

CALIBRATION PROCEDURS FOR MODEL 6010 MULTIFUNCTION TESTER

(1) Loop (Ohm) Ranges Adjustment

1. Set the resistance test equipment (originally made by Kyoritsu to test model 4116, 4118, 4120) to provide 230V/50Hz.
2. Using a test lead for Model 6010, connect the instrument to the resistance test equipment as shown below.
3. Set the function switch of 6010 to 20 ohm loop range.
4. Set the dia selector of the resistance test equipment to 20 ohm position.
5. Adjust variable resistor VR6 of 6010 so that it reads 230V AC.
6. Adjust VR1 of 6010 so that it reads an offset resistance of the resistance test equipment +/- 2 digit when the test button of 6010 is pressed.
This should be done at both 0° and 180° phase shifts.

Note: The offset resistance of the resistance test equipment is a loop resistance of the power supply itself of the resistance test equipment. Even when the resistance test equipment is set to 0 ohm position, it does not accurately read 0 ohm.

7. Set the dial selector of the resistance test equipment to 10 ohm position and adjust VR3 of 6010 so that it reads 10 ohm + an insulation test equipment offset resistance +/- 5 digit when the test button of 6010 is pressed. This should be done at both 0° and 180° phase shifts.

8. Set the dial selector of the resistance test equipment to 18 ohm range position and check that 6010 gives readings within the following range:

From 17.50 ohm + an offset resistance of the resistance test equipment

to 18.50 ohm + an offset resistance of the resistance test equipment

This should be done at both 0° and 180° phase shifts.

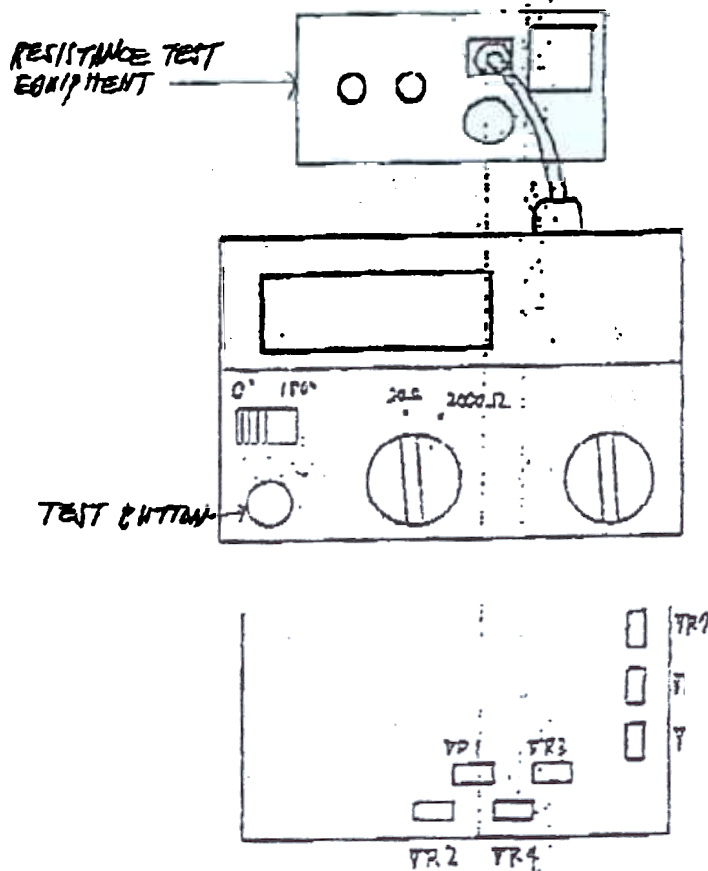
9. Set the function switch of 6010 to 2000 ohm loop range position and the dial selector of the resistance test equipment to 0 ohm. Adjust VR2 of 6010 so that it reads 0 ohm +/- 4 digit.

This should be done at both 0° and 180° phase shifts

10. Set the dial selector of the resistance test equipment to 1000 ohm position and adjust VR4 of 6010 so that it reads 1000 ohm +/- 5 digit when the test button of 6010 is pressed.

This should be done at both 0° and 180° phase shifts.

11. Set the dial selector of the resistance test equipment to 1800 ohm position and check that 6010 reads 1750 to 1850 ohms when the test button of 6010 is pressed. This should be done at both 0° and 180° phase shifts.



(2) RCD Test Ranges Adjustment

1. Set the time/current test equipment (originally made by Kyoritsu) to provide 230V/50Hz
2. Connect the test lead to 6010 as shown below:
3. Set the function switch of 6010 to x 1 RCD function

and range switch to 100mA range position

~~Set the time/current test equipment to 200mA position.~~

4. Press the test button of 6010 and check that the time/current test equipment reads trip time within the limit of 1930 to 2030 mS

This check should be made at both 0° and 180° phase shifts.

5. Press the test button of 6010 and adjust VR7 so that it reads 1980 mS +/- 5 digit.

This should be done at both 0° and 180° phase shifts.

6. Set the function switch of 6010 to x 1/2 RCD test current function and range switch to 10mA range position.
Set the time/current test equipment to 20mA position

7. Press the test button of 6010 and adjust VR5 so that it reads 5 mA +/- 3 dgt.

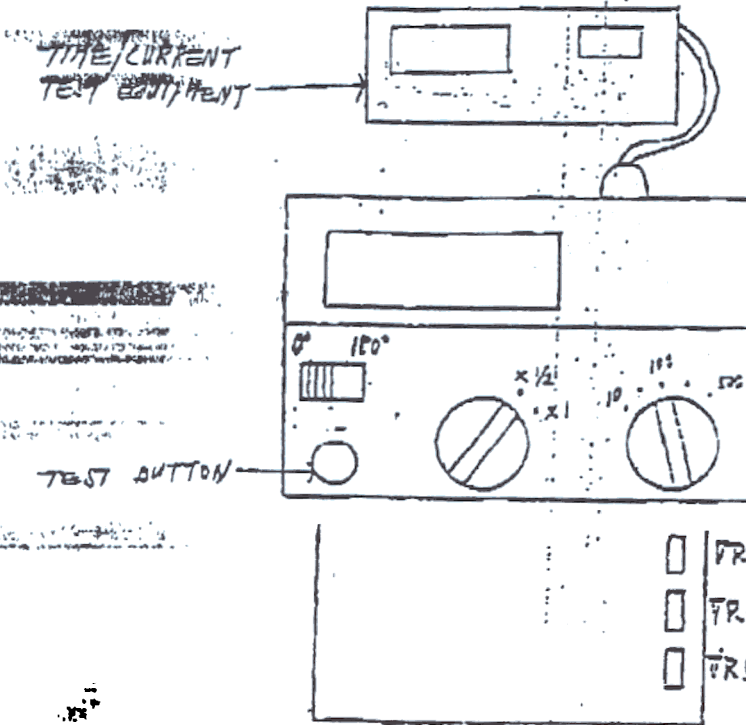
~~This should be done at both 0° and 180° phase shifts~~

8. Check that 6010 performs within specification at 500mA x 1 and 500mA x 1/2 test current factors.
It should read:

488 - 512 mA at 500mA x 1 function

244 - 256 mA at 500mA x 1/2 function

This should be done at both 0° and 180° phase shifts



(FOR Robin KTS1610 ONLY)

= Earth Current Check

Set the time/current test equipment to 20mA. Check that earth current is 0.5mA and less at 20 ohm and 2000 ohm loop resistance ranges and RCD x 1/2 and x 1 ranges (at both 0 and 180 phase shifts).

= Trip Current Duration Check

With the test button pressed, check that a trip time of 37 to 43ms is displayed on the time/current test equipment and the instrument at RCD x 1/2 ranges and Fast 150mA ranges (both at 0 and 180 phase shifts).

(3) Check for Over Temperature Symbol

Before checking for over temperature symbol, set up the test jig to see if the components are mounted on the PCB correctly.

1. Set 6010 to the test jig
2. Set the function switch to x 1/2 or x 1 RCD test

function

3. Feed 230V i

4 C ck h h H f j id
te b
i d bu

5 Ch h h TH h f h j d

TE 2000 f

6 Check h th I no f l

Room Temperature

Monitor Reading

0°

5

10°

54

25°

(4) Che 0 id

C

shown

2



τ

reads below 0.25 ohm.

4. Set the resistance box to 19 ohm and 190 ohm. Check that 6010 reads as follows:

At 19 ohm setting: 18.50 + 0 ohm - 19.50 + 0 ohm

At 190 ohm setting: 185.0 + 0 ohm - 195.0 + 0 ohm

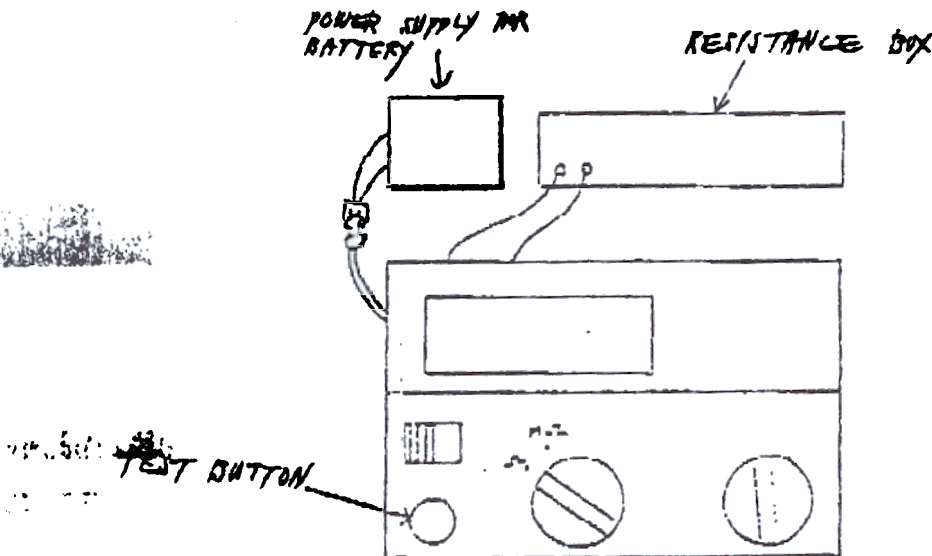
5. Set the function switch of 6010 to $M\Omega$ position and resistance box to 0 ohm position

6. Press the test button of 6010 and check that it reads 0.00M ohm.

7. Set the resistance box to 19 M ohm and 190 M ohm. Check that 6010 reads as follows:

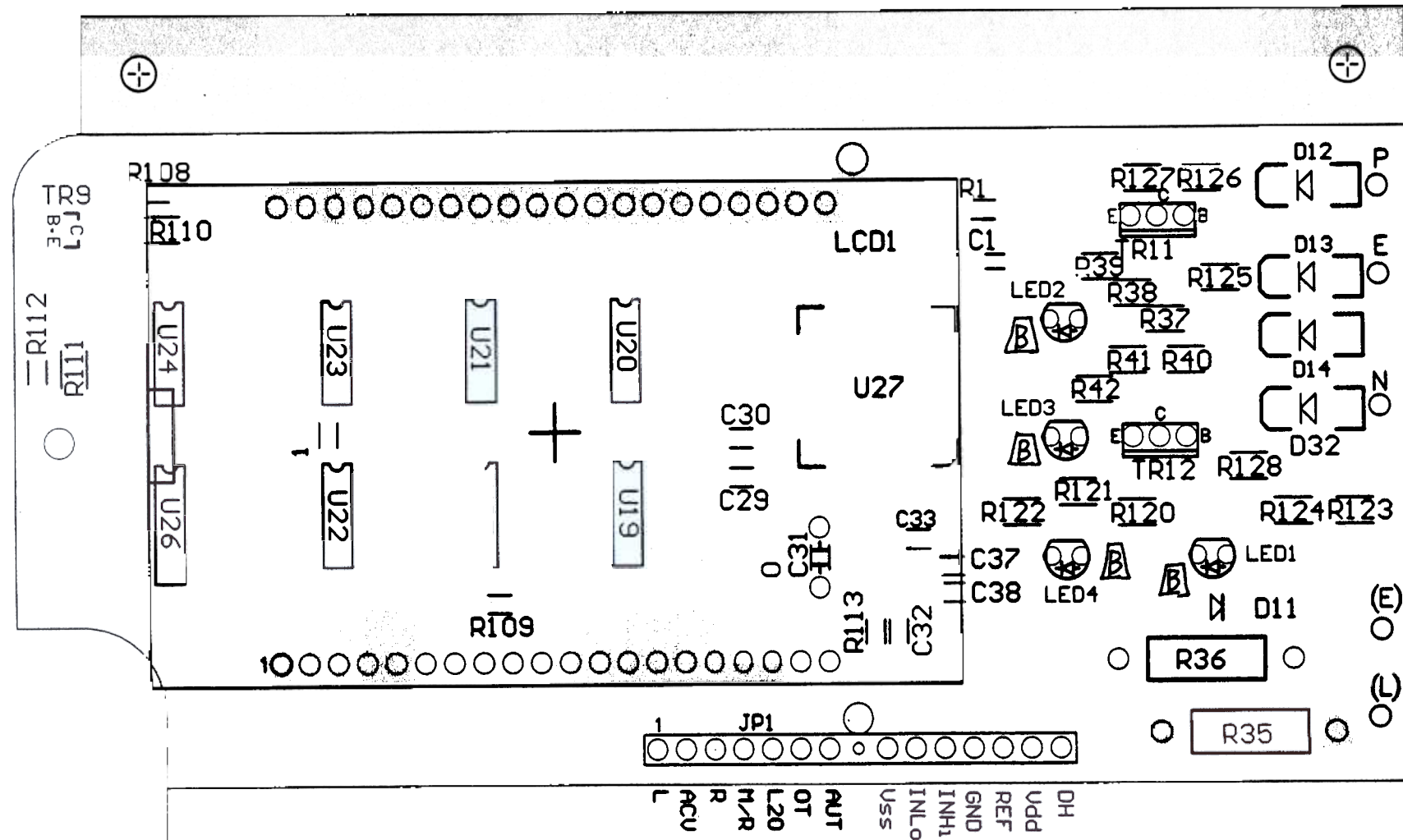
At 19M ohm setting: 18.50 - 19.50 M ohm

At 190 M ohm setting: 185.0 - 195.0 M ohm



		TOP METAL MASK
	TOP SILKSCREEN	KEEP OUT

KTS1610 DISPLAY PCB 50-1392B



Part	Used	PartType	Designators
	1		BT1
	2	1/2WF10M	R10 R12
	3	1WF2	R33
	4	2SA1162Y/GR	TR2
	5	2SB962-Z	TR3
(H)	6	2SK680 or 2SK1772	TR1 TR5
	7	2SSW2	SW2
	8	8 HEADER	JP2
	9	8R2022	SW1
	10	16YK100M	C14
	11	16YK470M	C1
	12	50SMC105J	C12 C18
	13	50SMC224J	C11
	14	65-1110	T1
	15	520HF0.5A/250V	F1
	16	6010	SW3 SW4 SW5 SW7 SW8
	17	CAP NP	CX
	18	CB24PAC	BZ1
	19	GRM39B102K	C16 C35
(F)	20	≠2 GRM39B103K	C8 C2
(F)	21	1 GRM39B182K	C2
(G)	22	1 GRM39B223K	C3
(G)	23	≠15 GRM40B104K	C4 C6 C13 C39 C40 C41 C42 C43 C44 C45 C46 C47 C48 C49 (G)C3
	24	GRM40F105Z	C7 C9 C15
	25	GRM40F474Z	C36
	26	GRM426F225Z	C17
	27	HEADER 15	JP1
	28	HZK5C	ZD1 ZD4
(F)	29	IR3M03A MC34063AP1	U1
	30	KVSF639AB1M	VR1 VR2 VR4 VR5
(D)	31	KVSF639AB 5K B10K	VR6
(D)	32	KVSF639AB 10K B5K	VR7
	33	KVSF639AB500K	VR3
	34	LT1097S8	U28
	35	MFO.047UF630V	C5
	36	NJM78L02UA	U5
	37	NJM2904M	U2
	38	NJMOP07	U3

Part	Used	PartType	Designators	
	39	3	RK73H2ATDF1.6K	R6 R7 R8
	40	4	RK73H2ATDF2K	R13 R15 R23 R67
Ⓓ	41	2	RK73H2ATDF3K	R22 R30
Ⓓ			RK73H2ATDF3.16K	R30
Ⓓ	42	2	RK73H2ATDF4.02K	R21 R30
Ⓓ			RK73H2ATDF8.66K	R82
	43	1	RK73H2ATDF6.98K	R66
	44	4	RK73H2ATDF20K	R14 R20 R64 R65
	45	1	RK73H2ATDF22K	R9
Ⓓ	46	2	RK73H2ATDF27K	R29 R63
Ⓓ			RK73H2ATDF28K	R29
	47	1	RK73H2ATDF100K	R136
	48	1	RK73H2ATDF820	R68
	49	2	RK73H2ATDJ200K	R59 R60
	50	1	RK73H2BTDF1.2M	R50
	51	1	RK73H2BTDF1.3M	R49
	52	1	RK73H2BTDF1M	R52
	53		RK73H2BTDF2	R34
	54		RK73H2BTDF2.2M	R61
	55		RK73H2BTDF2M	R62
	56		RK73H2BTDF7.5M	R48
Ⓓ	57		RK73H2BTDF 120K 124K	R28
	58		RK73H2BTDF750K	R53
	59		RK73K2ATD180	R3
	60	3	RK73K2ATDJ1K	R5 R18 R25
	61	14	RK73K2ATDJ1M	R47 R54 R55 R56 R77 R78 R102 R103 R104 R105 R107 R130 R131 R133
	62	4	RK73K2ATDJ2.2M	R70 R71 R75 R76
	63		RK73K2ATDJ2K	R4
	64		RK73K2ATDJ62K	R46
	65	13	RK73K2ATDJ100K	R1 R17 R19 R26 R27 R31 R32 R58 R69 R106 R117 R134 R135
	66		RK73K2ATDJ200K	R132
	67	3	RK73K2ATDJ510K	R57 R81 R119
Ⓓ	68	2	RK73K2ATDJ680	R72 R129
Ⓓ			RK73H2ATDF750Ω	R72



Part	Used	PartType	Designators
69	3	RK73K2BTDG3M	R51 R118 R137
70	1	RK73K2BTDG6.2M	R43
71	2	RK73M2ATDJ1.6M	R44 R45
72	2	RK73M2BTDJ22M	R79 R80
73	1	RK73Z2BTD0	R138
74	5	RLR4003	D5 D6 D8 D9 D10
75	23	RLS4448	D3 D4 D7 D15 D16 D17 D18 D19 D28 D29 D30 D31 D33 D34 D35 D36 D37 D38 D39 D40 D41 D42 D43
76		SPR1W1K	R16
77	1	SPR3W39K	R11
78		SR73K2BTDJ0.39	R2
79	1	TC4071BF	U8
80	1	TC4077BF	U6
81	1	U05TH44	D2
82	1	UPD4001BG	U9
83	1	UPD4015BG	U12
84	2	UPD4052BG	U17 U18
85	3	UPD4053BG	U4 U7 U16
86		UPD4066BG	U13
87		UPD4081BG	U11
88		UPD4520	U10
89		W06	D1
90	1	YK220UF16V	C10
Ⓐ 91	1	AMZV50 103	Cx1

Part	Used	PartType	Designators
1	3	1/4S1KJ	R92 R101 R116
2	1	1/4S1MJ	R139
3	1	1/4S10KF	R88
4	1	1/4S10KJ	R93
5	1	1/4S100KF	R87
6	3	1/4S100KJ	R86 R97 R115
7	1	1/4S470J	R91
8	1	1N4003	D20
9	5	1N4448	D22 D23 D24 D25 D26
10	≠	1WF10	R94 R95
11	1	8 HEADER	JP2
12	1	16YK100M	C23
13	2	50SMC103J	C27 C28
14	2	50SMC104J	C25 C26
15	1	BT151-800R	SCR1
16	1	DE1007E222Z3K	C24
17	2	DTND502K	TH1 TH2
18	1	HZ7A1	ZD2
19	1	IRF830	TR7
20	3	JA101Q	TR6 TR8 TR10
21	1	NJM2904D	U15
22	1	RD16S51K	R84
23	2	RD16S100J	R98 R99
24	1	RGBS20L9.1J	R96
25	1	S505 6.3A	F2
26	1	S81250	U14
27	1	SFOR3G42	SCR2
28	1	SN14K2C3KF	R85
29	1	SPR1/2W15KJ	R100
30	1	SPR3W15K	R83
31	2	SPR5W220G	R89 R90
32	1	VDR2322	VDR1
33	1	W06	D21
34	1	WZ150	ZD3
35	2	YK220UF16V	C19 C21
36	2	YK1000UF16V	C20 C22
37	1	1WF9.76Ω	R95

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規格番号	00-1917	3/3	改訂番号	H	ページ	4/5
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Par	Used	PartType	Designators
1		2SC2712Y/GR	TR9
2	2	2SC3075	TR11 TR12
3		50SMC474J	C31
4		7116CKW	U27
5		GRM39CH101J	C34
6	4	GRM40B104K	C29 C30 C37 C38
7	2	GRM40F474Z	C32 C33
8		HEADER 15	JP1
9	1	KLC-732P	LCD1
10	1	RK73H2BTDF1M	R110
		RK73H2BTDF200K	R111
12	3	RK73K2ATDJ1M	R108 R109 R112
13	2	RK73K2ATDJ47K	R113 R114
14	4	RK73K2BTDJ1M	R123 R124 R125 R126
15	3	RK73K2BTDJ10K	R39 R42 R122
16	6	RK73K2BTDJ20K	R37 R38 R40 R41 R120 R121
17	2	RK73K2BTDJ470K	R127 R128
18	4	RLR4004	D12 D13 D14 D32
19		RLS4448	D11
20	2	SPR2W15KJ	R35 R36
21		TC4028BF	U26
22		TC4071BF	U24
23		TC4077BF	U21
 24	4	PLA125 TLSU125	LED1 LED2 LED3 LED4
 25	2	UPD4011BG or CD4011BM96	U19 U20
26	2	UPD4030BG	U22 U25
27		UPD4081BG	U23

