

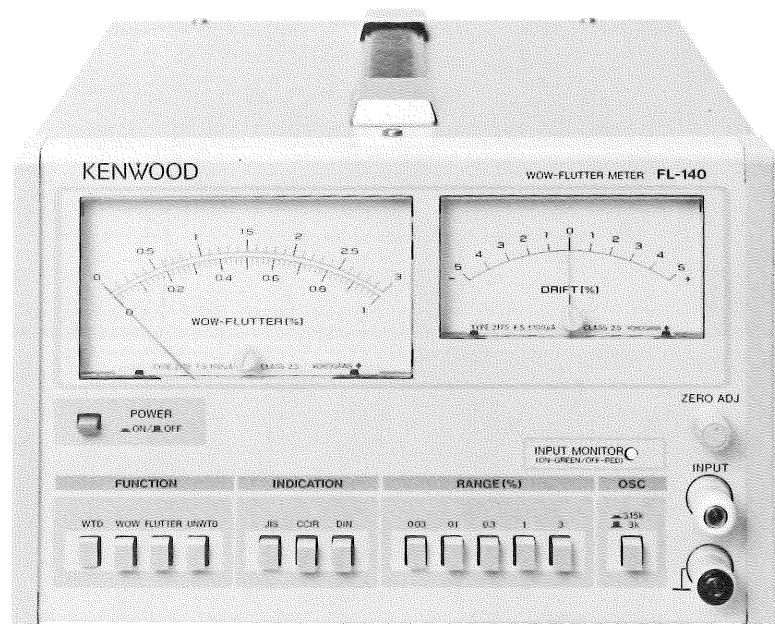
WOW-FLUTTER METER

FL-140

SERVICE MANUAL

KENWOOD CORPORATION

KENWOOD



WARNING

The following instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

CONTENTS

ADJUSTMENT	3
PARTS LIST	4
SCHEMATIC DIAGRAM	6
P.C. BOARD	7

ADJUSTMENT

To obtain the best performance, periodically calibrate the unit. Sometimes, only one mode need be calibrated, while at other times, all modes should be calibrated. When one mode is calibrated, it must be noted that the other modes may be affected. When calibrating all modes, perform the calibration in the specified sequence.

The following calibration required an accurate measuring instrument and an insulated adjusting flat blade screwdriver. If they are not available, contact your dealer. For optimum adjustment, turn the power on and warm up the unit sufficiently (more than 30 minutes) before starting.

Before calibrating the unit, check the power supply voltage.

TEST EQUIPMENT REQUIRED

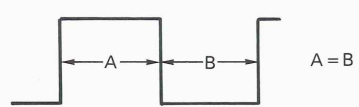
The following instrument or their equivalent should be used for making adjustment.

Test Equipment	Model	Maker
Frequency Counter	FC-758	KENWOOD
Digital Multimeter	45	FLUKE
Sine-Wave Generator	651B	HP
SSVM	VT-171	KENWOOD
Wow-Flutter Calibrator	MWS-670C	MEGURO
Oscilloscope	CS-6030	KENWOOD
Distortion Meter	885	ShibaSoku
Watt-meter	DPB-1W	YEW
Insulation Meter	SM-5	TOA
Fuction Generator	FG-273	KENWOOD

1. OSC SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	Procedure
OSC frequency	TC 1	Connect a F-counter to TP7 and adjust the frequency. 10.080 MHz \pm 50 Hz
OSC OUT	VR24	Connect a DMM to OSC OUT and adjust the output voltage. 0.2 Vrms \pm 20% (0.16 Vrms to 0.24 Vrms) Ensure that the voltage does not change even when the frequency is switched between 3 kHz and 3.15 kHz.

2. WOW-FLUTTER METER SECTION ADJUSTMENTS

Item	Adjustment VR (TC)	Procedure
Offset	VR19 VR21	Short-circuit the input. <ul style="list-style-type: none"> Connect the DVM (DCV) to TP5, then adjust to 0 V. Connect the DVM (DCV) to TP6, then adjust to 0 V.
Pulse duration	VR1	Connect an oscilloscope to TP1, apply 3 kHz sine wave to the input, and adjust so that the duty ratio of the waveform at TP1 becomes 50%.  Note: The input voltage shall be no more than 5 mVrms.
fo detector	VR2	Connect a DVM (DCV) to TP2, then adjust to 0 V.

PREPARATION FOR ADJUSTMENT

Control Settings

The control settings listed below must be used for each adjustment procedure.

Exceptions to these settings will be noted as they occur. After completing a adjustment, return the controls to the following settings.

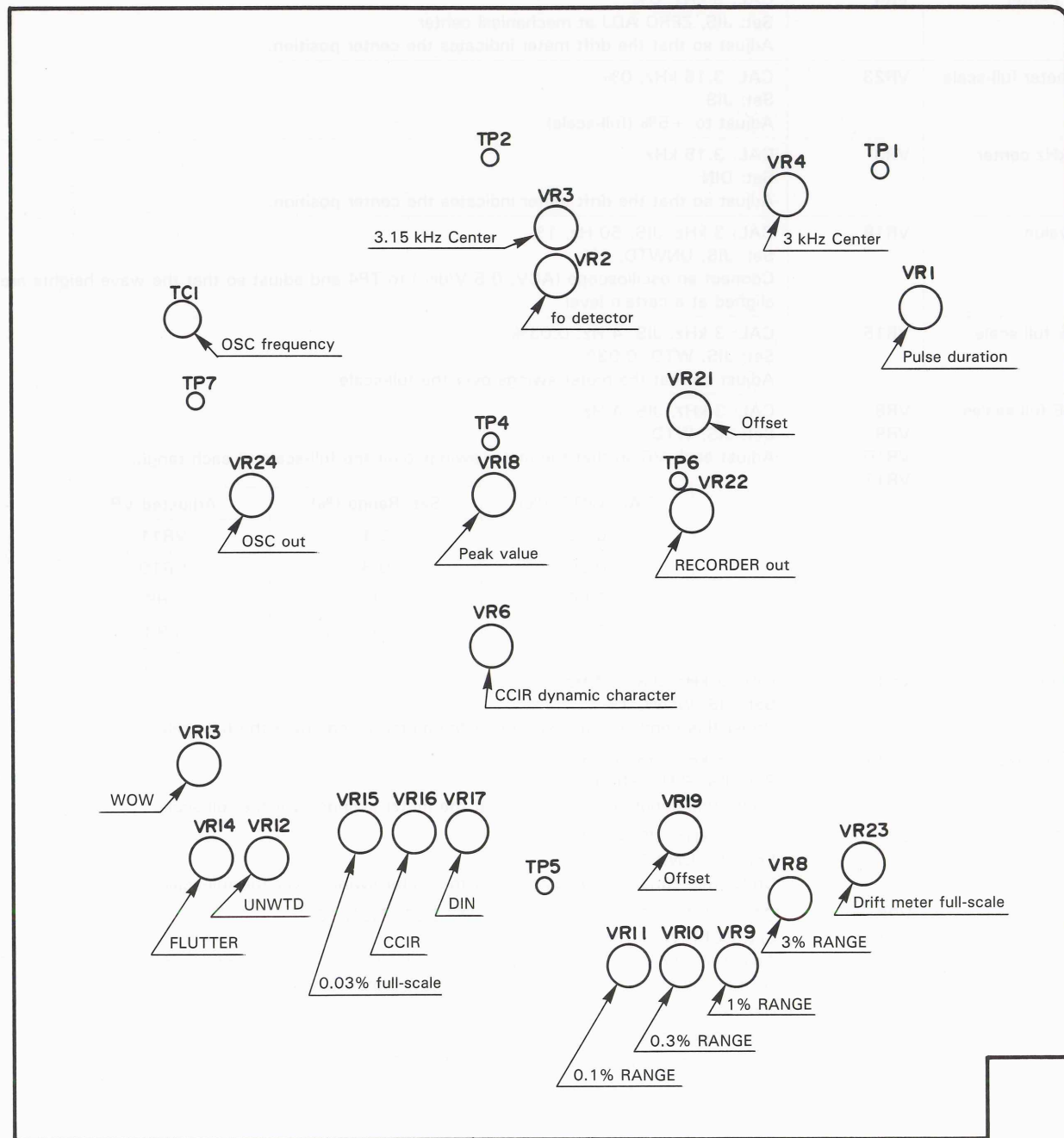
NAME OF KNOBS	POSITION
POWER	ON
OSC	3 kHz

ADJUSTMENT

Item	Adjustment VR (TC)	Procedure															
3 kHz center	VR4	CAL: 3 kHz, 0% Set: JIS, ZERO ADJ at mechanical center Adjust so that the drift meter indicates the center position.															
Drift meter full-scale	VR23	CAL: 3.15 kHz, 0% Set: JIS Adjust to +5% (full-scale).															
3.15 kHz center	VR3	CAL: 3.15 kHz Set: DIN Adjust so that the drift meter indicates the center position.															
Peak value	VR18	CAL: 3 kHz, JIS, 50 Hz, 1% Set: JIS, UNWTD, 1% Connect an oscilloscope (ACV, 0.5 V/div.) to TP4 and adjust so that the wave heights are all aligned at a certain level.															
0.03% full-scale	VR15	CAL: 3 kHz, JIS, 4 Hz, 0.03% Set: JIS, WTD, 0.03% Adjust so that the meter swings over the full-scale.															
RANGE full-scales	VR8 VR9 VR10 VR11	CAL: 3 kHz, JIS, 4 Hz Set: JIS, WTD Adjust each VR so that the meter swings over the full-scale at each range. <table border="1" data-bbox="2113 836 2828 1018"> <thead> <tr> <th>CAL: WOW (%)</th> <th>Set: Range (%)</th> <th>Adjusted VR</th> </tr> </thead> <tbody> <tr> <td>0.10</td> <td>0.1</td> <td>VR11</td> </tr> <tr> <td>0.30</td> <td>0.3</td> <td>VR10</td> </tr> <tr> <td>1.00</td> <td>1</td> <td>VR9</td> </tr> <tr> <td>3.00</td> <td>3</td> <td>VR8</td> </tr> </tbody> </table>	CAL: WOW (%)	Set: Range (%)	Adjusted VR	0.10	0.1	VR11	0.30	0.3	VR10	1.00	1	VR9	3.00	3	VR8
CAL: WOW (%)	Set: Range (%)	Adjusted VR															
0.10	0.1	VR11															
0.30	0.3	VR10															
1.00	1	VR9															
3.00	3	VR8															
WOW level	VR13	CAL: 3 kHz, JIS, 1.4 Hz, 1% Set: JIS, WOW, 1% Under this condition, adjust so that the meter swings over the full-scale.															
FLUTTER level	VR14	CAL: 3 kHz, JIS, 40 Hz, 1% Set: JIS, FLUTTER, 1% Under this condition, adjust so that the meter swings over the full-scale.															
UNWTD level	VR12	CAL: 3 kHz, JIS, 40 Hz, 1% Set: JIS, UNWTD, 1% Under this condition, adjust so that the meter swings over the full-scale.															
CCIR dynamic character	VR6 VR16	CAL: 3 kHz, CCIR PULSE, 40 Hz, 1%, DURATION 100 ms Set: CCIR, WTD, 1% Adjust and hold VR16 so that the meter indicates 1% at the maximum swing, and adjust VR6 so that the meter indicates 0.34% at the minimum swing.															
CCIR level	VR16	CAL: 3 kHz, CCIR, 40 Hz, 1% Set: CCIR, UNWTD, 1% Adjust so that the meter swings over the full-scale.															
DIN level	VR17	CAL: 3.15 kHz, CCIR, 40 Hz, 1% Set: DIN, UNWTD, 1% Adjust so that the meter swings over the full-scale.															
Recorder output voltage	VR22	CAL: 3 kHz, JIS, 40 Hz, 1% Set: JIS, UNWTD, 1% Under this condition (as swing over the full-scale), adjust so that the recorder output voltage becomes 1 V DC.															

ADJUSTMENT

OVERALL UNIT (X65-1400-00)



PARTS LIST

FL-140 UNIT

Y80-1410-00

REF.NO	PARTS NO	NAME & DESCRIPTION
	A01-1229-02	CASE
	A01-1230-02	CHASSIS
	A13-0948-13	FRAME,SIDES
	A21-1177-02	DECORATIVE PANEL
	A22-0884-12	SUB PANEL
	A83-0007-02	REAR PANEL
	B01-0705-03	ESCUTCHEON
	B31-0752-05	METER;WOW-FLUTTER
	B31-0753-05	METER;DRIFT
	B42-3699-04	SERIAL NO. PLATE
	B63-0015-00	INSTRUCTION MANUAL;ENG./JAP.
	D21-0929-04	EXTENSION SHAFT
	D22-0501-04	JOINT & COUPLING
	E04-0259-05	BNC RECEPTACLE
	E18-0365-05	AC SELECTOR WITH 6X30MM FUSE
	E18-0366-15	AC SELECTOR WITH 5X20MM FUSE
	E21-0669-03	PAIR TERMINAL
	E21-0671-03	TERMINAL,BLACK
	E21-0672-03	TERMINAL,WHITE
	E23-0565-05	EARTH WASHER
	E30-1644-15	BS POWER CORD
	E30-1818-05	JIS POWER CORD SET
	E30-1819-05	CEE POWER CORD SET
	E30-1820-05	UL/CSA POWER CORD SET
	E30-1821-05	SAA POWER CORD SET
	E31-2928-05	WIRE ASS'Y;INLET TO GND
	E38-0091-15	WIRE ASS'Y;INPUT TO P1
	E38-0092-15	WIRE ASS'Y;RECORDER TO P2
	E38-0093-05	WIRE ASS'Y;SCOPE TO P3
	E38-0094-15	WIRE ASS'Y;OSC TO P3
	E38-0282-05	WIRE ASS'Y;INLET,FUSE TO P10
	F05-2012-05	FUSE(6X30MM) 0.2A/250V
	F05-2015-05	FUSE(5X20MM) T200MA/250V
	F05-3011-05	FUSE(6X30MM) 0.3A/250V
	F20-0639-04	INSULATOR
	F20-0686-04	INSULATOR
	H10-2851-02	FOAMED STYRENE PAD(FRONT)
	H10-2852-02	FOAMED STYRENE PAD(REAR)
	H20-1709-14	VINYL COVER
	H53-0015-14	CARTON BOX
	J02-0363-04	RUBBER FOOT,REAR
	J02-0525-13	RUBBER FOOT,FRONT
	J02-0528-04	TILT STAND
	J21-4713-04	BRACKET;VOLUME
	J21-4715-04	BRACKET;SWITCH
	J30-0633-04	SPACER
	J61-0049-05	WIRE BAND
	K01-0544-05	HANDLE
	K23-0808-03	KNOB(ONE USED)
	K27-0504-04	BUTTON;GRAY,USED 13 PIECES
	K27-0559-04	KNOB,ORANGE
	L01-9951-15	POWER TRANSFORMER
	N09-0623-04	SCREW,SEMS PAN HD M3X8
	N09-0654-05	SCREW,SEMS PAN HD M4X8
	N09-0739-05	SCREW,SEMS BINDING TAPTITE 3X8
	N09-0757-05	SCREW,SEMS BINDING TAPTITE 3X6
	N09-0777-05	SCREW,SEMS PAN HD M4X6
	N10-2030-41	NUT, HEX M3
	N14-0620-05	FLANGE NUT M4
	N17-1030-41	LOCK WASHER M3
	N30-3010-41	SCREW, PAN HD M3X10
	N88-3008-41	SCREW, FLAT HD TAPTITE 3X8
	N89-3008-41	SCREW, BINDING TAPTITE 3X8
	X65-1400-00	OVERALL UNIT
	X67-1000-00	ACCESSORY CORD(CA-36)

OVERALL UNIT

X65-1400-00

REF.NO	PARTS NO	NAME & DESCRIPTION
	E38-0098-05	WIRE ASS'Y;P5,10 TO JW4
	E38-0099-15	WIRE ASS'Y;P9 TO JW5
	E38-0100-05	WIRE ASS'Y;P6 TO JW6
	E38-0101-05	WIRE ASS'Y;P8 TO JW7
	F01-0879-05	HEAT SINK
	J25-5403-13	PCB (UNMOUNTED)
	N09-0623-04	SCREW,SEMS M3X8
	N30-3012-41	SCREW, PAN HD M3X12
	S40-2511-05	PUSH SWITCH,POWER
C1	CQ93M2A104K	CAP. MYLAR 0.1 10% 100V
C2	CQ93BP2A333F	CAP. MYLAR 0.033 1% 100V
C3	CQ93BP2A333F	CAP. MYLAR 0.033 1% 100V
C4	CQ93BP2A274F	CAP. MYLAR 0.27 1% 100V
C5	CQ93BP2A274F	CAP. MYLAR 0.27 1% 100V
C6	CE04HW1E100M	CAP. ELECTRO 10 20% 25V
C7	CE04HW1E100M	CAP. ELECTRO 10 20% 25V
C8	CC45FCH1H271J	CAP. CERAMIC 270P 5% 50V
C9	CE04BW1E100M	CAP. ELECTRO 10 20% 25V
C10	CC45FSL1H331J	CAP. CERAMIC 330P 5% 50V
C11	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C12	CK45FB1H102K	CAP. CERAMIC 1000P 10% 50V
C13	CE04EW1E470M	CAP. ELECTRO 47 20% 25V
C14	CQ92FM1H103K	CAP. MYLAR 0.01 10% 50V
C15	CQ93BP2A101J	CAP. MYLAR 100P 5% 100V
C16	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C17	CE04BW1E101M	CAP. ELECTRO 100 20% 25V
C18	CE04EW1H010M	CAP. ELECTRO 1 20% 50V
C19	C91-1319-05	CAP. 10000P .25% 50V
C20	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C21	CQ93BP2A164F	CAP. MYLAR 0.16 1% 100V
C22	CQ93BP2A114F	CAP. MYLAR 0.11 1% 100V
C23	CF92V1H152J	CAP. POLYESTER 1500P 5% 50V
C24	CE04BW1E101M	CAP. ELECTRO 100 20% 25V
C25	CQ93BP2A823F	CAP. MYLAR 0.082 1% 100V
C26	CQ93BP2A823F	CAP. MYLAR 0.082 1% 100V
C27	CF92V1H222J	CAP. POLYESTER 2200P 5% 50V
C28	CF93AN2A684J	CAP. POLYESTER 0.68 5% 100V
C29	CQ93BP2A334F	CAP. MYLAR 0.33 1% 100V
C30	CQ93BP2A334F	CAP. MYLAR 0.33 1% 100V
C31	CQ93BP2A333F	CAP. MYLAR 0.033 1% 100V
C32	CQ93BP2A274F	CAP. MYLAR 0.27 1% 100V
C33	CQ93BP2A274F	CAP. MYLAR 0.27 1% 100V
C34	CQ93BP2A274F	CAP. MYLAR 0.27 1% 100V
C35	CQ93BP2A473F	CAP. MYLAR 0.047 1% 100V
C36	CQ93BP2A474F	CAP. MYLAR 0.47 1% 100V
C37	CF93AN2A684J	CAP. POLYESTER 0.68 5% 100V
C38	CQ93BP2A474F	CAP. MYLAR 0.47 1% 100V
C39	CF93AN2A684J	CAP. POLYESTER 0.68 5% 100V
C40	CQ92FM1H682K	CAP. MYLAR 6800P 10% 50V
C41	CQ92FM1H392K	CAP. MYLAR 3900P 10% 50V
C42	CE04BW1E470M	CAP. ELECTRO 47 20% 25V
C43	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C44	CE04EW1E101M	CAP. ELECTRO 100 20% 25V
C45	C90-0904-05	CAP. ELECTRO 47 20% 25V
C46	C90-0903-05	CAP. ELECTRO 33 20% 25V
C47	C90-0904-05	CAP. ELECTRO 47 20% 25V
C48	C90-0903-05	CAP. ELECTRO 33 20% 25V
C49	CC45FCH1H220J	CAP. CERAMIC 22P 5% 50V
C50	CC45FCH1H220J	CAP. CERAMIC 22P 5% 50V
C51	CQ92FM1H104K	CAP. MYLAR 0.1 10% 50V
C52	CC45FCH1H220J	CAP. CERAMIC 22P 5% 50V
C53	CE04EW1V222M	CAP. ELECTRO 2200 20% 35V
C54	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C55	CE04EW1E221M	CAP. ELECTRO 220 20% 25V
C56	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C57	CE04EW1V222M	CAP. ELECTRO 2200 20% 35V
C58	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C59	CE04EW1E221M	CAP. ELECTRO 220 20% 25V
C60	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C61	CE04EW1C472M	CAP. ELECTRO 4700 20% 16V
C62	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C63	CE04EW1A221M	CAP. ELECTRO 220 20% 10V
C64	CK45FF1H473Z	CAP. CERAMIC 0.047 50V
C65	CF92V1H393J	CAP. POLYESTER 0.039 5% 50V
C66	CQ92FM1H473J	CAP. MYLAR 0.047 5% 50V
C67	CF92V1H183J	CAP. POLYESTER 0.018 5% 50V
C68	CF92V1H122J	CAP. POLYESTER 1200P 5% 50V
C69	CQ93BP2A391J	CAP. MYLAR 390P 5% 100V
C70	CE04EW1E100M	CAP. ELECTRO 10 20% 25V
C71	CQ92FM1H682K	CAP. MYLAR 6800P 10% 50V
C77	CE04EW1E4R7M	CAP. ELECTRO 4.7 20% 25V
C78	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V
C79	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V
C80	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V
C81	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V
C82	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V
C83	C91-1315-05	CAP. CERAMIC 0.1 80/-10% 50V

PARTS LIST

MARADACI CITANINHO

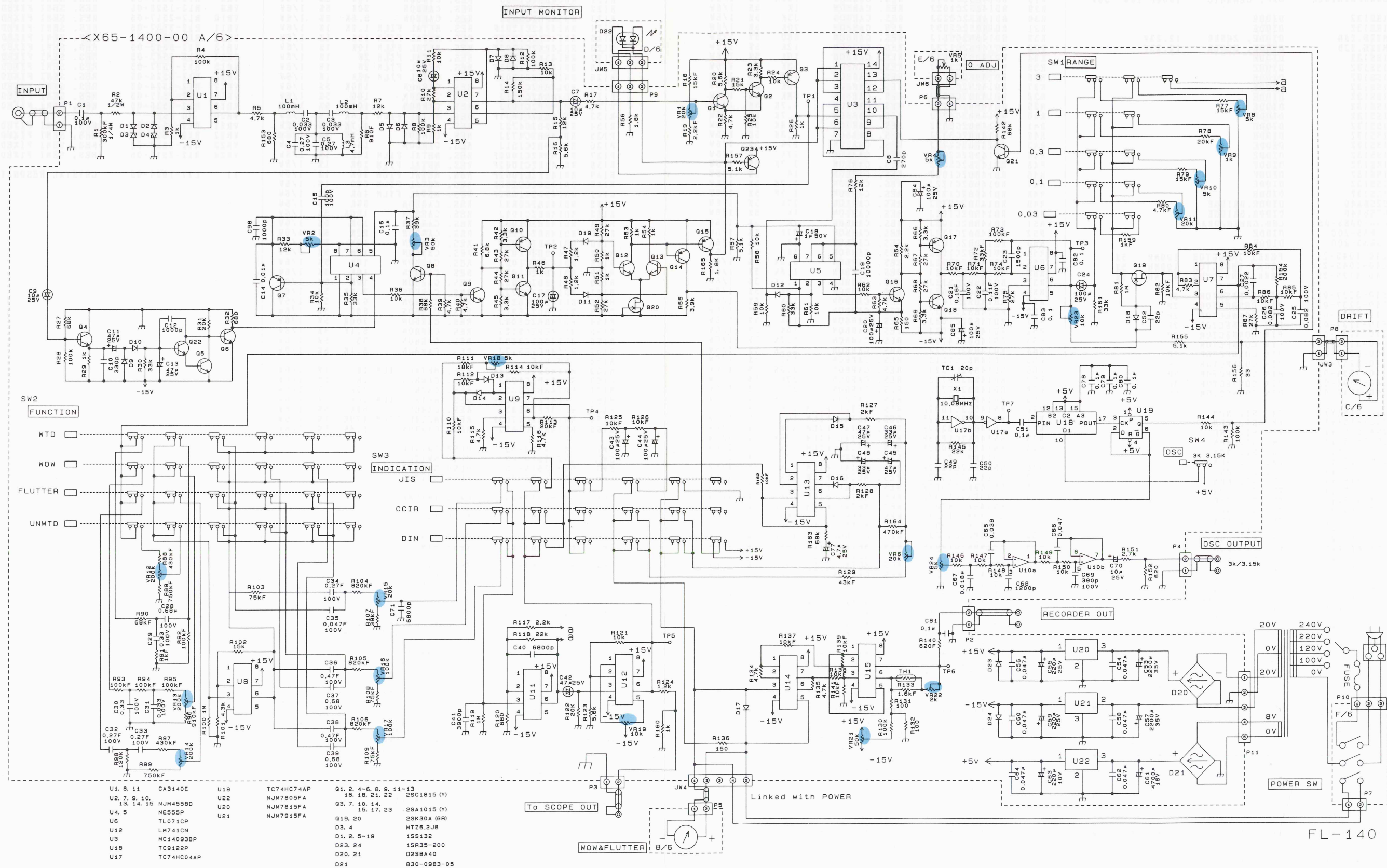
PARTS LIST

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	TOL	VAL
C84	CE04EWE1E101M	CAP. ELECTRO	100	20%	25V
C85	CE04EWE1E101M	CAP. ELECTRO	100	20%	25V
C98	CK45FB1H102K	CAP. CERAMIC	1000P	10%	50V
D1	1SS132	DIODE			
D2	1SS132	DIODE			
D3	MTZ6.2JB	DIODE, ZENER	12.23V		
D4	MTZ6.2JB	DIODE, ZENER	12.23V		
D5	1SS132	DIODE			
D6	1SS132	DIODE			
D7	1SS132	DIODE			
D8	1SS132	DIODE			
D9	1SS132	DIODE			
D10	1SS132	DIODE			
D11	1SS132	DIODE			
D12	1SS132	DIODE			
D13	1SS132	DIODE			
D14	1SS132	DIODE			
D15	1SS132	DIODE			
D16	1SS132	DIODE			
D17	1SS132	DIODE			
D18	1SS132	DIODE			
D19	1SS132	DIODE			
D20	D2SBA40	DIODE, BRIDGE			
D21	D2SBA40	DIODE, BRIDGE			
D22	B30-0983-05	LED, GREEN/ORANGE			
D23	1SR35-200	DIODE			
D24	1SR35-200	DIODE			
L1	L40-1045-21	FERRI INDUCTOR	100MH	5%	
L2	L40-1045-21	FERRI INDUCTOR	100MH	5%	
L3	L40-4725-29	FERRI INDUCTOR	4.7MH	5%	
P1	E40-3237-05	PIN CONNECTOR	2P		
P2	E40-3237-05	PIN CONNECTOR	2P		
P3	E40-3237-05	PIN CONNECTOR	2P		
P4	E40-3237-05	PIN CONNECTOR	2P		
P5	E40-3237-05	PIN CONNECTOR	2P		
P6	E40-3237-05	PIN CONNECTOR	2P		
P7	E40-3237-05	PIN CONNECTOR	2P		
P8	E40-3237-05	PIN CONNECTOR	2P		
P9	E40-3238-05	PIN CONNECTOR	3P		
P10	E40-0304-05	PIN CONNECTOR	3P		
P11	E40-3240-05	PIN CONNECTOR	5P		
Q1	2SC1815(Y)	TR. SI, NPN			
Q2	2SC1815(Y)	TR. SI, NPN			
Q3	2SA1015(Y)	TR. SI, PNP			
Q4	2SC1815(Y)	TR. SI, NPN			
Q5	2SC1815(Y)	TR. SI, NPN			
Q6	2SC1815(Y)	TR. SI, NPN			
Q7	2SA1015(Y)	TR. SI, PNP			
Q8	2SC1815(Y)	TR. SI, NPN			
Q9	2SC1815(Y)	TR. SI, NPN			
Q10	2SA1015(Y)	TR. SI, PNP			
Q11	2SC1815(Y)	TR. SI, NPN			
Q12	2SC1815(Y)	TR. SI, NPN			
Q13	2SC1815(Y)	TR. SI, NPN			
Q14	2SA1015(Y)	TR. SI, PNP			
Q15	2SA1015(Y)	TR. SI, PNP			
Q16	2SC1815(Y)	TR. SI, NPN			
Q17	2SA1015(Y)	TR. SI, PNP			
Q18	2SC1815(Y)	TR. SI, NPN			
Q19	2SK30A(GR)	FET, N-CHANNEL			
Q20	2SK30A(GR)	FET, N-CHANNEL			
Q21	2SC1815(Y)	TR. SI, NPN			
Q22	2SC1815(Y)	TR. SI, NPN			
Q23	2SA1015(Y)	TR. SI, PNP			
R1	RN14BK2E3003F	RES. METAL FILM	300K	1%	1/4W
R2	RD14BB2H473J	RES. CARBON	47K	5%	1/2W
R3	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R4	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R5	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R6	RN14BK2C9100F	RES. METAL FILM	910	1%	1/6W
R7	RD14BB2C123J	RES. CARBON	12K	5%	1/6W
R8	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R9	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R10	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R11	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R12	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R13	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R14	RD14BB2C154J	RES. CARBON	150K	5%	1/6W
R15	RD14BB2C123J	RES. CARBON	12K	5%	1/6W
R16	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R17	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R18	RN14BK2C1502F	RES. METAL FILM	15K	1%	1/6W
R19	RN14BK2C2201F	RES. METAL FILM	2.2K	1%	1/6W
R20	RD14BB2C562J	RES. CARBON	5.6K	5%	1/6W
R21	RD14BB2C153J	RES. CARBON	15K	5%	1/6W
R22	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R23	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R24	RD14BB2C103J	RES. CARBON	10K	5%	1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	TOL	VAL
R25	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R26	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R27	RD14BB2C683J	RES. CARBON	68K	5%	1/6W
R28	RD14BB2C104J	RES. CARBON	100K	5%	1/6W
R29	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R30	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R31	RD14BB2C203J	RES. CARBON	20K	5%	1/6W
R32	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R33	RD14BB2C123J	RES. CARBON	12K	5%	1/6W
R34	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R35	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R36	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R37	RD14BB2C393J	RES. CARBON	39K	5%	1/6W
R38	RD14BB2C683J	RES. CARBON	68K	5%	1/6W
R39	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R40	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R41	RD14BB2C682J	RES. CARBON	6.8K	5%	1/6W
R42	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R43	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R44	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R45	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R46	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R47	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R48	RD14BB2C122J	RES. CARBON	1.2K	5%	1/6W
R49	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R50	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R51	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R52	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R53	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R54	RD14BB2C102J	RES. CARBON	1K	5%	1/6W
R55	RD14BB2C392J	RES. CARBON	3.9K	5%	1/6W
R56	RD14BB2C182J	RES. CARBON	1.8K	5%	1/6W
R57	RD14BB2C512J	RES. CARBON	5.1K	5%	1/6W
R58	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R59	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R60	RD14BB2C333J	RES. CARBON	33K	5%	1/6W
R61	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R62	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R63	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R64	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W
R65	RD14BB2C151J	RES. CARBON	150	5%	1/6W
R66	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R67	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R68	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R69	RD14BB2C332J	RES. CARBON	3.3K	5%	1/6W
R70	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R71	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R72	RN14BK2C3302F	RES. METAL FILM	33K	1%	1/6W
R73	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R74	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R75	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R76	RN14BK2C1202F	RES. METAL FILM	12K	1%	1/6W
R77	RN14BK2C1502F	RES. METAL FILM	15K	1%	1/6W
R78	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R79	RN14BK2C1502F	RES. METAL FILM	15K	1%	1/6W
R80	RN14BK2C4701F	RES. METAL FILM	4.7K	1%	1/6W
R81	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R82	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R83	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R84	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R85	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R86	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R87	RD14BB2C273J	RES. CARBON	27K	5%	1/6W
R88	RN14BK2C4303F	RES. METAL FILM	430K	1%	1/6W
R89	RN14BK2C7503F	RES. METAL FILM	750K	1%	1/6W
R90	RN14BK2C6802F	RES. METAL FILM	68K	1%	1/6W
R91	RN14BK2C1001F	RES. METAL FILM	1K	1%	1/6W
R92	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R93	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R94	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R95	RN14BK2C1003F	RES. METAL FILM	100K	1%	1/6W
R96	RN14BK2C9103F	RES. METAL FILM	910K	1%	1/6W
R97	RN14BK2C4303F	RES. METAL FILM	430K	1%	1/6W
R98	RD14BB2C124J	RES. CARBON	120K	5%	1/6W
R99	RN14BK2C7503F	RES. METAL FILM	750K	1%	1/6W
R100	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R101	RD14BB2C432J	RES. CARBON	4.3K	5%	1/6W
R102	RD14BB2C153J	RES. CARBON	15K	5%	1/6W
R103	RN14BK2C7502F	RES. METAL FILM	75K	1%	1/6W
R104	RN14BK2C8203F	RES. METAL FILM	820K	1%	1/6W
R105	RN14BK2C8203F	RES. METAL FILM	820K	1%	1/6W
R106	RN14BK2C8203F	RES. METAL FILM	820K	1%	1/6W
R107	RN14BK2C3902F	RES. METAL FILM	39K	1%	1/6W
R108	RN14BK2C7502F	RES. METAL FILM	75K	1%	1/6W
R109	RN14BK2C7502F	RES. METAL FILM	75K	1%	1/6W
R110	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R111	RN14BK2C1802F	RES. METAL FILM	18K	1%	1/6W
R112	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R113	RN14BK2C2002F	RES. METAL FILM	20K	1%	1/6W
R114	RN14BK2C1002F	RES. METAL FILM	10K	1%	1/6W
R115	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R116	RD14BB2C472J	RES. CARBON	4.7K	5%	1/6W
R117	RD14BB2C222J	RES. CARBON	2.2K	5%	1/6W

REF. NO	PARTS NO	NAME & DESCRIPTION	QTY	TOL	VAL
R118	RD14BB2C223J	RES. CARBON	22K	5%	1/6W
R119	RD14BB2C105J	RES. CARBON	1M	5%	1/6W
R120	RD14BB2C681J	RES. CARBON	680	5%	1/6W
R121	RD14BB2C103J	RES. CARBON	10K	5%	1/6W
R122	RD14BB2C203J	RES. CARBON	20K	5%	1/6

SCHEMATIC DIAGRAM

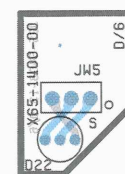
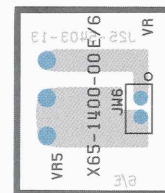
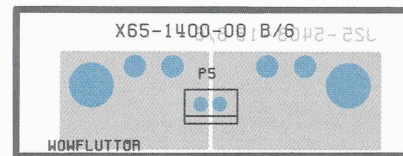
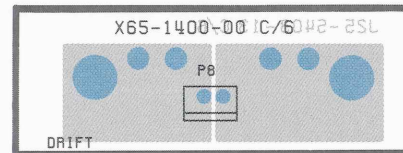
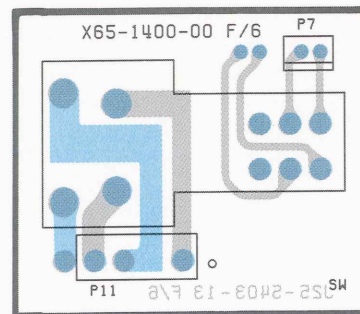
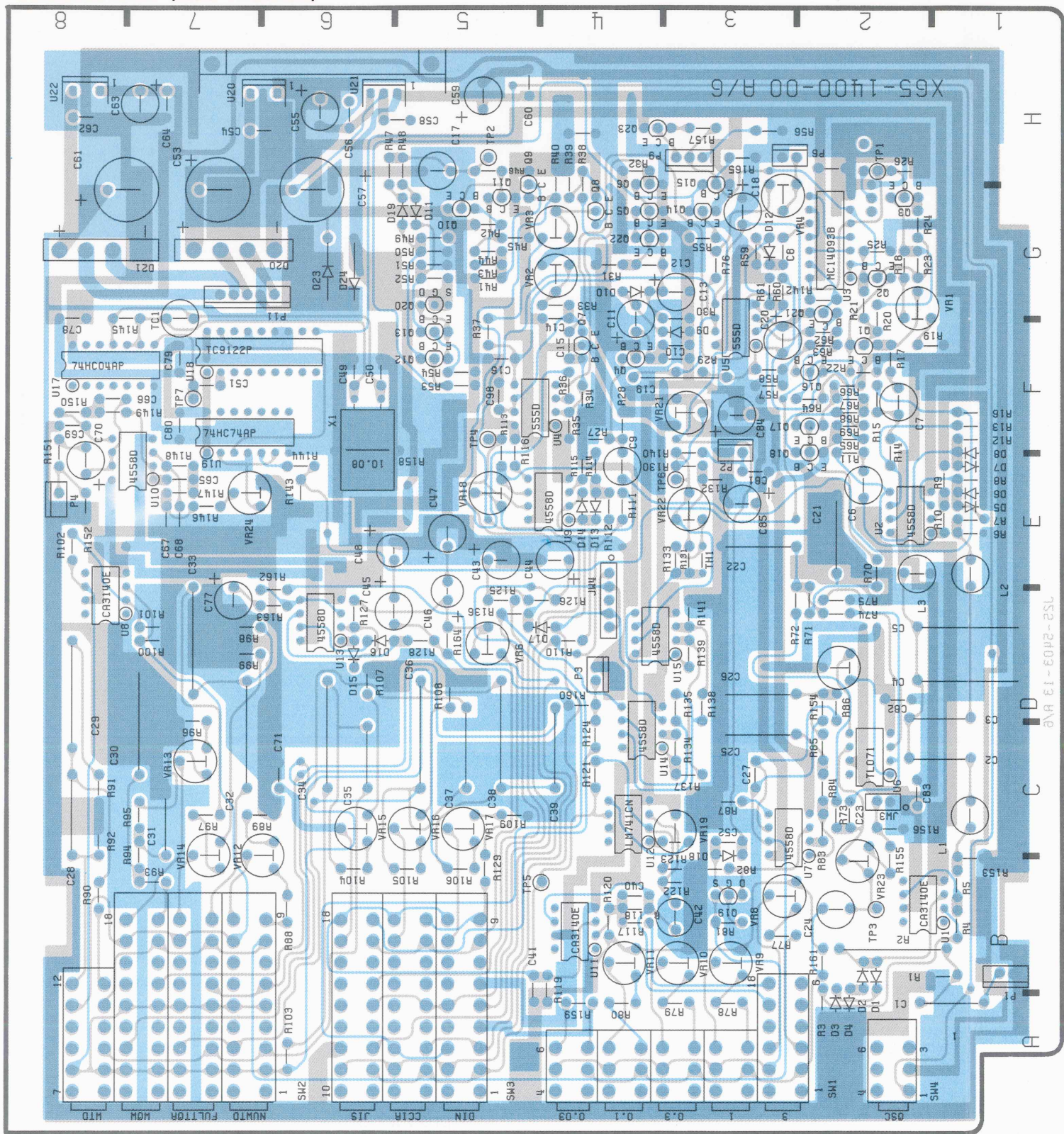


U1, 8, 11	CA3140E	U19	TC74HC74AP	Q1, 2, 4-6, 8, 9, 11-13	2SC1815 (Y)
U2, 7, 9, 10, 13, 14, 15	NJM4558D	U20	NJM7805FA	Q3, 7, 10, 14, 15, 17, 23	2SA1015 (Y)
U4, 5	NE555P	U21	NJM7915FA	Q18, 20	2SK30A (GR)
U6	TL071CP			Q3, 4	MTZ6.2JB
U12	LM741CN			Q1, 2, 5-19	1SS132
U3	MC14093BP			Q23, 24	1SR35-200
U18	TC9122P			Q20, 21	D2SBA40
U17	TC74HC04AP			Q21	830-0983-05

FL-140

P.C. BOARD

OVERALL UNIT (X65-1400-00)



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