil 3Φ4T			☆
C55	C91-0462-05	Cap.	0.0047μF	☆		L19, 20	L34-0895-05	Coil 3Φ6T			
C56	CE04W1C220M	E	22μF	16V		L21	L33-0632-05	Choke coil			
C57	CC45SL1H220J	C	22pF	± 5%		L22	L19-0321-05	Transformer (wide band)			☆
C58	CC45SL1H390J	C	39pF	± 5%		L23	L34-0897-05	Tuning coil			☆
C59	CC45SL1H220J	C	22pF	± 5%		L24	L71-0217-05	Monolithic filter 10T15A			
C60	CC45SL1H150J	C	15pF	± 5%		L25	L33-0002-05	Choke coil			
C61	CK45B1H102K	C	1000pF	± 10%		L26	L72-0014-05	Ceramic filter SFE10.7MA5			
C62	CC45CH1H150J	C	15pF	± 5%		L27	L33-0632-05	Choke coil			
C63	CC45SL1H220J	C	22pF	± 5%		X1	L77-0863-05	Quartz crystal 10.245MHz			☆
C64	C91-0462-05	Cap.	0.0047μF	☆				Special round head screw M1×8			☆
C65	CK45B1H102K	C	1000pF	± 10%				Special nut M1			☆
C66	CC45CH1H220J	C	22pF	± 5%							
C67	CK45B1H102K	C	1000pF	± 10%							
C68	CC45CH1H050C	C	5pF	± 0.25pF							
C69	CK45B1H102K	C	1000pF	± 10%							
C70	C90-0825-05	E	22μF	16V	☆						

PARTS LIST

Ref. No.	Parts No.	Description			Re-marks	Ref. No.	Parts No.	Description			Re-marks
VR1	R12-3423-05	Semi-fixed resistor	22kΩ(H)		☆	C60	CC45SL1H150J	C	15pF	±5%	
VR2	R12-3426-05	Semi-fixed resistor	30kΩ		☆	C61	CK45B1H102K	C	0.001μF	±10%	
	S50-1405-05	Micro-switch			☆	C62	CC45CH1H150J	C	15pF	±5%	
TX.RX UNIT (X44-1420-XX) XX: 10 (K), 51(T), 61(W)											
C1	CC45TH1H070D	C	7pF	±0.5pF		C63	CC45SL1H220J	C	22pF	±5%	
C2	CC45CH1H010C	C	1pF	±0.25pF		C64	C91-0462-05	Cap.	0.0047μF		
C3	CC45TH1H070D	C	7pF	±0.5pF		C65	CK45B1H102K	C	0.001μF	±10%	
C4	CC45SL1H101J	C	100pF	±5%		C66	CC45CH1H220J	C	22pF	±5%	
C5.6	CK45B1H102K	C	0.001μF	±10%		C67	CK45B1H102K	C	0.001μF	±10%	
C7.8	C91-0462-05	Cap.	0.0047μF			C68	CC45CH1H050C	C	5pF	±0.25pF	
C9	CC45TH1H070D	C	7pF	±0.5pF		C69	CK45B1H102K	C	0.001μF	±10%	
C10	CC45CH1H220J	C	22pF	±5%		C70	C90-0825-05	E	22μF	16V	
C11	CC45CH1H0R5C	C	0.5pF	±0.25pF		C71	C91-0462-05	Cap.	0.0047μF		
C12	CC45TH1H070D	C	7pF	±0.5pF		C72	CC45CH1H220J	C	22pF	±5%	
C13	CC45SL1H101J	C	100pF	±5%		C73	C91-0462-05	Cap.	0.0047μF		
C14	C91-0462-05	Cap.	0.0047μF			C74.75	CK45B1H102K	C	0.001μF	±10%	
C15	CC45CH1H0R5C	C	0.5pF	±0.25pF		C76	C91-0462-05	Cap.	0.0047μF		
C16	CC45TH1H070D	C	7pF	±0.5pF		C77	CC45SL1H390J	C	39pF	±5%	
C17	CC45CH1H070D	C	7pF	±0.5pF		C78	CC45TH1H050C	C	5pF	±0.25pF	
C18	C91-0462-05	Cap.	0.0047μF			C79	C91-0462-05	Cap.	0.0047μF		
C19	CK45B1H681K	C	680pF	±10%		C80	CC45CH1H270J	C	27pF	±5%	
C20	C91-0462-05	Cap.	0.0047μF			C81	CK45B1H102K	C	0.001μF	±10%	
C21	CC45CH1H040C	C	4pF	±0.25pF		C82	CS15E1A330M	T	33μF	10V	
C22	CC45CH1H220J	C	22pF	±5%		C83	CK45B1H102K	C	0.001μF	±10% (T) (W)	
C23	CK45B1H102K	C	0.001μF	±10%		C84	CE04W1C220Q	E	22μF	16V (T) (W)	
C24	CK45B1H471K	C	470pF	±10%		C85	CS15E1E010M	T	1μF	25V (T) (W)	
C25	C91-0462-05	Cap.	0.0047μF			C86	CK45B1H102K	C	0.001μF	±10% (T) (W)	
C26	CK45B1H471K	C	470pF	±10%		C87	CS15E1E010M	T	1μF	25V (T) (W)	
C27	CK45B1H102K	C	0.001μF	±10%		C88	CE04W1HR47Q	E	0.47μF	50V (T)	
C28	CS15E1C220M	T	22μF	16V		C88	CE04W1C220Q	E	22μF	16V (W)	
C29	C91-0462-05	Cap.	0.0047μF			C89	CK45B1H102K	C	0.001μF	±10% (W)	
C30	CQ92M1H392K	M	0.0039μF	±10%		C90	CS15E1C150M	T	15μF	16V (T)	
C31	CQ92M1H222K	M	0.0022μF	±10%		C91	CK45B1H102K	C	0.001μF	±10% (T)	
C32	CE04W1HR47Q	E	0.47μF	50V		C92	CS15E1A150M	T	15μF	10V (T)	
C33	C91-0473-05	Cap.	0.033μF	±10%	☆	C94	C91-0462-05	Cap.	0.0047μF		
C34	CQ92M1H153K	M	0.015μF	±10%		C95~97	CK45B1H102K	C	0.001μF	±10%	
C35	CQ92M1H102K	M	0.001μF	±10%		C98	CC45SL1H470J	C	47pF	±5% (T) (W)	
C36	CQ92M1H222K	M	0.0022μF	±10%		C99	CC45SL1H101J	C	100pF	±5% (K)	
C37	CE04W1A470Q	E	47μF	10V		TC1	C05-0309-05		Ceramic trimmer	40pF	
C38	CS15E1A470M	T	47μF	10V		TC2	C05-0067-05		Ceramic trimmer	25pF	
C39	CS15E1C4R7M	T	4.7μF	16V		TC3	C05-0309-05		Ceramic trimmer	40pF	
C40	CS15E1E3R3M	T	3.3μF	25V		J1	E03-0155-05		DC jack		
C41	CK45B1H102K	C	0.001μF	±10%		J2	E11-0408-05		MIC jack		
C42	CS15E1C4R7M	T	4.7μF	16V		J3.4	E11-0407-05		Earphone jack		☆
C43	CE04W1C101Q	E	100μF	16V		F01-0745-04		Heat sink			
C44	CE04W1H010Q	E	1μF	50V		F10-1242-14		RX shield plate			
C45	C91-0473-05	Cap.	0.033μF	±10%	☆	F10-1243-14		Drive shield plate			
C46	C91-0457-05	Cap.	0.022μF			F10-1244-14		IC shield plate			
C47	C91-0462-05	Cap.	0.0047μF			F10-1245-04		TX shield plate			
C48	CS15E1C150M	T	15μF	16V		F10-1251-04		IF shield plate			
C49	C91-0472-05	Cap.	0.1μF	±10%		L1.2	L31-0347-05		Tuning coil		
C50	CQ92M1H222K	M	0.0022μF	±10%		L3	L40-2292-01		Ferrи-inductor 2.2μH		
C51	CQ92M1H392K	M	0.0039μF	±10%		L4~6	L31-0347-05		Tuning coil		
C52	CS15E1A470M	T	47μF	10V		L7	L34-0891-05		Tuning coil		
C53	CK45B1H102K	C	0.001μF	±10%		L9	L72-0316-05		Ceramic filter CFW455E		
C54	CE04W1C100Q	E	10μF	16V		L10	L79-0446-05		Ceramic discri CFY455S		
C55	C91-0462-05	Cap.	0.0047μF			L11	L40-1021-03		Ferrи-inductor 1mH		
C56	C90-0825-05	E	22μF	16V		L12	L40-6825-04		Ferrи-inductor 6.8mH		
C57	CC45SL1H220J	C	22pF	±5%		L13	L40-1021-03		Ferrи-inductor 1mH		
C58	CC45SL1H390J	C	39pF	±5%		L14	L34-0894-05		Coil	3φ5T	
C59	CC45SL1H220J	C	22pF	±5%		L15	L34-0893-05		Coil	3φ4T	
						L16	L34-0894-05		Coil	3φ5T	
						L17	L34-0892-05		Coil	2φ10T	

PARTS LIST

Ref. No.	Parts No.	Description	Re-marks
L18	L34-0893-05	Coil	3φ4T
L19,20	L34-0895-05	Coil	3φ6T
L21	L33-0632-05	Choke coil	
L22	L19-0321-05	Transformer (wide band)	
L23	L34-0897-05	Tuning coil	
L24	L71-0226-05	Monolithic filter 10T15B	☆
L25	L33-0002-05	Choke coil	
L27	L33-0632-05	Choke coil	
X1	L77-0863-05	Crystal	10.245MHz
	N09-0615-05	Round screw	M1 × 8
	N14-0514-05	Nut	M1
	N30-2004-41	Round screw	
	N30-2604-41	Round screw	
VR1	R12-3423-05	Trim. pot.	22kΩ (B)
VR2	R12-3426-05	Trim. pot.	30kΩ (T) (W)
	S50-1405-05	Micro-switch	

PLL UNIT (X50-1640-XX) XX: 10(K), 51(T), 61(W)

C1	CC45CH1H100D	C	10pF ± 0.5pF	
C2	CC45CH1H070D	C	7pF ± 0.5pF	
C3	CC45CH1H220J	C	22pF ± 5%	
C4	CC45CH1H180J	C	18pF ± 5%	
C5,6	CC45CH1H030C	C	3pF ± 0.25pF	
C7	CC45CH1H220J	C	22pF ± 5%	
C8	CC45TH1H080D	C	8pF ± 0.5pF	
C9	CS15E1VR47M	T	0.47μF 35V	
C10	CK45F1H103Z	C	0.01μF +80%, -20%	
C11	CC45TH1H050C	C	5pF ± 0.25pF	
C12	CK45F1H103Z	C	0.01μF +80%, -20%	
C13	CC45CH1H220J	C	22pF ± 5%	
C14,15	CC45CH1H050C	C	5pF ± 0.25pF	
C16,17	CC45CH1H030C	C	3pF ± 0.25pF	
C18	CC45SL1H101J	C	100pF ± 5%	
C19	C90-0246-05	Cap.	0.01μF ± 10%	
C20	CS15E1A150M	T	15μF 10V	
C21	CK45F1H103Z	C	0.01μF +80%, -20%	
C22	CE04W1A330Q	E	33μF 10V	
C23	CQ92M1H472K	ML	4700pF 50V	
C24	CS15E1C1R5M	T	1.5μF 16V	
C25	CC45CH1H120J	C	12pF ± 5%	
C26	CC45TH1H060D	C	6pF ± 0.5pF	
C27	CC45CH1H020C	C	2pF ± 0.25pF	
C28	CC45CH1H010C	C	1pF ± 0.25pF	
C29	CC45CH1H080D	C	8pF ± 0.5pF	
C30	CC45CH1H030C	C	3pF ± 0.25pF	
C31	CC45CH1H050C	C	5pF ± 0.25pF	
C32	CK45F1H103Z	C	0.01μF +80%, -20%	
C33	CE04W1C100Q	E	10μF 16V	
C34	CC45CH1H030C	C	3pF ± 0.25pF	
C35	CC45TH1H080D	C	8pF ± 0.5pF	
C36	CC45TH1H010C	C	1pF ± 0.25pF	
C37	CK45F1H103Z	C	0.01μF +80%, -20%	
C38	CE04W1A470Q	E	47μF 10V	
C39,40	CS15E1V0R1M	T	0.1μF 35V	
C41	CE04W1A470Q	E	47μF 10V	
C42	CE04W1E4R7Q	E	4.7μF 25V	
C43	CE04W1C100Q	E	10μF 16V	
C44	CE04W1A330Q	E	33μF 10V	
C45	CK45B1H102K	C	1000pF ± 10%	
C46	CE04W1A470Q	E	47μF 10V	
C47	CS15E1V0R1M	T	0.1μF 35V	
C48,49	CK45B1H102K	C	1000pF ± 10%	
C50	CS15E1V0R1M	T	0.1μF 35V	
C51	CC45CH1H050C	C	5pF ± 0.25pF	
C52	CK45B1H102K	C	1000pF ± 10%	
C53	CC45TH1H080D	C	8pF ± 0.5pF	

Ref. No.	Parts No.	Description			Re-marks
C54	CC45TH1H010C	C	1pF ± 0.25pF		
C55	CC45CH1H330J	C	33pF ± 5%		
C56	C90-0821-05	T	(Non Polar) 4.7μF 3.15V		
C57	CC45CH1H180J	C	18pF ± 5%		
C58	CC45CH1H330J	C	33pF ± 5%		
C59	CEO4W1C100Q	E	10μF 16V		
C60	CEO4W1HR47Q	E	0.47μF 50V		
C61	C90-0822-05	E	47μF 16V		☆
C62	C91-0462-05	Cap	0.0047μF		☆
C63	CS15E1VR33M	T	0.33μF 35V		
C64	CS15E0J470M	T	47μF 6.3V		
C65	CE04W1E4R7Q	E	4.7μF 25V		
C66	CS15E1VR68M	T	0.68μF 35V		
C67,68	CK45B1H102K	C	1000pF ± 10%		
C69	CC45CH1H050C	C	5pF ± 0.25pF		
C70	CC45SL1H121J	C	120pF ± 5%		
C71	CC45CH1H330J	C	33pF ± 5%		
C72	CE04W1C330Q	E	33μF 16V		
C73	CC45SL1H101J	C	100pF ± 5%		
C74	CE04W1C330Q	E	33μF 16V		
C75	CC45CH1H120J	C	12pF ± 5%		

TC1,2	C05-0303-05	Trimmer	20pF	
—	F10-1246-14	PLL shield plate		☆
—	F11-0765-04	VCO shield plate		☆
L1,2	L33-0605-05	Choke coil 4.7μH		
L3,4	L34-0890-05	Tuning coil		☆
L5	L40-1501-03	Ferri-inductor 15μH		
L6	L40-1092-01	Ferri-inductor 1μH		
L7	L32-0625-05	VCO coil		☆
L8	L40-1092-01	Ferri-inductor 1μH		
L9	L34-0890-05	Tuning coil		☆
L10	L40-1021-03	Ferri-inductor 1mH		
L11	L34-0890-05	Tuning coil		☆
L12	L78-0004-05	Ceramic oscillator 397KHz		☆
L13	L78-0003-05	Ceramic oscillator 3.58MHz (K)		☆
L14	L79-0458-05	Spurious filter AFL13F3500B1		☆
L15,16	L40-1001-01	Ferri-inductor 10μH		
X1	L77-0860-05	Quartz crystal 42.6MHz		☆
X2	L77-0861-05	Quartz crystal 46.1666MHz		☆
X3	L77-0862-05	Quartz crystal 10.240MHz		☆
R64	R90-0527-05	Resistor block 470K × 10		☆
VR1	R12-3422-05	Trim. pot	20kΩ	☆
VR2	R12-2408-05	Trim. pot	5kΩ	☆
VR3	R12-3425-05	Trim. pot	10kΩ	☆
VR4	R12-2408-05	Trim. pot	5kΩ (K type)	☆
S1	S40-1401-05	Push switch SQUELCH		☆
S2	S40-1401-05	Push switch SUB TONE (K, T type)		☆
S2	S40-1402-05	Push switch (W type)		☆
S3	S40-1402-05	Push switch REVERSE		☆
—	S29-1416-05	Rotary switch TX OFFSET (K type)		☆
—	S29-1417-05	Rotary switch TX OFFSET (W, T type)		☆

PLL UNIT (X50-1660-XX) XX: 10(K), 51(T), 61(W)

C1	CC45CHIH100D	C	10pF ± 0.5pF	
C2	CC45CHIH220J	C	22pF ± 5%	
C3	CC45CHIH030C	C	3pF ± 0.25pF	
C4	CC45CHIH220J	C	22pF ± 5%	
C5	CC45THIH080D	C	8pF ± 0.5pF	
C6	CK45F1H103Z	C	0.01μF +80% -20%	
C7	CC45CHIH070C	C	7pF ± 0.5pF	
C8	CC45CHIH180J	C	18pF ± 5%	
C9	CC45CHIH030C	C	3pF ± 0.25pF	

FOR SERVICE MANUALS

CONTACT:

17

MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

PARTS LIST

Ref. No.	Parts No.	Description			Re-marks	Ref. No.	Parts No.	Description			Re-marks
C10	CC45CHIH120J	C	12pF	±5%		—	F10-1246-14	PLL Shield plate			
C11	CC45CHIH220J	C	22pF	±5%		—	F11-0765-04	VCO Shield case			
C12	CC45THIH050C	C	5pF	±0.25pF		L1	L33-0605-05	Choke coil 0.47μH			
C13	CK45FIH103Z	C	0.01μF	+80% -20%		L2	L34-0890-05	Tuning coil			
C14~16	CC45CHIH050C	C	5pF	±0.25pF		L3	L33-0605-05	Choke coil 0.47μH			
C17,18	CC45CH1H030C	C	3pF	±0.25pF		L4	L34-0890-05	Tuning coil			
C19	CC45SLIH101J	C	100pF	±5%		L5	L40-1501-03	Ferri-inductor 15μH			
C20	C90-0246-05	C	0.01μF	±10%		L6	L40-1092-01	Ferri-inductor 1μH			
C21	C90-0833-05	E	33μF	16V		L7	L32-0625-05	VCO coil			
C22	CS15E1A150M	T	15μF	10V		L8	L40-1092-01	Ferri-inductor 1μH			
C23	C90-0832-05	E	47μF	10V		L9,10	L34-0890-05	Tuning coil			
C24	CK45FIH103Z	C	0.01μF	+80% -20%		L11	L40-1021-03	Ferri-inductor 1mH			
C25	C90-0821-05	T	4.7μF	3.15V(Non polar)		L12	L79-0458-05	Spurious filter AFL13F 3500B1			
C26	CC45CH1H330J	C	33pF	±5%		L13	L78-0004-05	Ceramic oscillator 397kHz			
C27	CC45CH1H330J	C	33pF	±5%		L14	L78-0003-05	Ceramic oscillator 3.58 MHz (K)			
C28	CQ92MH1472K	ML	0.0047μF			L15	L40-1001-01	Ferri-inductor 10μH			
C29	CC45CHIH120J	C	12pF	±5%		L16	L40-4791-01	Ferri-inductor 4.7μH			
C30	CC45CHIH020C	C	2pF	±0.25pF		L17	L40-1001-01	Ferri-inductor 10μH			
C31	CC45THIH060D	C	6pF	±0.5pF		X1	L77-0860-05	Crystal 42.6MHz			
C32	CC45CHIH010C	C	1pF	±0.25pF		X2	L77-0861-05	Crystal 46.166MHz			
C33	CC45CHIH080D	C	8pF	±0.5pF		X3	L77-0862-05	Crystal 10.240MHz			
C34	CC45CHIH030C	C	3pF	±0.25pF		VR1	R12-2408-05	Trim. pot 5kΩ			
C35	CC45CHIH050C	C	5pF	±0.25pF		VR2	R12-3422-05	Trim. pot 20kΩ			
C36	CC45CHIH030C	C	3pF	±0.25pF		VR3	R12-2408-05	Trim. pot 5kΩ (K)			
C37	CS15E1EIR5M	T	1.5μF	25V		R56	R90-0527-05	Resistor block 470kΩ × 10			
C38	C90-0831-05	E	33μF	10V		—	R92-0150-05	Short jumper			
C39	C90-0830-05	E	10μF	16V		—	S29-1416-05	Rotary switch TX OFF SET (K)			
C40	CK45FIH103Z	C	0.01μF	+80% -20%		—	S29-1417-05	Rotary switch TX OFF SET (W) (T)			
C41	CC45THIH080D	C	8pF	±0.5pF		S1	S40-1401-05	Push switch BUSY			
C42	CC45THIH010C	C	1pF	±0.25pF		S2	S40-1401-05	Push switch TONE (K) (T)			
C43	CK45FIH103Z	C	0.01μF	+80% -20%		S2	S40-1402-05	Push switch TONE (W)			
C44	CC45CHIH050C	C	5pF	±0.25pF		S3	S40-1401-05	Push switch REVERSE			
C45	CC45THIH080D	C	8pF	±0.5pF		PLL UNIT (X50-1710-XX) XX: 10(K), 51(T), 61(W)					
C46	CC45THIH010C	C	1pF	±0.25pF		C1.79	CC45CH1H100D	C	10pF	±0.5pF	
C47	CK45BIH102K	C	0.001μF	±10%		C2	CC45CH1H220J	C	22pF	±5%	
C48	CC45CHIH330J	C	33pF	±5%		C3	CC45CH1H030C	C	3pF	±0.25pF	
C49	CE04W1A330Q	E	33μF	10V		C4	CC45CH1H220J	C	22pF	±5%	
C50	CS15E1VORIM	T	0.1μF	35V		C5	CC45THIH080D	C	8pF	±0.5pF	
C51,52	CK45BIH102K	C	0.001μF	±10%		C6	CK45FIH103Z	C	0.01μF	+80% -20%	
C53	CS15EIVORIM	T	0.1μF	35V		C7	CC45CH1H070D	C	7pF	±0.5pF	
C54	CK45BIH102K	C	0.001μF	±10%		C8	CC45CH1H180J	C	18pF	±5%	
C55,56	CE04W1A470Q	E	47μF	10V		C9	CC45CH1H030C	C	3pF	±0.25pF	
C57	CE04W1E4R7Q	E	4.7μF	25V		C10	CC45CH1H120J	C	12pF	±5%	
C58	CE04W1C100Q	E	10μF	16V		C11	CC45CH1H220J	C	22pF	±5%	
C59,60	CS15E1VOR1M	T	0.1μF	35V		C12	CC45THIH050C	C	5pF	±0.25pF	
C61	CE04W1C470Q	E	47μF	16V		C13	CK45FIH103Z	C	0.01μF	+80% -20%	
C62	C91-0462-05	Cap.	0.0047μF			C14~16	CC45CH1H050C	C	5pF	±0.25pF	
C63	CE04W1C100Q	E	10μF	16V		C17,18	CC45CH1H030C	C	3pF	±0.25pF	
C64	CC45CHIH330J	C	33pF	±5%		C19	CC45SLIH101J	C	100pF	±5%	
C65	CC45SLIH121J	C	120pF	±5%		C20	C90-0246-05	C	0.01μF	±10%	
C66	CS15E1VR33M	T	0.33μF	35V		C21	C90-0833-05	E	33μF	16V	
C67	CS15E1V100M	T	10μF	25V		C22	CS15E1A150M	T	15μF	10V	
C68	CS15E1VR47M	T	0.47μF	35V		C23	C90-0832-05	E	47μF	10V	
C69	CS15E1C4R7M	T	4.7μF	16V		C24	CK45FIH103Z	C	0.01μF	+80% -20%	
C70	CK45BIH102K	C	0.001μF	±10%		C25	C90-0821-05	Cap.	4.7μF	3.15V Non polar	
C71	CS15E1VR47M	T	0.47μF	35V							
C72	CK45B1H102K	C	0.001μF								
C73	CK45B1H102K	C	0.001μF (K)								
C74	CC45CH1H150J	C	15pF								
C75,76	CK45B1H102K	C	0.001μF								
C77	CS15E1C1R5M	T	1.5μF	16V							
TC1.2	C05-0303-05	Ceramic trimmer 20pF									

PARTS LIST

Ref. No.	Parts No.	Description			Re-marks	Ref. No.	Parts No.	Description			Re-marks
C26.27	CC45CH1H330J	C	33pF	±5%		L13	L78-0004-05	Ceramic oscillator	397kHz		
C28	CQ92M1H472K	ML	0.0047μF	±10%		L14	L78-0003-05	Ceramic oscillator	3.58MHz (K)		
C29	CC45CH1H120J	C	12pF	±5%		L15	L40-1001-01	Ferri-inductor	10μH		
C30	CC45CH1H020C	C	2pF	±0.25pF		L16	L40-4791-01	Ferri-inductor	4.7μH		
C31	CC45TH1H060D	C	6pF	±0.5pF		L17	L40-1001-01	Ferri-inductor	10φH		
C32	CC45CH1H010C	C	1pF	±0.25pF		X1	L77-0860-05	Crystal	42.6MHz		
C33	CC45CH1H080D	C	8pF	±0.5pF		X2	L77-0861-05	Crystal	46.1666MHz		
C34	CC45CH1H030C	C	3pF	±0.25pF		X3	L77-0862-05	Crystal	10.240MHz		
C35	CC45CH1H050C	C	5pF	±0.25pF		R56	R90-0527-05	Resistor block	470kΩ × 10		
C36	CC45CH1H030C	C	3pF	±0.25pF		VR1	R12-2408-05	Trim. pot.	5kΩ		
C37	CS15E1E1R5M	T	1.5μF	25V		VR2	R12-3422-05	Trim. pot.	20kΩ		
C38	C90-0831-05	E	33μF	10V		VR3	R12-2408-05	Trim. pot.	5kΩ (K)		
C39	C90-0830-05	E	10μF	16V		S29	S29-1416-05	Rotary switch TX OFFSET (K)			
C40	CK45F1H103Z	C	0.01μF	+80. -20%		S29	S29-1417-05	Rotary switch TX OFFSET (T) (W)			
C41	CC45TH1H080D	C	8pF	±0.5pF		S1	S40-1401-05	Push switch BUSY			
C42	CC45TH1H010C	C	1pF	±0.25pF		S2	S40-1401-05	Push switch TONE (K) (T)			
C43	CK45F1H103Z	C	0.01μF	+80. -20%		S2	S40-1402-05	Push switch TONE (W)			
C44	CC45CH1H050C	C	5pF	±0.25pF		S3	S40-1401-05	Push switch REVERSE			
C45	CC45TH1H080D	C	8pF	±0.5pF							
C46	CC45TH1H010C	C	1pF	±0.25pF							
C47	CK45B1H102K	C	0.001μF	±10%							
C48	CC45CH1H330J	C	33pF	±5%							
C49	CE04W1A330M	E	33μF	10V							
C50	CS15E1V0R1M	T	0.1μF	35V							
C51.52	CK45B1H102K	C	0.001μF	±10%							
C53	CS15E1V0R1M	T	0.1μF	35V							
C54	CK45B1H102K	C	0.001μF	±10%							
C55.56	CE04W1A470M	E	47μF	10V							
C57	CE04W1E4R7M	E	4.7μF	25V							
C58	CE04W1C100M	E	10μF	16V							
C59.60	CS15E1V0R1M	T	0.1μF	35V							
C61	CE04W1C470M	E	47μF	16V							
C62	C91-0462-05	Cap.	0.0047μF								
C63	CE04W1C100M	E	10μF	16V							
C64	CC45CH1H330J	C	33pF	±5%							
C65	CC45SL1H121J	C	120pF	±5%							
C66	CS15E1VR33M	T	0.33μF	35V							
C67	CS15E1A100M	T	10μF	10V							
C68	CS15E1VR47M	T	0.47μF	35V							
C69	C90-0482-05	E	4.7μF	25V							
C70	CK45B1H102K	C	0.001μF	±10%							
C71	CS15E1VR47M	T	0.47μF	35V							
C72	CK45B1H102K	C	0.001μF	±10%							
C73	CK45B1H102K	C	0.001μF	±10% (K)							
C74	CC45CH1H150J	C	15pF	±5%							
C75.76	CK45B1H102K	C	0.001μF	±10%							
C77	CS15E1C1R5M	T	1.5μF	16V							
C78	C90-0482-05	E	4.7μF	25V							
C80	CK45B1H102K	C	0.001μF	±10%							
TC1.2	C05-0303-05	Ceramic trimmer		20pF							
	F10-1246-14	PLL shield plate									
	F11-0765-04	VCO shield case									
L1	L33-0605-05	Choke coil	0.47μH								
L2	L34-0890-05	Tuning coil									
L3	L33-0605-05	Choke coil	0.47μH								
L4	L34-0890-05	Tuning coil									
L5	L40-1501-03	Ferri-inductor	15μH								
L6	L40-1092-01	Ferri-inductor	1μH								
L7	L32-0625-05	VCO coil									
L8	L40-1092-01	Ferri-inductor	1μH								
L9.10	L34-0890-05	Tuning coil									
L11	L40-1021-03	Ferri-inductor	1mH								
L12	L79-0458-05	Spurious filter AFL13F3500B1									

FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

PACKING

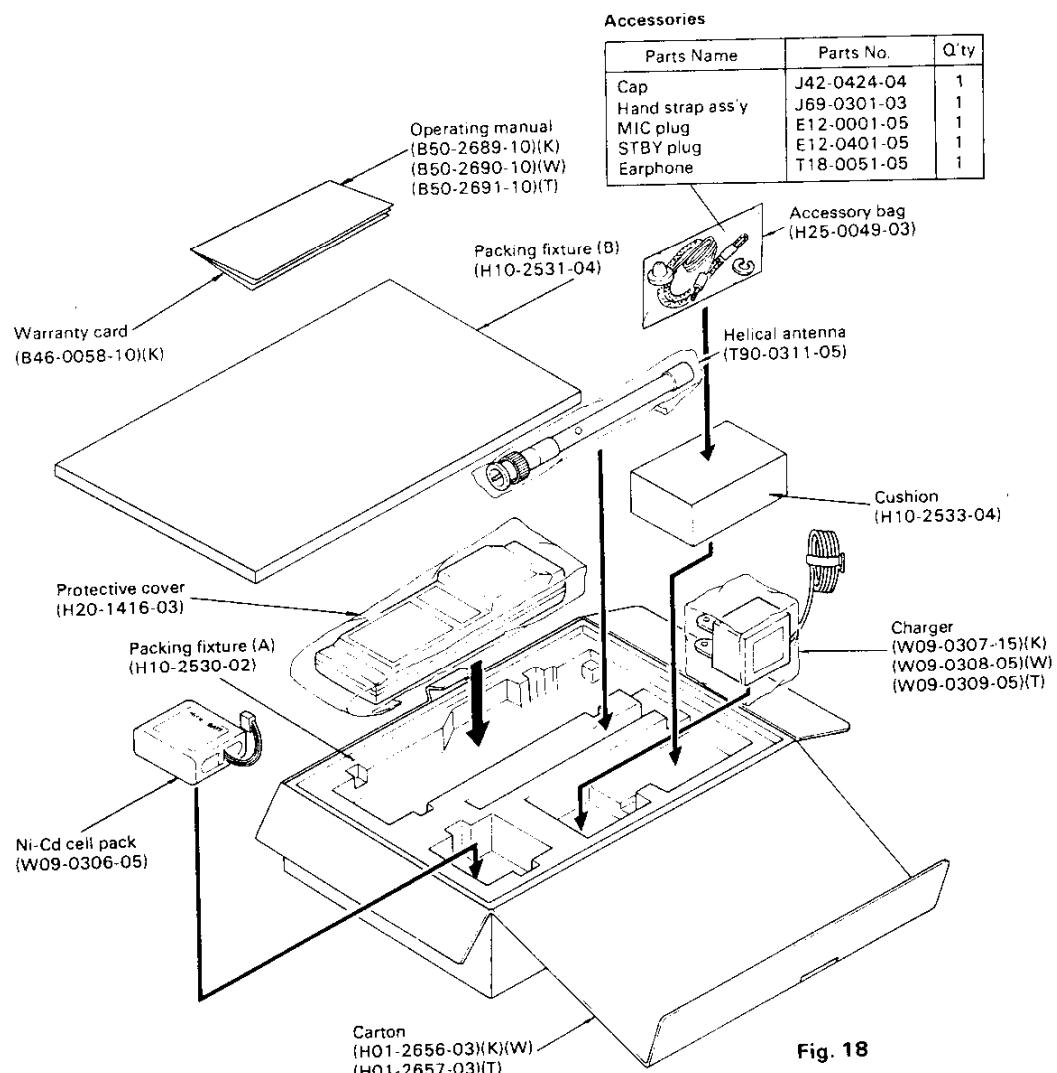


Fig. 18

FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

DISASSEMBLY

No.	Parts No.	Description
1	K29-0730-04	Frame
2	K29-0730-04	P.T.T lever
3	G01-0810-04	Coil spring
4	E04-0251-05	BNC Receptacle
5	E23-0513-05	Grounding lug
6	R05-3409-15	Variable resistor (AF VOL)
7	R05-4403-05	Variable resistor (SQ)
8	J19-1331-03	Battery case
9	E31-2047-05	Cable with plug (Battery)
10	S29-1416-05	Rotary switch (K type)
	S29-1417-05	Rotary switch (W, T type)
11	A21-0731-14	Ornamental panel (K type)
	A21-0734-14	Ornamental panel (W type)
	A21-0735-14	Ornamental panel (T type)
12	X44-1330-XX	TX.RX unit
	or X44-1420-XX	
13	A02-0607-02	Case (Front)
14	S59-0402-05	Key board ass'y (K type)
	or S59-0404-05	
	S59-0403-05	Key board ass'y (W, T type)
	or S59-0405-05	
15	T07-0206-05	Speaker
16	G13-0625-04	Sponge A
17	T91-0312-05	Condenser microphone
18	G13-0626-04	Sponge B
19	B10-0626-04	Front glass
20	X54-1480-10	Display unit
21	B42-1679-14	Name plate (LCD)
22	F15-0628-04	Shadow mask
23	F20-0513-04	Insulating sheet
24	X50-1640-XX, X50-1660-XX or X50-1710-XX	PLL unit
25	B03-0514-04	Switch mask
26	K27-0411-04	Push knob
27	K23-0730-04	Knob A
28	K23-0731-04	Knob B
29	A53-0301-03	Cover ass'y
30	A02-0608-02	Case (Rear)
31	B40-2494-14	Name plate (K type)
	B40-2496-04	Name plate (W type)
	B40-2497-04	Name plate (T type)
32	J69-0302-04	Both-side adhesive sheet
33	G13-0627-04	Sponge C
34	N08-0504-04	Ornamental screw
35	J32-0742-04	Boss C
36	J32-0743-04	Boss D
37	B43-0631-14	Badge (K, W type)
	B43-0634-04	Badge (T type)
38		Mylar tape
39	G02-0514-24	Earth spring
40	J32-0740-04	Boss A
41	J32-0741-04	Boss B
42	N30-3025-45	Screw 3 x 25
43	N30-3008-45	Screw 3 x 8
44		Both-side adhesive sheet
45	G02-0527-04	Earth spring (B)
46	F15-0629-04	Jack mask (A)
47	F15-0630-04	Jack mask (B)
48	J42-0424-04	Cap for DC jack
49		tape
50	F10-1267-04	magnetic shield
51		Double faced tape
52		Tape

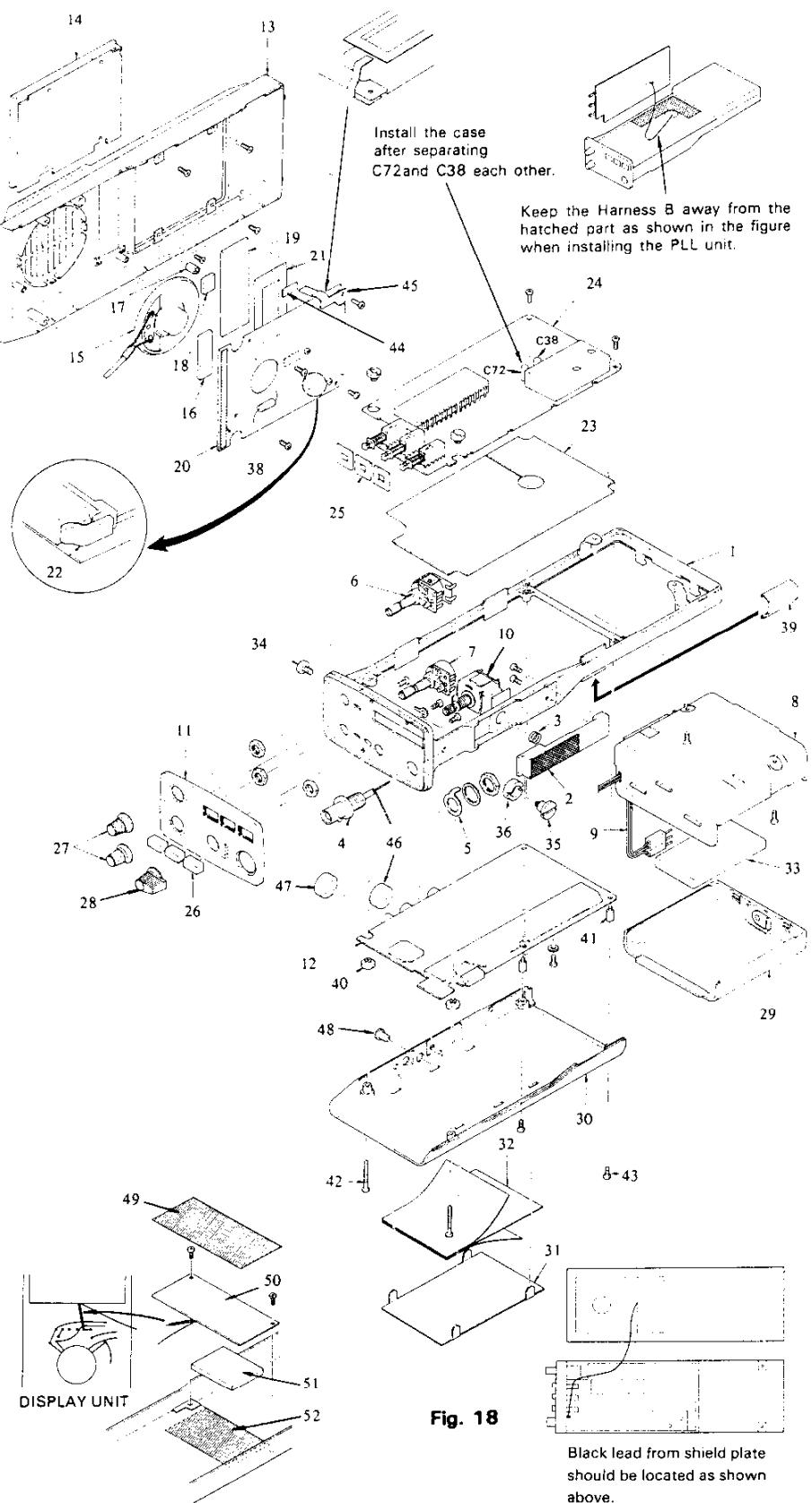


Fig. 18

Black lead from shield plate
should be located as shown
above.

μ PD651C-017 Terminal function (PLL unit X50-1660-XX, Q18)

Pin No.	Terminal Name	Input Signal	Output Signal	Description	Pulse
1	CL1			Clock signal 397 kHz	
2	PC0		○		at 145.000 MHz H
3	PC1		○		H
4	PC2		○		L
5	PC3		○		L
6	INT	○		H at transmit and receive, L at BACK UP ON	
7	RES	○		H for a moment at power ON with BACK UP OFF. Normally L	
8	PDO		○		at 145.000 MHz L
9	PD1		○		L
10	PD2		○		L
11	PD3		○		L
12	PE0		○		at 145.000 MHz L
13	PE1		○		L
14	PE2		○		L
15	PE3		○		L
16	PFO		○	BCD display output	○
17	PF1		○	Pulse output at receive	○
18	PF2		○	Only one cycle pulse output at transmit	○
19	PF3		○		○
20	TEST	○		DC 5V	
21	Vcc	○		DC 5V	
22	PG0		○	Key board line output	2nd line 4-5-6-MS
23	PG1		○		1st line 1-2-3-C
24	PG2		○		4th line ▼-0-▲-M
25	PG3		○		3rd line 7-8-9-MR
26	PH0		○	Digital display output	
27	PH1		○		
28	PH2		○		
29	PH3		○		
30	PIO		○	Key lock, Reverse, Squelch OPEN/BUSY output	
31	PI1		○	Repeater common output	
32	PI2		○	MR indication at H	
33	PA0	○		H } K type	L } T, W type
34	PA1	○		H }	H }
35	PA2	○		H at receive, L at transmit	
36	PA3	○		Hat squelch ON, L at scan stop	
37	PB0	○		Key board column input 1-4-7-▼	Repeater + input, reverse input
38	PB1	○		2-5-8-0	Repeater - input, key lock input
39	PB2	○		3-6-9-▲	
40	PB3	○		C-MS-MR-M	Repeater M input
41	Vss			GND	
42	CLO			Clock signal 397 kHz	

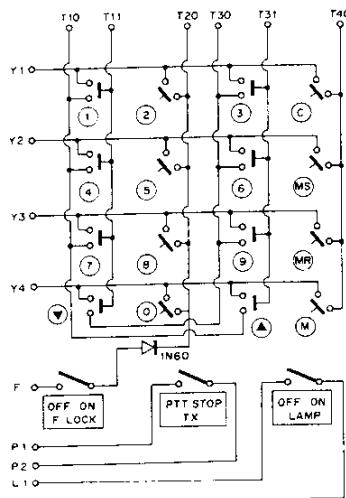
Key board ass'y (S59-0402-05)
(S59-0403-05)

Fig. 16

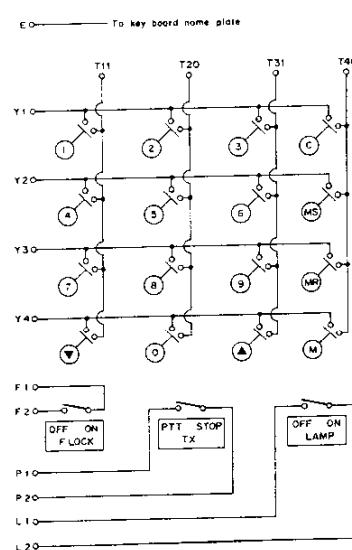
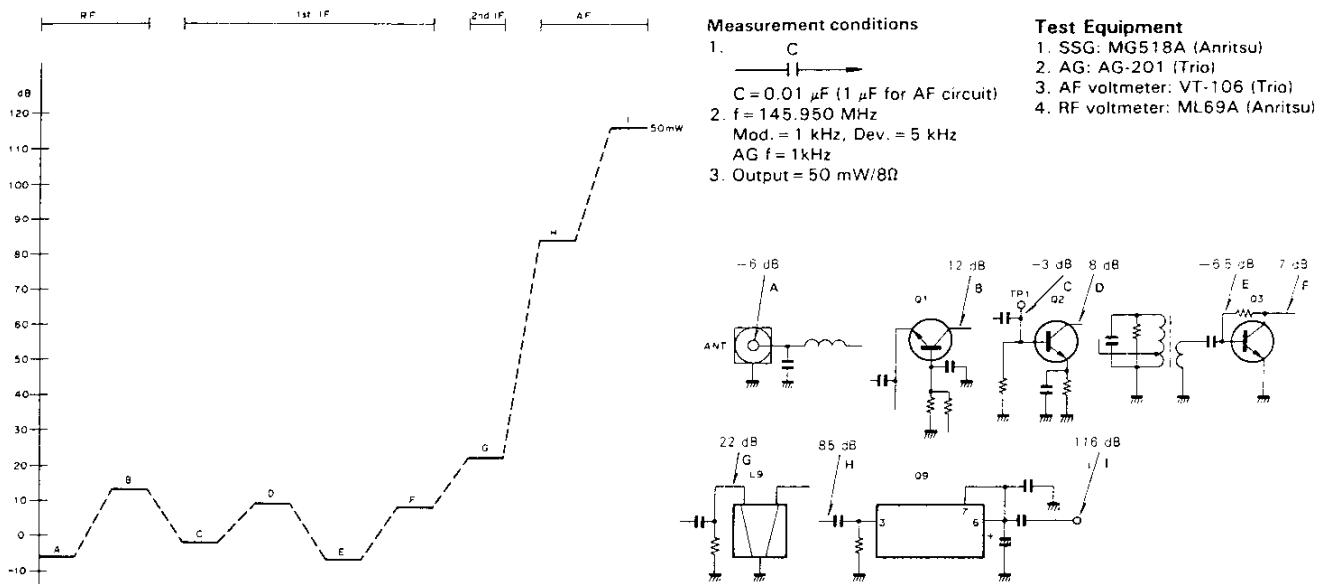
Key board ass'y
(S59-0404-05)
(S59-0405-05)

Fig. 17

LEVEL DIAGRAM

RX Section



TX section

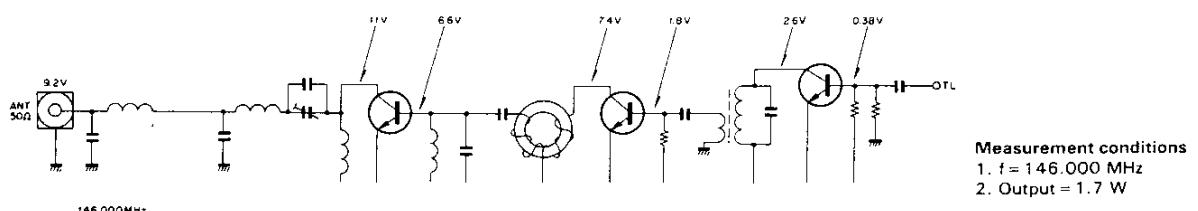


Fig. 19

ADJUSTMENT

TEST EQUIPMENT REQUIRED

1. RF VTVM

- Input impedance: 1MΩ min., 20pF max.
- Voltage range: 10 mV to 300 V
- Frequency range: 200 MHz min.

2. Power Meter

- Impedance: 50Ω
- Measuring range: 5W
- Frequency range: 150 MHz min.

3. DC Power Supply

- Voltage: Variable from 6V to 12V
- Current: 1 A min.

4. Linear Detector

5. Directional Coupler

6. Oscilloscope

With horizontal input terminal and high sensitivity.

7. Audio Voltmeter

- Frequency range: 50Hz to 10kHz
- Input impedance: More than 1 MΩ
- Voltage range: 3 mV to 30V

8. AF Oscillator

- Frequency range: 300 Hz to 5 kHz
- Output: 0.5 mV to 1 V

9. Frequency Counter

- Minimum input sensitivity: About 50mV
- Frequency range: 150 MHz min.

10. SSG (Standard Signal Generator)

- Capable of covering 144~148 MHz
- Capable of Frequency modulation.

11. DVM (Digital Voltmeter).

12. Audio Dummy Load.

- 8Ω, 5W (approx.)

ADJUSTMENT

BEFORE ADJUSTMENT

If you are making adjustments or repairs for the first time, or if you are not familiar with the proper way of handling the transceiver, read these instructions first before attempting adjustment or repair. It is necessary to keep the following in mind.

Alignment tools

- (1) When adjusting the trimmers or coils, use a non-inductive alignment tool made of delrin plastic, nylon, or ceramic material.
- (2) This transceiver uses miniature semi-fixed variable resistors. Use a flat blade screwdriver which correctly matches the part to be adjusted.

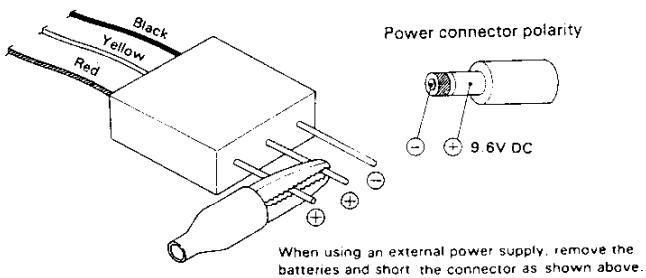


Fig. 20

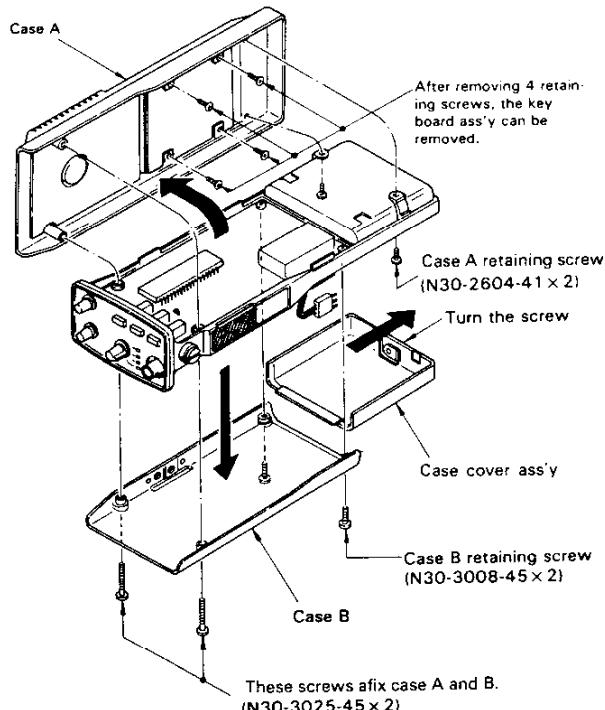


Fig. 21

Operation on External Power

When operating the transceiver on external power, connect the power cord to the CHARGE jack, making sure that the polarity is correct. Refer to Fig. 20.

RECEIVER UNIT INSPECTION AND ADJUSTMENT

Before inspection or adjustment, set the TX switch to the STOP position. Use an RF FUSE between the SSG output and transceiver input. The fuse will protect the generator against accidental transmitter damage.

★ The SSG output level as indicated is open circuit voltage.

1. Control and Switch Settings

Power Switch	ON
TX OFFSET Switch	BU OFF
Squelch Control	Minimum
BUSY/OPEN Switch	BUSY
S. TONE switch	OFF
REV/NORM Switch	NORM

2. Checking the Micro Processor

1) Power voltage

Check the following using a DVM.

- a. Voltage of 4.7~5.2V should be present at Q25 pin 21 (X50-1640-XX) or Q18 (X50-1660-XX, X50-1710-XX) on the PLL unit
- b. Voltage of 5~5.5 V should be present at C2 (+) on the indicator unit.
- c. With the PTT switch depressed, 9.6V should be present at the TB line on the PLL unit.

2) Turn the power switch ON and check that the indicator displays 5.000.

3) Key Board frequency entry.

- a. The 1st digit (MHz) of the indicator should be 4, 5, 6 or 7 (K type), or 4 or 5 (W, T type). No other figures should indicate.
- b. The 2nd digit (100 kHz) and 3rd digit (10 kHz) should indicate as entered by the numeral keys
- c. The 4th digit (1 kHz) should be 0 when the 0, 1, 2, 3 or 4 key is depressed, and should be 5 when the 5, 6, 7, 8 or 9 Key is depressed.
- d. The indicator should display 5.000 when the "C" key is depressed.
- e. The frequency display should advance 5 kHz each time the "▲" key is depressed. The display should continuously advance when this key is kept depressed.

* Over-range: The display should repeat between 3.900 and 8.495 (K type only).

- f. The indicator should count down the frequency as above when the "▼" key is depressed.
- g. With a given frequency displayed, press the M1~0 keys in order to check the memory function. The "◀" MR flag should appear at the conclusion of a memory input.

ADJUSTMENT

- h. The frequencies stored in memory should be displayed when the "MR" and 1~0 keys are pressed
 - * The frequency is displayed following the channel number. By pressing the "MR" key, the frequency display goes off and a channel number appears for about a second.
- i. The memories should be scanned when the "MS" key is pressed.
 - * When the "MS" key is pressed, MS can only be released by the "STOP" key. In the MS mode, key input is not possible.
- j. No key inputs are possible when the F. LOCK switch is ON.

3. PLL Unit Adjustment

1) PLL IF Adjustment

- a. Set the frequency to 6.000 (5.000 for W, T type) and connect an RF VTVM to TP1
- b. Adjust L3 (X50-1640-XX) or L2 (X50-1660-XX, X50-1710-XX) and L9 for maximum meter reading
- c. Transmit and adjust L4 for maximum reading

2) Setting of PLL Voltage

- a. Set the frequency to 4.000 and connect a digital voltmeter to TP2.
- b. Adjust L7 for 1.5V.
- c. Next, set the frequency to 7.995 and check that voltage is less than 4.5 V.
- d. Transmit and check that the voltage between the frequencies 4.000 to 7.995 is between 1~4.5 V.

3) Frequency adjustment

- a. Set the frequency to 6.000 and connect a frequency counter to TP3
- b. Adjust TC1 for 135.300 MHz
- c. Transmit and adjust TC2 for 146.000 MHz

4. Adjustment of Backup Circuit (X50-1640-XX)

- a. Set the TX OFFSET switch to the "S" position and connect a digital voltmeter to the Q25 pin 21.
- b. With the power switch set to OFF, adjust VR3 for 4.7 V

5. Transmitter Unit Adjustment

- a. Set the frequency to 146.000 MHz and connect a power meter to the antenna.
- b. With the transceiver in transmit mode, adjust L11 (X50-1640-XX) or L10 (X50-1660-XX, X50-1710-XX) in the PLL unit and L23 and TC2 in the TX-RX unit for maximum DC current consumption.
- c. Adjust TC1 and TC3 observing both the power meter and current consumption. Obtain maximum power output for minimum current.
The power should be more than 1.5W within the band

6. Modulator Adjustment

- a. Connect a linear detector to the unit.
- b. Set the frequency to 146.000 MHz and apply 35 mV at 1 kHz from the AG output through a 10 μ F/16V capacitor to the MIC terminal.
Transmit and adjust VR1 (X50-1640-XX) or VR2 (X50-1660-XX, X50-1710-XX) in the PLL unit for 4.5 kHz.
 - * Connect a capacitor of 10 μ F/16V between the MIC terminal and the AG output
- c. Decrease the AG output to 3.5 mV and adjust VR1 (X50-1640-XX) or VR2 (X50-1660-XX, X50-1710-XX) in the PLL unit for 3.5kHz deviation.
- d. Increase the AG output back to 35mV and check that deviation still indicates 4.5 kHz.
 - * Set the frequency to 144.000 MHz and 147.995 MHz and check that the maximum deviation is within 5 kHz
- e. Disconnect the AG and press the "C" key in transmit mode. Adjust VR4 (X50-1640-XX) or VR3 (X50-1660-XX, X50-1710-XX) in the PLL for 3 kHz deviation (K type only).
- f. Vary the power supply voltage between 8.1~11.5V, and check with the linear detector for abnormal oscillations

7. RX Unit Adjustment

- a. Connect the SSG (DEV: 5 kHz, MOD: 1 kHz) to the antenna terminal and a dummy load (8 ohms) to the EAR phone terminal.
Connect an AF VTVM and oscilloscope across the audio output.
- b. Receive a signal at 145.980 MHz and connect an RF VTVM to TP3 in the TX-RX unit. Set the SSG output to about 10 dB (2 μ V) and adjust L1, L2, L4, L5, L6, L7 and L8 for maximum.
- c. Reduce the SSG output to -6 dB (.25 μ V) and adjust L1 and L2 for maximum AF output.
- d. Check that the S/N ratio in-band is better than 28 dB at 1 μ V input.
- e. With the transceiver set to an empty channel, adjust the squelch control to 9 o'clock and adjust VR1 for noise threshold

FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

PARTS LAYOUT / REF. DATA

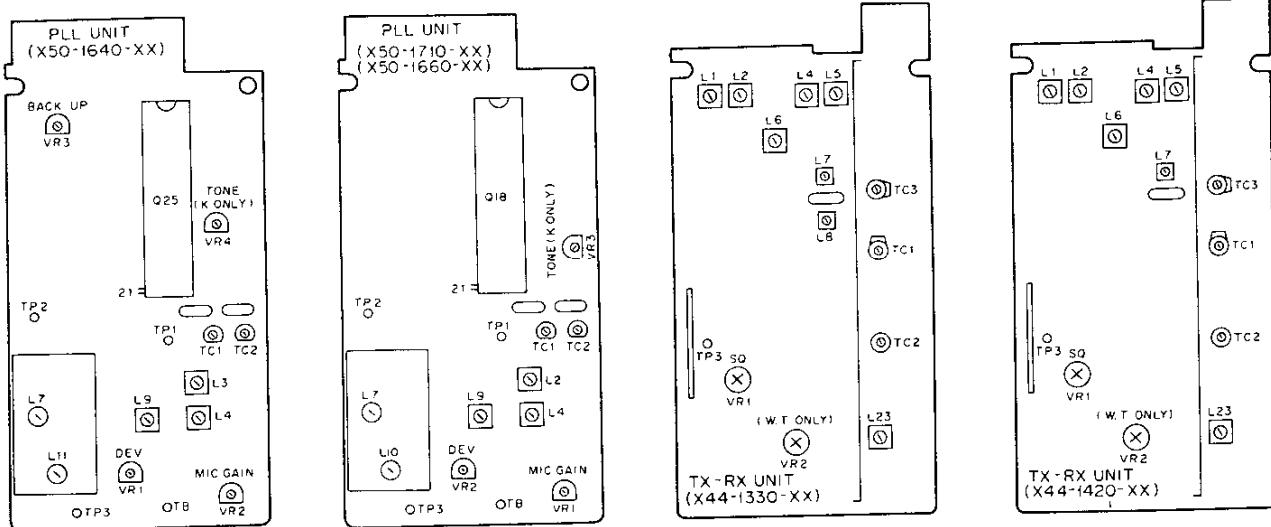


Fig. 22 Parts layout

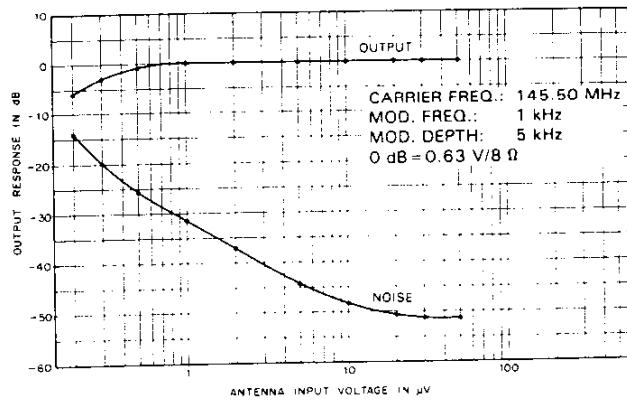


Fig. 23 Signal-to-noise ratio and output level vs antenna input

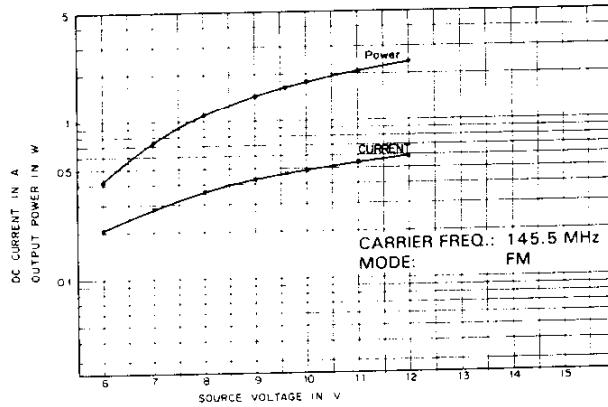
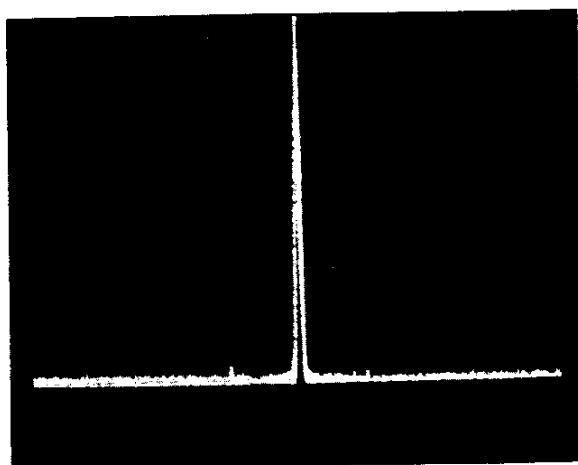
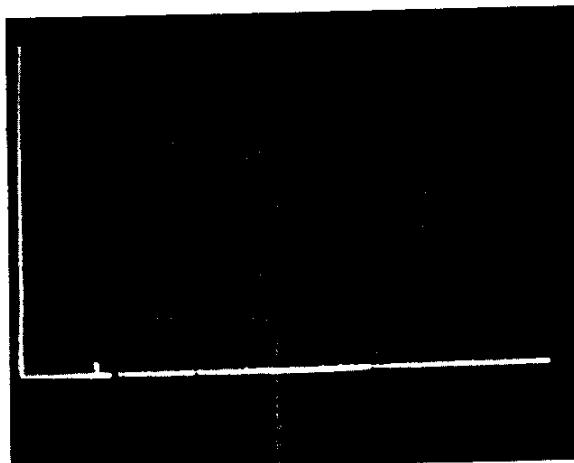


Fig. 24 Source voltage vs current drain and output power



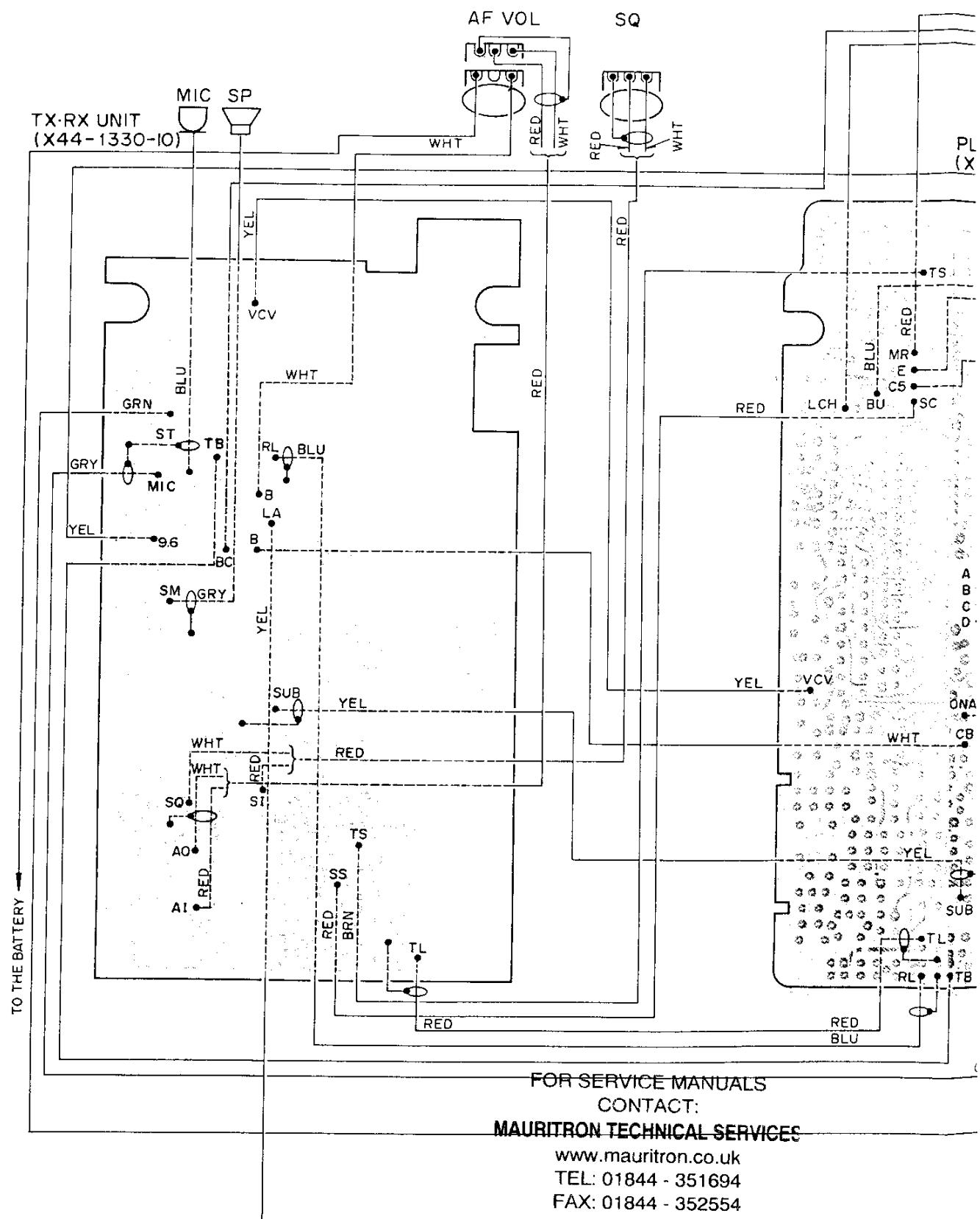
CARRIER FREQ.: 145.00 MHz
RF POWER: 1.5 W
SCAN WIDTH: 5 MHz/DIV
BAND WIDTH: 100 kHz
SCAN TIME: 0.1 SEC
VIDEO FILTER: 10 kHz

Fig. 25 (a) An example of adjacent spurious

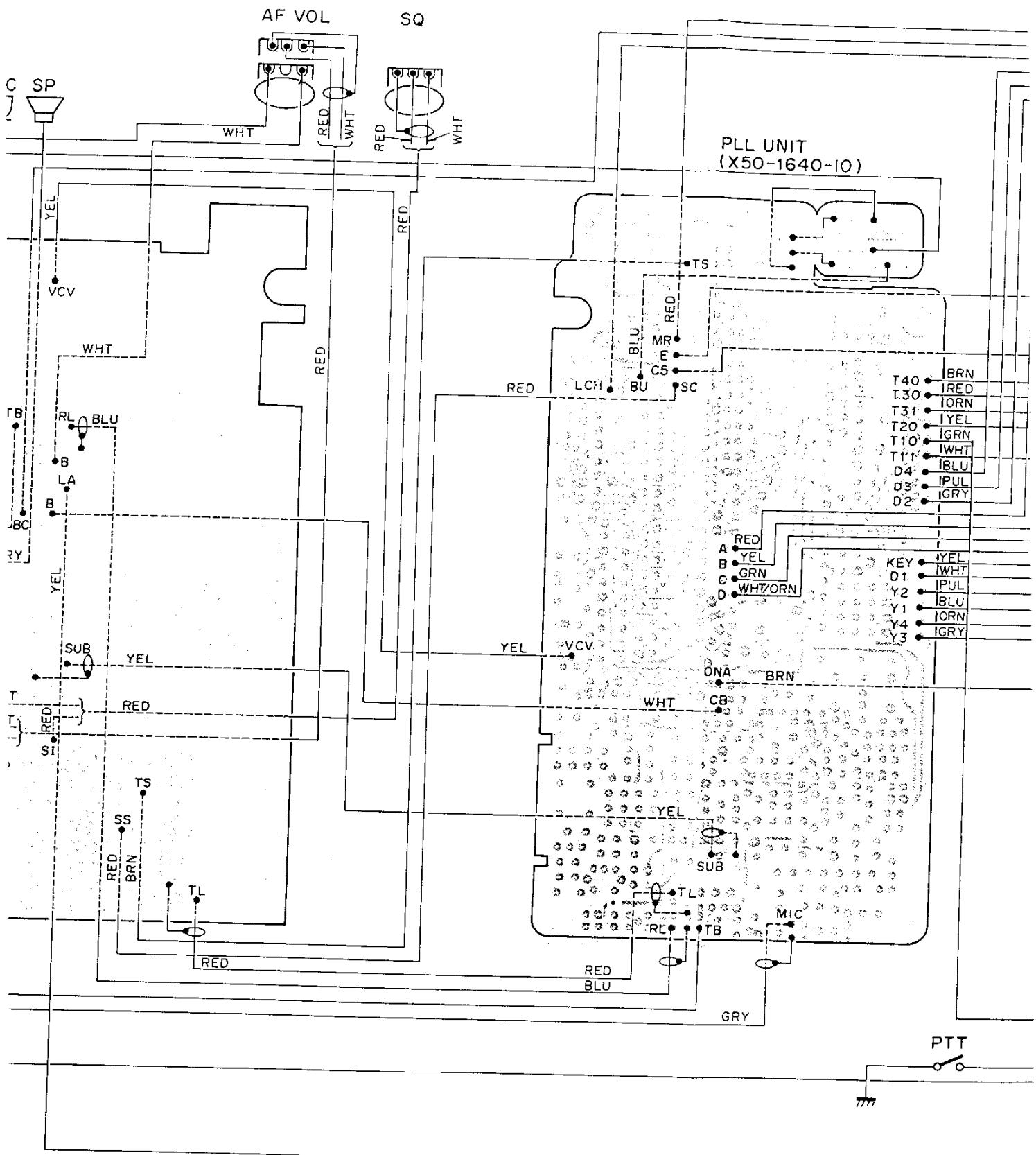


CARRIER FREQ.: 145.00 MHz
RF POWER: 1.5 W
SCAN WIDTH: 100 MHz/DIV
BAND WIDTH: 100 kHz
SCAN TIME: 10 SEC
VIDEO FILTER: 100 Hz

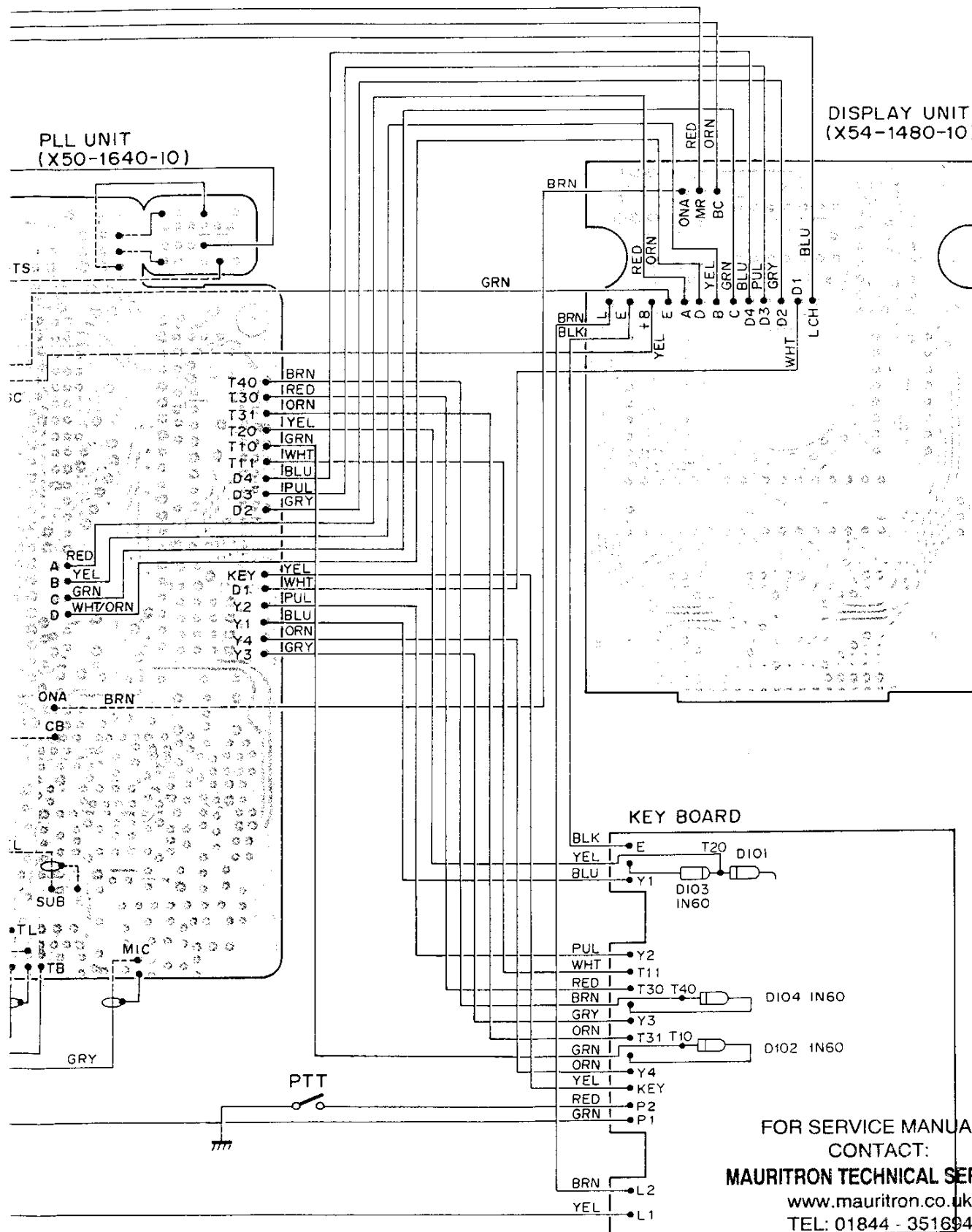
Fig. 25 (b) An example of harmonics spurious



WIRING DIAGRAM (K type) from S/N



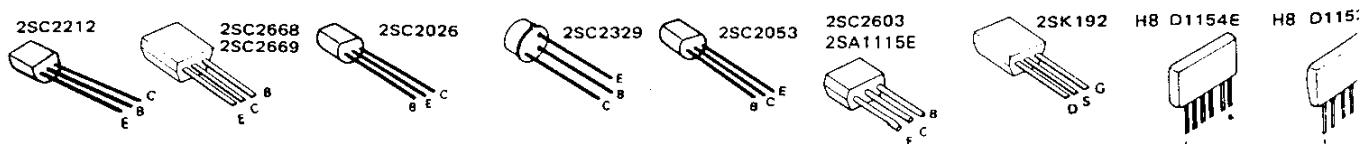
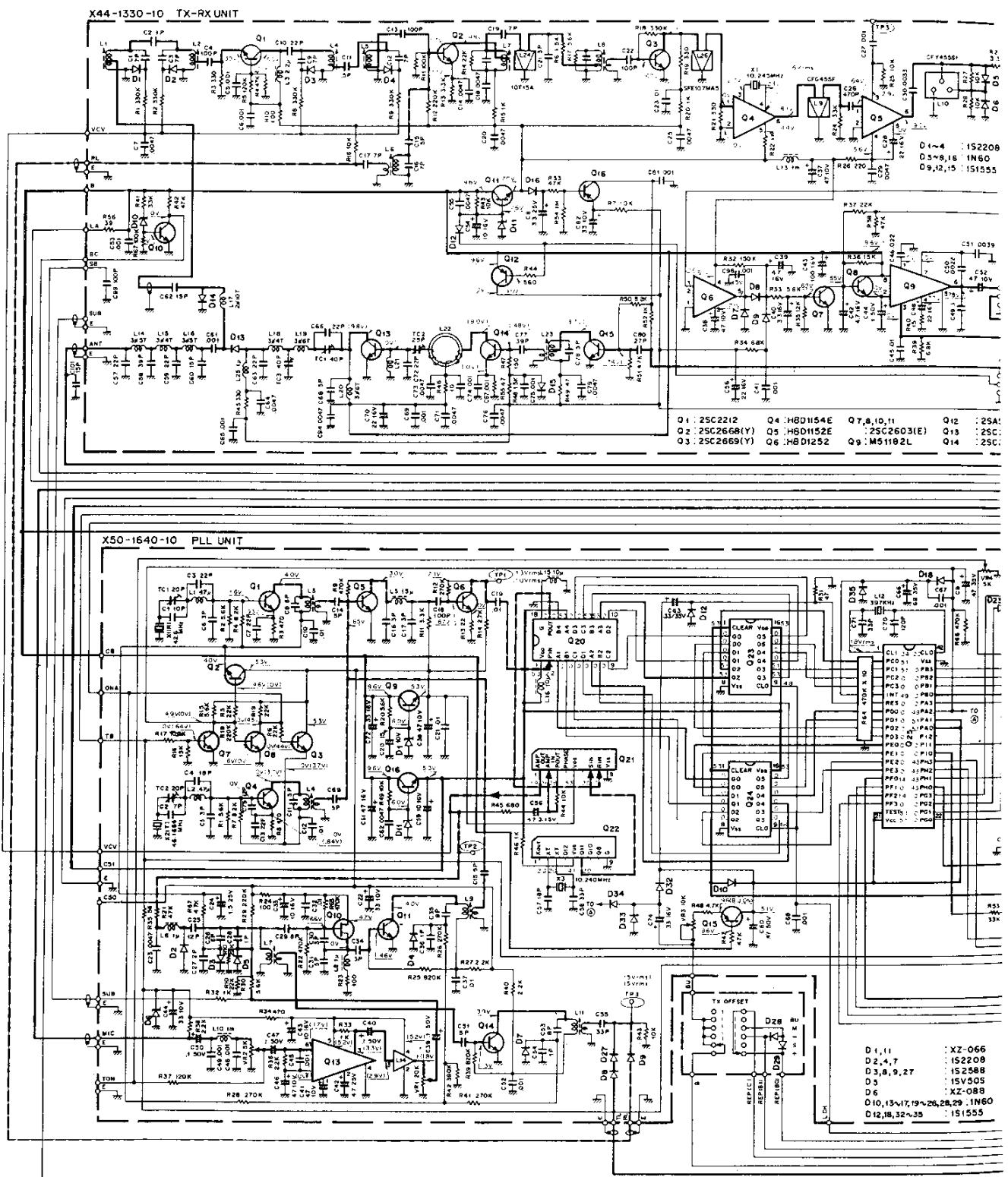
WIRING DIAGRAM (K type) from S/N 006XXXX~010XXXX



FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
 TEL: 01844 - 351694
 FAX: 01844 - 352554

SCHEMATIC

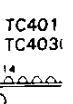
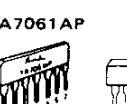
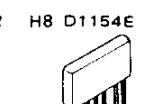
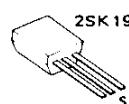
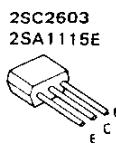
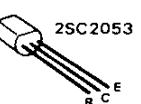
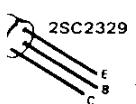
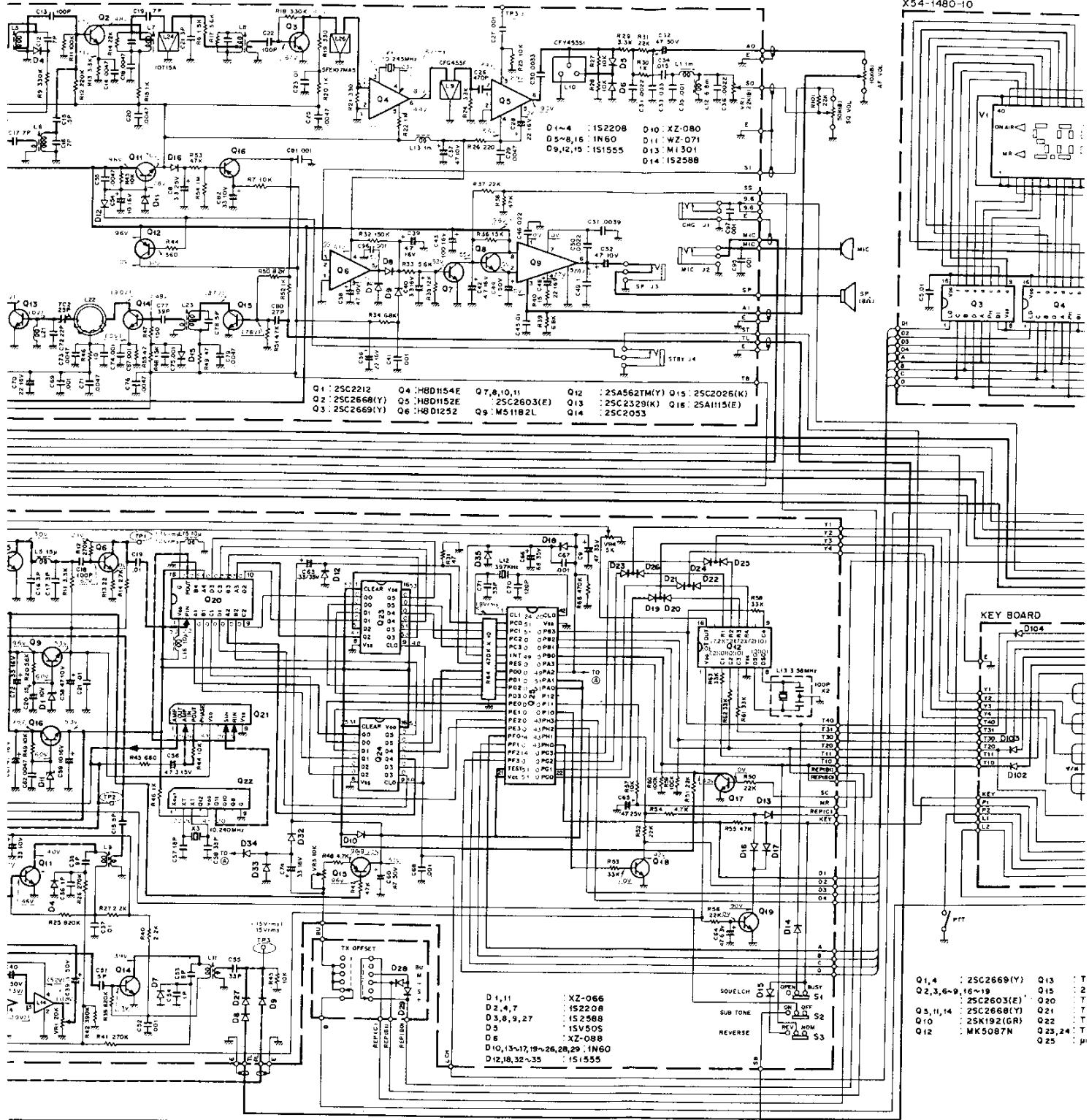
— Signal line - - - OSC & Control line — B line Adjusting point



B line

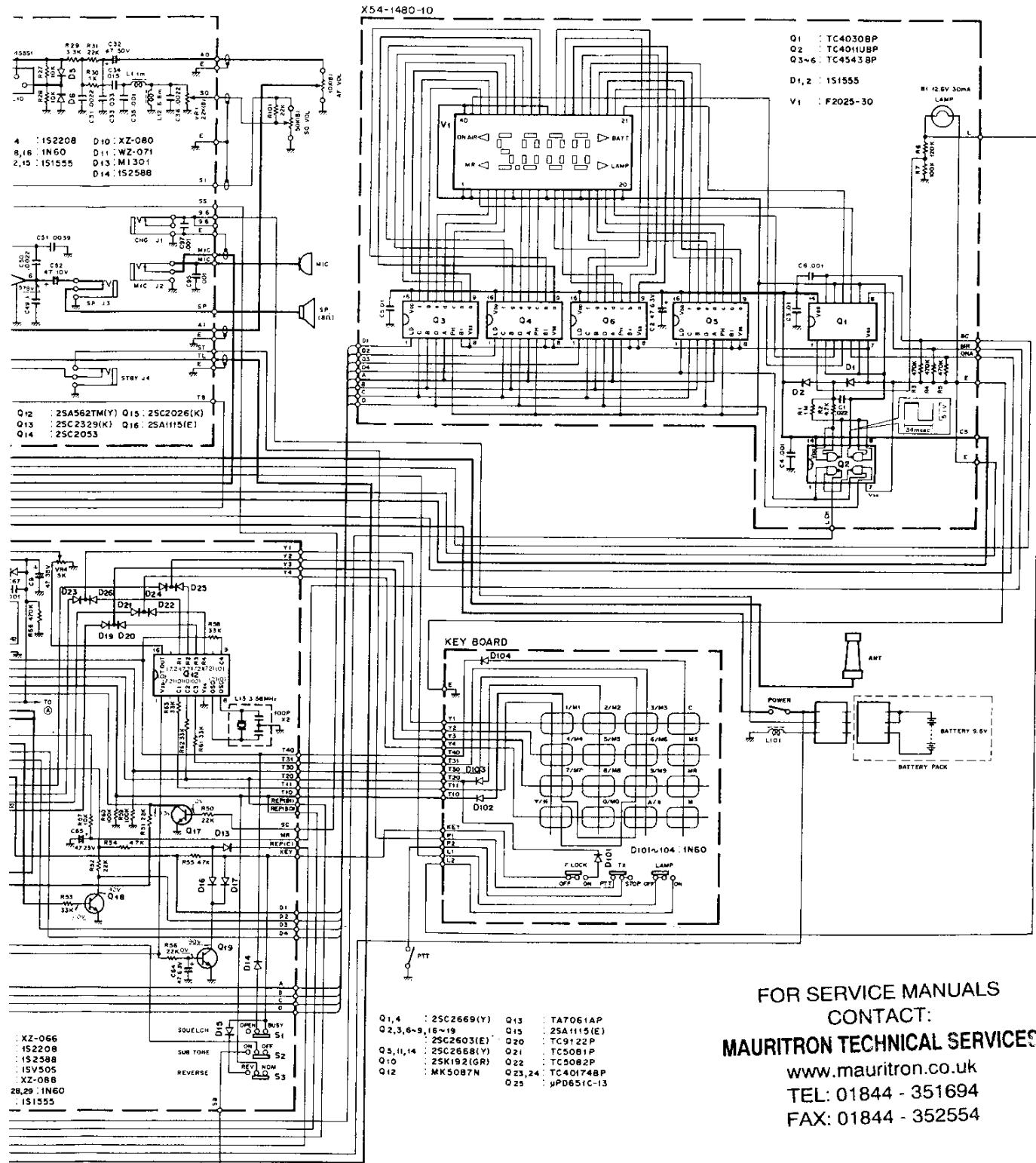
Adjusting point

SCHEMATIC DIAGRAM (K type) from S/N 006XXXX~



EMATIC DIAGRAM (K type) from S/N 006XXXX~010XXXX

Voltage measure condition.
 Power supply voltage: 9.6V
 MODE: S
 Frequency: 145.000 MHz
 Receive section: no input signal, squelch on.
 Transmitter section: 50Ω Load
 (): Transmitter voltage



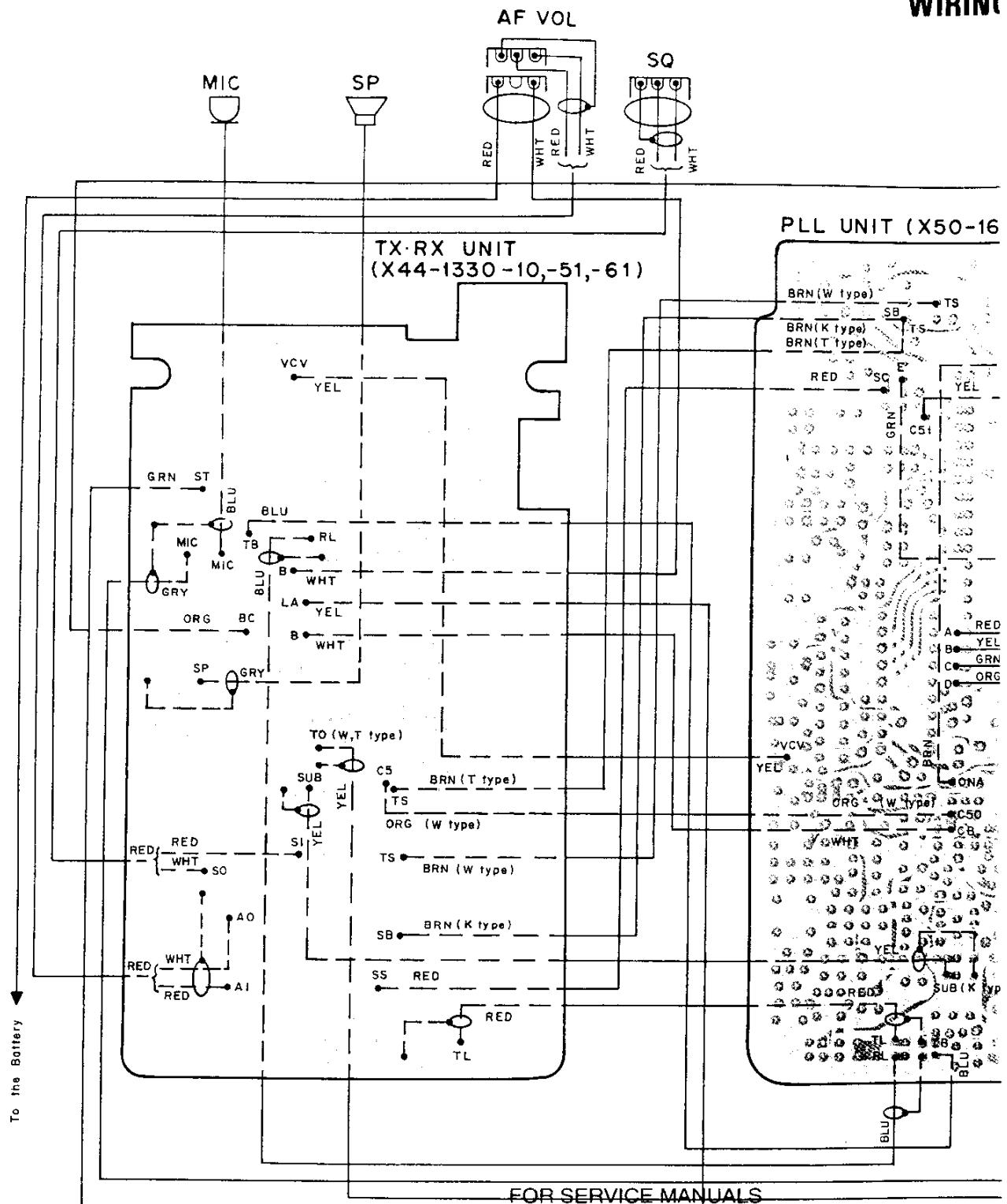
FOR SERVICE MANUALS
CONTACT:

MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554



FOR SERVICE MANUALS

CONTACT:

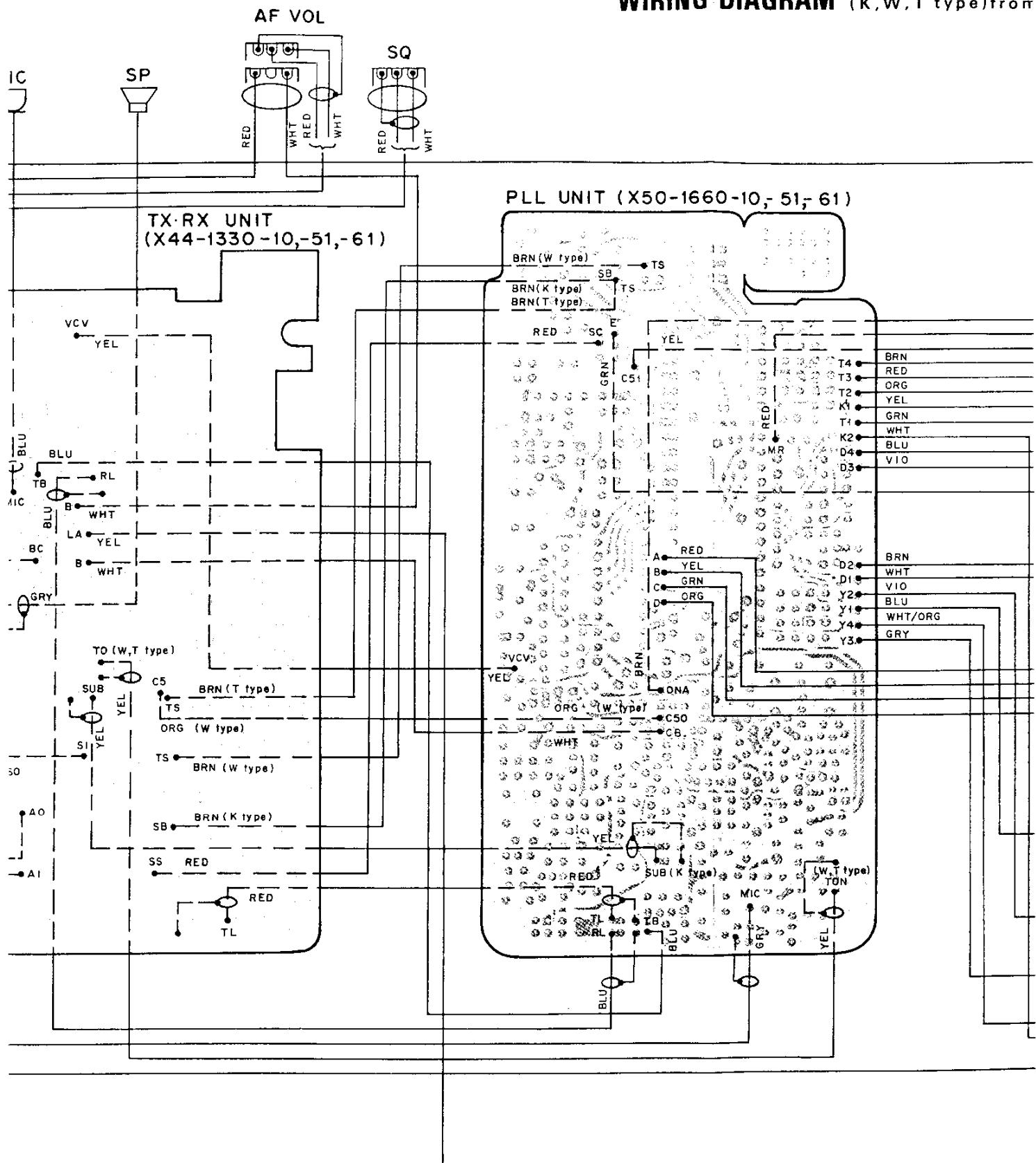
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

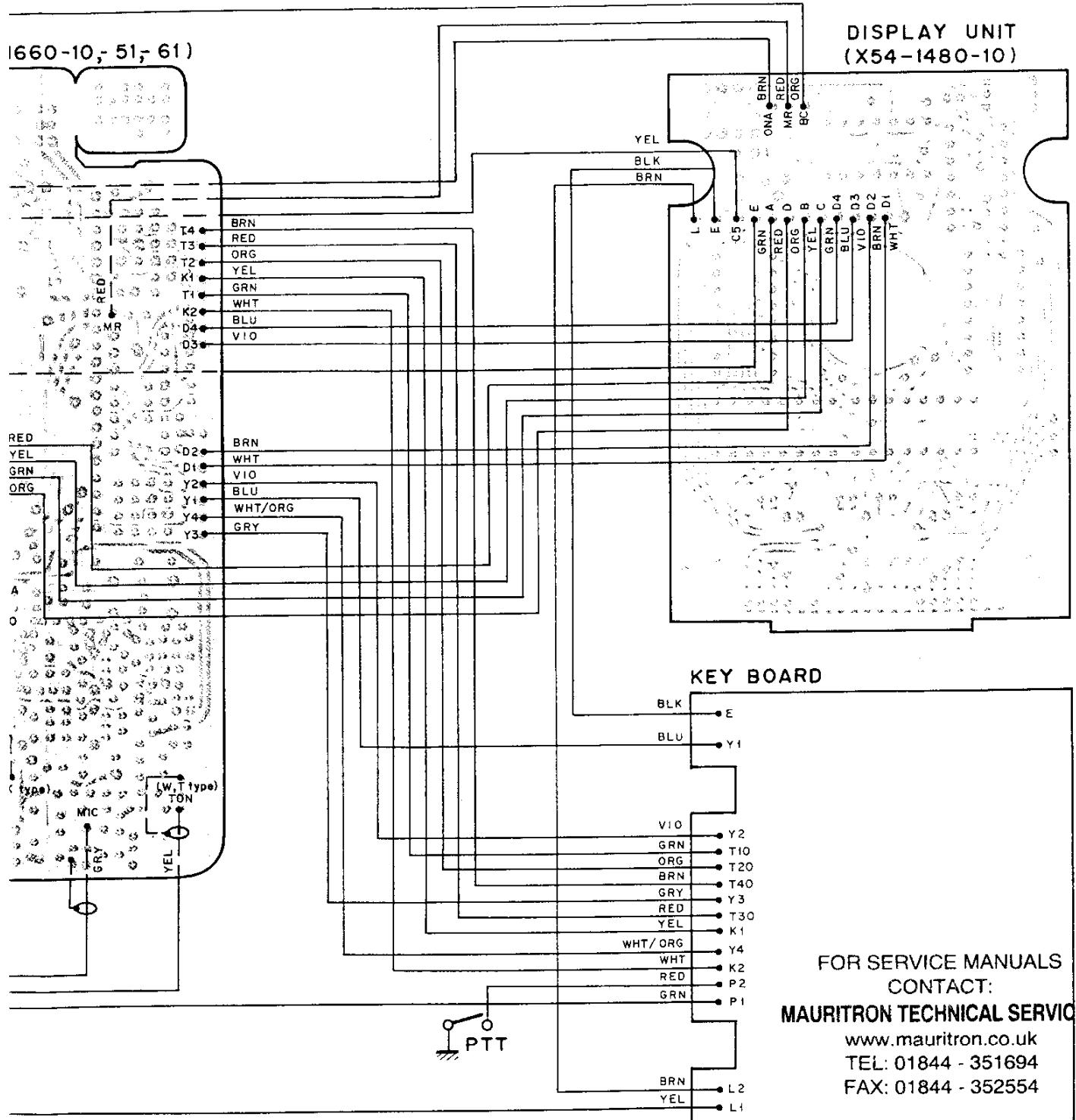
TEL: 01844 - 351694

FAX: 01844 - 352554

WIRING DIAGRAM (K,W,T type) from



WIRING DIAGRAM (K,W,T type) from S/N 011XXXX~108XXXX

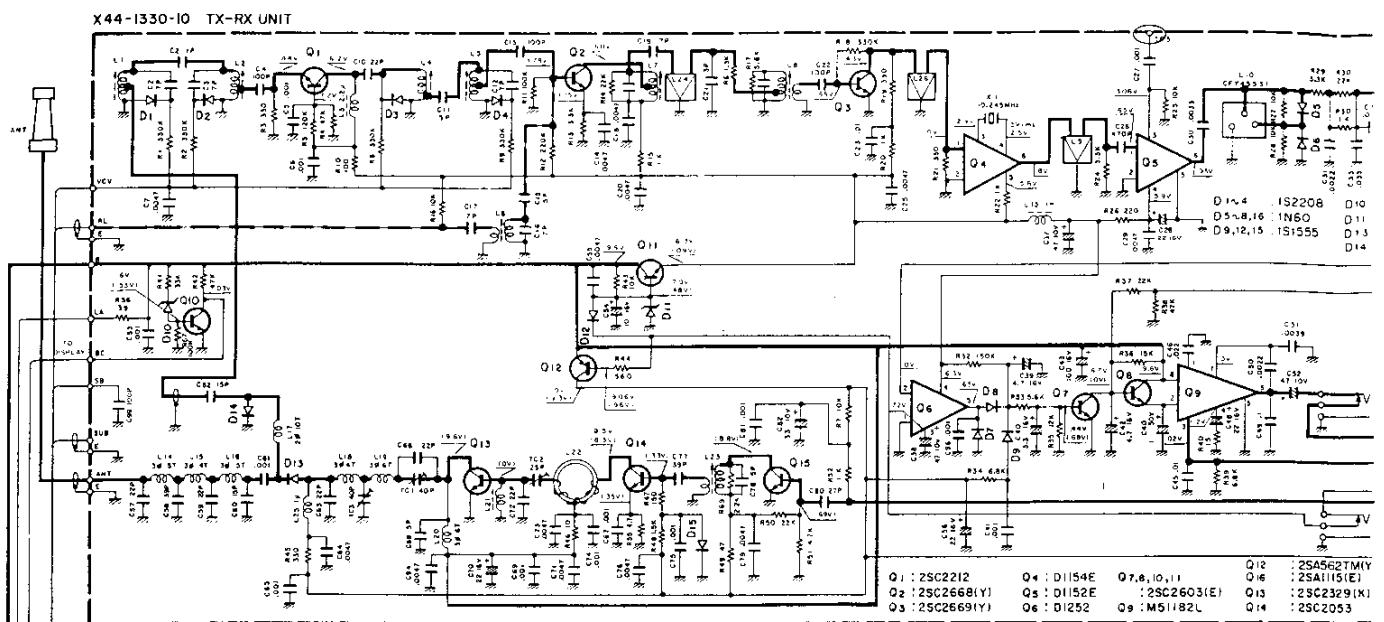


FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

SCHEMATIC DIAGRAM

— Signal line - - - OSC & Control line — B line Adjusting point



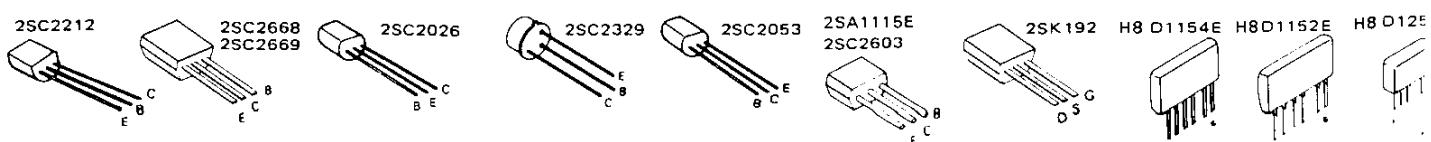
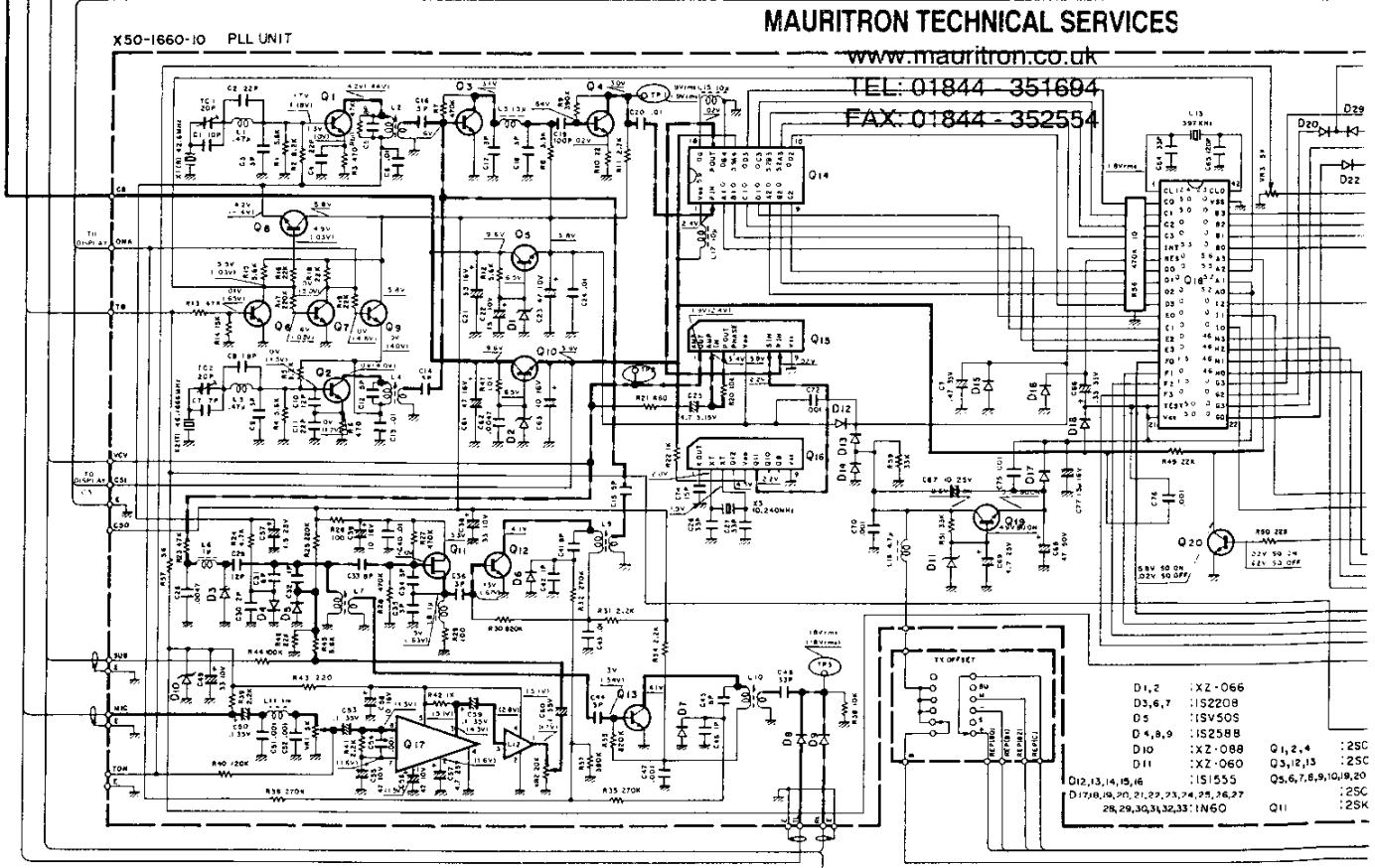
FOR SERVICE MANUALS
CONTACT:

MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

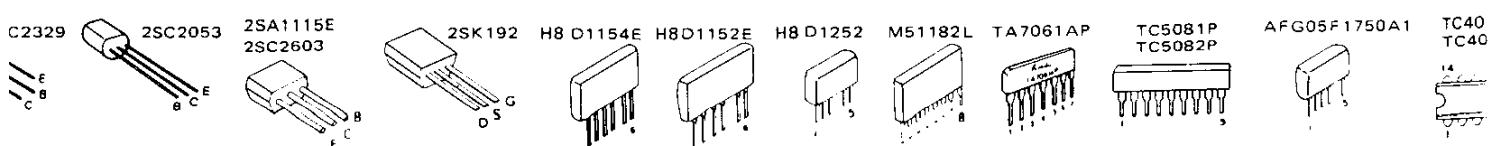
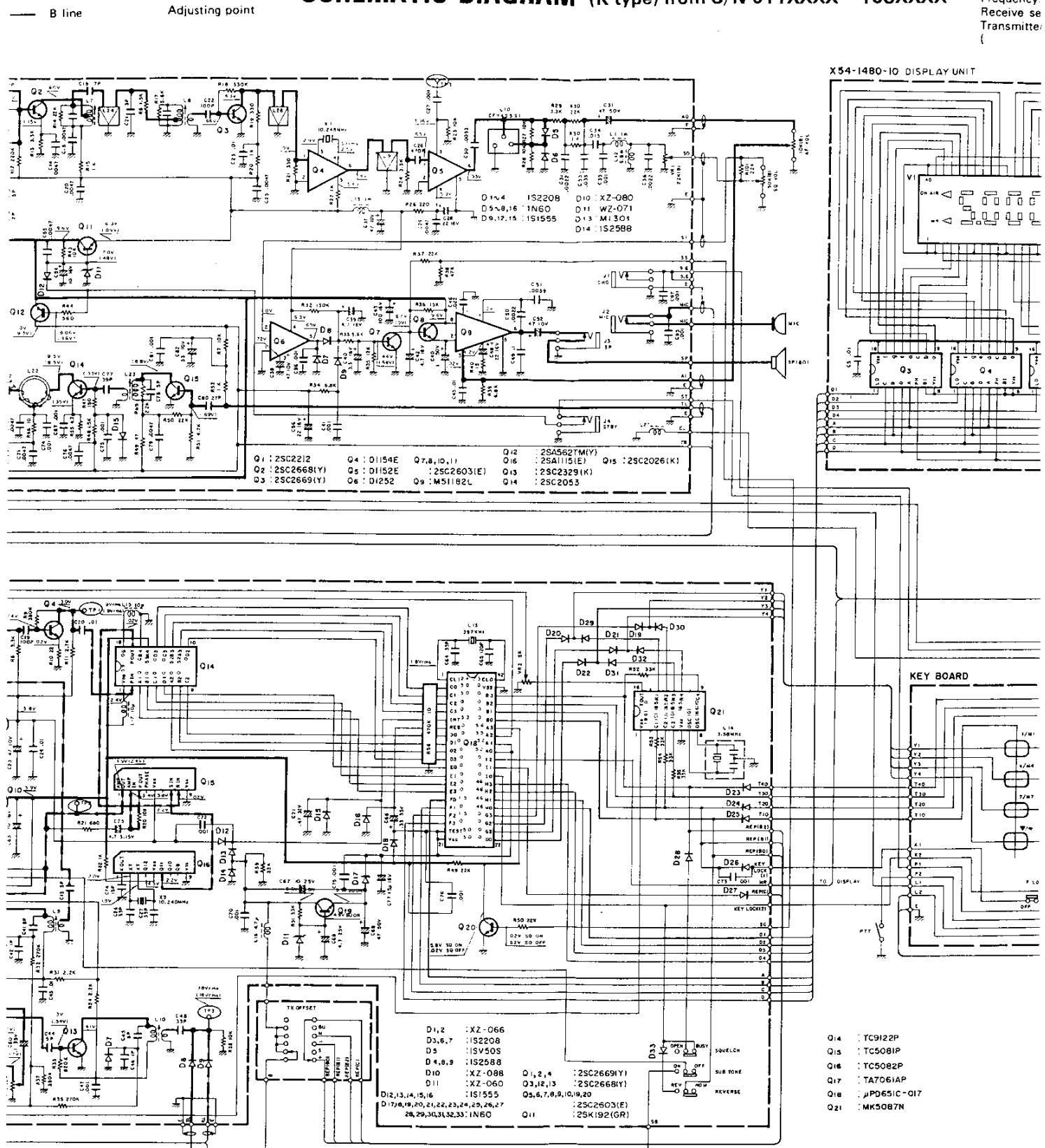
TEL: 01844 - 351694

FAX: 01844 - 352554



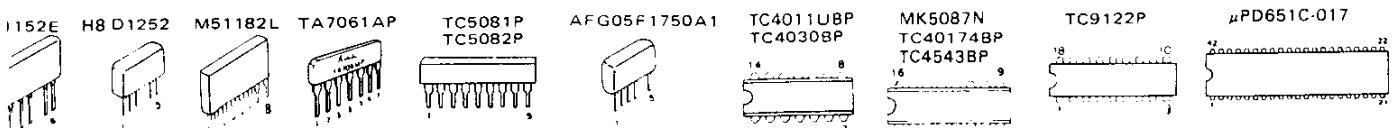
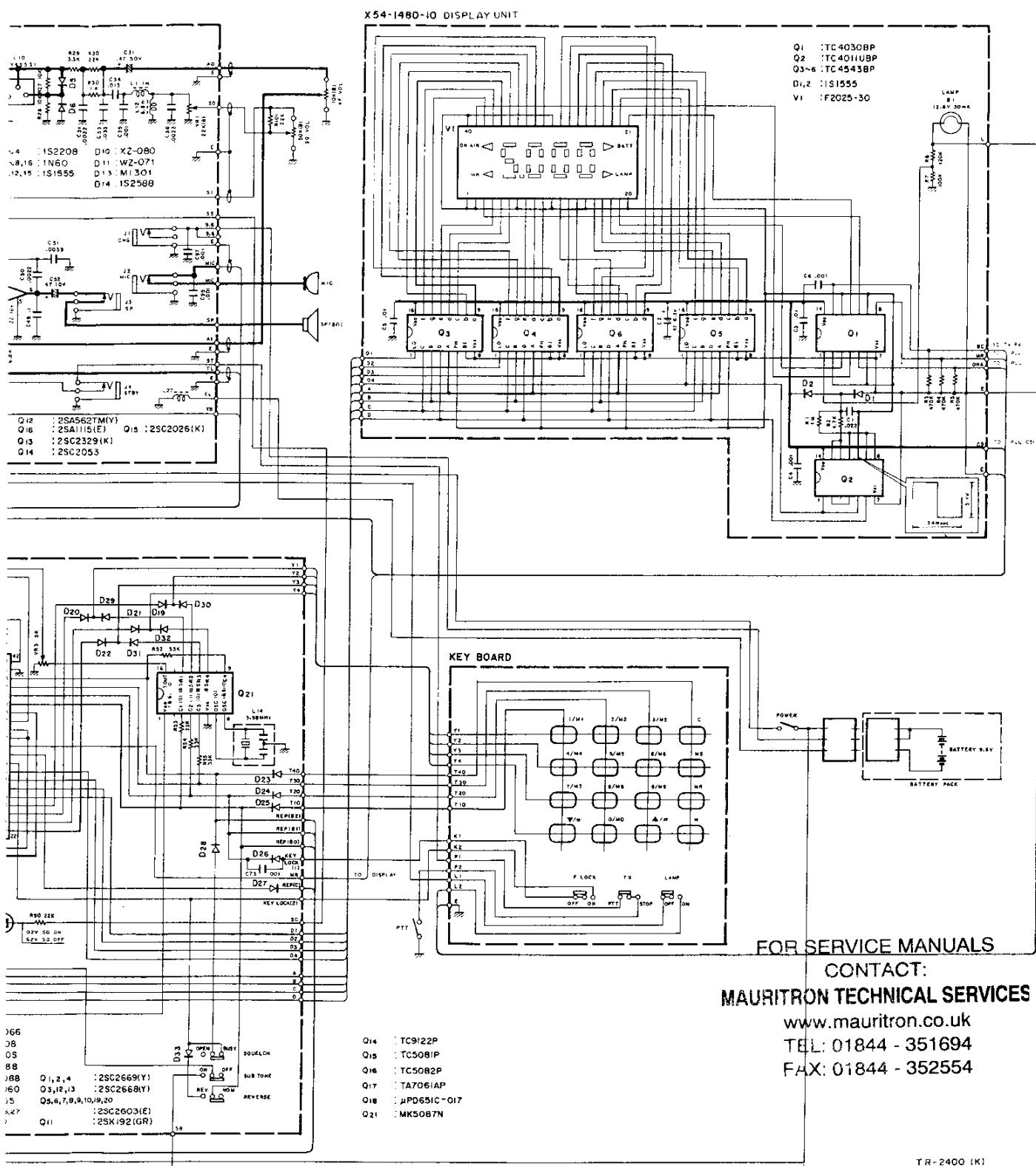
SCHEMATIC DIAGRAM (K type) from S/N 011XXXX~108XXXX

Voltage me:
Power sup:
MODE:
Frequency:
Receive se:
Transmitter:

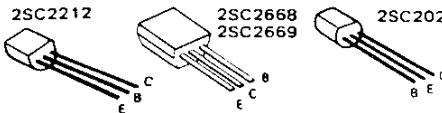
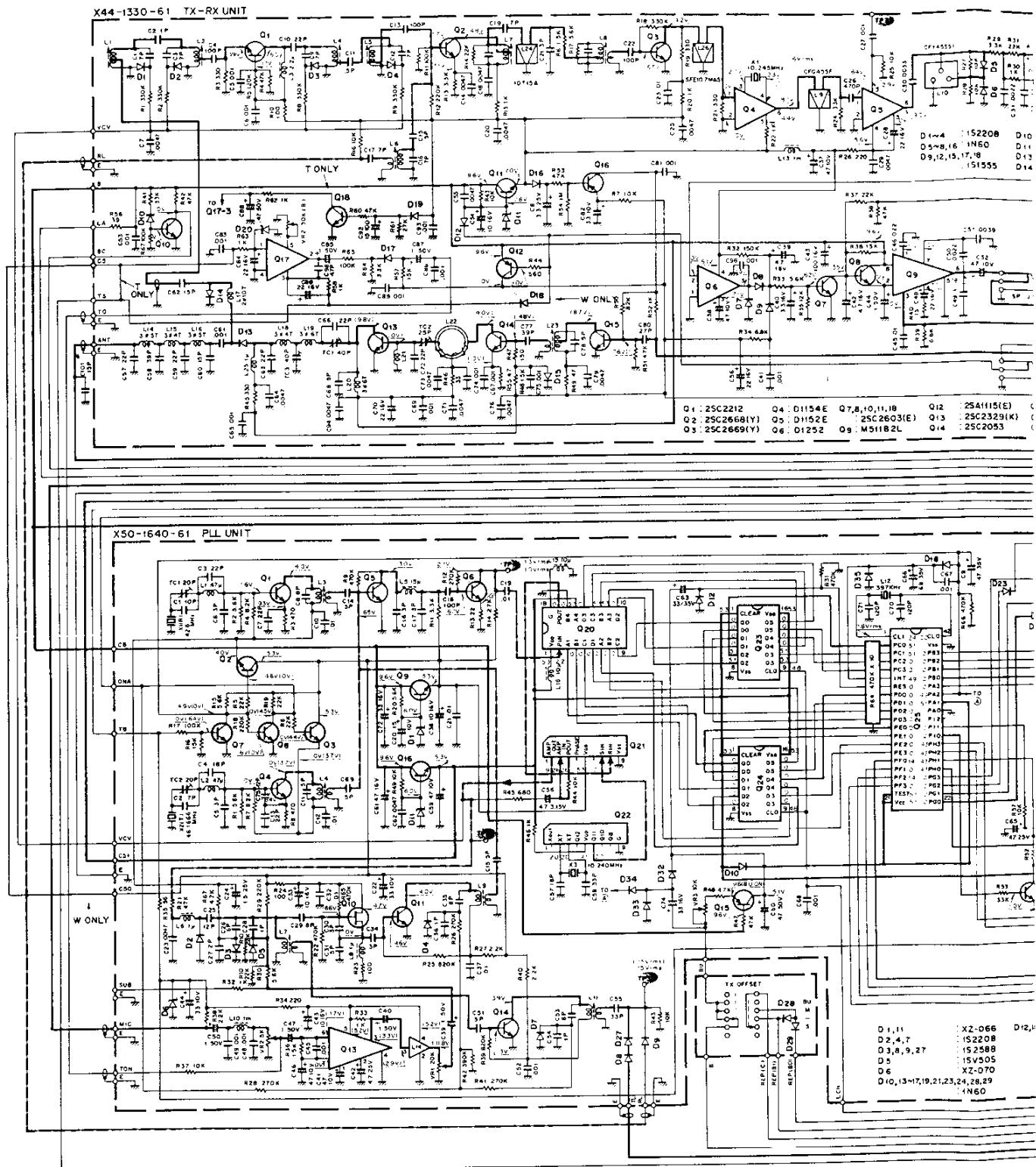


GRAM (K type) from S/N 011XXXX~108XXXX

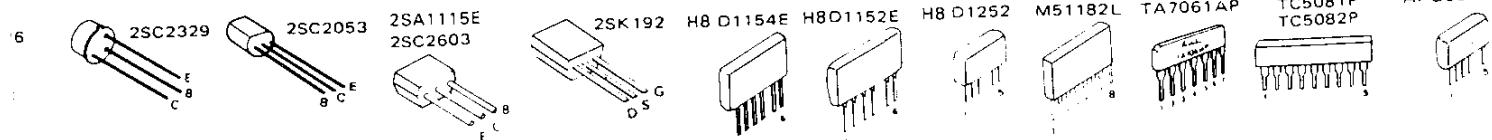
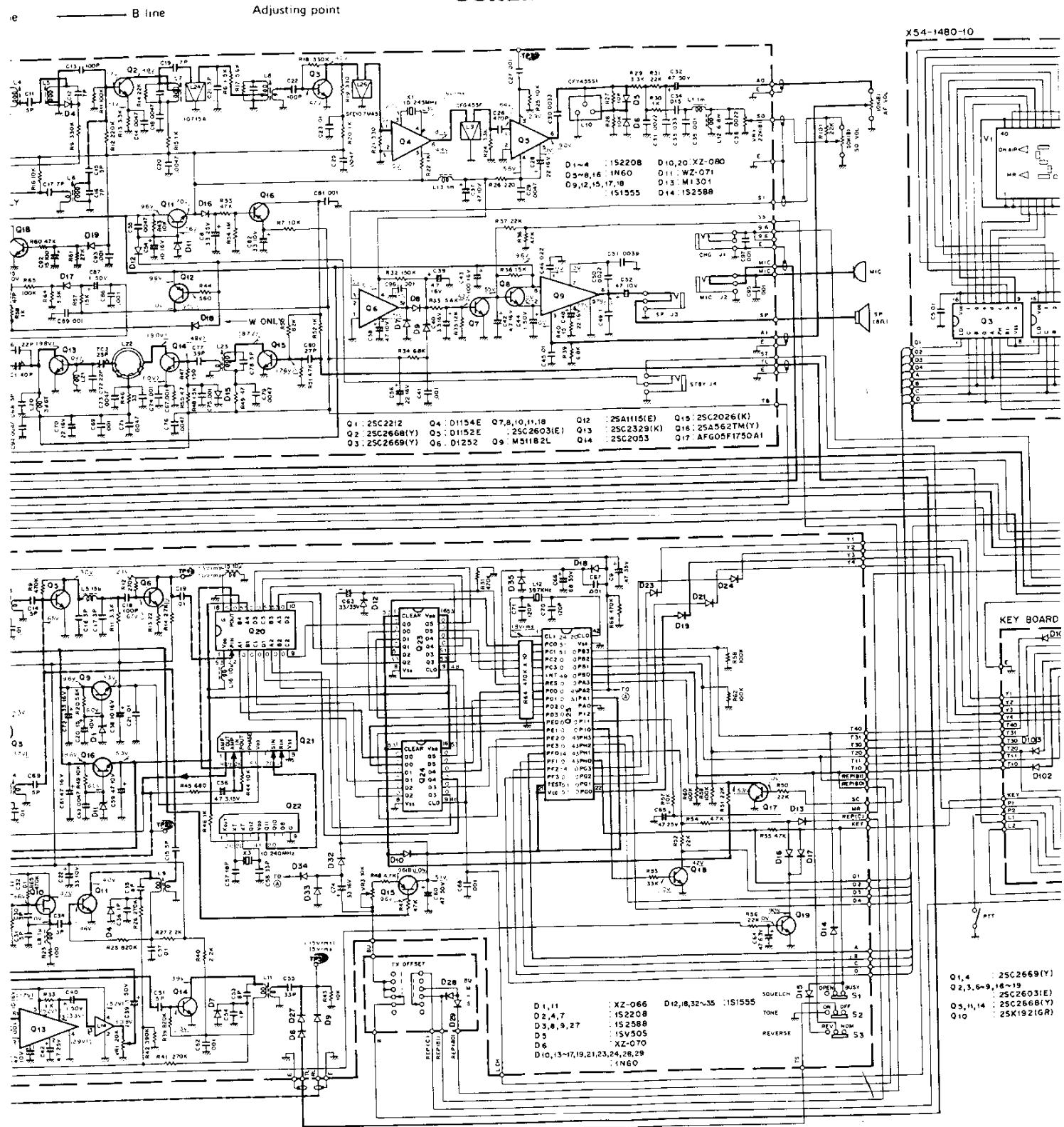
Voltage measure condition.
 Power supply voltage: 9.6V
 MODE: S
 Frequency: 145.000 MHz
 Receive section: no input signal, squelch on.
 Transmitter section: 50Ω Load
 Transmitter voltage



— Signal line - - - OSC & Control line — B line Adjusting point

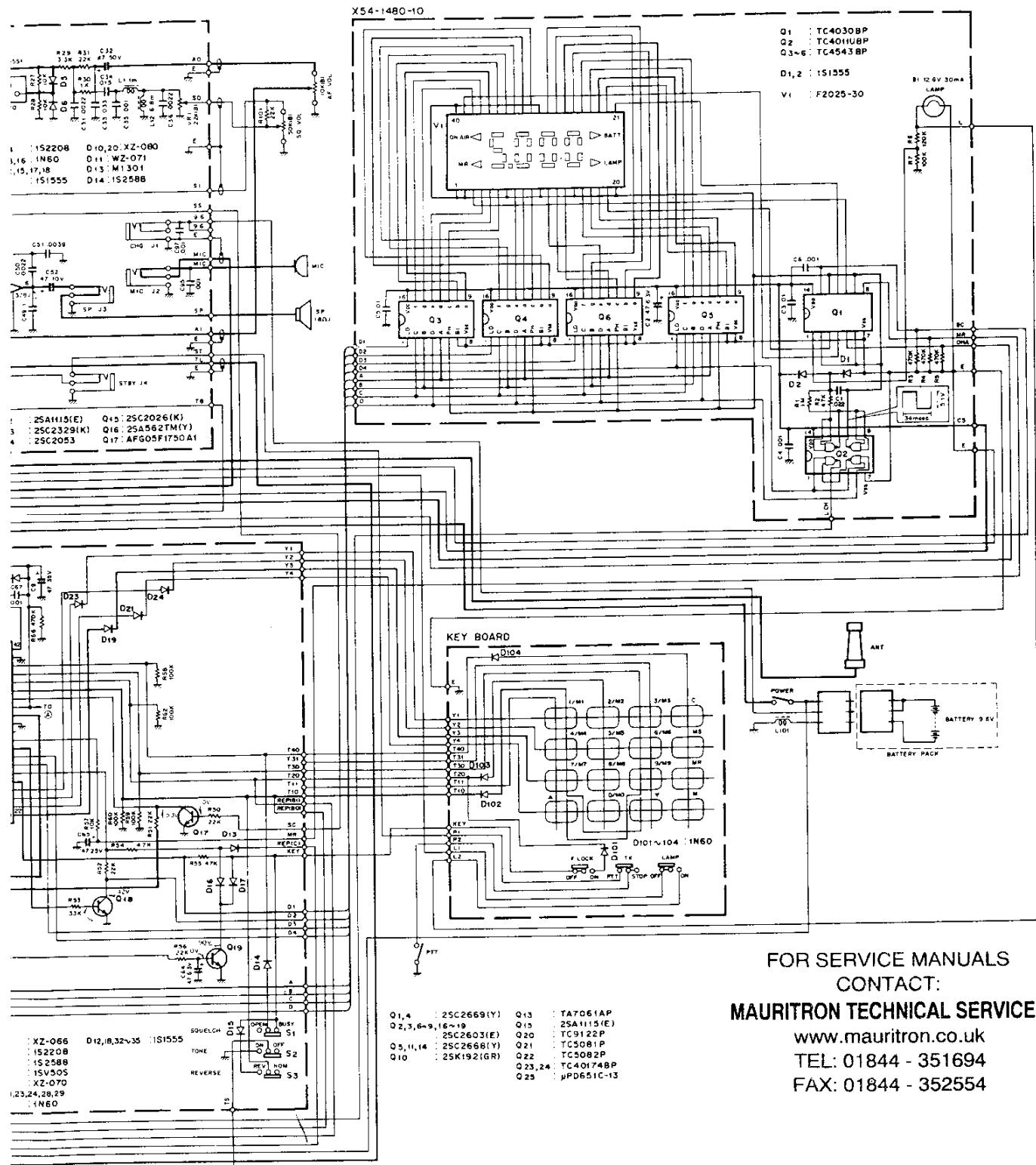


SCHEMATIC DIAGRAM (W, T type) from S/N 006XXXX~01



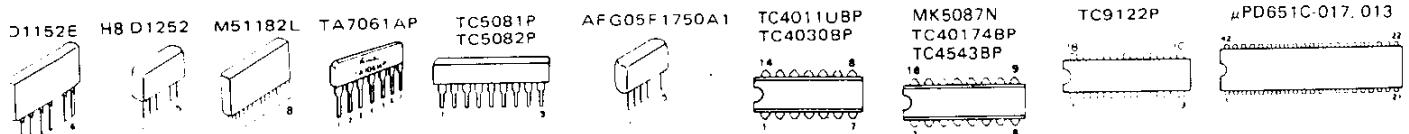
C DIAGRAM (W, T type) from S/N 006XXXX~010XXXX

Voltage measuer condition:
 Power supply voltage: 9.6V
 MODE: S
 Frequency: 145.000 MHz
 Receive section: no input signal, squelch on.
 Transmitter section: 50Ω Load
 Transmitter voltage:

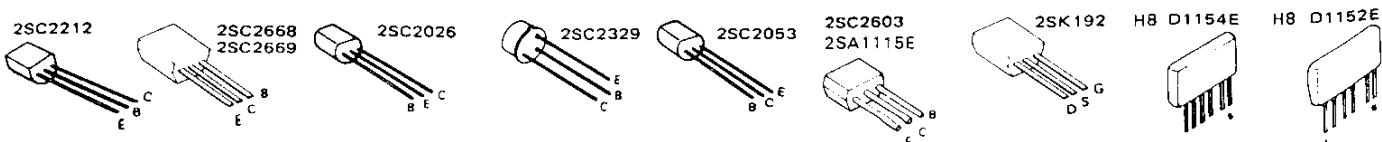
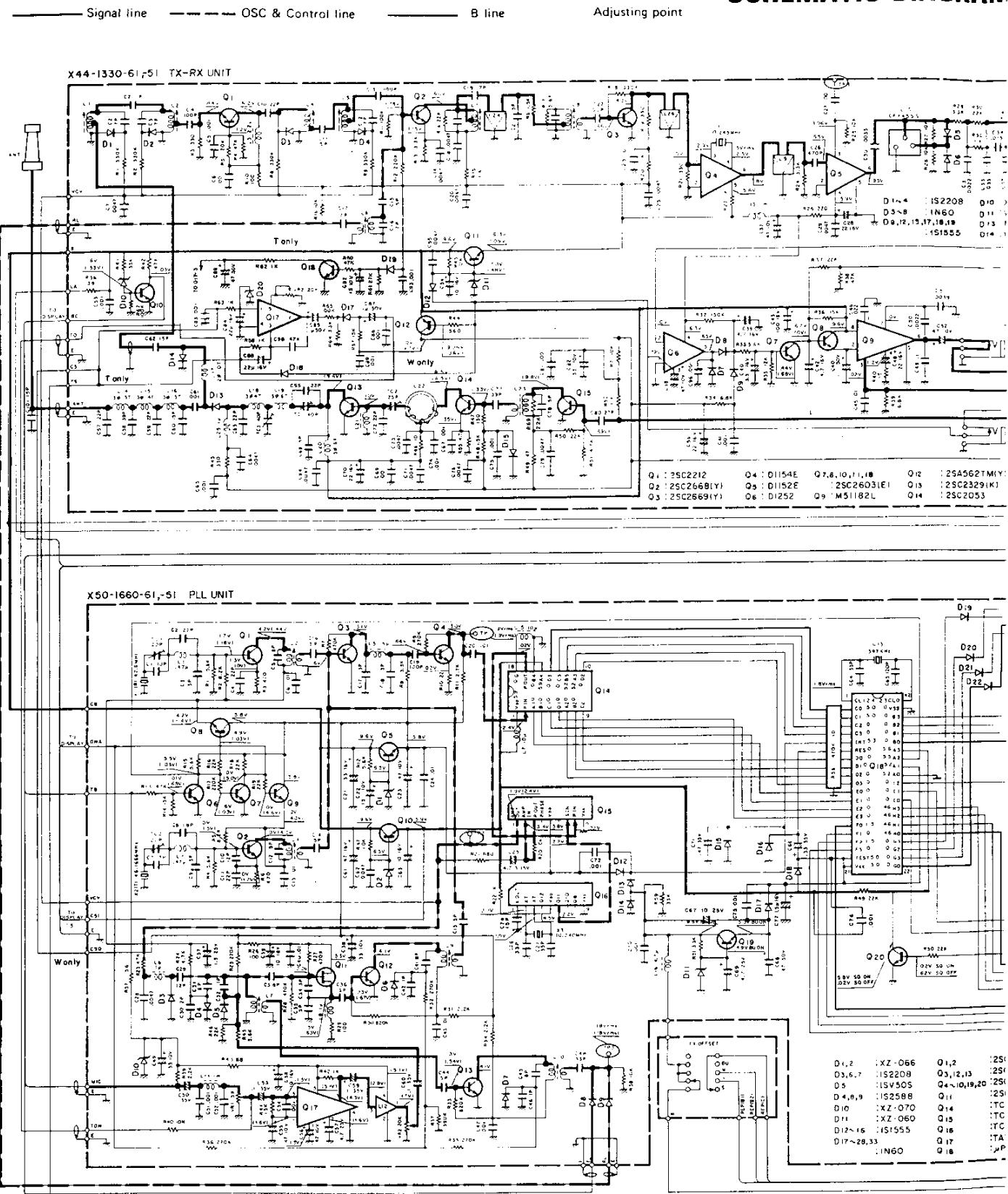


FOR SERVICE MANUALS
CONTACT:

MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
 TEL: 01844 - 351694
 FAX: 01844 - 352554



SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM (W. T type) from S/N 011XXXX~108XXXX

B line

Adjusting point

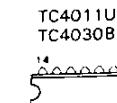
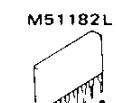
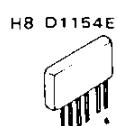
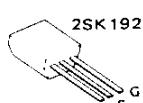
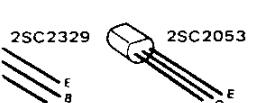
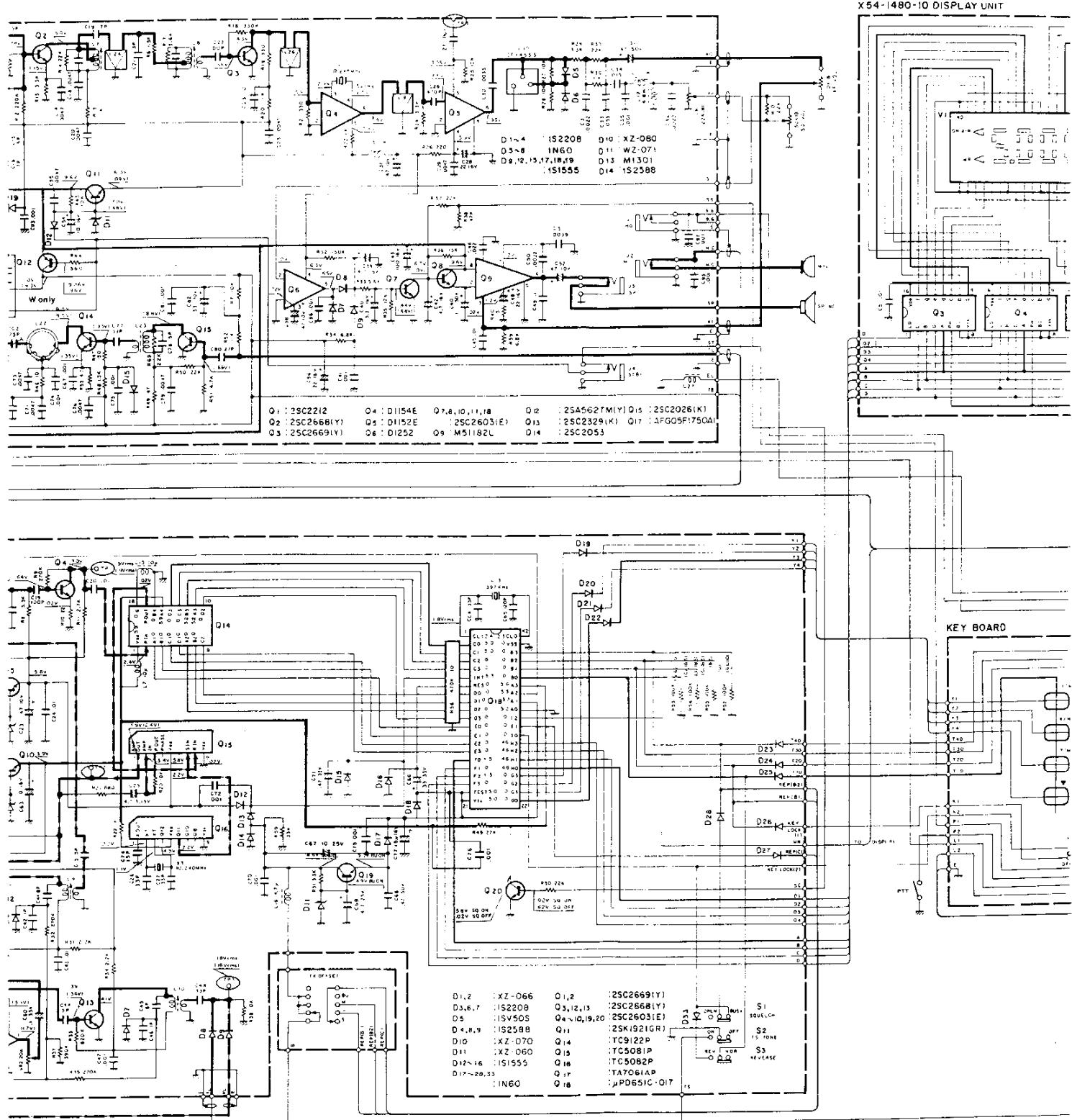
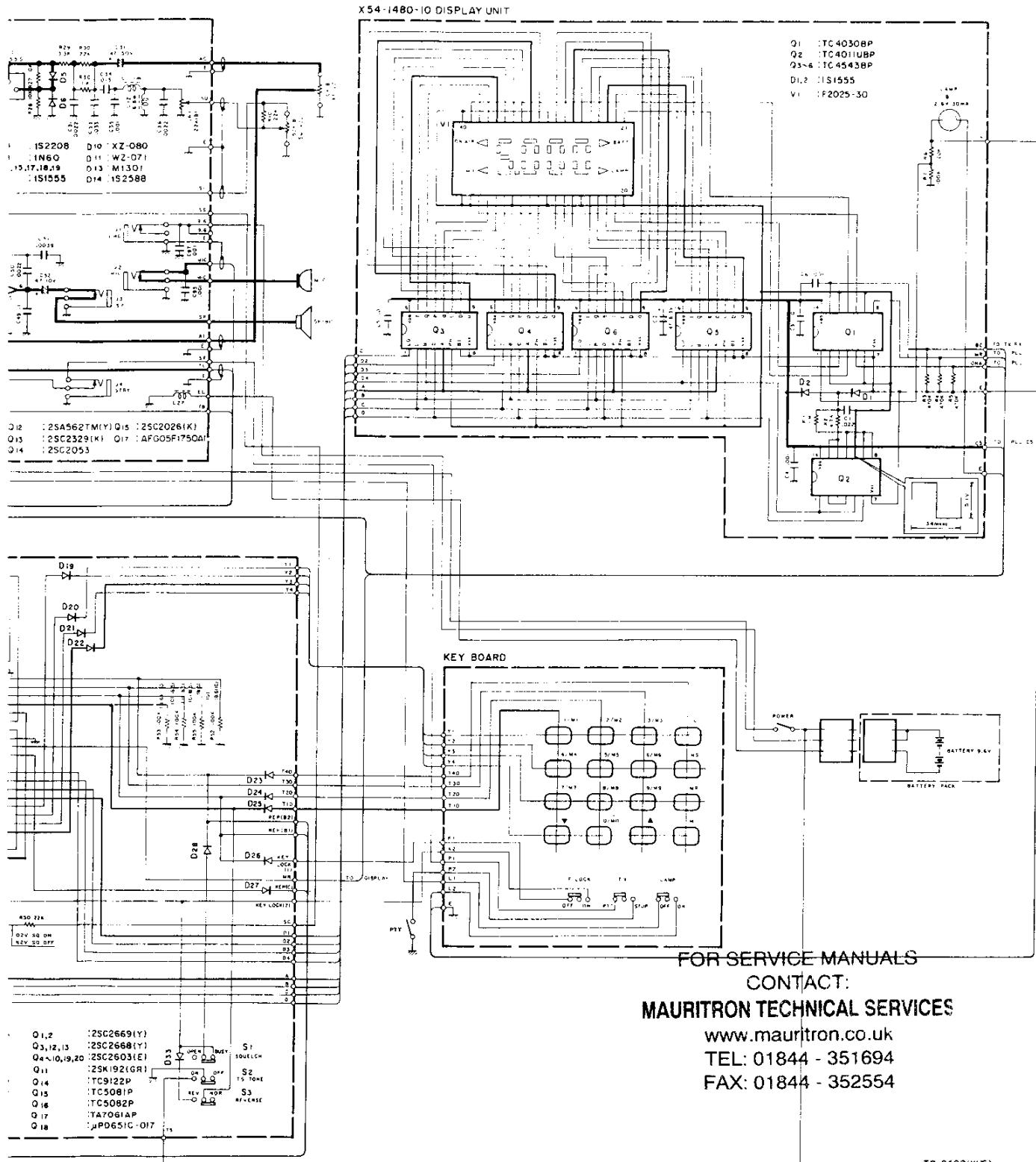


DIAGRAM (W. T type) from S/N 011XXXX~108XXXX

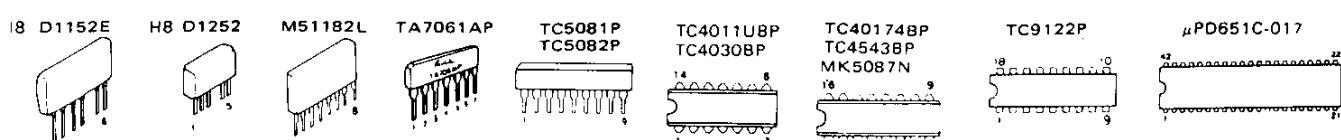
Voltage measure condition:
 Power supply voltage: 9.6 V
 MODE: S
 Frequency: 145.000 MHz
 Receive section: no input signal, squelch on.
 Transmitter section: 50 Ω Load
 Transmitter voltage

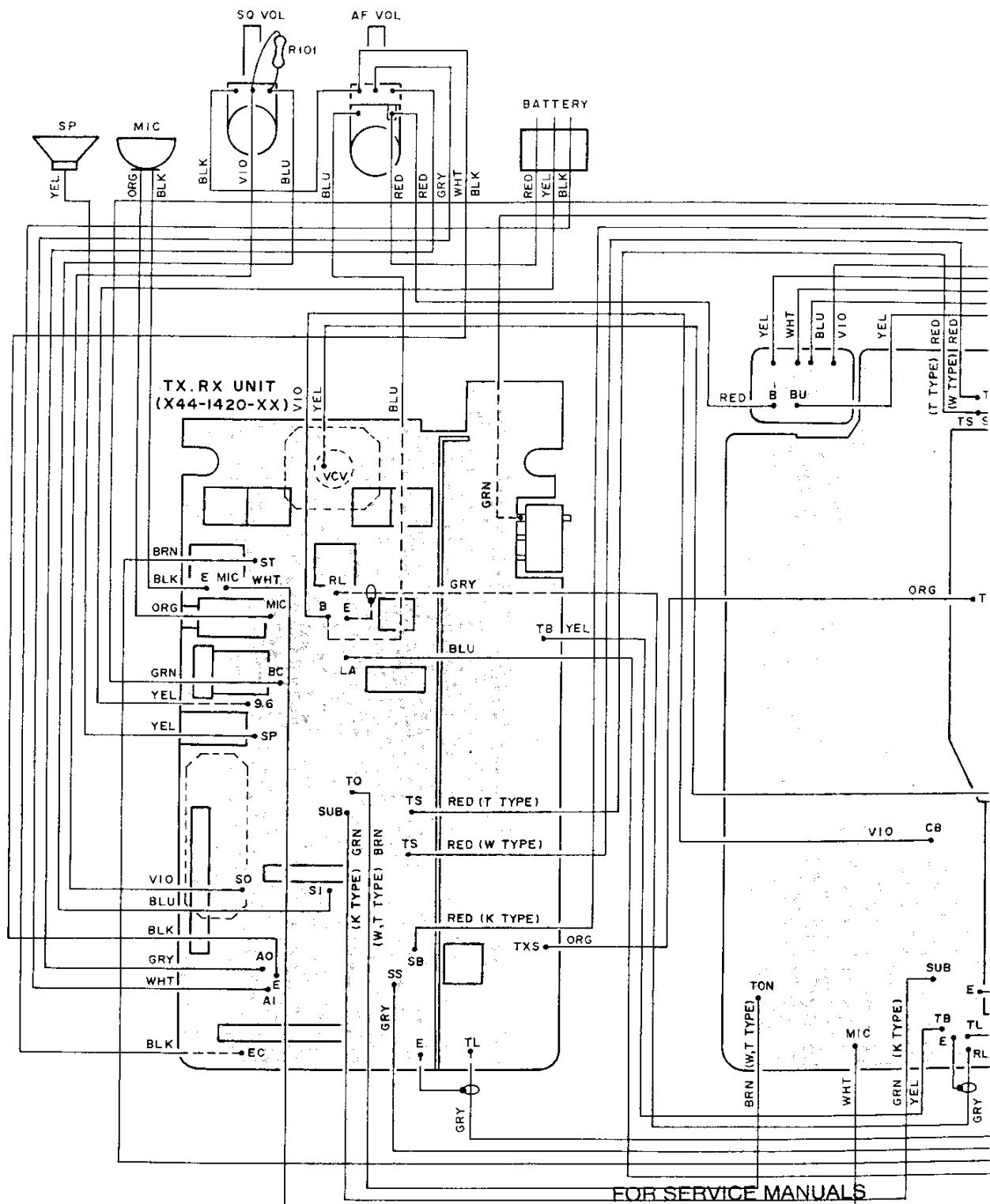


FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

TR-2400(W,T)





FOR SERVICE MANUALS

CONTACT:

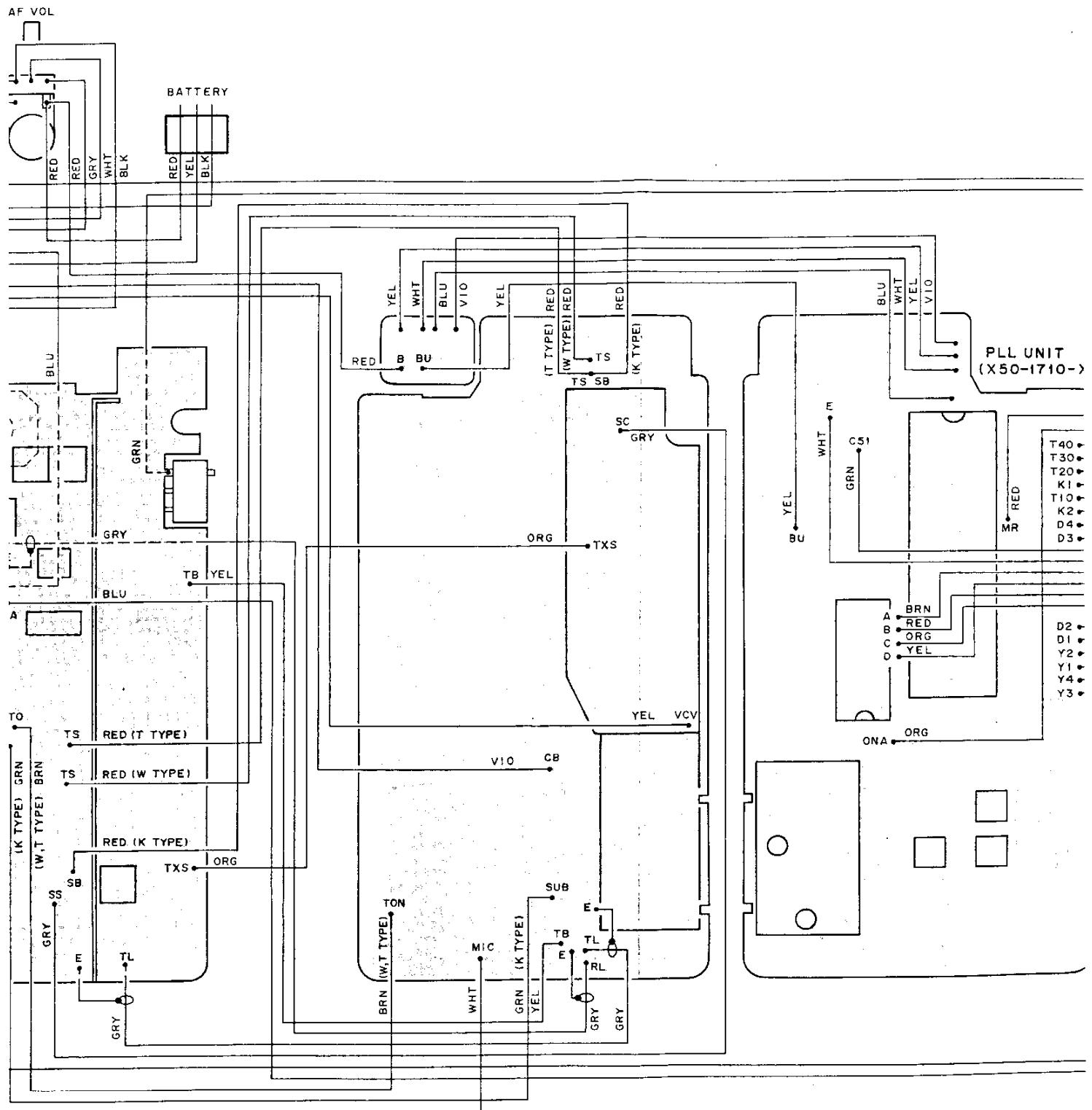
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

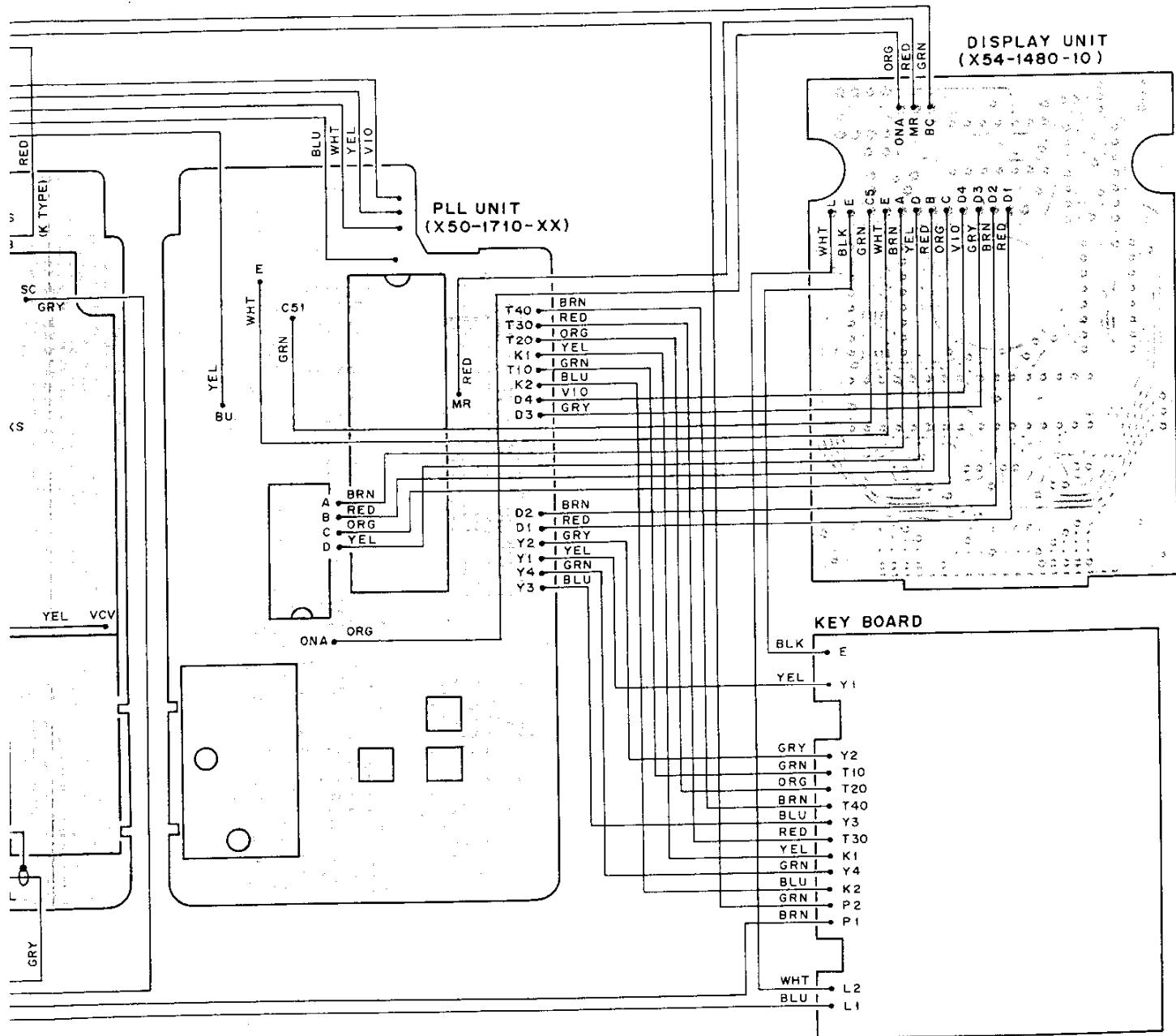
TEL: 01844 - 351694

FAX: 01844 - 352554

WIRING DIAGRAM (K, W, T type) from S/N 109XXX



G DIAGRAM (K, W, T type) from S/N 109XXXX~



FOR SERVICE MANUALS
CONTACT:
MAURITRON TECHNICAL SERVICES
www.mauritron.co.uk
TEL: 01844 - 351694
FAX: 01844 - 352554

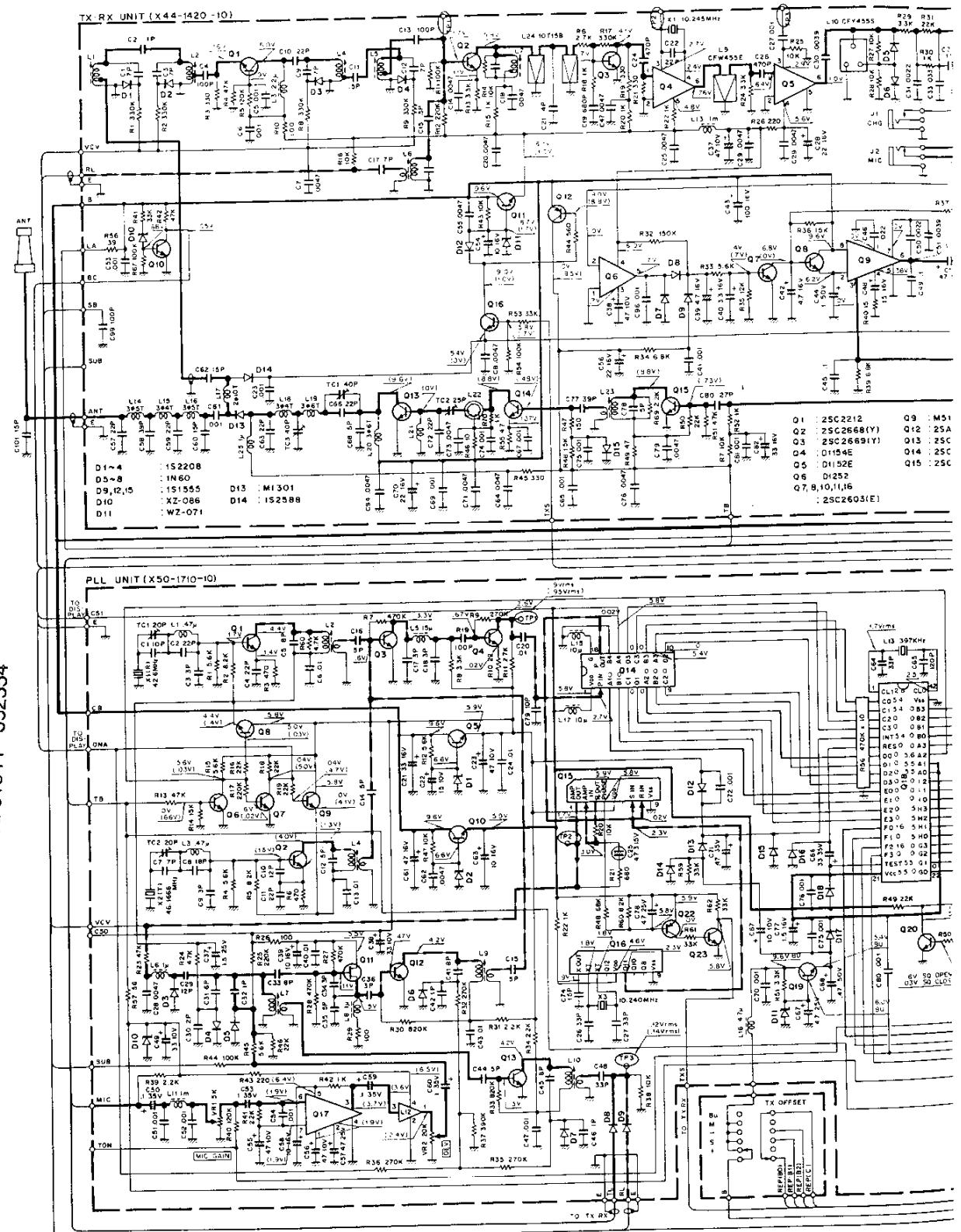
SCHEMATIC DIAGR

Signal line

OSC & Control line

B line

Adjusting point



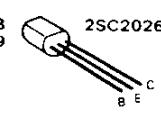
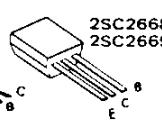
FOR SERVICE MANUALS

MAURITRON TECHNICAL SERVICES

TEL: 01844 - 351694
FAX: 01844 - 352554

CONTACT:

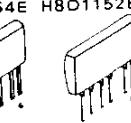
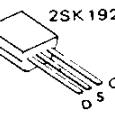
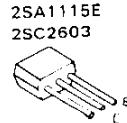
2SC2212



2SC2329



2SA1115E
2SC2603



H8 C

SCHEMATIC DIAGRAM (K type) from S/N 109XXXX~

B line

Adjusting point

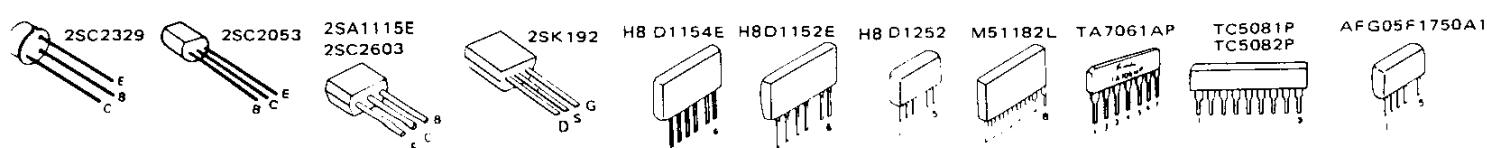
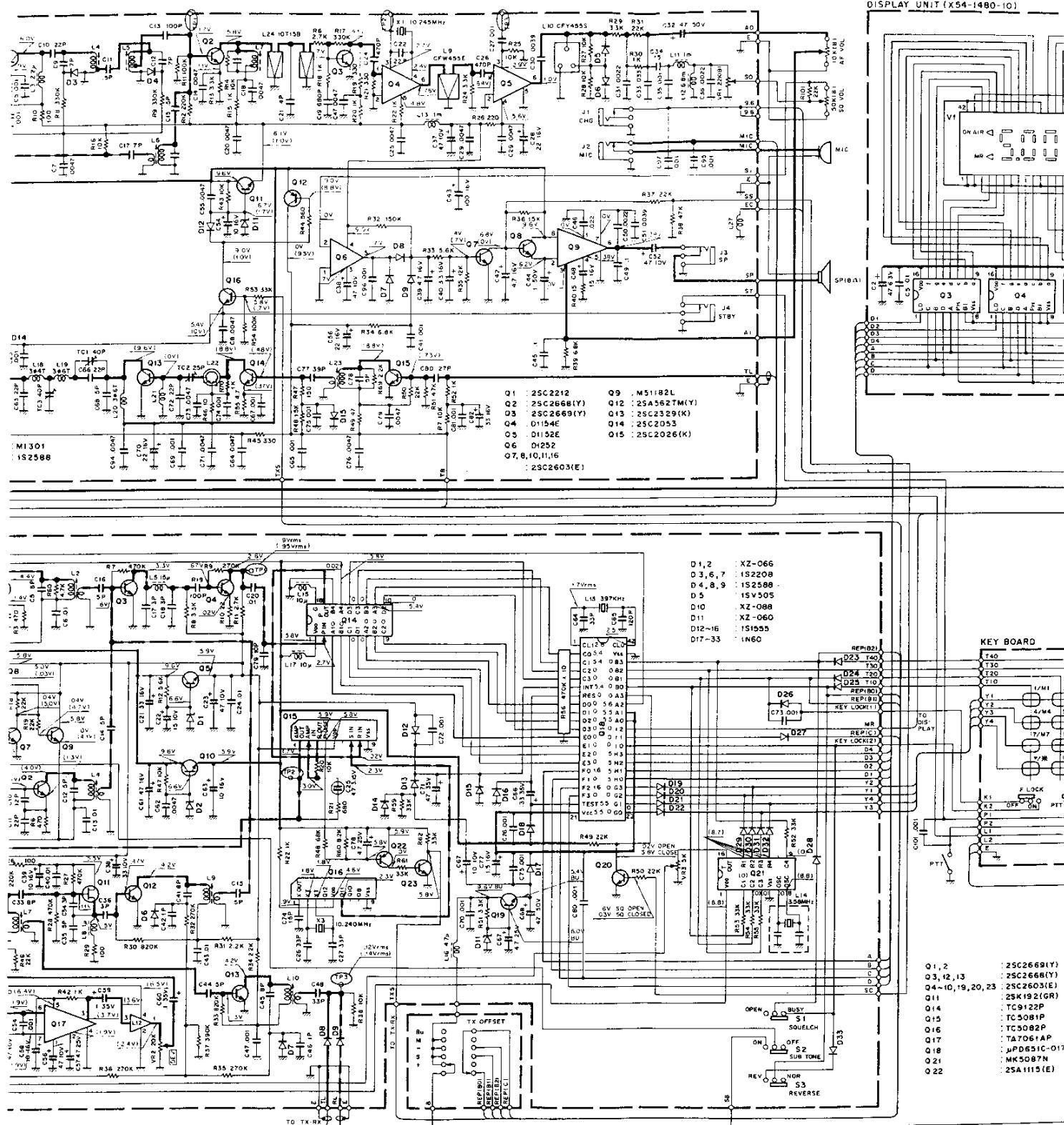
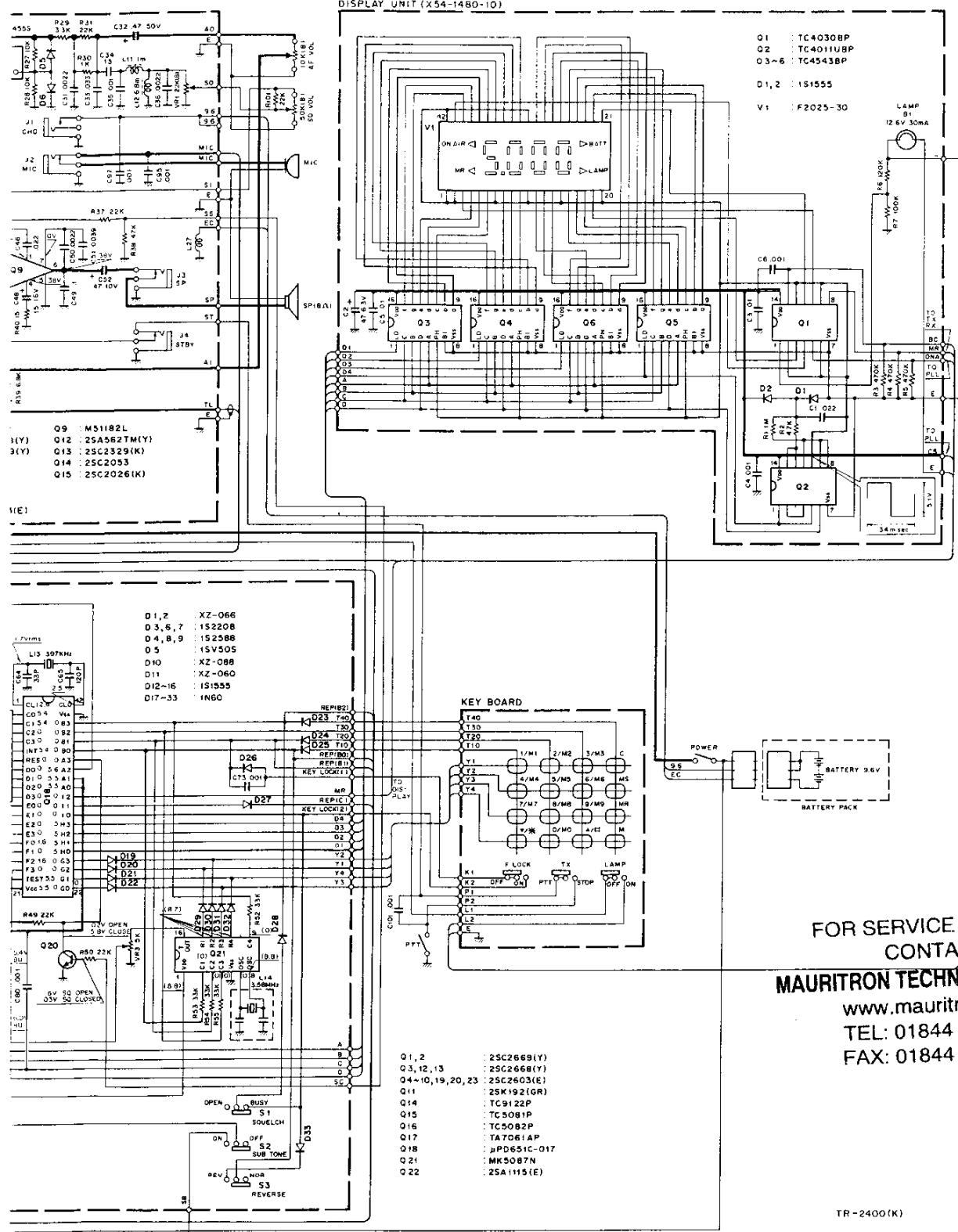


DIAGRAM (K type) from S/N 109XXXX~

Voltage measure condition.
 Power supply voltage: 9.6 V
 MODE: S
 Frequency: 145.000 MHz
 Receive section: no input signal, squelch on.
 Transmitter section: 50 Ω Load
 (): Transmitter voltage



FOR SERVICE MANUALS
CONTACT:

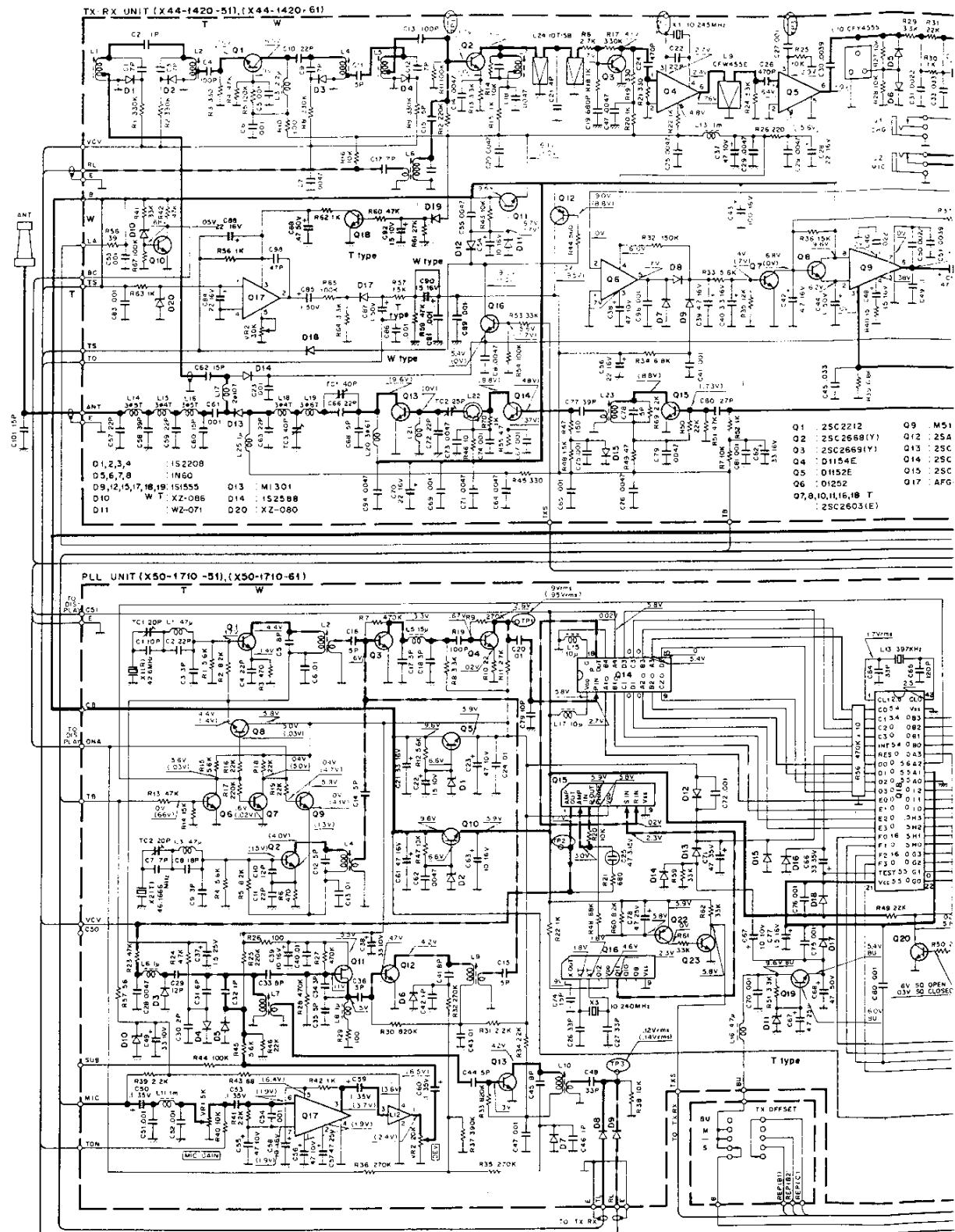
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

TR-2400(K)



FOR SERVICE MANUALS

CONTACT:

MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk

TEL: 01844 - 351694

FAX: 01844 - 352554

SCHEMATIC DIAGRAM (W, T type) from S/N 109XXXX

I line B line Adjusting point

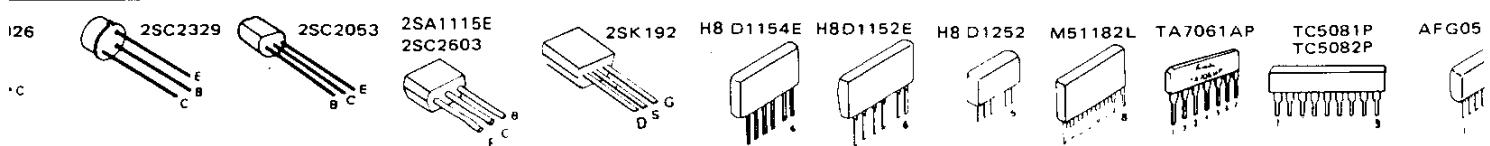
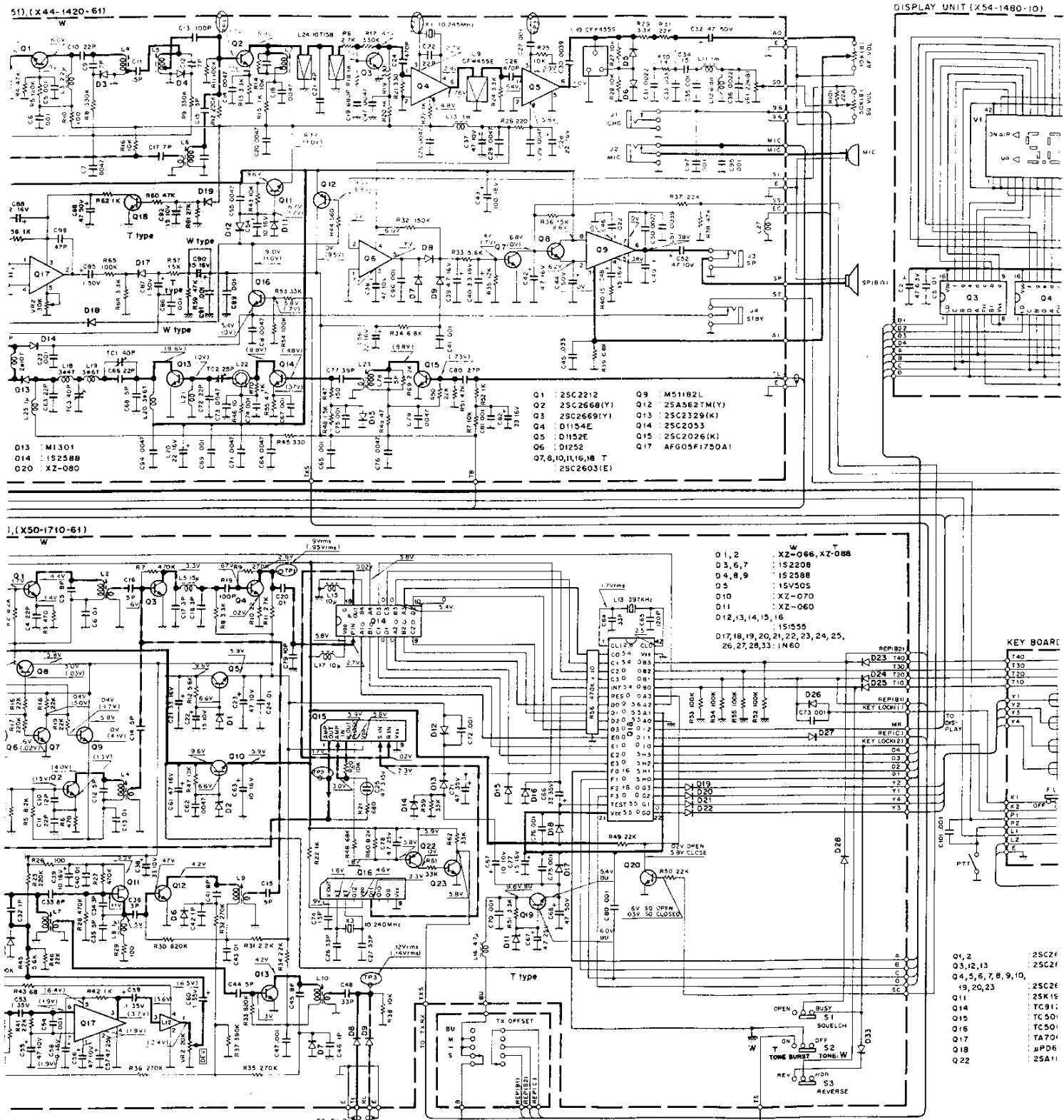
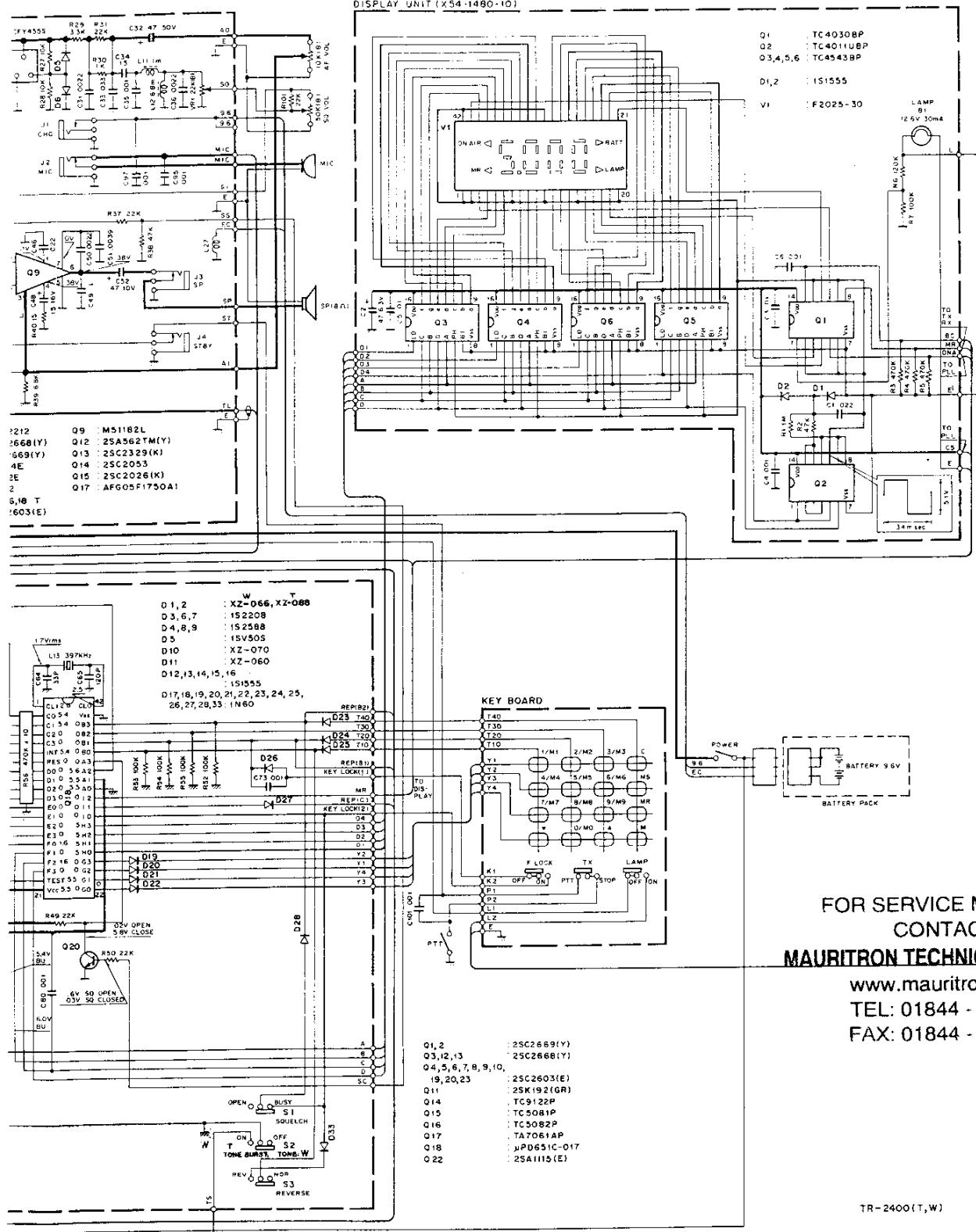
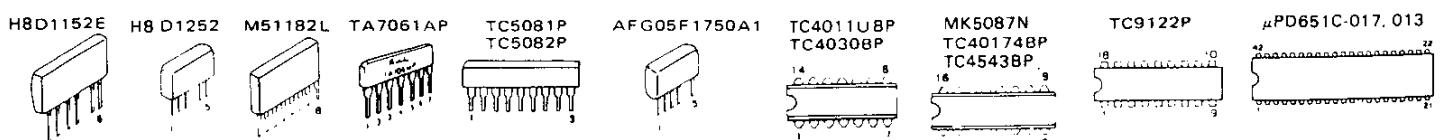


DIAGRAM (W, T type) from S/N 109XXXX

Voltage measure condition.
 Power supply voltage: 9.6 V
 MODE: S
 Frequency: 145 000 MHz
 Receive section: no input signal. squelch on.
 Transmitter section: 50 Ω Load
 (). Transmitter voltage

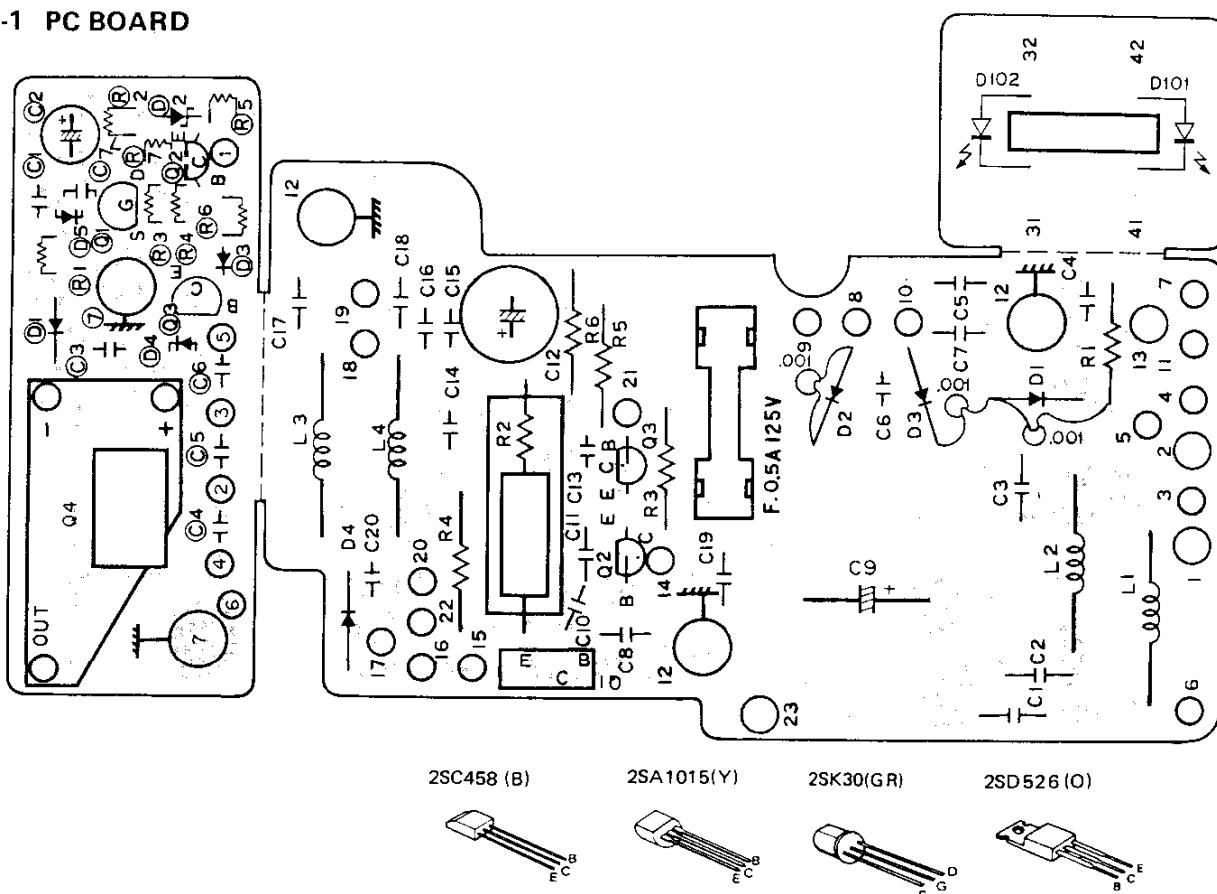


TR-2400 (T, W)

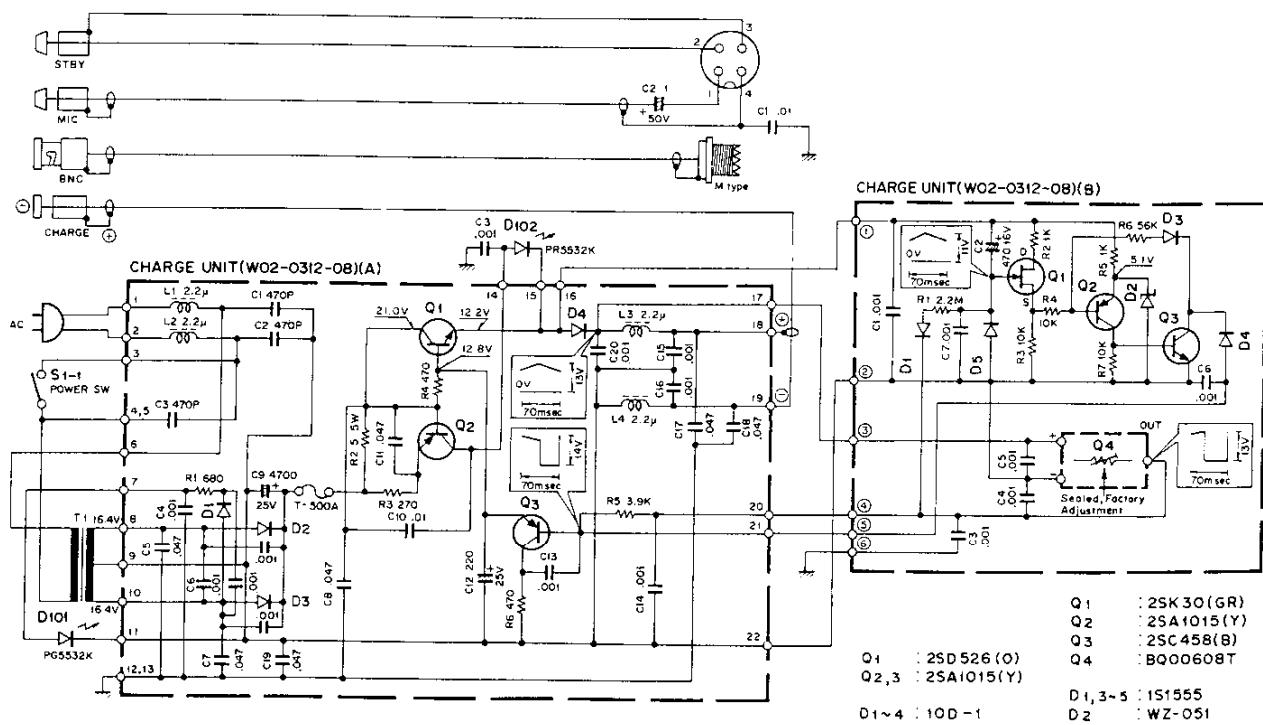


ST-1 BASE STAND

ST-1 PC BOARD



ST-1 SCHEMATIC DIAGRAM



BC-5/ST-1

BC-5 DC-DC CHARGER

SPECIFICATIONS

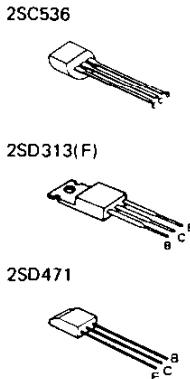
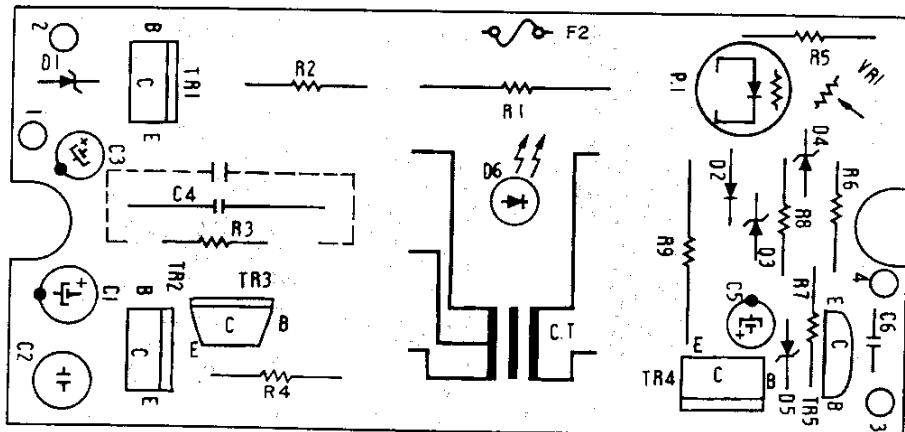
Input: 13.8V DC
 Output: 11.6V DC, 250 mA
 Operating input voltage: 13.8V DC \pm 15%
 Charging characteristic: The Ni-Cd Pack (8 "AA" type cells in series) can be charged over 70% within 2 hours at 25° \pm 3°C.
 Operating temperature: 0°C to +45°C
 Power consumption: Less than 13W at 13.8V DC input, 250 mA load.
 Weight: Approximately 350g (0.77 lbs.)

ST-1 BASE STAND

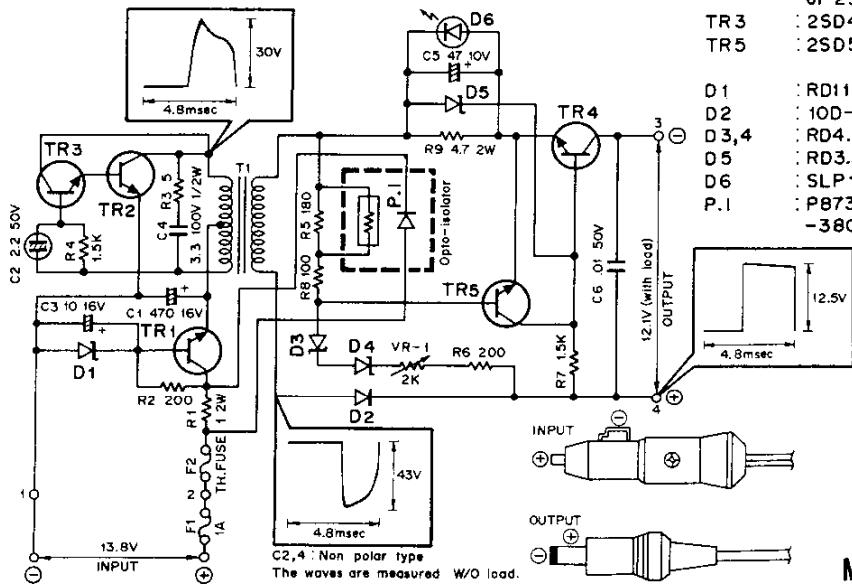
SPECIFICATIONS

Application: Nickel cadmium (Ni-Cd) battery charger
 400 mA
 Charging current: 0°C to +45°C
 Operating temperature: 120V AC 60 Hz, 220V, 240V AC 50/60 Hz
 Power requirement:
 There are three versions of the ST-1, a 120V, a 220V and a 240V line model.
 Each model is preset to the line voltage of the destination.
 Dimensions: Wide 122 mm (4-13/16")
 High 82 mm (3-1/4")
 Deep 177 mm (7")
 Weight: 1 kg (2.2 lbs.)

BC-5 PC BOARD



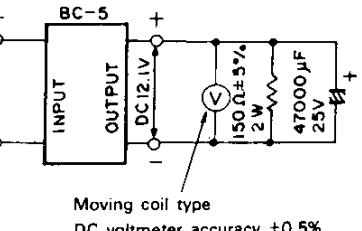
BC-5 SCHEMATIC DIAGRAM



TR1,2,4 : 2SD526(O)
 or 2SD313(F)
 TR3 : 2SD471
 TR5 : 2SD536

D1 : RD11EB
 D2 : 10D-1
 D3,4 : RD4.7EB
 D5 : RD3.3EB2
 D6 : SLP131B
 P.I. : P873G35 -380

< Adjustment of BC-5 >



Adjust VR-1 to obtain 12.1V DC output with 13.8V DC input.
 Use a moving coil type DC voltmeter, not a digital voltmeter for measuring.

FOR SERVICE MANUALS
 CONTACT:
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk
 TEL: 01844 - 351694
 FAX: 01844 - 352554

ST-1,BC-5,PB-24,SC-3 PARTS LIST

Ref. No.	Parts No.	Description	Re-marks
ST-1 (BASE STAND) (K, T, W, X)			
-	A01-0770-23	Case (lower) (K)	☆
-	A01-0771-13	Case (lower) (T) (W) (X)	☆
-	A02-0609-01	Case (upper)	☆
-	A53-0303-04	Stopper (model name) (K) (W) (X)	☆
-	A53-0304-04	Stopper (model name) (T)	☆
-	B41-0614-04	Warning plate	☆
-	B46-0058-10	Warranty card (K)	
-	B50-2714-00	Operating manual	☆
-	E04-0152-05	UHF type receptacle	
-	E06-0453-05	4P Mic jack	
-	E30-0181-05	AC cord (K)	
-	E30-0185-05	AC cord (X)	
-	E30-0685-05	AC cord (W)	
-	E30-0602-05	AC cord (T)	
-	E30-1659-05	Mic plug cord	☆
-	E30-1660-05	BNC cord ass'y	☆
-	E30-1661-08	DC plug cord	☆
-	H01-2668-03	Carton (inside) (K) (W) (X)	☆
-	H01-2669-03	Carton (inside) (T)	☆
-	H12-0468-03	Cushion	☆
-	H25-0079-04	Protective bag 200 × 200	
-	H25-0106-04	Protective bag 250 × 350	
-	J02-0069-05	Foot × 4	
-	J41-0006-00	Cord bush AC (K)	
-	J41-0024-15	Cord bush AC (T) (W) (X)	
-	J41-0038-05	Cord bush Coax. Cable	
-	J42-0418-08	Cord bush MIC, DC	☆
T1	L01-8021-08	Transformer (K)	☆
T1	L01-8032-08	Transformer (W)	☆
T1	L01-8042-08	Transformer (T) (X)	
S1	S36-1402-05	Power switch	☆
D101	V11-7273-86	LED PG5532K	☆
D102	V11-7272-36	LED PR5532K	
-	W02-0313-08	Charge unit	☆

Charge Unit (W02-0312-08) (Block A)

-	F05-5016-05	Fuse 0.5A × 2 (slow blow)	
-	J13-0406-08	Fuse holder	☆
L1~4	L33-0601-05	Choke coil 2.2mH	
Q1	V04-0526-30	Tr 2SD526(O)	
Q2,3	V01-1015-06	Tr 2SA1015(Y)	
D1~4	V11-0159-05	Diode 10D-1	

Charge Unit (W02-0312-08) (Block B)

D1	V11-0076-05	Diode 1S1555	
D2	V11-4103-60	Diode XZ-051(Sub. of WZ-051)	
D3~5	V11-0076-05	Diode 1S1555	
Q1	V09-0016-05	FET 2SK30 (GR)	
Q2	V01-1015-06	Tr 2SA1015 (Y)	
Q3	V03-0093-05	Tr 2SC458 (B)	
Q4	W02-0312-05	Module BQ00608T	☆

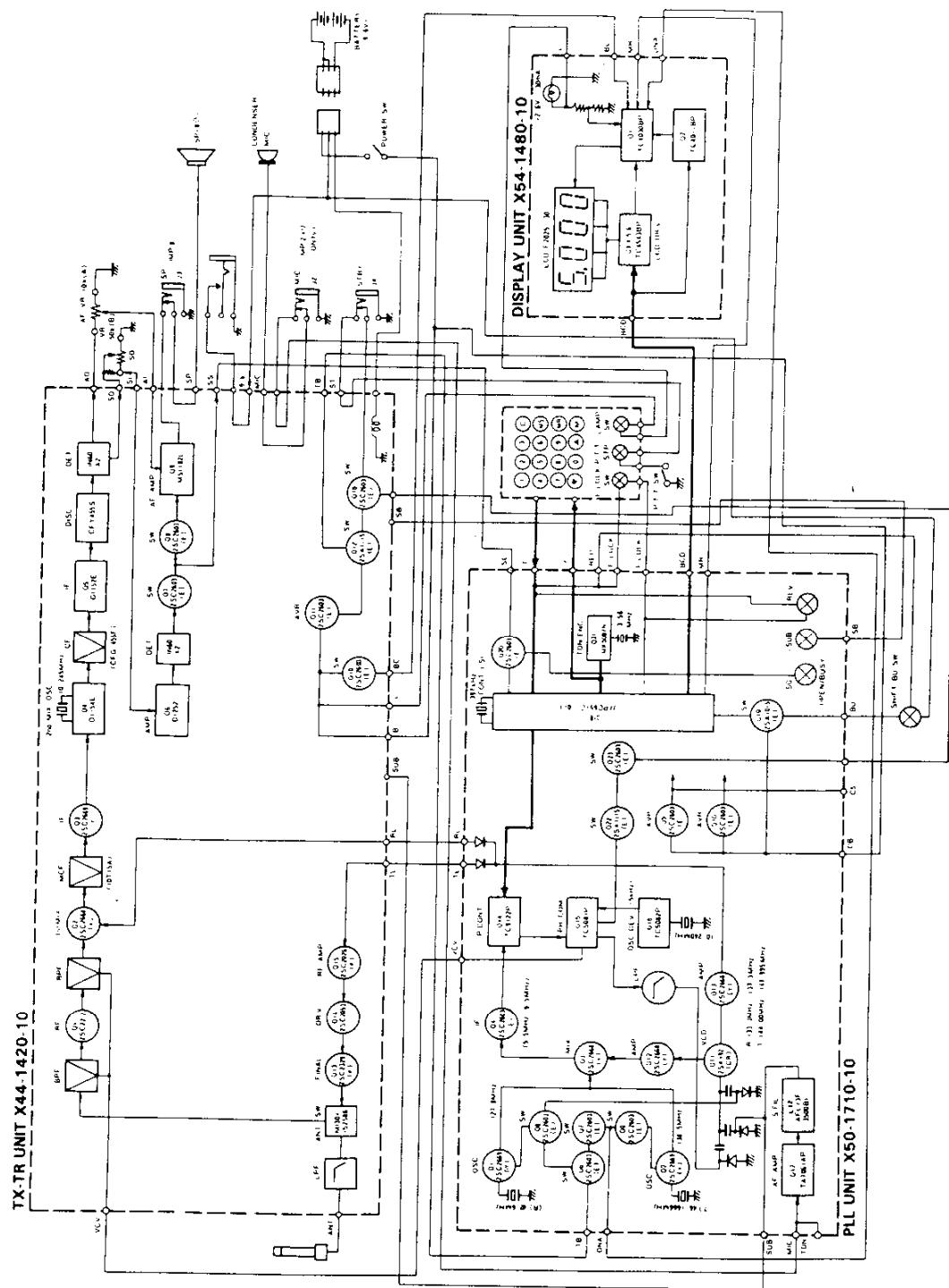
Ref. No.	Parts No.	Description	Re-marks
BC-5(K,T,W,X)			
-	A02-0610-08	Case	☆
C3	C91-0468-05	Metalized film cap. 3.3 μF 100V	☆
-	E30-1663-03	Input cord with plug	☆
-	E30-1664-03	Output cord with plug	☆
F2	F09-0407-08	Thermal fuse 98°C 125V 3A	☆
-	H01-2670-08	Carton (inside) (K) (W) (X)	☆
-	H01-2671-08	Carton (inside) (T)	☆
-	L19-0322-08	Transformer	☆
-	N09-0621-08	Screw × 2 3 × 42mm	☆
-	N10-2030-45	Nut × 2	
-	W02-0314-08	Charge module	☆
Charge Module(W02-0314-08)			
D1	V11-4474-06	Zenner diode RD11EB	☆
D2	V11-0159-05	Diode 10D-1	
D3,4	V11-4473-96	Zener diode RD4.7EB	☆
D5	V99-7770-26	Zenner diode RD3.3EB2	☆
D6	V11-6174-16	LED SLP-131B	☆
P,I	V11-7774-26	Opto-isolator P873G35-380	☆
TR1,2,4	V04-0526-30	Tr 2SD526(O) or 2SD313(F)	
TR3	V04-0313-16	Tr 2SD471	
TR5	V04-0471-00	Tr 2SC536	
PB-24			
-	E31-2046-05	Cable with connector for W09-0306-05	☆
-	E03-0203-05	DC jack for charging cord ass'y	
-	E30-1658-04	Charging cord ass'y	☆
-	W09-0306-05	Ni-Cd battery unit	
SC-3(T,W,X)			
-	J19-1333-03	Clip	☆
-	J32-0742-04	Boss C (BAND)	
-	J32-0743-04	Boss D (BAND)	
-	J32-0744-04	Clip boss × 2	☆

PB-24 Ni-Cd Rechargeable Battery

SPECIFICATIONS

Voltage:	9.6V
Capacity:	450 mAh/90 mA
Normal charge:	45 mA × 15 hrs.
Continuous charge:	9 mA ~ 22.5 mA
Nominal discharge:	90 mA
Maximum continuous discharge:	900 mA
Minimum pack voltage for charging:	8.4V

BLOCK DIAGRAM (K type) from S/N 109XXXX~



A product of
TRIO-KENWOOD CORPORATION
 17-5, 2-chome, shibuya, shibuya-ku Tokyo 150, Japan

FOR SERVICE MANUALS
 CONTACT:
MAURITRON TECHNICAL SERVICES

www.mauritron.co.uk
 TEL: 01844 - 351694
 FAX: 01844 - 352554

TRIO-KENWOOD COMMUNICATIONS
 1111 West Walnut Street, Compton California 90220, U.S.A.
TRIO-KENWOOD COMMUNICATIONS, GmbH
 D 6374 Steinbach TS, Industriestrasse 8A, West Germany
TRIO-KENWOOD ELECTRONICS, N.V.
 Leuvensesteenweg 504 B-1930 Zaventem, Belgium
TRIO-KENWOOD (AUSTRALIA) PTY. LTD.
 4E Woodcock Place, Lane Cove NSW 2066, Australia

© 1981-10/1986-6 PRINTED IN JAPAN B51-0904-20(KWT) [2] 350(G)