

RECIPROCAL FREQUENCY COUNTER UNIVERSAL COUNTER

MYOUNG

RFC-125 (125 MHz)
RFC-1000 (1 GHz)
RFC-1300T(1.3 GHz)
RUC-1300 (1.3 GHz)

OPERATOR'S MANUAL



MYOUNG CORPORATION

YEO EUI DO P.O.BOX 14 SEOUL, KOREA

CABLE : "MYOUNG CRP"

TELEX : K24283 MYOUNG

FAX : (02) 784 - 2387

PHONE : (02) 784 - 9942 (Rep.)

TABLE OF CONTENTS

SECTION	TITLE	PAGE
1. INTRODUCTION & SPECIFICATION		
1. INTRODUCTION	2
2. SPECIFICATION	3
2. OPERATION		
1. INTRODUCTION	6
2. PREPARATION FOR USE	6
3. FRONT PANEL AND REAR PANEL FEATURES	7
4. OPERATING CHARACTERISTICS	12
3. SERVICING		
1. GENERAL	15
2. FUSE REPLACEMENT	15
3. CARE	15
4. PART LIST AND SCHEMATIC DIAGRAM	15

SECTION 1.

INTRODUCTION & SPECIFICATION

1. INTRODUCTION

The Myoung Model MYOUNG series are 10Hz to 125MHz (RFC-125), 1GHz (RFC-1000), 1.3GHz(RFC-1300T, RUC-1300) multiple-function counter.

It features an eight high bright seven segment LED display, soft touch switch, low consumption circuit design, small size, light weight, high-stabilized crystal oscillator (or TCO for RUC-1300) for measurement of accuracy and full input signal conditioning.

The functions are RESET, SELF TEST, HOLD, FREQUENCY, PERIOD, TOTALIZE, RPM, LINEAR, RATIO A/B, DIFFERENCE A-B, ADDITION A+B, TIME INTERVAL A→B and ATTENUATION 1/20.

This is accomplished by the custom designed microprocessor.

The location of controls, indicators, connectors and all of information for this model are provided in this manual.

It is recommended that whole information and details should be read and understood before attempting to operate the instrument for correct operation and best results.

2. SPECIFICATIONS

The Pertinent Specifications are listed as follows :
2—1 Input frequency Measurement

*Measuring Range	5Hz to 125MHz(For RFC-125)
Channel A ;	5Hz to 100MHz auto Range
Channel A and B(RUC-1300) :	• LSD Displayed : Depending Gate time and Input Signal • AT Least 7 Digits Displayed per Second of Gate Time
Channel B :	100MHz to 1 GHz((RFC-1000)
Channel C(RUC-1300) :	100MHz to 1.3GHz(RFC-1300T, RUC-1300)
* Input voltage	
Channel A :	50mV RMS Sine Wave or 140mV p-p (For RFC-125)
Channel A and B (RUC-1300) :	50mV RMS Sine Wave or 70mV p-p ATTN: X1, X20 fixed
Channel B :	35mV RMS Sine Wave or 100mV p-p
Channel C(RUC—1300) :	
*Maximum Input Voltage	
Channel A :	250V p-p(DC+AC)
Channel A and B(RUC-1300) :	
Channel B :	3V
Channel C(RUC-1300) :	
*Input Impedance,	
Channel A :	Approx, 1Mohm Less Than 35pF
Channel A and B(RUC-1300)	
Channel B :	50 Ohm
Channel C(RUC—1300)	
*ATTENUATOR	
Channel A :	1 or 1/20
Channel A and B(RUC-1300) :	
*Time Base	0.1S, 1S, 10S
Channel A and B :	Switch Selectable
Channel A, B and C(RUC-1300) :	
*Resolution	
Channel A and B	
Channel A, B and C(RUC-1300) :	
10MHz or more	10Hz/0.1S, 1Hz/1S, 0.1Hz/10S
10MHz or less	5 digit/10ms 6 digit/0.1S. 7 digit/1S 8 digit/10S

2-2 Period measurements

*Channel A

Channel A and B(RUC-1300)

Range : 10n Sec to 10 Sec

LSD Displayed : 1 uSec to 0.1Psec

Depending on Gate Time and Input Signal At Least
7 Digits Displayed per second of Gate Time

*Channel B

Channel C(RUC-1300)

Range : 1nSec to 10nSec

LSD Displayed : Least Display Limited by Display Method-0.1Psec

2-3 Totalize A

Totalize A or B(RUC-1300)

Manual Range : 0 to 99, 999, 999

Manual Reset possible

2-4 Ratio A / B measurements(For RUC - 1300)

Range : 0.1Hz to 100MHz Both Channels

LSD Displayed : $\frac{2.5 \times \text{period}}{\text{Gate Time}} \times \text{Ratio}$

2-5 Difference A-B(For RUC-1300)

Range : 0.1Hz to 100MHz Both Channels

LSD Displayed : 100Hz to 100uHz Depending on Gate Time, Input
Signal and Display Method.

2-6 Addition A+B(For RUC-1300)

Range : 5Hz to 100MHz Both Channels

LSD Displayed : 100Hz to 10nHz Depending on Gate Time and Input
Signal

2-7 Time Interval A→B (For RUC-1300)

Range : 100nSec to 10Sec

LSD Displayed : 100nSec

Average : 1, 10, 100, Intervals Averaged

2-8 RPM(For RFC - 1300T)

Range : 6.000-9,999,999RPM

1 Pulse/Revolution Detector

At least 7 digits Displayed

2-9 Linearity(For RFC-1300T)

Range: 1.88cm/sec - 9,999,999cm/sec
Diameter: 30mm Wheel Detector
At least 7 digits Displayed

2-10 General

Standard Frequency: 10MHZ
Aging Rate: 1×10^{-6} /Month
Temperature: ± 5.0 PPM (0°C 50°C)
(with Tcxo option)
Display: 8 Digit 7mm Red LED Display with Decimal point.
KHz, MHz, Hz, RPM & cm/s(For RFC-1300T) and usec Indication
Operating Temperature: Rated, Range of use -5°C +50°C
Storage and Transport: -40°C +60°C
Humidity operation: 10 to 90%RH
Storage: 5 to 95%RH
Power Requirement: Line 115V/230V $\pm 15\%$
Dimension L×W×H: 218mm×275mm×78mm

SECTION 2.

OPERATION

1. INTRODUCTION

This section provides complete operating information needed for this multi-function counter. This section includes a description of all front panel controls, connectors and indicators, operating instructions, operator's maintenance.

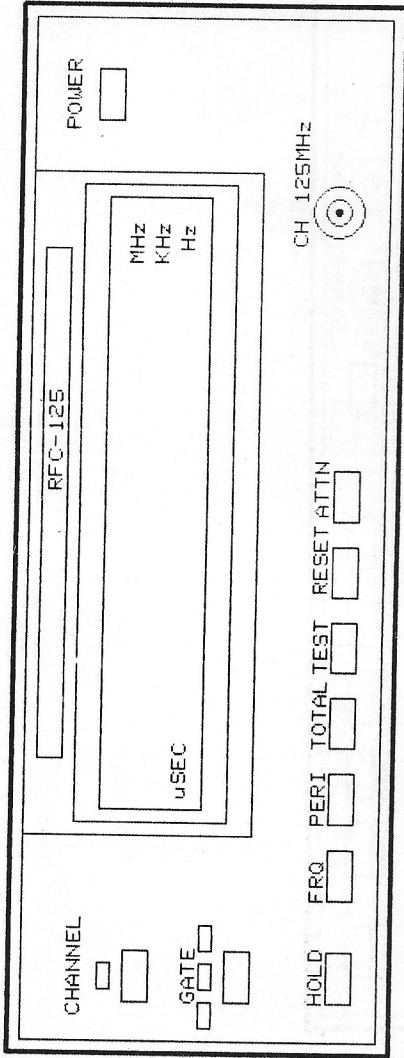
2. PREPARATION FOR USE

1) Power Requirements.

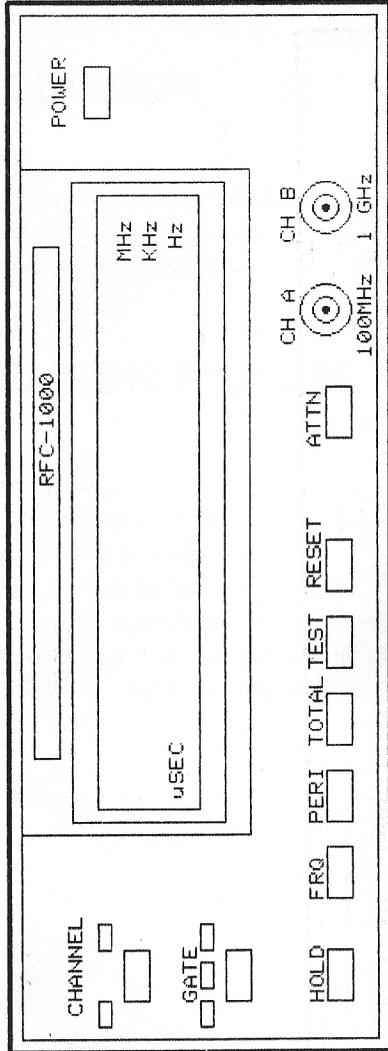
It requires a power source of 115 or 230V AC, 45 to 70Hz single phase. Power consumption is 10 watts maximum.

2) Line Voltage Selection.

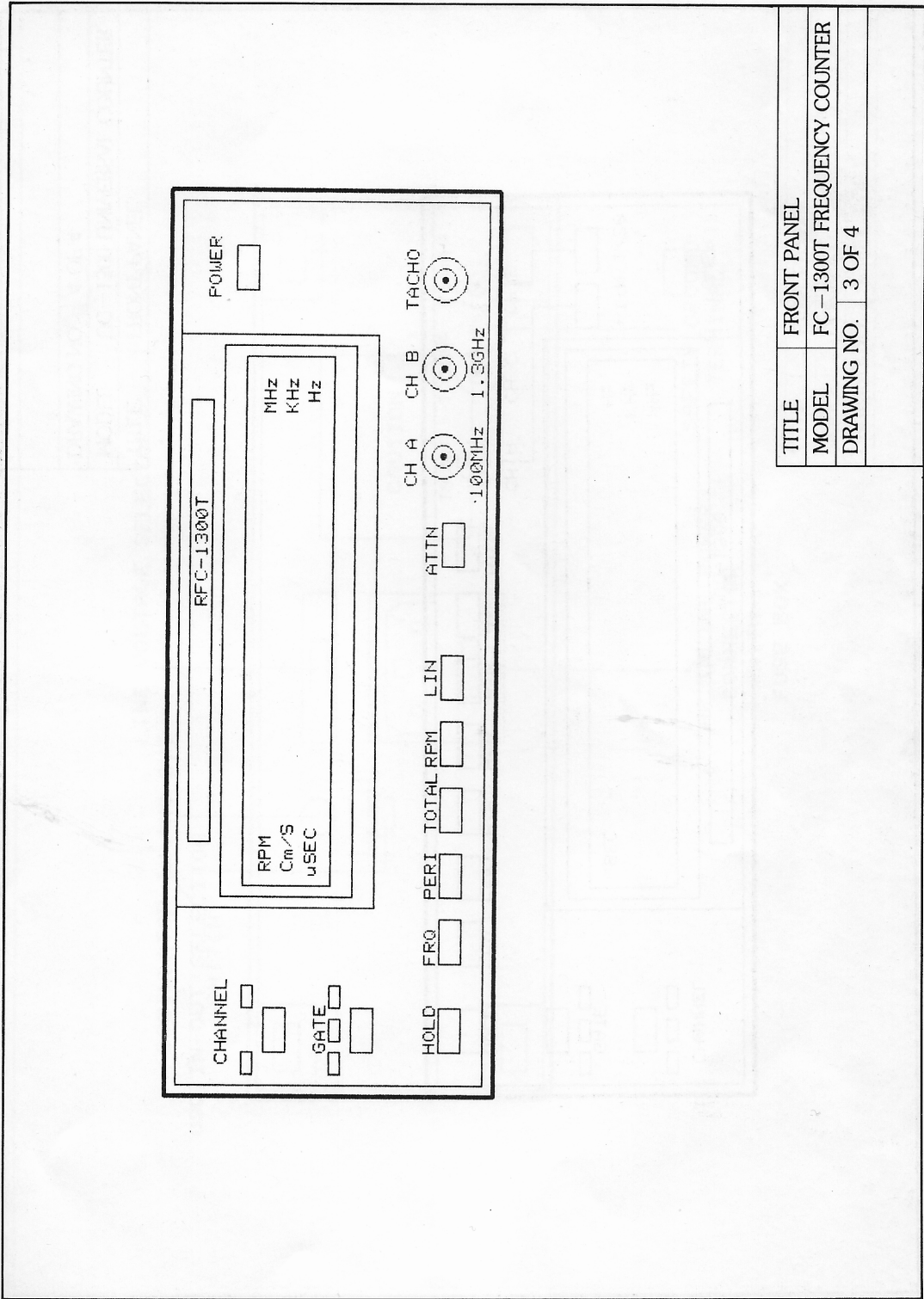
Line voltage selection is determined by the position of the line voltage selector switch located on the rear panel. Line voltage is preset at the factory for 115V (90–120V) or 230V (180–250V) as ordered by the customer.



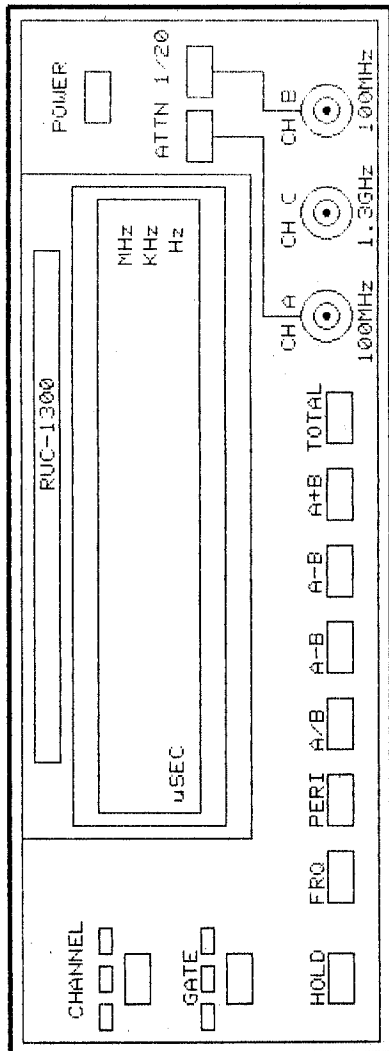
TITLE	FRONT PANEL
MODEL	FC-125 FREQUENCY COUNTER
DRAWING NO.	1 OF 4



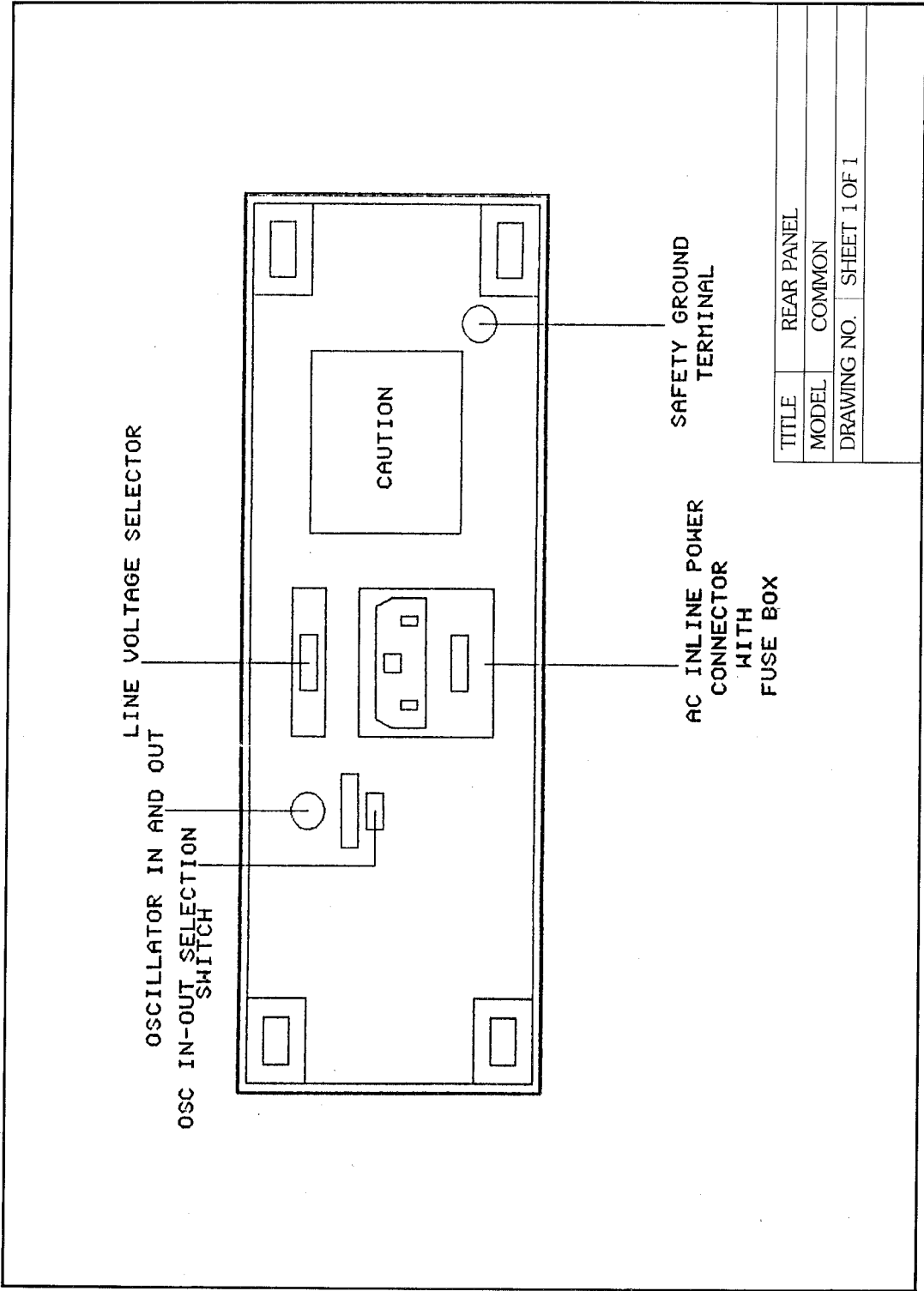
TITLE	FRONT PANEL
MODEL	FC-1000 FREQUENCY COUNTER
DRAWING NO.	2 OF 4



TITLE	FRONT PANEL
MODEL	FC-1300T FREQUENCY COUNTER
DRAWING NO.	3 OF 4



TITLE	FRONT PANEL
MODEL	UC-1300 UNIVERSAL COUNTER
DRAWING NO.	4 OF 4



TITLE	REAR PANEL
MODEL	COMMON
DRAWING NO.	SHEET 1 OF 1

4. OPERATING CHARACTERISTICS

NOTE : Locate the voltage selector of the instrument in accordance with the power source prior to press the power switch to the ON position.

4-1. FREQUENCY MEASUREMENT PROCEDURE

Perform frequency measurements as follows :

- 1) Press the power switch to the ON position.
- 2) Set the Channel selector to the desired Channel prior to press the frequency switch.
- 3) Select the desired gate time.
- 4) Connect the input signal to the front-panel BNC connector.
- 5) Set ATTN. To desired position. If input signal level is greater than 300mV, depressing the ATTN. switch will decrease the triggering sensitivity of the input signal by 20 and reduce errors.
- 6) Read the frequency on display and observe the unit of measurement indication to the right of the display.

4-2. PERIOD MEASUREMENT PROCEDURE

Perform period measurements as follows :

- 1) Press the power switch to the ON position.
- 2) Set the channel selector to the desired channel prior to press the PERIOD switch to select the period mode of operation.
- 3) Connect the input signal to the front-panel BNC connector.
- 4) Read the period time on display and observe the unit of measurement indication to the right of the display.

4-3. TOTALIZE MEASUREMENT PROCEDURE

Perform totalize measurements as follows :

- 1) Press the POWER switch to the ON position.
- 2) Press the TOTAL switch to select the totalize mode of operation and the RESET switch to initialize the counter and totalize can be operated at CH A lower than 30MHz.
- 3) Connect the input signal to the front-panel BNC connector.
- 4) Set ATT. to disired position. If input signal level is greater than 300mV, depressing the ATT. switch will decrease the triggering sensitivity of the input signal by 20 and reduce errors.
- 5) Read the accumulated total on display after depressing the HOLD switch.

4-4. TEST MODE

The self-test mode provides a means of verifying proper over-all operation of counter, excluding input section, time base accuracy, and time base dividers used in the period mode.

- 1) Press the power switch to the ON position.
- 2) Press the TEST switch to select the self-test mode.
- 3) Display shows PASS
- 4) Press the GATE SWITCH 1 : the display should read 10,00000MHz with the instrument gating once every second.
- 5) Press the GATE SWITCH 10: the display should read 10,000000MHz with the instrument gating once every 10 seconds.
- 6) Press the GATE SWITCH 0.1 : the display should read 10,0000MHz with the instrument gating once every 0.1 second.

4-5 RESET MODE

When pressed, immediately resets the counter to begin a new measurement. Usually used in the totalize mode to begin a new measurement.

4-6 RPM & LIN MEASUREMENT PROCEDURE(For RFC-1300T)

Perform RPM & LIN measurements as follows :

- 1) Press the power switch to the ON position.
- 2) Press the RPM or LIN switch.
- 3) Connect the Tachometer Probe to the front-panel Tacho Connector.
- 4) Gate time will be set at 1 sec automatically.
- 5) Read the RPM or LIN on display and observe the measurement indication to the left of the display.

4-7. RATIO A / B MEASUREMENT PROCEDURE(For RUC-1300)

This measurement shows the value of the CH-A signal divided by the CH-B signal.

- 1) Press the power switch to the ON position.
- 2) Press the A/B switch.
- 3) Connect the input signal to the front-panel BNC connector CH-A and CH-B.
- 4) Read the value on display.

4-8. TIME INTERVAL A→B MEASUREMENT PROCEDURE (For RUC - 1300)

This measurement counts of a scaled reference frequency for a period whose start is determined by the CH-A input signal and whose stop is determined by the CH-B signal.

- 1) Press the power switch to the ON position.
- 2) Press the A→B switch.
- 3) Connect the input signal to the front-panel BNC connector CH-A and CH-B.
- 4) Read the value on display.

4-9. DIFFERENCE A-B MEASUREMENT PROCEDURE (For RUC - 1300)

This measurement shows the value of the difference between CH-A signal and CH-B signal.

- 1) Press the power switch to the ON position.
- 2) Press A-B switch.
- 3) Connect the input signal to the front-panel BNC connector CH-A and CH-B.
- 4) Read the value on display.

4-10 ADDITION A+B MEASUREMENT PROCEDURE (For RUC - 1300)

This measurement shows the value of the total CH-A signal and CH-B signal.

- 1) Press the power switch to the ON position.
- 2) Press the A+B switch.
- 3) Connect the input signal to the front-panel BNC connector CH-A and CH-B.
- 4) Read the value on display.

4-11 TOTALIZE MEASUREMENT PROCEDURE (For RUC - 1300)

Perform totalize measurements as follows :

- 1) Press the POWER switch to the ON position.
- 2) Press the TOTAL switch to select the totalize mode of operation and to initialize the counter.
- 3) Connect the input signal to the front-panel BNC connector.
- 4) Set ATT. to desired position. If input signal level is greater than 300mV, depressing the ATT. switch will decrease the triggering sensitivity of the input signal by 20 and reduce errors.
- 5) Read the accumulated total on display after depressing the HOLD switch.

SECTION 3.

SERVICING

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

3-1. GENERAL

This Instrument contains no operator-serviceable parts except the fuse. Improper procedures or parts may create hazard to the user.

Refer servicing to qualified personnel only.

3-2. FUSE REPLACEMENT

The line fuse is located at the back of the instrument.

Use the following procedure to replace a fuse.

WARNING

Remove all power and input/output connections to the instrument before removing the snap-on cap. Do not replace a blown fuse with one which has a larger rating or slower time lag characteristic than those specified.

3-3. CARE

WARNING

Do not attempt to clean this instrument with the test leads connected to a power source or when it is connected to the AC powerline.

- 1) Immediately clean all spilled materials from the instrument and wipe dry. If necessary, moisten a damp cloth with soap and water to clean plastic surfaces.
- 2) Whenever possible, avoid exposure or usage in areas which are subject to temperature and humidity extremes, vibration or mechanical shock, dust or corrosive fumes or strong electrical or electromagnetic interferences.
- 3) Storage : When the instrument is not in use, store it in a location free from temperature extremes, dust and corrosive fumes, and mechanical vibration or shock.

WARNING

Maintenance described herein is performed with power supplied to the instrument and protective covers removed. Such maintenance should be performed only by service-trained personnel who are aware of the hazard involved (for example, fire and electrical shock). Where maintenance can be performed without power applied, the power should be removed.

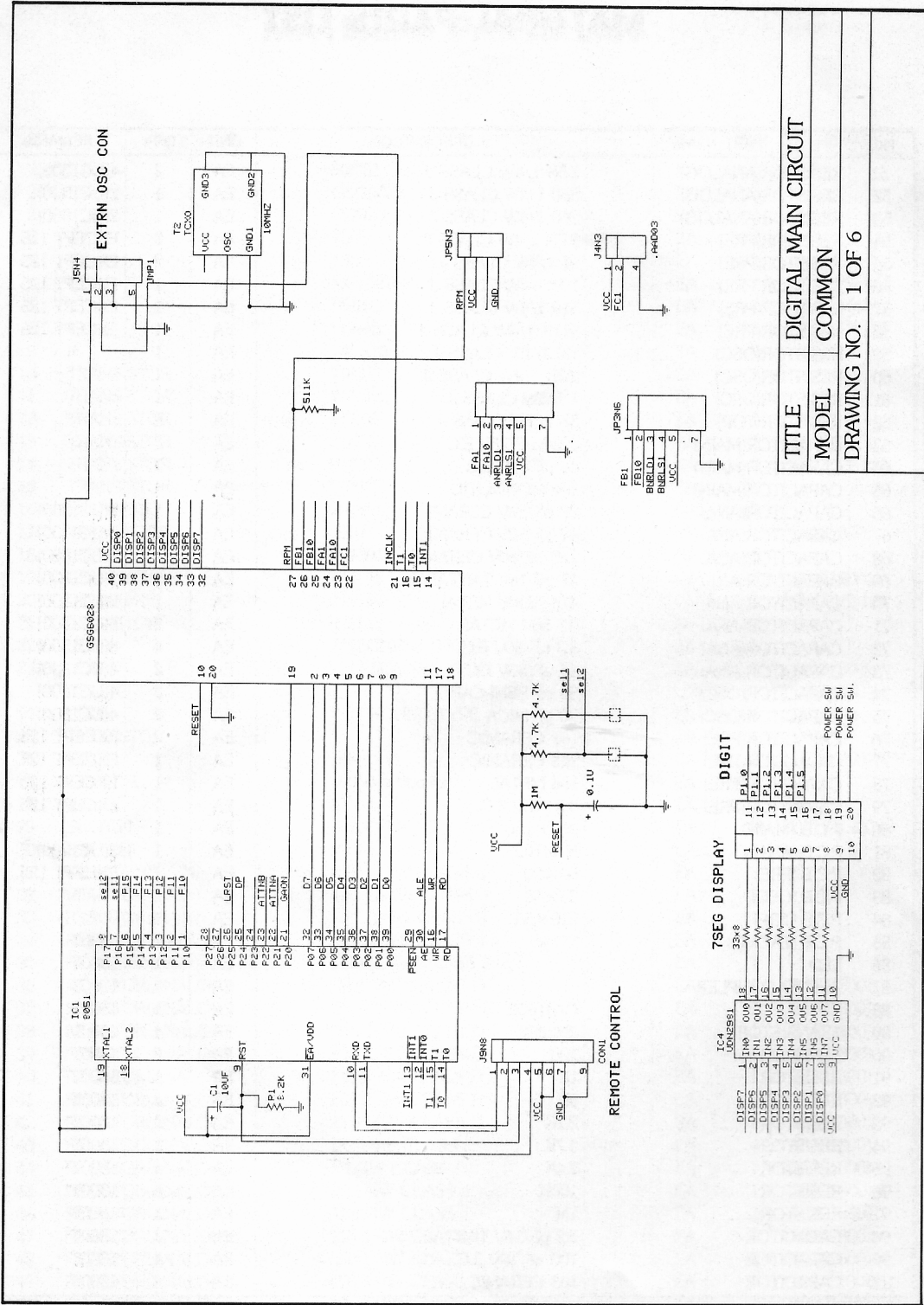
3-4. PART LIST AND SCHEMATIC DIAGRAM

MATERIAL PARTS LIST

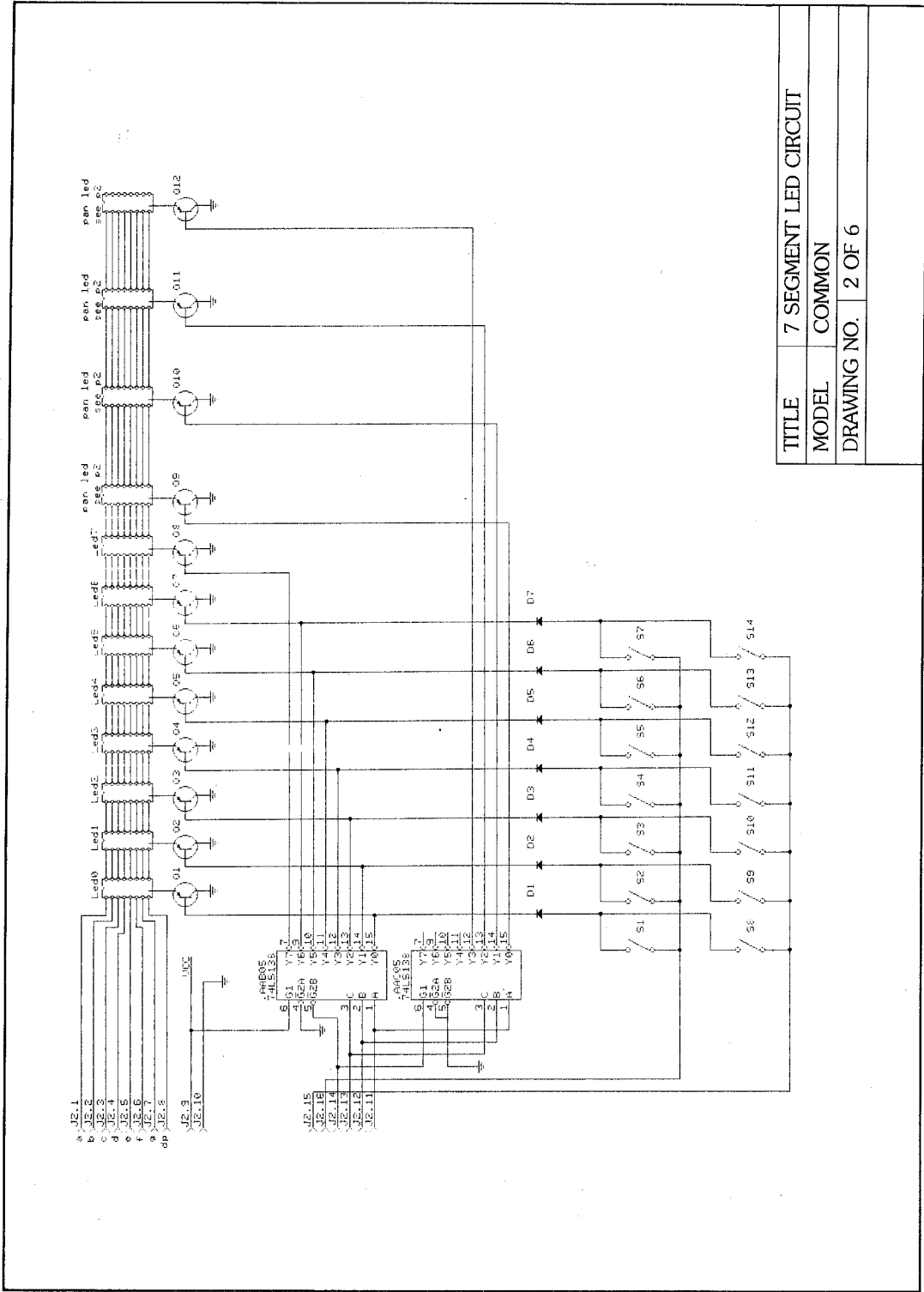
No.	PART NAME	DESCRIPTION	UNIT	Q'TY	REMARK
1	CPU	80C51	EA	1	
2	LSI	GSG6028	EA	1	
3	IC	UDN2981A	EA	1	
4	IC	7805	EA	1	
5	IC	7806	EA	1	
6	IC	MC10216P	EA	1	2(UC1300)
7	IC	B551C	EA	1	2(UC1300)
8	IC	U666B	EA	1	EXCEPT 125
9	IC	74LS138	EA	2	
10	TRANSISTOR	TIP32	EA	1	
11	TRANSISTOR	2N2222	EA	2	
12	TRANSISTOR	BF509	EA	1	2(UC1300)
13	TRANSISTOR	C9015	EA	2	4(UC1300)
14	TRANSISTOR	BC327	EA	2	EXCEPT 125
15	TRANSISTOR	TIP31C	EA	1	
16	TRANSISTOR	2N2907	EA	12	
17	TRANSISTOR	J310	EA	1	2(UC1300)
18	DIODE	IN4004	EA	2	
19	DIODE(ANA)	IN4148	EA	3	6(UC1300)
20	DIODE(PRE)	IN4148	EA	2	EXCEPT 125
21	DIODE(TOP)	IN4148	EA	7	
22	LED	7 SEGMENT 200PKF	EA	8	
23	LED	RED SQUARE TYPE	EA	5	6(UC1300) 4(FC125)
24	LED	RED ROUND TYPE	EA	4	6(1300T)
25	THEMISTOR	1K	EA	1	
26	V.R.	25K	EA	1	2(UC1300)
27	CRYSTAL	100MHz 20ppm	EA	1	
28	RELAY	RY-5	EA	1	
29	SWITCH	TOUCH TYPE	EA	9	12(UC1300)
30	SWITCH	PUSH TYPE	EA	1	
31	RESISTOR(MAIN)	4.7K 1/4W CLASS J	EA	3	
32	RESISTOR(MAIN)	470 1/4W CLASS J	EA	2	
33	RESISTOR(MAIN)	1 1/4W CLASS J	EA	3	
34	RESISTOR(MAIN)	8.2K 1/4W CLASS J	EA	1	
35	RESISTOR(MAIN)	511K 1/4W CLASS J	EA	1	
36	RESISTOR(ANALOG)	1M 1/2W CLASS D	EA	1	2(UC1300)
37	RESISTOR(ANALOG)	350K 1/2W CLASS D	EA	1	2(UC1300)
38	RESISTOR(ANALOG)	50K 1/4W CLASS D	EA	1	2(UC1300)
39	RESISTOR(ANALOG)	800 1/4W CLASS D	EA	1	2(UC1300)
40	RESISTOR(ANALOG)	1.62K 1/4 CLASS D	EA	1	2(UC1300)
41	RESISTOR(ANALOG)	261 1/4W CLASS D	EA	2	4(UC1300)
42	RESISTOR(ANALOG)	237 1/4W CLASS D	EA	1	2(UC1300)
43	RESISTOR(ANALOG)	1K 1/4W CLASS J	EA	4	8(UC1300)
44	RESISTOR(ANALOG)	1 1/4W CLASS J	EA	1	2(UC1300)
45	RESISTOR(ANALOG)	10 1/4W CLASS J	EA	1	2(UC1300)
46	RESISTOR(ANALOG)	51 1/4W CLASS J	EA	1	2(UC1300)
47	RESISTOR(ANALOG)	510 1/4W CLASS J	EA	1	2(UC1300)
48	RESISTOR(ANALOG)	560 1/4W CLASS J	EA	2	4(UC1300)
49	RESISTOR(ANALOG)	470 1/4W CLASS J	EA	6	12(UC1300)
50	RESISTOR(ANALOG)	100 1/4W CLASS J	EA	1	2(UC1300)

MATERIAL PARTS LIST

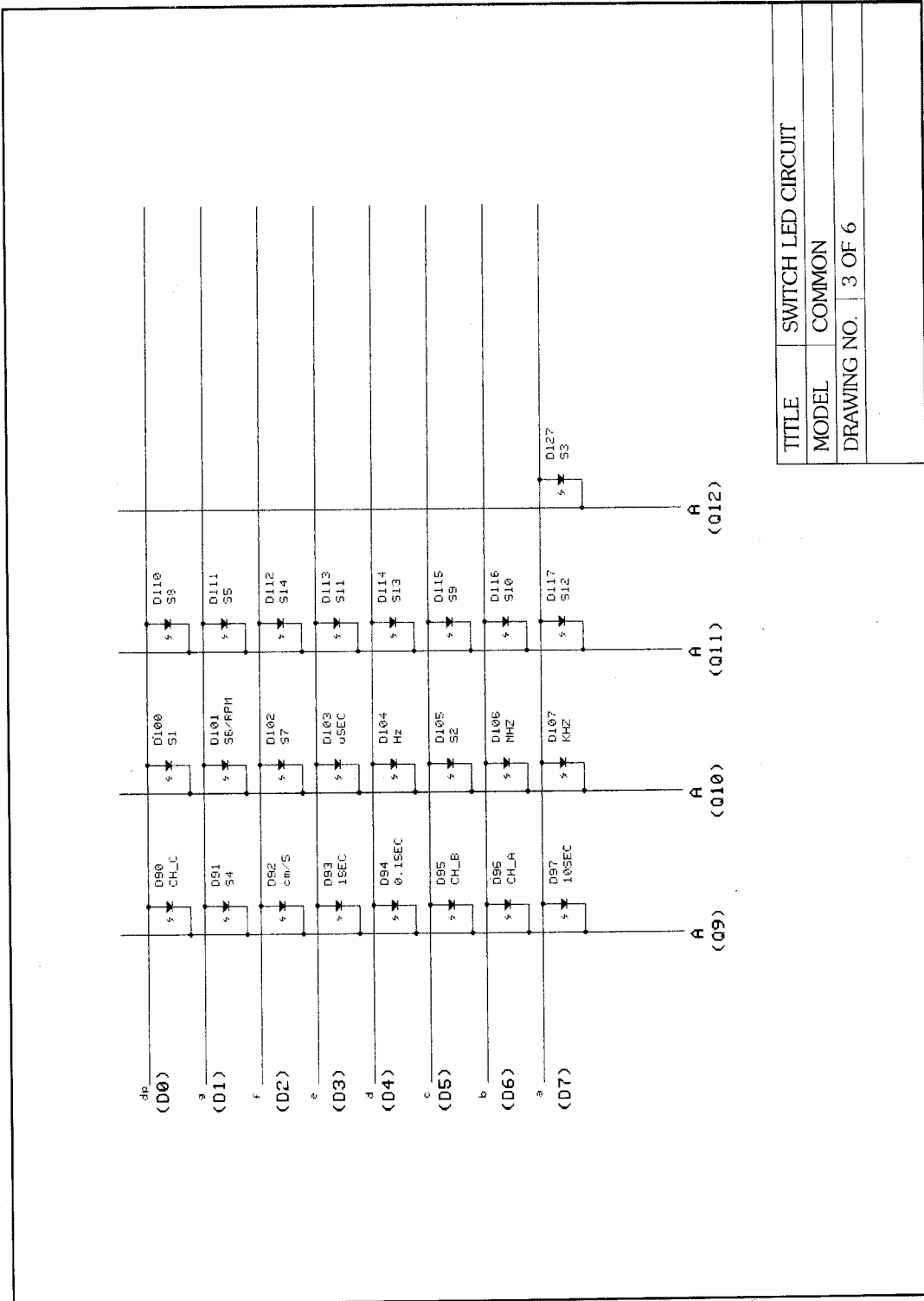
No.	PART NAME	DESCRIPTION	UNIT	Q'TY	REMARK
51	RESISTOR(ANALOG)	1.5K 1/4W CLASS J	EA	2	4(UC1300)
52	RESISTOR(ANALOG)	860 1/4W CLASS J	EA	1	2(UC1300)
53	RESISTOR(ANALOG)	360 1/4W CLASS J	EA	1	2(UC1300)
54	RESISTOR(PRE)	2.2K 1/4W CLASS J	EA	2	EXCEPT 125
55	RESISTOR(PRE)	51 1/4W CLASS J	EA	2	EXCEPT 125
56	RESISTOR(PRE)	100 1/4W CLASS J	EA	1	EXCEPT 125
57	RESISTOR(PRE)	510 1/4W CLASS J	EA	1	EXCEPT 125
58	RESISTOR(PRE)	511K 1/4W CLASS J	EA	1	EXCEPT 125
59	RESISTOR(OSC)	1M 1/4W CLASS J	EA	1	
60	RESISTOR(OSC)	2.2K 1/4W CLASS J	EA	1	
61	RESISTOR(OSC)	1 1/4W CLASS J	EA	1	
62	RESISTOR(TOP)	33 1/2W CLASS J	EA	8	
63	CAPACITOR(MAIN)	2200 uF/25V E.C.	EA	2	
64	CAPACITOR(MAIN)	47 uF/50V E.C	EA	7	
65	CAPACITOR(MAIN)	104 MONOLITIC	EA	4	
66	CAPACITOR(ANA)	22 pF/50V CERAMIC	EA	1	2(UC1300)
67	CAPACITOR(ANA)	47 pF/50V CERAMIC	EA	2	4(UC1300)
68	CAPACITOR(ANA)	220 pF/50V CERAMIC	EA	1	2(UC1300)
69	CAPACITOR(ANA)	47 pF/16V TANTAL	EA	1	2(UC1300)
70	CAPACITOR(ANA)	474 /250V METAL	EA	1	2(UC1300)
71	CAPACITOR(ANA)	0.1 50V METAL	EA	3	6(UC1300)
72	CAPACITOR(ANA)	3.3 uF/50V E.C.	EA	4	8(UC1300)
73	CAPACITOR(ANA)	47 uF/50V E.C.	EA	2	4(UC1300)
74	CAPACITOR(OSC)	35 pF SEMI-CAP	EA	2	4(UC1300)
75	CAPACITOR(OSC)	20 pF MICA	EA	2	4(UC1300)
76	CAPACITOR(PRE)	102 CERAMIC	EA	2	EXCEPT 125
77	CAPACITOR(PRE)	103 CERAMIC	EA	1	EXCEPT 125
78	CAPACITOR(PRE)	104 METAL	EA	1	EXCEPT 125
79	CAPACITOR(PRE)	3.3 /25V E.C.	EA	1	EXCEPT 125
80	P.C.B (MAIN)	205x150	EA	1	
81	P.C.B.(ANA)	50x100	EA	1	2(UC1300)
82	P.C.B.(PRE)	50x20	EA	1	EXCEPT 125
83	P.C.B.(OSC)	35x40	EA	1	
84	P.C.B.(TOP)	210x65	EA	1	
85	P.C.B.(TACHO)	x	EA	1	1300T
86	LED		EA	1	1300T
87	PHOTO COUPLER		EA	1	1300T
88	IC	CA3160E	EA	1	1300T
89	TRANSISTOR	2N2222	EA	1	1300T
90	RESISTOR	100	EA	2	1300T
91	RESISTOR	1K	EA	1	1300T
92	RESISTOR	2K	EA	1	1300T
93	RESISTOR	2.2K	EA	1	1300T
94	RESISTOR	4.7K	EA	1	1300T
95	RESISTOR	2.4K	EA	1	1300T
96	RESISTOR	100K	EA	5	1300T
97	RESISTOR	1M	EA	1	1300T
98	CAPACITOR	2.2 pF/16V TANTAL	EA	1	1300T
99	CAPACITOR	100 uF/10V E.C.	EA	1	1300T
100	CAPACITOR	103 CERAMIC	EA	4	1300T



TITLE DIGITAL MAIN CIRCUIT
MODEL COMMON
DRAWING NO. 1 OF 6

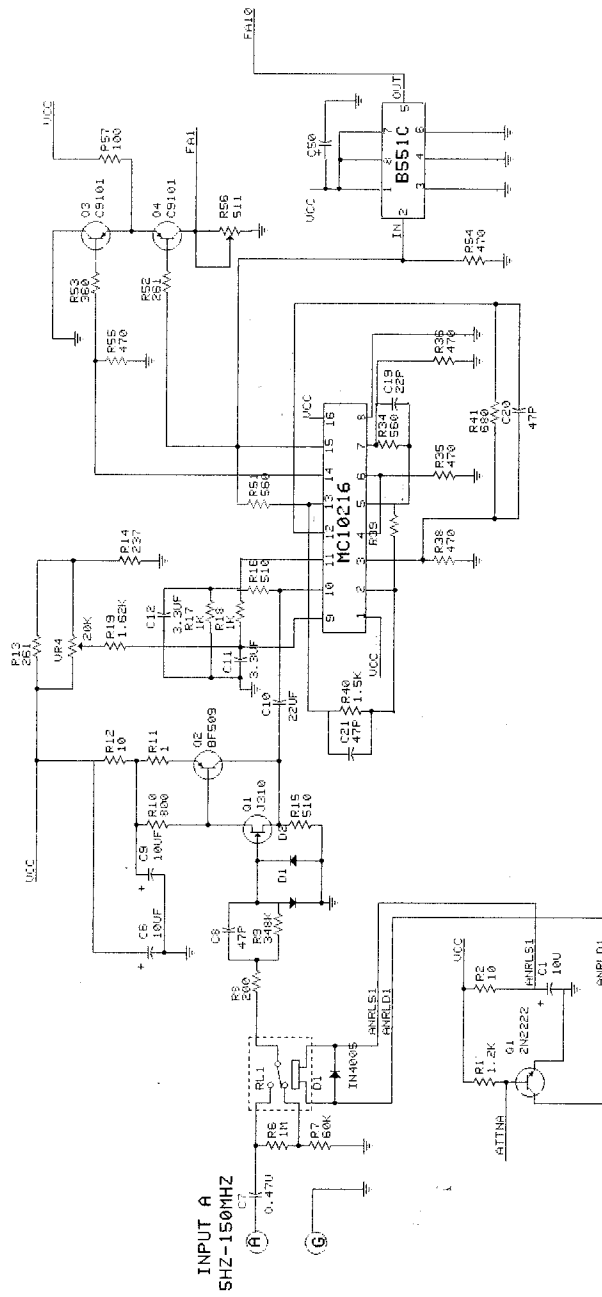


TITLE	7 SEGMENT LED CIRCUIT
MODEL	COMMON
DRAWING NO.	2 OF 6



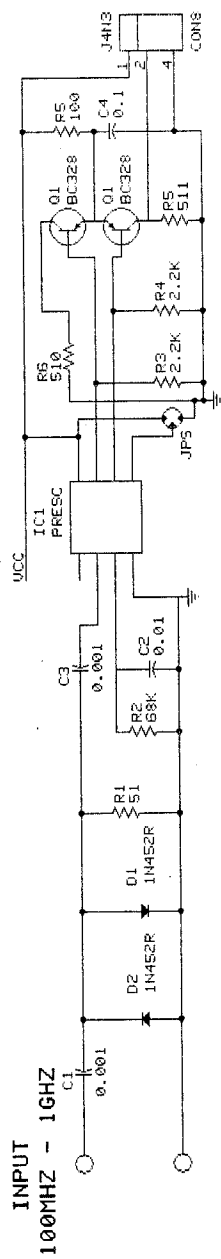
TITLE	SWITCH LED CIRCUIT
MODEL	COMMON
DRAWING NO.	3 OF 6

THIS IS ANALOG INPUT CIRCUIT

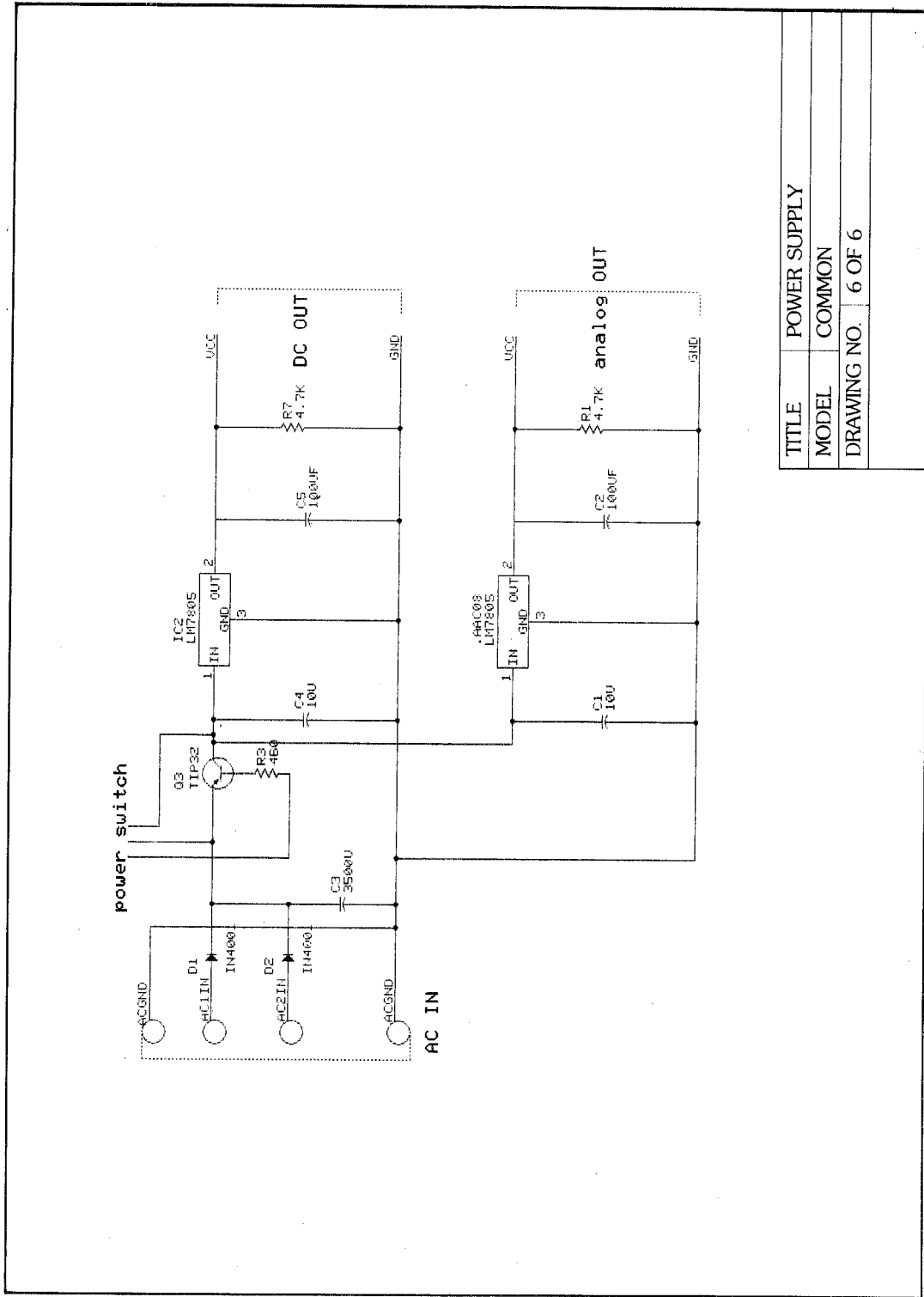


INPUT A
SHZ-150MHZ

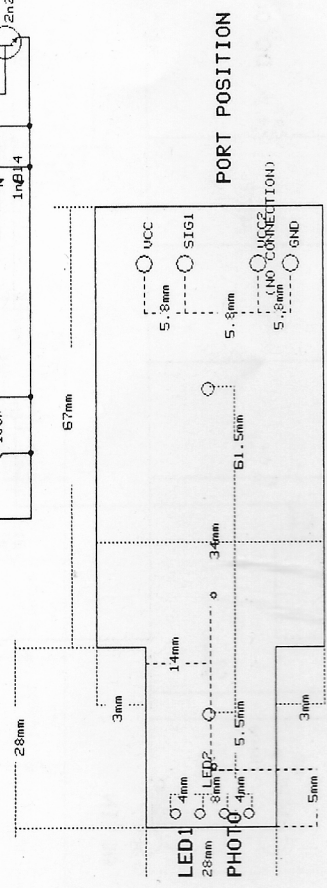
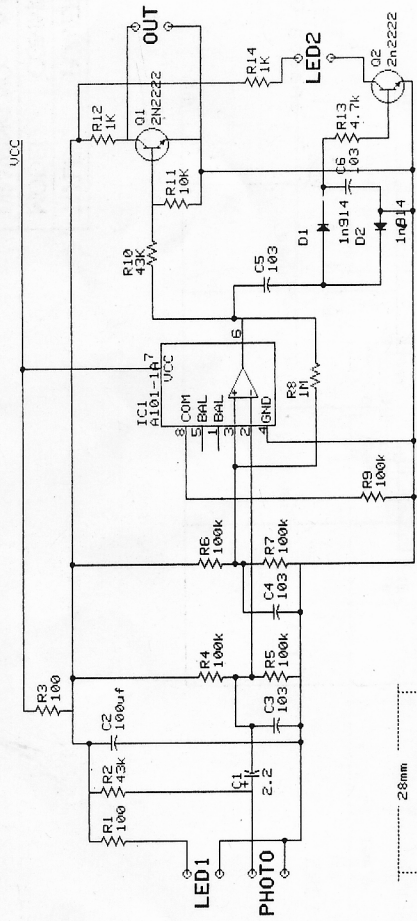
TITLE	ANALOG INPUT CIRCUIT
MODEL	COMMON
DRAWING NO.	4 OF 6



TITLE	PRESCALER CIRCUIT
MODEL	COMMON
DRAWING NO.	5 OF 6



TITLE	POWER SUPPLY
MODEL	COMMON
DRAWING NO.	6 OF 6



TITLE	TACHO PCB
MODEL	RFC-1300T
DRAWING NO.	1 OF 1