FLUKE
70 Series
Multimeters

Service Manual

P/N 731034
January 1984 Rev. 1, 5/89

FLUKE

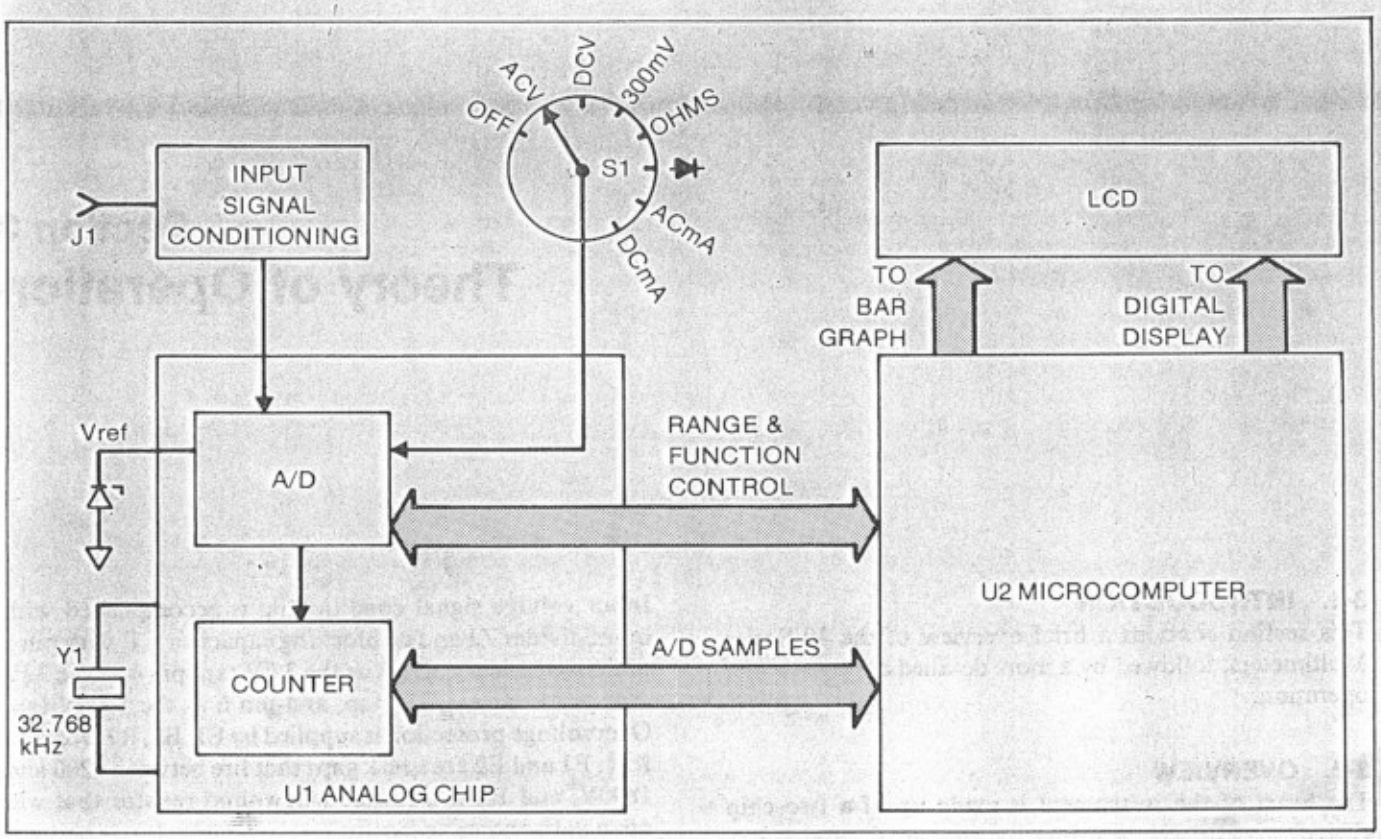


Figure 3-1. Overview

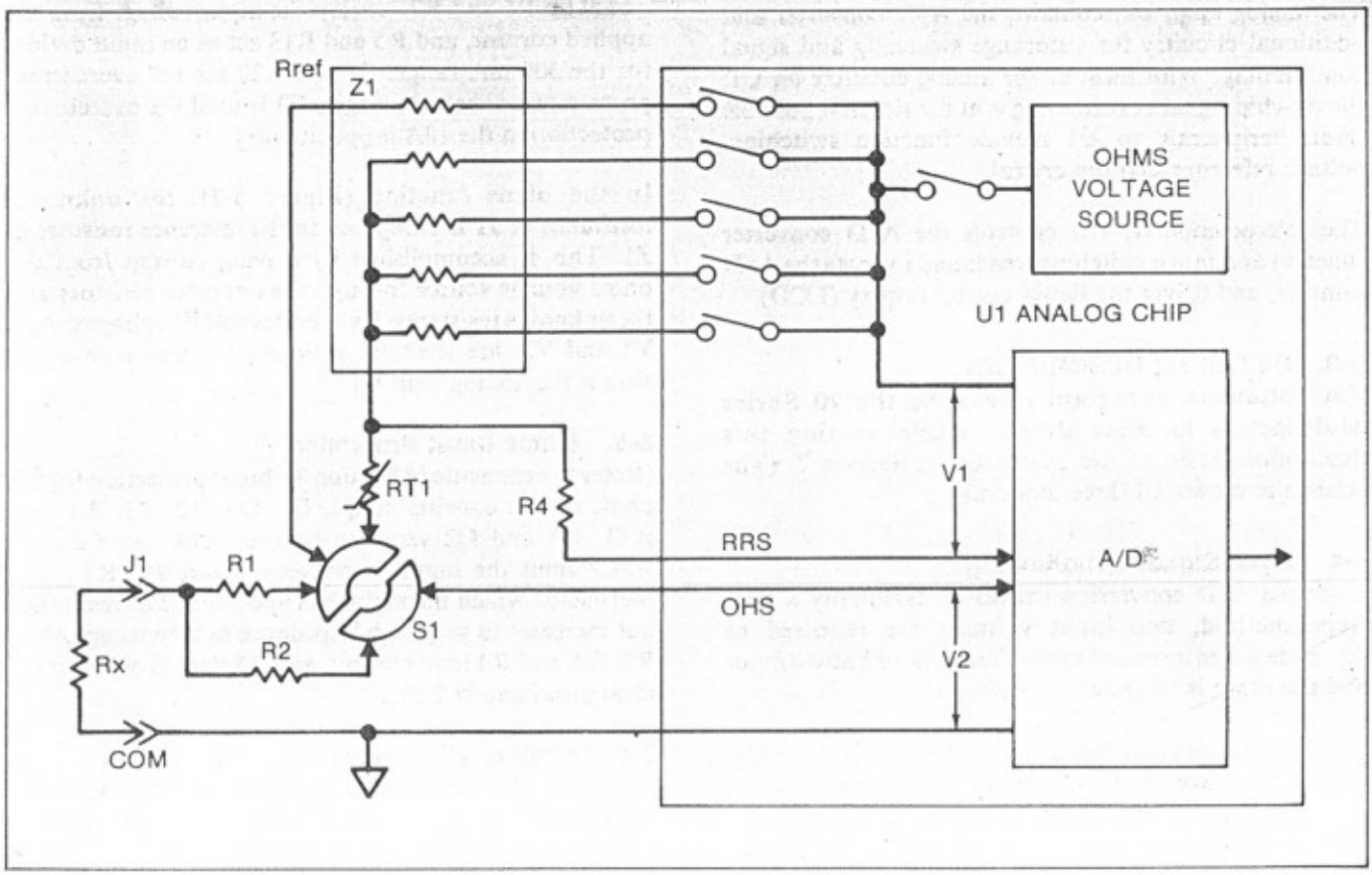


Figure 3-2. Ohms Function

3. Referring to Table 4-4, set the Decade Resistor or Fluke 5100B to the resistance value indicated in steps 1 through 6. Verify that the display reading is within the limits shown.

4-11. Diode Test

To test the 75 and 77 meters, perform the following steps:

1. Put the UUT in the Diode Test function.

NOTE

On Fluke 5100 series calibrators, activate the 50Ω divider override.

2. Apply an input from the DC Voltage Calibrator of +.090V dc to the V-Ohm and Common input terminals of the UUT and verify that the beeper is on.

3. Increase the DC Voltage Calibrator output to +.110V dc and verify that the beeper is off.

To test the 73 meter, apply an input from the DC Voltage Calibrator of +2V dc to the V-Ohm and Common input terminals of the UUT. Verify that the display reading is between +1.960 and +2.040.

4-12. DC mA Test (75 & 77 Only)

1. Set the output of the DC Current Calibrator to zero and connect it to the 300 mA and Common input terminals of the UUT.

2. Set the DC Current Calibrator to the output shown in Table 4-5, and verify that the UUT display reading is within the limits shown.

4-13. DC Amps Test

1. Set the DC Current Calibrator for zero output and connect it to the 10A & Common input terminals of the UUT.

2. Apply currents as indicated in Table 4-6 and verify the display reading is within the limits shown.

Table 4-2. AC Voltage Test

STEP	INPUT		DISPLAY READING		
	VOLTAGE	FREQ.	73	75	77
1	2.7V	100 Hz	2.617 to 2.783	2.644 to 2.756	2.644 to 2.756
2	2.7V	500 Hz	2.617 to 2.783	2.644 to 2.756	2.644 to 2.756
3	750V	100 Hz	725 to 775	733 to 767	733 to 767
4	750V	1000 Hz	725 to 775	733 to 767	733 to 767

Table 4-3. DC Voltage Test

STEP	DC INPUT VOLTAGE	DISPLAY READING		
		73	75	77
1	+2.7V	2.680 to 2.720	2.685 to 2.715	2.691 to 2.709
2	+27V	26.80 to 27.20	26.85 to 27.15	26.91 to 27.09
3	+270V	268.0 to 272.0	268.5 to 271.5	269.1 to 270.9
4	+1000V	991 to 1009	993 to 1007	995 to 1005
5*	+300 mV	297.8 to 302.2	298.4 to 301.6	299.0 to 301.0
*300mV function only				

Table 4-4. Resistance Test

STEP	INPUT RESISTANCE	DISPLAY READING		
		73	75	77
1	100Ω	98.8 to 101.2	99.1 to 100.9	99.3 to 100.7
2	1000Ω	989 to 1011	992 to 1008	994 to 1006
3	10 kΩ	9.89 to 10.11	9.92 to 10.08	9.94 to 10.06
4	100 kΩ	98.9 to 101.1	99.2 to 100.8	99.4 to 100.6
5	1 MΩ	.989 to 1.011	.992 to 1.008	.994 to 1.006
6	10 MΩ	9.69 to 10.31	9.74 to 10.26	9.79 to 10.21

Table 4-5. DC mA Test

STEP	INPUT CURRENT	DISPLAY READING
		75 & 77
1	+27 mA	26.58 to 27.43
2	+200 mA	195.8 to 204.2

Table 4-6. DC Amps Test

STEP	INPUT CURRENT (5100B)	DISPLAY READING	
		73	75 & 77
1	+1.99999A dc	1.94 to 2.06	1.95 to 2.05

4-14. CALIBRATION

1. Set the DC Voltage Calibrator to zero and set the UUT to the VDC function.

2. Connect the DC Voltage Calibrator to the V-Ohm and Common input terminals of the UUT.

3. Set the DC Voltage Calibrator for an output of +3V dc and adjust R8 for a display reading of +3.000V dc ± .001V.

4-15. TROUBLESHOOTING

A fault guide for the 70 Series Multimeters is given in Table 4-7. This guide can be helpful in isolating troubles to a component area. Also, procedures are given below to help isolate the troubles further. In these procedures, the 70 Series Multimeter is referred to as the unit under test (UUT).

When troubleshooting the 70 Series Multimeters, use the precautions listed on the static awareness sheet to prevent damage from static discharge.

4-16. Overall System Check

Make the following checks in the order listed. All measurements are made with respect to common.

1. Put the UUT function switch in the VDC position.

2. Using a DVM, check +VDD (TP-1) or the positive battery post for 3.1V dc ± .1V.

   Probable failure: BT1, CR1, U1, loose battery connector

3. Connect an oscilloscope or counter to pin 54 of U1 or to the junction of C12 and Y1 crystal. Check for a 32.768 kHz sine wave approximately 600 mV p-p in amplitude. Note that U2 and the display will not work if the clock circuit is not working.

   Probable failure: U1, Y1, or C12

4. Check for a reference voltage of 1.00V dc (adjustable by R8) at pin 14 of U1 or the junction of R15 and R16.

   Probable failure: R8, R14, R15, R16, VR1, or CR2

5. Check that VM (V middle) is 1.6V dc ± .1V at pin 28 of U2 or at the junction of R11 and R12.

   Probable failure: R11, R12 or C10

4-17. VDC Signal Tracing

Make the following checks in the order listed. All measurements are made with respect to common.

1. Put the UUT in the VDC function and apply 2V dc to the input.

2. Using a DVM, measure the input at J1 for 2V dc.

3. Measure pin 1 of Z1 input divider for 2V dc.

   Probable failure: R1, S1, E1

WARNING

R1 IS A FUSIBLE RESISTOR. TO ENSURE SAFETY, USE EXACT REPLACEMENT ONLY.

NOTE

Measurements in steps 4, 5, and 6 may be affected by loading.

4. Measure Z1 pin 3 for 200 mV dc.

   Probable failure: Z1, U1

5. Measure for 200 mV dc at the active filter input (AFI, pin 26 of U1 or R9).

   Probable failure: U1

6. Measure for 200 mV at the active filter output (AFO, pin 27 of U1 or R9).

   Probable failure: R9, C5 or C6

Table 4-7. Fault Guide

SYMPTOM	ACTION	POSSIBLE COMPONENT
Blank display	Follow overall system check (paragraph 4-16)	BT1, U1, U2, Y1, CR1, C12
Display reads zero in volts function	Trace DC signal (paragraph 4-17)	E1, R1, Z1, R9, U1, S1
Display hangs up in power-up self test (see Figure 4-2)	Follow overall system check (paragraph 4-16)	R14, R8, R15, R16, VR1, C7, C8, Z1, CR2, U1
Display reads OL or zero in 300mA		R13, U1
Display reads zero in 300mA or 10A current ranges		F1, F3, R5, R13, R20
AC volts is not accurate		R17 & R18
Display reads OL in 300mV range		Q3 shorted, U1
AC volts noisy at 50 to 60 Hz		R9, R10, C5, C6
Display has wrong annunciator called	Check Table 3-1 for correct codes	S1 REAR, U1
Volts inaccurate		Check calibration
Ohms inaccurate		Z1, U1
Intermittent display	Clean connectors and connector strips of the LCD and pca	Display assembly
Display reads constant offset in volts		C5, C6, or C7 shorted
Ohms reads low or won't read OL		Q1 or Q2 shorted or leaky, E1, E2
Ohms reads randomly or flashes between on-scale and OL		R1, RT1

Table 5-1. 73 Final Assembly
(See Figure 5-1.)

REF DES ITEM NO	DESCRIPTION	PART NUMBER	MFRS SPLY CODE	MANUFACTURER'S PART NUMBER	QTY
101	Case, Bottom Assembly	828608	89536	828608	1
102	Shield, Bottom	748236	89536	748236	1
111	Spring, Coil, Comp	697227	83553	C0360-026-0500	1
116	Screw, Thd form, 4-24x1/4	519116	COMMERCIAL		1
201	Case, Top Assembly	828624	89536	828624	1
202	Shield, Top	819300	89536	819300	1
203	Screw, Thd form, 2-14x.375	821140	COMMERCIAL		1
206	Window, LCD	642082	89536	642082	1
207	Bracket, LCD	646653	89536	646653	1
208	Mask, Bracket	642090	89536	642090	1
209	Conn, LCD/PCA, Elastomeric	649632	89536	649632	2
216	Screw, Thd form, 4-14x3/8	448456	COMMERCIAL		4
221	Knob, Switch	661033	89536	661033	1
222	Shaft, Knob	646661	89536	646661	1
223	Spring, Detent	646679	89536	646679	1
226	Shock Absorber	428441	89536	428441	1
241	Screw, Thd form, 5-14x3/4	733410	COMMERCIAL		4
246	Foot, Non-skid	640565	89536	640565	4
301	Decal	828517	89536	828517	1
302	Label, Window - Fluke/Philips	844340	89536	844340	1
U3	LCD, 3.75 digit, Bar Graph	640581	18520	LF-7031G	1
N.S.	Screw, Thd form, 5-14x3/4	733410	COMMERCIAL		4
N.S.	Decal, Warning	828707	89536	828707	1
N.S.	Decal, Warning	828715	89536	828715	1
N.S.	Fluke 73 Operator's Manual	704601	89536	704601	1
N.S.	TL70 Test Leads	642033	89536	642033	1

N.S. = NOT SHOWN

WARNING

FOR SAFETY PURPOSES, CASE TOPS AND CASE BOTTOMS SHOULD NOT BE INTERCHANGED BETWEEN PCA TYPES (i.e., DO NOT USE THE CASE TOP SPECIFIED FOR THE 7X-3001 ON THE 7X-3011, ETC.)

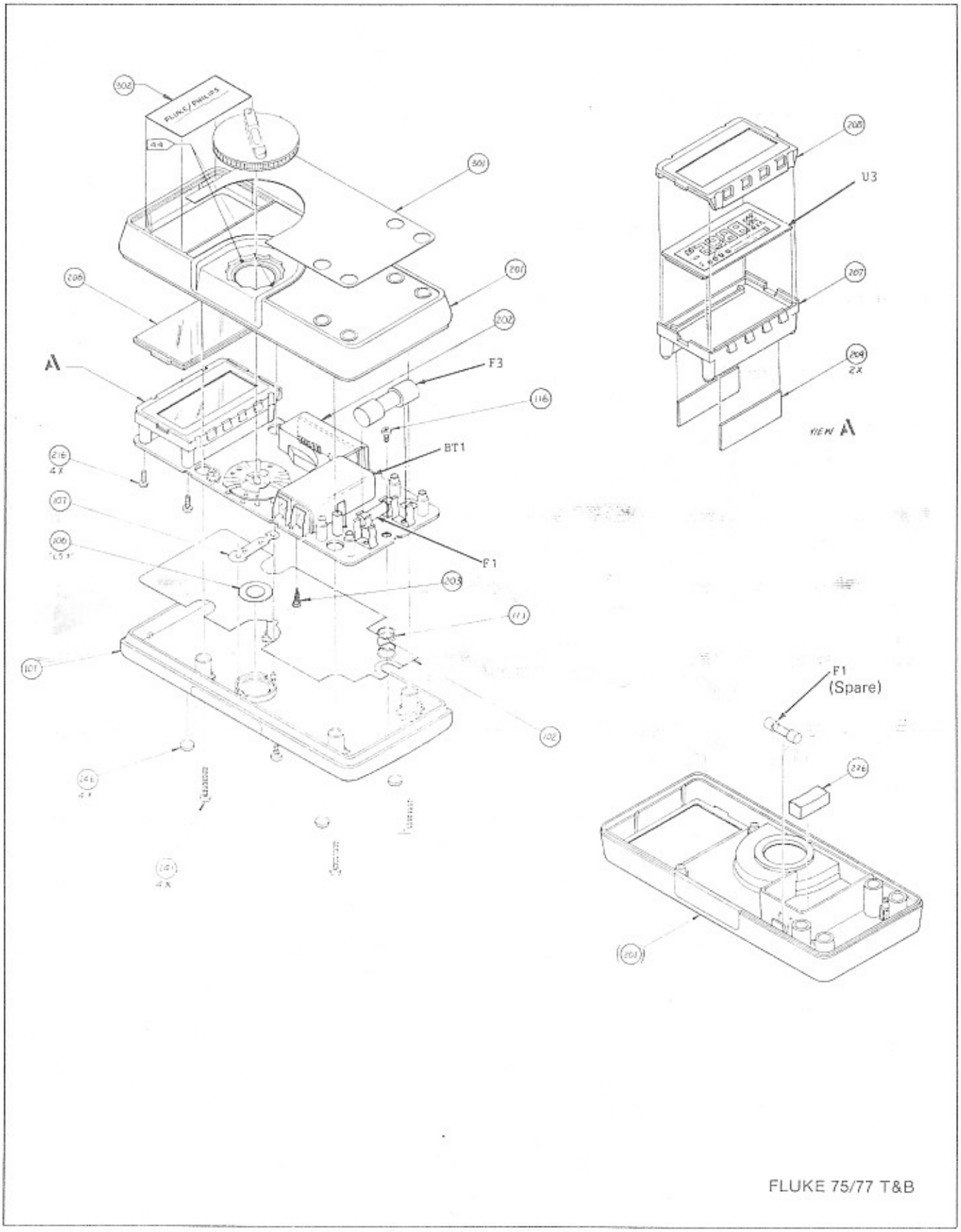


Figure 5-1. Final Assembly

Table 5-4. 73 A1 Main PCA
(See Figure 5-2.)

REF DES ITEM NO		DESCRIPTION	PART NUMBER	MFRS SPLY CODE	MANUFACTURER'S PART NUMBER	QTY
BT1		Battery, Primary, 9V	696534	66571	216	1
C1		Cap, Poly, .022uF, 1000V, 10%	721019	60935	MKT-1.60	1
C2,C10		Cap, Tant, .47uF, 35V, 20	655035	56289	199D474X0035AA1	2
C4		Cap, Alum, 2.2uF, 50V, 20%	650069	62643	SRA50VB225M4X15LL	1
C5,C6		Cap, Polyca, .027uF, 63V, 10%	720979	65964	CMK5273K63L29BULK	2
C7		Cap, Polyes, .47uF, 50V, 10%	697409	60935	185.47K50RBB	1
C8		Cap, Polypr, .033uF, 63V, 10	721050	60935	171.033K63B	1
C9		Cap, Tant, 6.8uF, 10V, 20%	655043	56289	199D685X0010BA1	1
C11		Cap, Tant, 2.2uF, 16V, 20%	706804	56289	199D225X0016AA1	1
C12		Cap, Cer, 47pF, 50V, 20%	706705	72982	RPE113Z5U470M50V	1
C13		Cap, Cer, .22uF, 50V, +80%-20%	733386	72982	RPE122Z5U224Z50V	1
C14,C15		Cap, Cer, 33pF, 50V, 5%	714543	72982	RPE113C0G330J50V	2
CR1,CR2		Diode, Radial Insert	659516	09214	1N4448	2
E1,E2		Surge Protector, 1500V	655134	91984	100	2
F3		Fuse, Fast, 15A, 600V	820829	71400	KTK-15	1
J1-4		Receptacle, Input	642959	89536	642959	3
Q1,Q3		Xstr, Sm Signal	685404	04713	SPS8763RLRA	2
Q2		Xstr, Sm Signal	698225	04713	2N3904RLRA2	1
R1	*	Res, MF, 1K, Fusible, 2%	854687	23237	FA8466	1
R2,R3		Res, Cer, 1M, 1W, 5%	655175	23237	RG1/2-105M-5%	2
R4		Res, CF, 100k, 1/4W, 5%	658963	59124	1-4-5P104K	1
R5		Res, CF, 390k, 1/4W, 5%	706754	59124	CF1-4VT394J,REEL	1
R7		Res, WW, .005, .5W, 1%	740415	05347	RCS02R0053F	1
R8		Res, Cer, Var, 100k, .3W, 20%	649897	51406	RVS0707V1003104M	1
R9,R19		Res, CF, 1M, 1/4W, 5%	649970	59124	1-4-5P105J	2
R10		Res, CF, 1.5M, 1/4W, 5%	649962	59124	1-4-5P155J	1
R11		Res, MF, 332k, 1/8W, 1%	655217	59124	MFF1-83323F	1
R12		Res, MF, 301k, 1/8W, 1%	655274	59124	MFF1-83013F	1
R14		Res, CF, 62k, 1/4W, 5%	713941	59124	CF1-4VT623J,REEL	1
R15		Res, MF, 56.2k, 1/8W, 1%	706242	59124	MF50D5622F	1
R16		Res, MF, 205k, 1/8W, 1%	706234	59124	MF50D5622F	1
R17		Res, MF, 20.5k, 1/8W, .5%	682716	59124	MF50D2052D	1
R18		Res, MF, 9.20k, 1/8W, .5%	715219	59124	MF50D9201D	1
RJ1		Varistor, 430V, 1mA, 10%	706838	09214	V264LAX1398	1
RT1		Thermistor, Pos, 1k, 40%, 25C	446849	54583	911P84E102YU13	1
S1		Switch, Rotary	642918	89536	642918	1
U1		8075 A/D Chip Tested	683052	89536	683052	1
U2		IC, CMOS, SM-5A, 4-Bit Micro	659656	18520	LR3676	1
VR1		Bandgap, Taped	729202	89536	729202	1
W3,W4		Res, Jumper, .25W, .02 ohm	682575	09969	FRJ-55	2
W5		Wire Jumper, PVC Insul.	747394	89536	747394	1
Y1		Crystal, 32.768 kHz, 3x8mm, 1%	643031	61429	NC38	1
Z1		Input Divider Network	683789	89536	683789	1
N.S.		Contact, 600V Fuse	707190	89536	707190	2
N.S.		Contact, Battery (Female)	654228	89536	654228	1
N.S.		Contact, Battery (Male)	642967	89536	642967	1

N.S. = NOT SHOWN

* WARNING--Fusible Resistor. To ensure safety, use exact replacement only.

Table 5-5. 75 A1 Main PCA
(See Figure 5-2.)

REF DES ITEM NO		DESCRIPTION	PART NUMBER	MFRS SPLY CODE	MANUFACTURER'S PART NUMBER	QTY
BT1		Battery, Primary, 9V	696534	66571	216	1
C1		Cap, Poly, .022uF, 1000V, 10%	721019	60935	MKT-1.60	1
C2,C10		Cap, Tant, .47uF, 35V, 20	655035	56289	199D474X0035AA1	2
C4		Cap, Alum, 2.2uF, 50V, 20%	650069	62643	SRA50VB225M4X15LL	1
C5,C6		Cap, Polyca, .027uF, 63V, 10%	720979	65964	CMK5273K63L29BULK	2
C7		Cap, Polyes, .47uF, 50V, 10%	697409	60935	185.47K50RBB	1
C8		Cap, Polypr, .033uF, 63V, 10	721050	60935	171.033K63B	1
C9		Cap, Tant, 6.8uF, 10V, 20%	655043	56289	199D685X0010BA1	1
C11		Cap, Tant, 2.2uF, 16V, 20%	706804	56289	199D225X0016AA1	1
C12		Cap, Cer, 47pF, 50V, 20%	706705	72982	RPE113Z5U470M50V	1
C13		Cap, Cer, .22uF, 50V, +80%-20%	733386	72982	RPE122Z5U224Z50V	1
C14,C15		Cap, Cer, 33pF, 50V, 5%	714543	72982	RPE113C0G330J50V	2
CR1,CR2		Diode, Radial Insert	659516	09214	1N4448	2
E1,E2		Surge Protector, 1500V	655134	91984	100	2
F1		Fuse, 5x20mm, .63A, 250V	740670	71400	GDA-630MA	2
F3		Fuse, Fast, 15A, 600V	820829	71400	KTK-15	1
J1-4		Receptacle, Input	642959	89536	642959	4
Q1,Q3		Xstr, Sm Signal	685404	04713	SPS8763RLRA	2
Q2		Xstr, Sm Signal	698225	04713	2N3904RLRA2	1
R1	*	Res, MF, 1K, Fusible, 2%	854687	23237	FA8466	1
R2,R3		Res, Cer, 1M, 1W, 5%	655175	23237	RG1/2-105M-5%	2
R4		Res, CF, 100k, 1/4W, 5%	658963	59124	1-4-5P104K	1
R5		Res, MF, 402k, 1/4w, .25%	706739	57668	CRB14CXE	1
R6		Res, 4.99, 2.5W, 1%	655019	09969	NS-2C4R99F	1
R7		Res, WW, .005, .5W, 1%	740415	05347	RCS02R0053F	1
R8		Res, Cer, Var, 100k, .3W, 20%	649897	51406	RVS0707V1003104M	1
R9,R19		Res, CF, 1M, 1/4W, 5%	649970	59124	1-4-5P105J	2
R10		Res, CF, 1.5M, 1/4W, 5%	649962	59124	1-4-5P155J	1
R11		Res, MF, 332k, 1/8W, 1%	655217	59124	MFF1-83323F	1
R12		Res, MF, 301k, 1/8W, 1%	655274	59124	MFF1-83013F	1
R13		Res, MF, 44.8k, 1/8W, .25%	706747	59124	MF50D4482C	1
R14		Res, CF, 62k, 1/4W, 5%	713941	59124	CF1-4VT623J,REEL	1
R15		Res, MF, 56.2k, 1/8W, 1%	706242	59124	MF50D5622F	1
R16		Res, MF, 205k, 1/8W, 1%	706234	59124	MF50D5622F	1
R17		Res, MF, 20.5k, 1/8W, .5%	682716	59124	MF50D2052D	1
R18		Res, MF, 9.20k, 1/8W, .5%	715219	59124	MF50D9201D	1
R20	*	Res, WW, Fusible, .36, 2W	740662	23237	SPF3605	1
RJ1		Varistor, 430V, 1mA, 10%	706838	09214	V264LAX1398	1
RT1		Thermistor, Pos, 1k, 40%, 25C	446849	54583	911P84E102YU13	1
S1		Switch, Rotary	642918	89536	642918	1
U1		8075 A/D Chip Tested	683052	89536	683052	1
U2		IC, CMOS, SM-5A, 4-Bit Micro	659656	18520	LR3676	1
VR1		Bandgap, Taped	729202	89536	729202	1
W1		Res, Jumper, .25W, .02	682575	09969	FRJ-55	1
W5		Wire Jumper, PVC Insul.	747394	89536	747394	1
Y1		Crystal, 32.768 kHz, 3x8mm, 1%	643031	61429	NC38	1
Z1		Input Divider Network	616870	89536	616870	1
N.S.		250V Fuse, Hldr, 5mmx20mm	697086	61857	H-0011-2	2
N.S.		Contact, 600V Fuse	707190	89536	707190	2
N.S.		Contact, Battery (Female)	654228	89536	654228	1
N.S.		Contact, Battery (Male)	642967	89536	642967	1

N.S. = NOT SHOWN

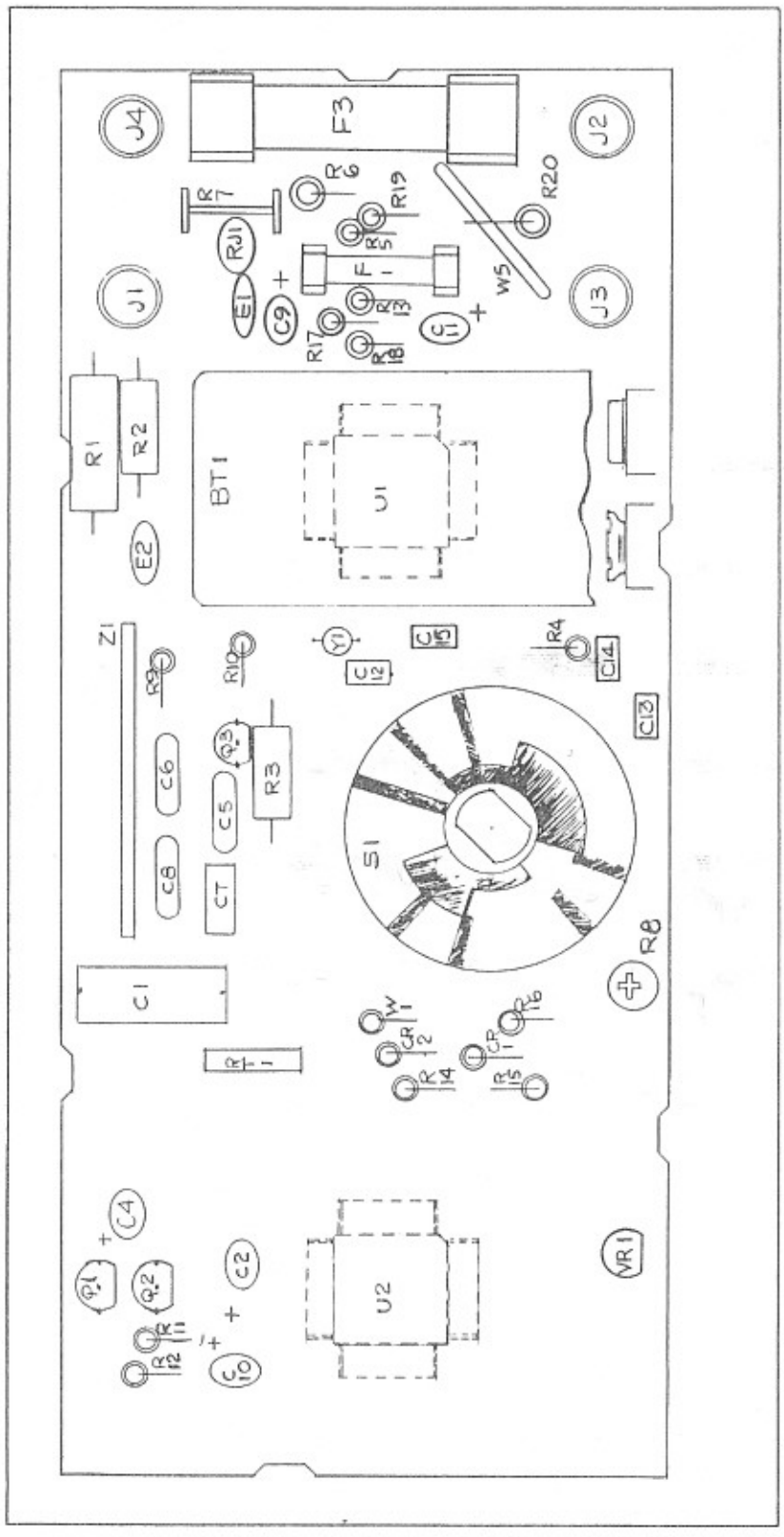
* WARNING--Fusible Resistor. To ensure safety, use exact replacement only.

Table 5-6. 77 A1 Main PCA
(See Figure 5-2.)

REF DES ITEM NO		DESCRIPTION	PART NUMBER	MFRS SPLY CODE	MANUFACTURER'S PART NUMBER	QTY
BT1		Battery, Primary, 9V	696534	66571	216	1
C2,C10		Cap, Tant, .47uF, 35V, 20	655035	56289	199D474X0035AA1	2
C4		Cap, Alum, 2.2uF, 50V, 20%	650069	62643	SRA50VB225M4X15LL	1
C5,C6		Cap, Polyca, .027uF, 63V, 10%	720979	65964	CMK5273K63L29BULK	2
C7		Cap, Polyes, .47uF, 50V, 10%	697409	60935	185.47K50RBB	1
C8		Cap, Polypr, .033uF, 63V, 10	721050	60935	171.033K63B	1
C9		Cap, Tant, 6.8uF, 10V, 20%	655043	56289	199D685X0010BA1	1
C11		Cap, Tant, 2.2uF, 16V, 20%	706804	56289	199D225X0016AA1	1
C12		Cap, Cer, 47pF, 50V, 20%	706705	72982	RPE113Z5U470M50V	1
C13		Cap, Cer, .22uF, 50V, +80%-20%	733386	72982	RPE122Z5U224Z50V	1
C14,C15		Cap, Cer, 33pF, 50V, 5%	714543	72982	RPE113C0G330350V	2
CR1,CR2		Diode, Radial Insert	659516	09214	1N4448	2
E1,E2		Surge Protector, 1500V	655134	91984	100	2
F1		Fuse, 5x20mm, .63A, 250V	740670	71400	GDA-630MA	2
F3		Fuse, Fast, 15A, 600V	820829	71400	KTK-15	1
J1-4		Receptacle, Input	642959	89536	642959	4
Q1,Q3		Xstr, Sm Signal	685404	04713	SPS8763RLRA	2
Q2		Xstr, Sm Signal	698225	04713	2N3904RLRA2	1
R1	*	Res, MF, 1K, Fusible, 2%	854687	23237	FA8466	1
R2,R3		Res, Cer, 1M, 1W, 5%	655175	23237	RG1/2-105M-5%	2
R4		Res, CF, 100k, 1/4W, 5%	658963	59124	1-4-5P104K	1
R5		Res, MF, 402k, 1/4w, .25%	706739	57668	CRB14CXE	1
R6		Res, 4.99, 2.5W, 1%	655019	09969	NS-2C4R99F	1
R7		Res, WW, .005, .5W, 1%	740415	05347	RCS02R0053F	1
R8		Res, Cer, Var, 100k, .3W, 20%	649897	51406	RVS0707V1003104M	1
R9,R19		Res, CF, 1M, 1/4W, 5%	649970	59124	1-4-5P105J	2
R10		Res, CF, 1.5M, 1/4W, 5%	649962	59124	1-4-5P155J	1
R11		Res, MF, 332k, 1/8W, 1%	655217	59124	MFF1-83323F	1
R12		Res, MF, 301k, 1/8W, 1%	655274	59124	MFF1-83013F	1
R13		Res, MF, 44.8k, 1/8W, .25%	706747	59124	MF50D4482C	1
R14		Res, CF, 62k, 1/4W, 5%	713941	59124	CF1-4VT623J,REEL	1
R15		Res, MF, 56.2k, 1/8W, 1%	706242	59124	MF50D5622F	1
R16		Res, MF, 205k, 1/8W, 1%	706234	59124	MF50D5622F	1
R17		Res, MF, 20.5k, 1/8W, .5%	682716	59124	MF50D2052D	1
R18		Res, MF, 9.20k, 1/8W, .5%	715219	59124	MF50D9201D	1
R20	*	Res, WW, Fusible, .36, 2W	740662	23237	SPF3605	1
RJ1		Varistor, 430V, 1mA, 10%	706838	09214	V264LAX1398	1
RT1		Thermistor, Pos, 1k, 40%, 25C	446849	54583	911P84E102YU13	1
S1		Switch, Rotary	642918	89536	642918	1
U1		8075 A/D Chip Tested	683052	89536	683052	1
U2		IC, CMOS, SM-5A, 4-Bit Micro	659656	18520	LR3676	1
VR1		Bandgap, Taped	729202	89536	729202	1
W2		Res, Jumper, .25W, .02	682575	09969	FRJ-55	1
W5		Wire Jumper, PVC Insul.	747394	89536	747394	1
Y1		Crystal, 32.768 kHz, 3x8mm, 1%	643031	61429	NC38	1
Z1		Input Divider Network	683797	89536	683797	1
N.S.		250V Fuse, Hldr, 5mmx20mm	697086	61857	H-0011-2	2
N.S.		Contact, 600V Fuse	707190	89536	707190	2
N.S.		Contact, Battery (Female)	654228	89536	654228	1
N.S.		Contact, Battery (Male)	642967	89536	642967	1

N.S. = NOT SHOWN

* WARNING--Fusible Resistor. To ensure safety, use exact replacement only.



75-1621

Figure 5-2. A1 Main PCA

Section 7
Schematic Diagram

7-1. INTRODUCTION

This section presents a schematic diagram for the Fluke 73, 75, and 77 Multimeters. Differences between the models are noted.

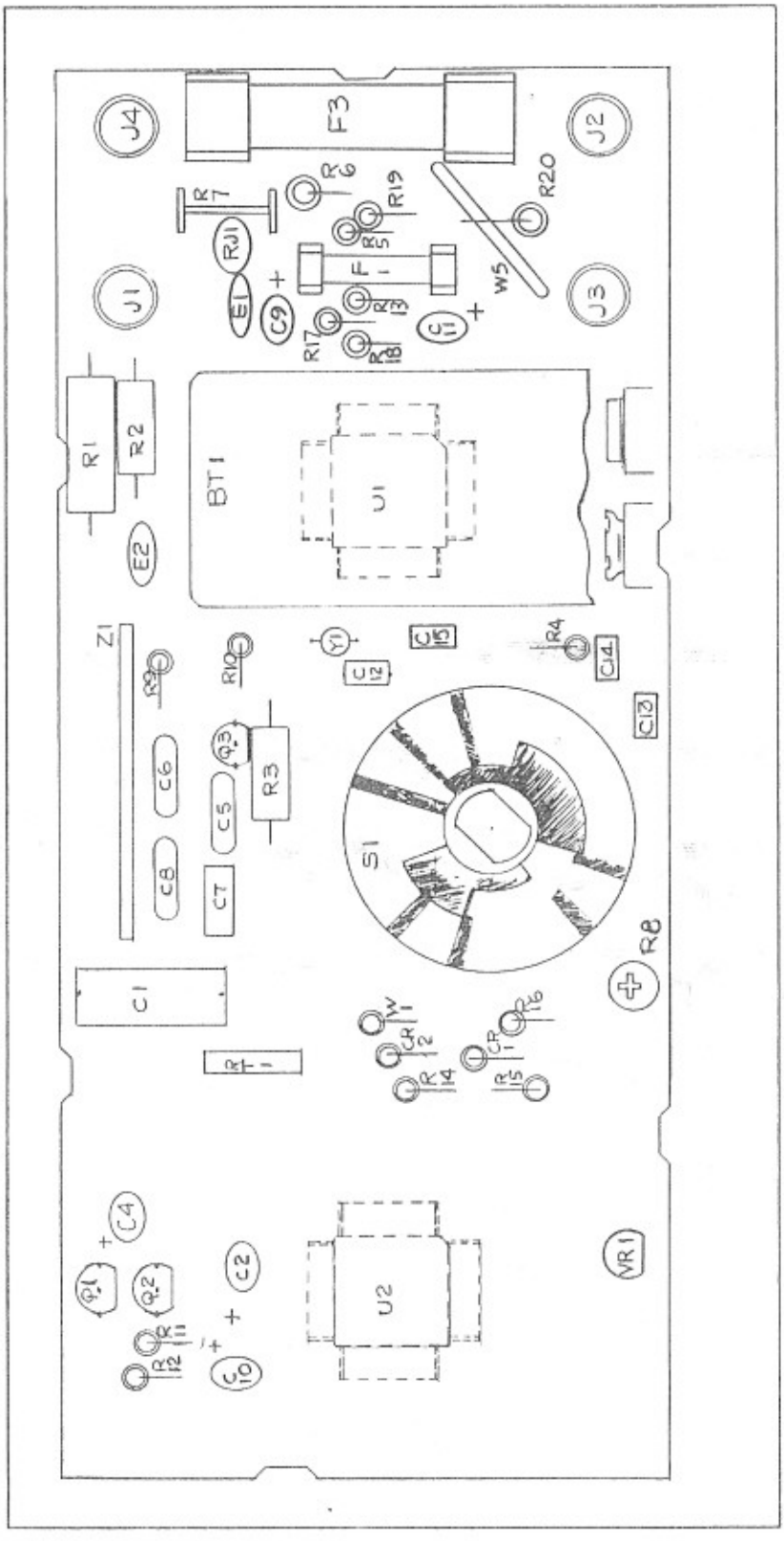
Table 7-1 contains a list of definitions for abbreviations used in the schematic drawing.

Table 7-1. Abbreviations

ABBREVIATION	DEFINITION
ACA	AC Converter Feedback
ACHI	AC Converter High
ACL	All Clear, Reset
ACLO	AC Converter Low
AFI	Active Filter Input
AFO	Active Filter Output
AMO	Amps Input
AM1	Amps Divide by 10
AZ	Auto Zero Point
BPR	Beeper Driver
BT	Battery
CLK	Clock Output
COM	Common
DCS	DC Sense

Table 7-1. Abbreviations (cont)

ABBREVIATION	DEFINITION
EC	Reference Voltage
FAO	Active Filter Amp Output
FA(-)	Active Filter Amp Feedback
INT	Integrator Output
K0	Buffer Divide By 1 Output
K1	Buffer Divide by 3 Output
LS	Loud Speaker
LO	Low
OHS	Ohms Sense
RNG	Range
RRS	Reference Resistor Sense
RT	Thermistor
VSS	Negative Supply Voltage
VDD	Positive Supply Voltage
VM	Volts Middle
WW	Wirewound
XTL	Crystal Oscillator Inputs
Z	Impedance



75-1621

Figure 7-1. A1 Main PCA

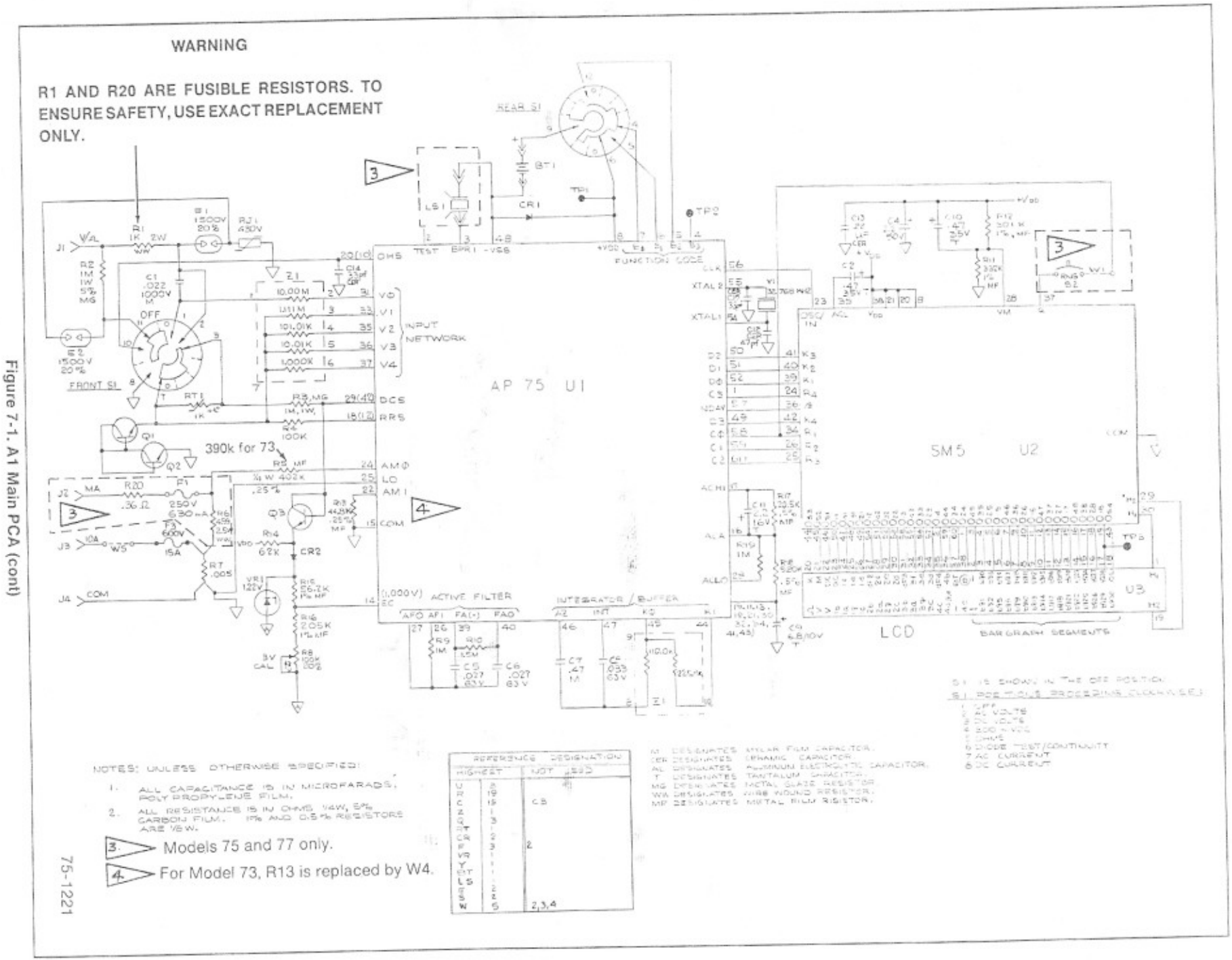


Figure 7-1. A1 Main PCA (cont)

Section 8
Manual Change Information

The A1 Main PCA in your 70 Series Multimeter may be one of the following types: 7X-3021, 7X-3011, or 7X-3001. This manual currently documents all 70 Series instruments that have the 7X-3021 A1 Main PCA. Make the changes to your manual as described in the following pages if the A1 Main PCA in your instrument is either a 7X-3011 or a 7X-3001. The pca type is located under the battery on the top side of the pca.

WARNING

FOR SAFETY PURPOSES, CASE TOPS AND CASE BOTTOMS SHOULD NOT BE INTERCHANGED BETWEEN PCA TYPES (i.e., DO NOT USE THE CASE TOP SPECIFIED FOR THE 7X-3001 ON THE 7X-3011, ETC.)

CHANGE #1 (7X-3011)

Make the following changes to your manual to reflect the 7X-3011 type of A1 Main PCA:

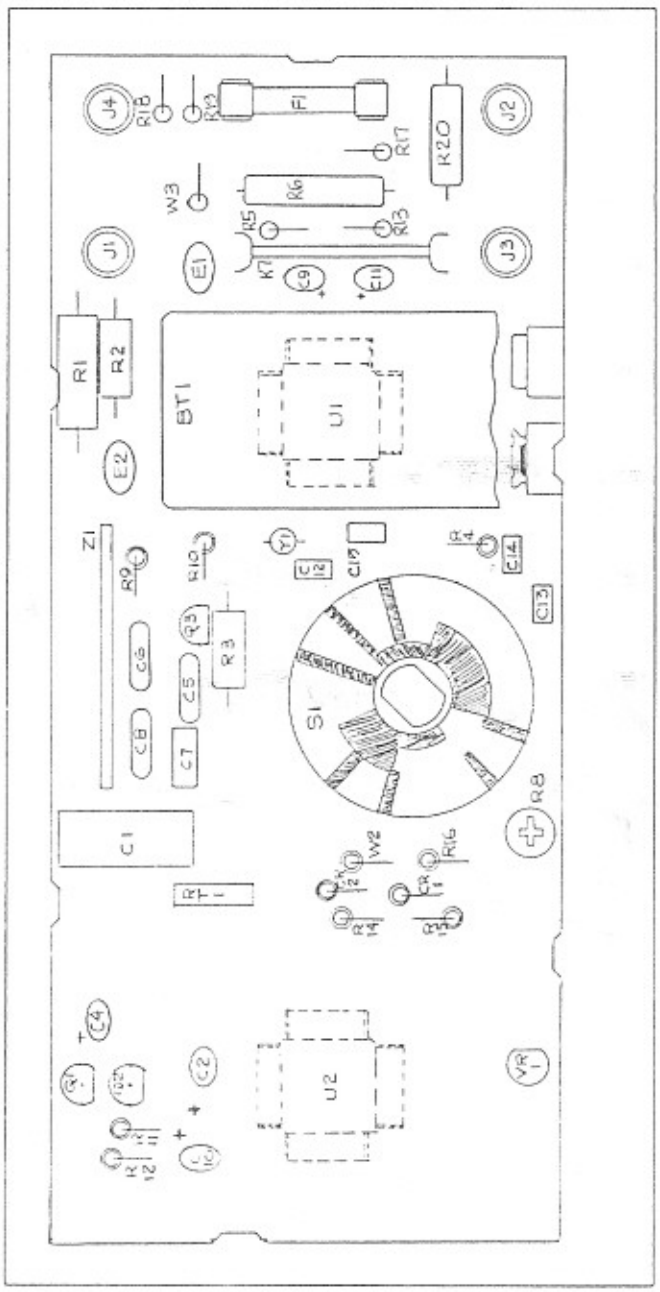
Change the appropriate parts lists as follows:

DELETE:	202	Shield, Top	819300
	203	Screw, Thd form, 2-14x.375	821140
	F3	Fuse, Fast, 15A 600V	820829

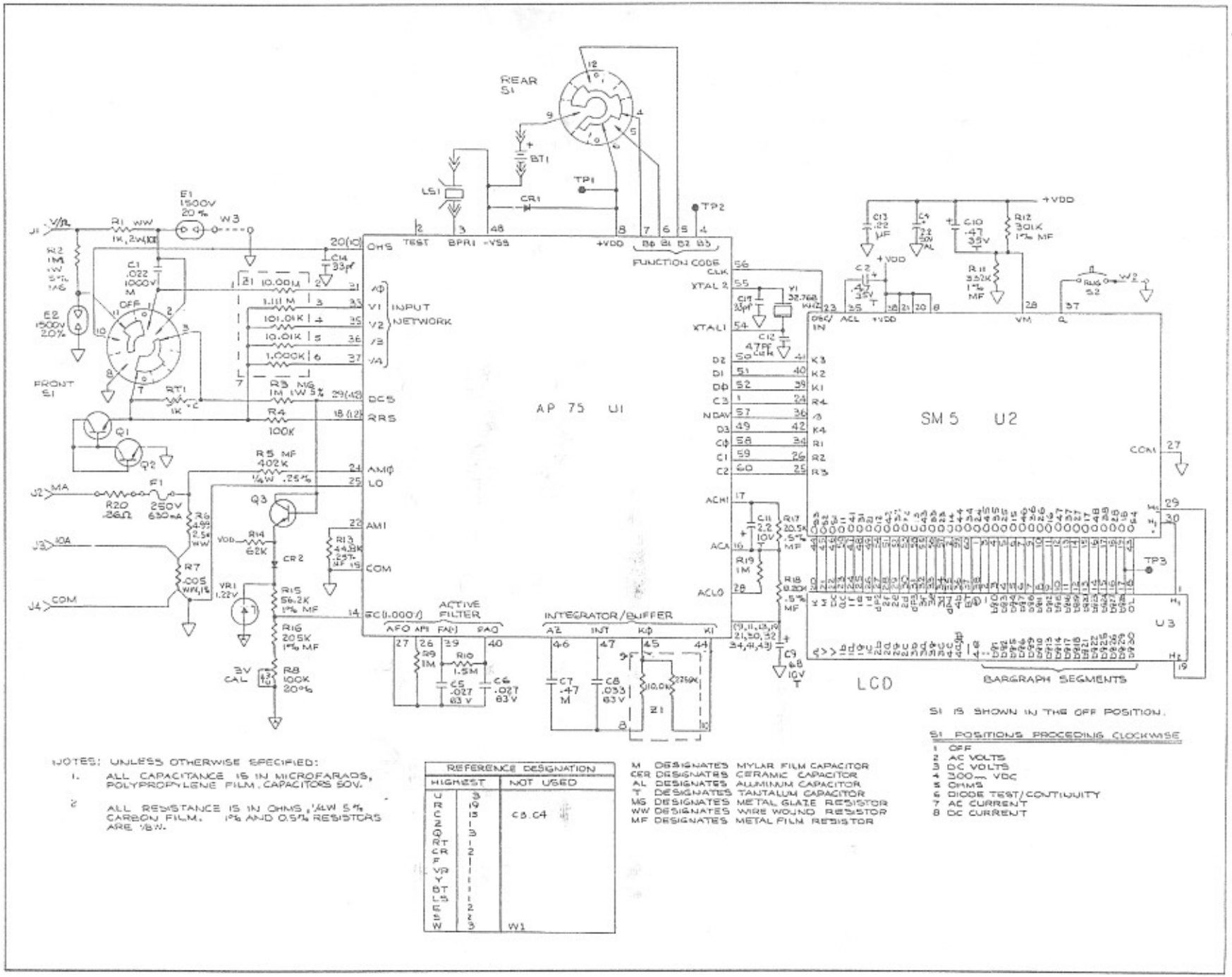
Change the Case Top Assembly and Case Bottom Assembly part numbers:

	CASE TOP ASSEMBLY			CASE BOTTOM ASSEMBLY		
	73	75	77	73	75	77
FROM:	828624	828632	828616	828608	828640	828640
TO:	656116	651752	652552	661009	785238	785238

Replace the 7X-1621 reference designator drawing with the 7X-1611.



7X-1611



NOTES: UNLESS OTHERWISE SPECIFIED:

1. ALL CAPACITANCE IS IN MICROFARADS, POLYPROPYLENE FILM CAPACITORS 50V.
2. ALL RESISTANCE IS IN OHMS, 1/4W 5% CARBON FILM. 1% AND 0.5% RESISTORS ARE 1/8W.

REFERENCE DESIGNATION	
HIGHEST	NOT USED
3	
2	C5, C4
1	
W3	W1

M DESIGNATES MYLAR FILM CAPACITOR
CER DESIGNATES CERAMIC CAPACITOR
AL DESIGNATES ALUMINUM CAPACITOR
T DESIGNATES TANTALUM CAPACITOR
MG DESIGNATES METAL GLAZE RESISTOR
WW DESIGNATES WIRE WOUND RESISTOR
MF DESIGNATES METAL FILM RESISTOR

S1 IS SHOWN IN THE OFF POSITION.

S1 POSITIONS PROCEEDING CLOCKWISE

1. OFF
2. AC VOLTS
3. DC VOLTS
4. 300Ω VDC
5. OHMS
6. DIODE TEST/CONTINUITY
7. AC CURRENT
8. DC CURRENT

CHANGE #2 (7X-3001)

Make the following changes to your manual to reflect the 7X-3001 version A1 Main PCA:

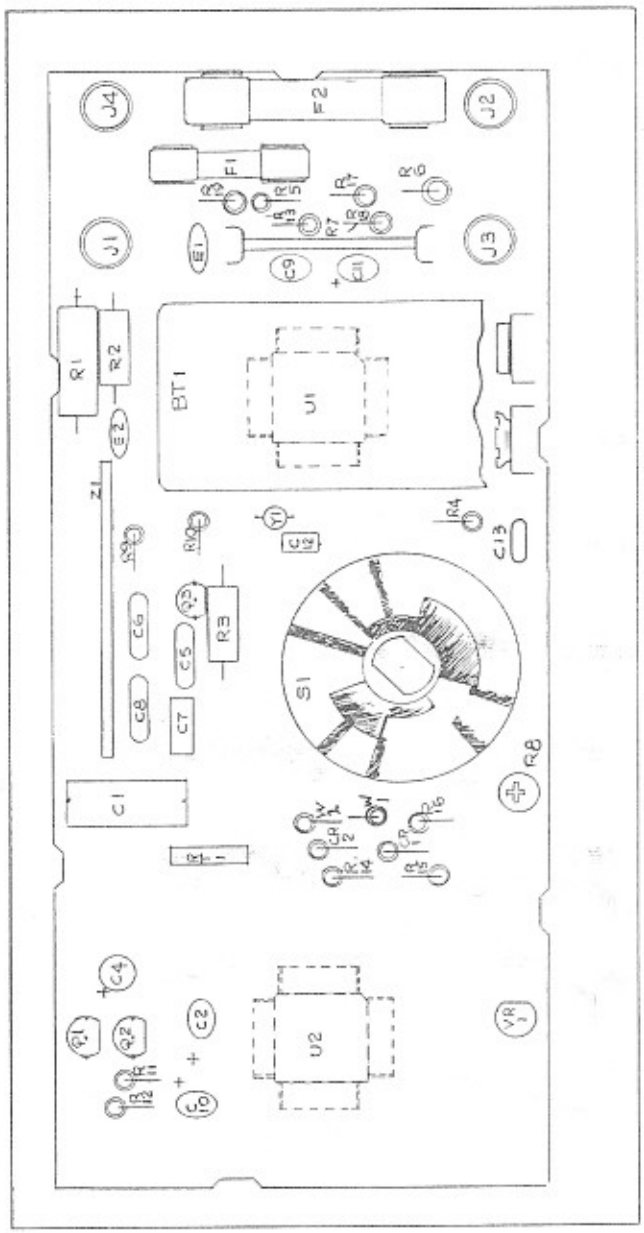
Change the appropriate parts lists as follows:

DELETE:	202	Shield, Top	819300
	203	Screw, Thd form, 2-14x.375	821140
	F3	Fuse, Fast, 15A 600V	820829
	R20	Res, WW, Fusible, .36, 2W	740662
	RJ1	Varistor, 430V, 1 mA, 10%	706838
ADD:	F2	Fuse, Fiber, 3A, 600V	475004

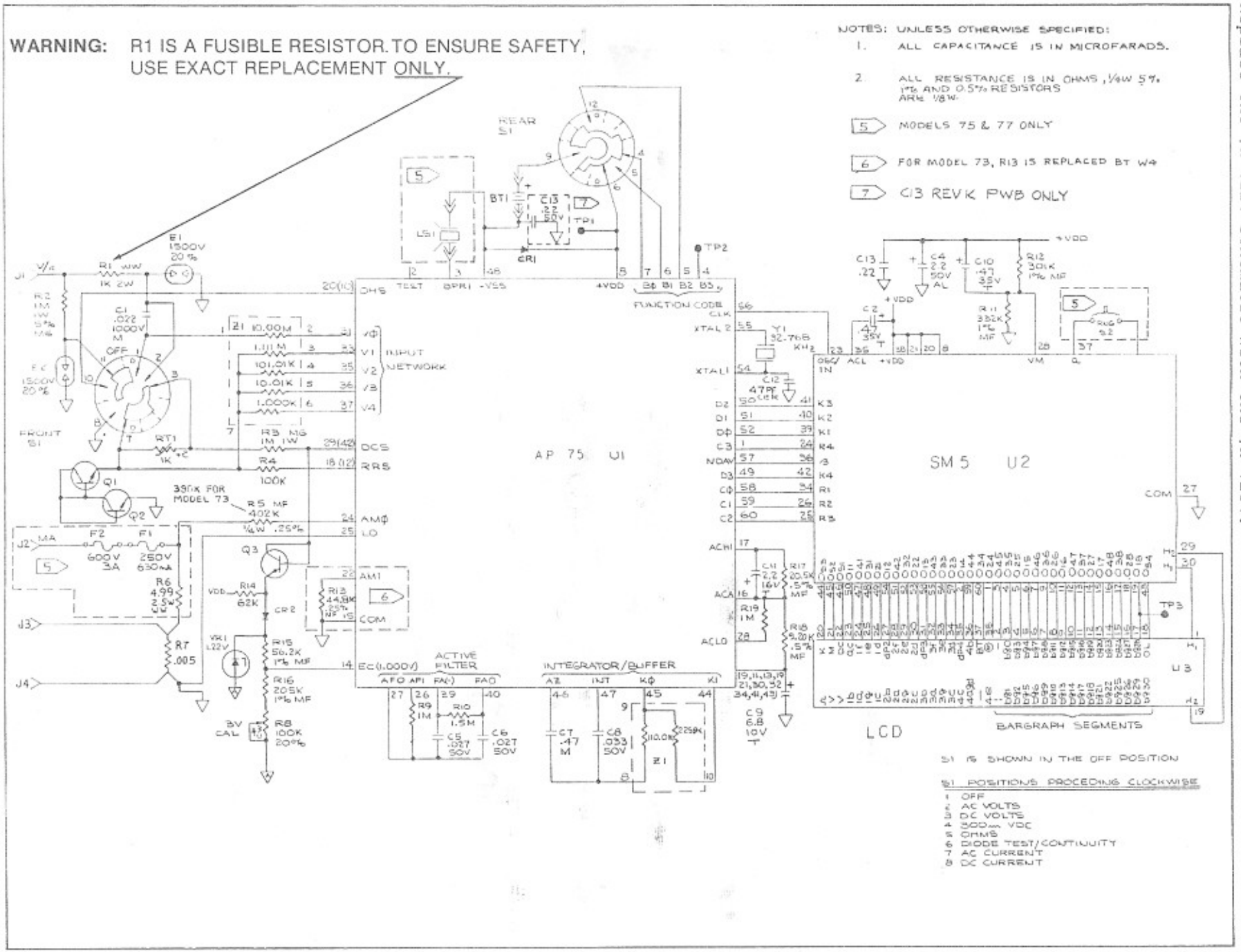
Change the Case Top Assembly and Case Bottom Assembly part numbers:

	CASE TOP ASSEMBLY			CASE BOTTOM ASSEMBLY		
	73	75	77	73	75	77
FROM:	828624	828632	828616	828608	828640	828640
TO:	656116	651752	652552	661009	654095	654075

Replace the 7X-1621 reference designator drawing with the 7X-1601:



7X-1601


WARNING: R1 IS A FUSIBLE RESISTOR. TO ENSURE SAFETY, USE EXACT REPLACEMENT ONLY.
NOTES: UNLESS OTHERWISE SPECIFIED:
1. ALL CAPACITANCE IS IN MICROFARADS.
2. ALL RESISTANCE IS IN OHMS, 1/4W 5%, 1% AND 0.5% RESISTORS ARE 1/8W.
5 MODELS 75 & 77 ONLY
6 FOR MODEL 73, R13 IS REPLACED BY W4
7 C13 REV K PWB ONLY
AP 75 U1
SM 5 U2
LCD
BARGRAPH SEGMENTS
INPUT NETWORK
ACTIVE FILTER
INTEGRATOR/BUFFER
390K FOR MODEL 73
S1 IS SHOWN IN THE OFF POSITION
S1 POSITIONS PROCEDING CLOCKWISE
1 OFF
2 AC VOLTS
3 DC VOLTS
4 300mV VDC
5 OHMS
6 DIODE TEST/CONTINUITY
7 AC CURRENT
8 DC CURRENT