OUTLINE OF SYSTEM

The KIC9316F-027 is a digital tuning system optimum for portable sets such as pocket radios, headphone stereo sets, etc.... By combining KIC9316F-027 with KIC7101F or KIC6134AF 4-band of FM/MW/LW (TV)/SW are provided compatibly with worldwide destinations.

RECEIVING BAND

AREA	BAND	CODE		RECEIVING BAND (Hz)	STEP (Hz)	f_{ref} (Hz)	IF (Hz)
		A1/SW1	A0/SW0				
U.S.A.	FM	0	0	(*1) 87.5 ~ 108.0 M	100/200 k	6.25 k	10.7 M
	MW			522 ~ 1620 k	9 k	3 k	450 k
				520 ~ 1710 k	10 k	5 k	
	TV			2 ~ 13 ch	1 ch	6.25/12.5k	10.7 M
World	FM	0	1	76.0 ~ 108.0 M	50/100 k	12.5 k	10.7 M
	MW			522 ~ 1620 k	9 k	3 k	450 k
				520 ~ 1710 k	10 k	5 k	
	LW			144 ~ 281 k	1 k	1 k	
Europe	FM	1	0	(*2) 65.0 ~ 75.0 M	50 k	12.5 k	10.7 M
				87.5 ~ 108.0 M	50 k		
	MW			522 ~ 1620 k	9 k	3 k	450 k
				520 ~ 1620 k	10 k	5 k	
	LW			144 ~ 281 k	1 k	1 k	
Japan	FM	1	1	76.0 ~ 108.0 M	50/100 k	12.5 k	- 10.7 M
	MW			522 ~ 1629 k	9 k	3 k	450 k
				520 ~ 1620 k	10 k	5 k	
	TV			1 ~ 12 ch	1 ch	6.25/12.5 k	- 10.7 M
-	SW	0	1	5.95 ~ 15.6 M	5 k	5 k	450 k
		1	0	3.8 ~ 12.5 M			
		1	1	2.3 ~ 7.3 M			
				9.5 ~ 26.1 M			

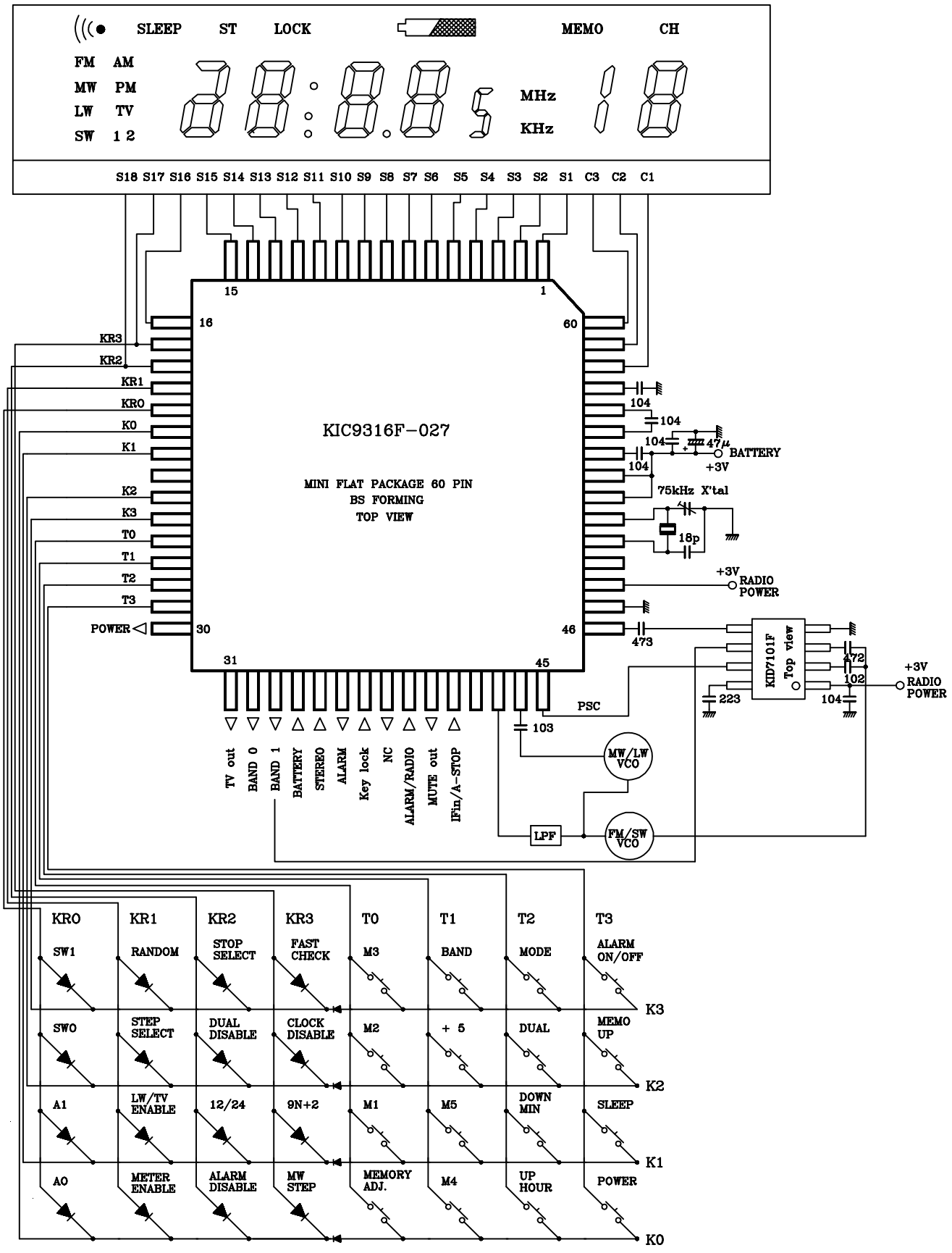
(*1) If step is 200kHz, range is 87.5~108.1MHz
(*2) FM band of Range is deceided by FM STEP jumper.

○ FUNCTIONAL OUTLINE

- Station Selection
  - 1push / 1step
  - Auto tuning
  - SW meter band scan

• Memory Function	fixed	Random	
FM/AM	10/10	15	Station
FM/AM/TV(LW)	10/10/5	15	"
FM/AM/SW-A or -B	10/5/5	15	"
FM/AM/SW1/SW2	5/5/5/5	10	"
FM/AM/LW/SW	5/5/5/5	10	"

KIC9316F-027 Layout



KEY MAP

	K0	K1	K2	K3
T0	MEMORY ADJ.	M1	M2	M3
T1	M4	M5	+5/+10	BAND
T2	UP HOUR	DOWN MIN.	DUAL	MODE
T3	POWER	SLEEP	MEMO UP	ALARM ON/OFF

KR0	* A0	* A1	* SW0	* SW1
KR1	* METER ENABLE	* LW/TV ENABLE	* FM STEP	* RANDOM
KR2	* ALARM DISABLE	* 12/24	* DUAL DISABLE	* STOP SELECT
KR3	* MW STEP	* 9N+2	* CLOCK DISABLE	* FAST CHECK

tact switch	* diode jumper

KEY FUNCTION

SYMBOL	FUNCTIONS
MEMORY ADJ.	The memory mode is set in frequency display. The time adjustment mode is set in time display.
M1 ~ M5 + 5 / +10	Calling and writing preset memory.
BAND	The receiving band is changed.
UP HOUR	The receiving frequency is up. The hour of time is up in clock adjustment mode.
DOWN MIN.	The receiving frequency is down. The minute of time is up in clock adjustment mode.
DUAL	The two clocks is changed cyclically. (clock1, clock2)
MODE	The display is changed as shown below. → frequency → clock → (alarm) power on power off
SLEEP	The sleep function is on/off.
POWER	The power is on/off.
ALARM ON/OFF	The alarm standby is on and release.
MEMO UP	The preset memory is increase every pushing.

DIODE JUMPER FUNCTION

<table>
<tr><td>SYMBOL</td><td>FUNCTIONS</td></tr>
<tr><td>A0
A1</td><td>Setting area
<table>
<tr><td>A 1</td><td>A 0</td><td>AREA</td></tr>
<tr><td>0</td><td>0</td><td>U.S.A</td></tr>
<tr><td>0</td><td>1</td><td>World</td></tr>
<tr><td>1</td><td>0</td><td>Europe/
E-Europe</td></tr>
<tr><td>1</td><td>1</td><td>Japan</td></tr>
</table></td></tr>
<tr><td>SW0
SW1</td><td>Setting of the receiving band of SW
<table>
<tr><td>SW 1</td><td>SW 0</td><td>receiving band [MHz]</td><td>Note.</td></tr>
<tr><td>0</td><td>0</td><td>no SW</td><td></td></tr>
<tr><td>0</td><td>1</td><td>5.95 ~ 15.6</td><td>SW A</td></tr>
<tr><td>1</td><td>0</td><td>3.80 ~ 12.50</td><td>SW B</td></tr>
<tr><td rowspan="2">1</td><td rowspan="2">1</td><td>2.30 ~ 7.30</td><td>SW1</td></tr>
<tr><td>9.50 ~ 26.10</td><td>SW2</td></tr>
</table></td></tr>
<tr><td>METER
ENABLE</td><td>Setting of method the seek tuning.
The diode is set. : meter band tuning
The diode is not set. : normal tuning</td></tr>
<tr><td>LW / TV
ENABLE</td><td>Setting of LW/TV band
The diode is set. : LW or TV enable
The diode is not set. : LW or TV disable</td></tr>
<tr><td>RANDOM</td><td>Setting of preset memory method
The diode is set. : random memory
The diode is not set. : fixed memory</td></tr>
<tr><td>FM STEP</td><td>Setting of step in areas except Europe
<table>
<tr><td>AREA</td><td>The diode is set.</td><td>The diode is no set.</td></tr>
<tr><td>U.S.A</td><td>100 kHz</td><td>200 kHz</td></tr>
<tr><td>World</td><td>50 kHz</td><td>100 kHz</td></tr>
<tr><td>Japan</td><td>50 kHz</td><td>100 kHz</td></tr>
</table>
Setting of receiving band in Europe
<table>
<tr><td>AREA</td><td>The diode is set.</td><td>The diode is no set.</td></tr>
<tr><td>Europe</td><td>87.5 ~ 108.0 M</td><td>65.0 ~ 75.0 M
87.5 ~108.0 M</td></tr>
</table></td></tr>
<tr><td>ALARM
DISABLE</td><td>Setting of alarm function
The diode is set. : alarm function disable
The diode is not set. : alarm function enable</td></tr>
</table>

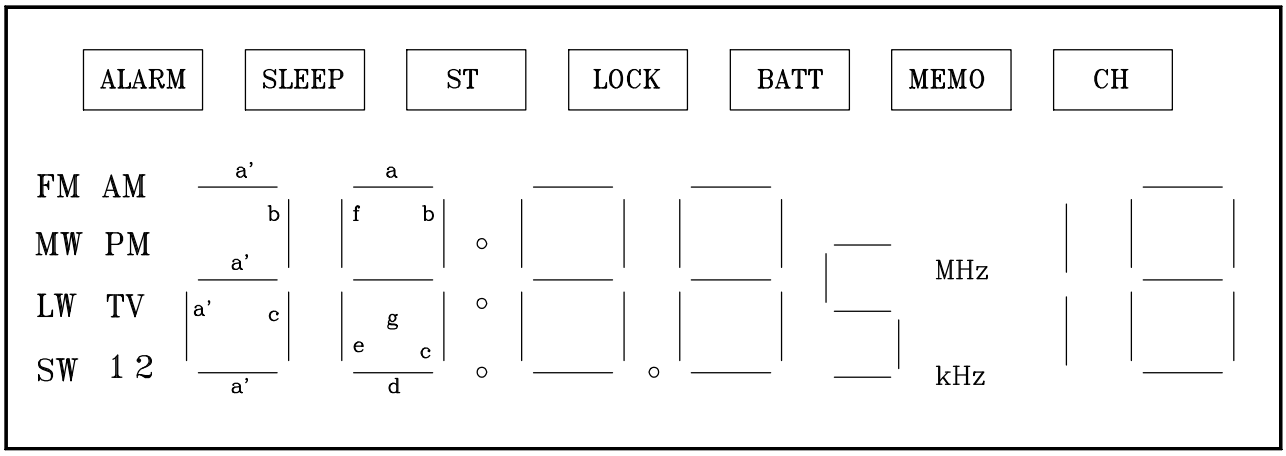
SYMBOL	EXPLANATION OF FUNCTION
12 /24	Setting of clock The diode is set . : 12H clock The diode is not set. : 24H clock
DUAL DISABLE	Setting of dual clock The diode is set. : dual clock disable The diode is not set : dual clock enable
STOP SELECT	Setting of stop check method The diode is set. : IF counting The diode is not set. : A-STOP signal
MW STEP	Setting of MW step. The diode is set. : 10kHz Step The diode is not set. : 9kHz Step U.S.A area is change setting (A0/A1=0/0)
9N + 2	Setting of LW step. The diode is set. : 9N+2 The diode is not set. : 9N
FAST CHECK	Setting of fast counter and LCD segment check. The diode is set. : clock counter minute/second. The diode is not set. : normal counter.
CLOCK DISABLE	Setting of clock. The diode is set. : clock enable The diode is not set. : clock disable

I/O PORTS

<table>
<tr><th>PORT</th><th>NO.</th><th>NAME</th><th>I/O</th><th>FUNCTION</th><th>ACTIVE</th><th>INT.</th></tr>
<tr><td>OT 0</td><td>30</td><td>POWER</td><td>OUT</td><td>power output :
"H" output : power on
"L" output : power off</td><td>H</td><td>H</td></tr>
<tr><td>OT 1</td><td>31</td><td>TV
OUTPUT</td><td>OUT</td><td>TV/EE output :
It outputs "H" level when 7 to 13 ch of TV band in USA and 4 to 12 ch of TV band in JAPAN area.</td><td>-</td><td>L</td></tr>
<tr><td>P 10</td><td>32</td><td>BAND 0</td><td>OUT</td><td rowspan="2">band output :
<table><tr><td></td><td>FM</td><td>MW</td><td>LW,TV,SW1</td><td>SW-A,SWB</td></tr><tr><td>BAND 0</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>BAND 1</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>P 11</td><td>33</td><td>BAND 1</td><td>OUT</td></tr>
<tr><td>P 12</td><td>34</td><td>BATTERY</td><td>IN</td><td>battery input :
"L" input : no battery indicator on and off
"H" input : no battery indicator off</td><td>L</td><td>-</td></tr>
<tr><td>P 13</td><td>35</td><td>STEREO</td><td>IN</td><td>stereo input :
"H" input : ST indicator on
"L" input : ST indicator off</td><td>H</td><td>-</td></tr>
<tr><td>P 20</td><td>36</td><td>ALARM</td><td>OUT</td><td>alarm output :
alarm buzzer sound output at alarm period.</td><td>-</td><td>L</td></tr>
<tr><td>P 21</td><td>37</td><td>KEY LOCK</td><td>IN</td><td>key lock input :
key input is unavailable when this terminal is "H" level.</td><td>H</td><td>-</td></tr>
<tr><td>P 22</td><td>38</td><td>NC</td><td>OUT</td><td>no use</td><td></td><td></td></tr>
<tr><td>P 23</td><td>39</td><td>ALARM
/
RADIO</td><td>IN</td><td>alarm radio select input :
To select alarm buzzer of power output at alarm period.
"H" input : alarm buzzer
"L" input : power output</td><td>-</td><td>-</td></tr>
<tr><td>MUTE</td><td>40</td><td>MUTE</td><td>OUT</td><td>mute output</td><td>H</td><td>H</td></tr>
<tr><td>IF IN
/ IN</td><td>41</td><td>IF-IN
/
A-STOP</td><td>IN</td><td>IF / A-STOP INPUT :
A stop signal is inputted for seek tuning and memory scan.
If STOP SELECT jumper is set, IF (FM 10.7MHz, AM/SW 450 kHz) is inputted.
If it is not set, A-STOP signal is inputted.</td><td>-</td><td>-</td></tr>
</table>

LCD map

SYMBOL	PIN NO.	SEGMENT NAME			FUNCTION
		COM1	COM2	COM3	
S 1	1	FM	MW	ALARM	FM : FM band MW : MW band ALARM : alarm mark
S 2	2	1	SW	LW	1, 2 : SW band / dual clock TV : TV band
S 3	3	2	TV	PM	PM : PM (clock)
S 4	4	1a′	AM	SLEEP	AM : AM (clock) SLEEP : sleep mark 1a′, 1c, 1b : 21.855
S 5	5	1c	1b	colon	colon : (clock)
S 6	6	2e	2f	ST	2a~g : 21.855
S 7	7	2d	2g	2a	ST : stereo mark SWdot : 21.855
S 8	8	SWdot	2c	2b	
S 9	9	3e	3f	LOCK	3a~g : 107.95
S 10	10	3d	3g	3a	LOCK : key lock mark FMdot : 107.95
S 11	11	FM dot	3c	3b	
S 12	12	4e	4f	BATT	4a~g : 107.95
S 13	13	4d	4g	4a	BATT : no battery mark 5 : 107.95
S 14	14	5	4c	4b	
S 15	15	kHz	MHz	MEMO	kHz : kHz mark MHz : MHz mark MEMO : memory mark
S 16	16	7e	7f	6bc	6bc : 107.95 15
S 17	17	7d	7g	7a	CH : CH mark
S 18	18	CH	7c	7b	7a-g : 107.95 15



BAND CHANGE

1. Principal function

The receiving band is changed.

2. Input ports and keys to be used.

BAND 0, BAND 1, TV OUTPUT, [BAND] key

3. Function

a. The receiving band is changed cyclically every pushing [BAND] key.

b. The receiving band is changed as shown below.

2 band selection

→ FM → MW →

3 band selection

→ FM → MW → LW/TV →

→ FM → MW → SW-A/B →

4 band selection

→ FM → MW → LW/TV → SW-A/B →

→ FM → MW → SW1 → SW2 →

c. The "AM" mark is on in MW band of USA area. In other area, "MW" mark is on.

d. The output for receiving band is as shown below.

RECEIVING BAND / OUT PORTS	FM-H	FM-L	MW	SW-1	SW-2	
	FMH	FM-L	MW	LW	SW-A	
	FMH	- I	MW	TV-L	SW-B	TV-H
BAND 0	L	L	H	L	H	L
BAND 1	L	L	L	H	H	H
TV/EE	L	H	L	L	L	H

TV-H : from ch7 to ch13 in USA area.
from ch4 to ch12 in JAPAN area.

FML : 64.0 ~ 75.0 MHz
FMH : 87.5 ~ 108.0 MHz

METER BAND

1. Principal function
   meter band

2. Input ports and keys to be used.
   [METER] key, METER ENABLE jumper

3. Function
   a. It is meter band mode to set METER ENABLE jumper is set in SW band.
   b. The meter band range is as shown below.

BAND	Frequency	STEP
SW1	2.300 ~ 2.495	5kHz
	3.200 ~ 3.400	
	3.900 ~ 4.000	
	4.750 ~ 5.060	
	5.950 ~ 6.200	
	7.100 ~ 7.300	
SW2	9.500 ~ 9.900	5kHz
	11.650 ~ 12.050	
	13.600 ~ 13.800	
	15.100 ~ 15.600	
	17.550 ~ 17.900	
	21.450 ~ 21.850	
	25.600 ~ 26.100	

BAND	Frequency	STEP
SW-A	5.950 ~ 6.200	5kHz
	7.100 ~ 7.300	
	9.500 ~ 9.900	
	11.650 ~ 12.050	
	13.600 ~ 13.800	
	15.100 ~ 15.600	

BAND	Frequency	STEP
SW-B	3.800 ~ 4.000	5kHz
	4.750 ~ 5.060	
	5.950 ~ 6.200	
	7.100 ~ 7.300	
	9.500 ~ 9.900	
	11.650 ~ 12.500	

   c. A receiving frequency reach the upper band edge, it goes to the lower band edge of upper band. In case of the lower band edge, it goes to the upper band edge of lower band.

TUNING

1. Principal function

1 push / 1 step tuning by [UP] / [DOWN] key.

2. Input ports and keys to be used.

[UP] key, [DOWN] key.

3. Function

a. 1 push / 1 step tuning by [UP] / [DOWN] key.

b. When [UP] / [DOWN] key is pushed for more than 500mS, auto tuning is started.

c. The auto tuning is stopped, if the station is detected.

d. But auto tuning is not stopped even when a station was detected in case [UP] / [DOWN] key is pushing continue.

e. The scan time is 100mS / step in FM band. In other bands, it is 200mS / step.

f. The tuning method is the saw tooth wave form method, and when the receiving frequency rearch the band edge, it goes to the opposite side and the continuous tuning is held for 500mS.

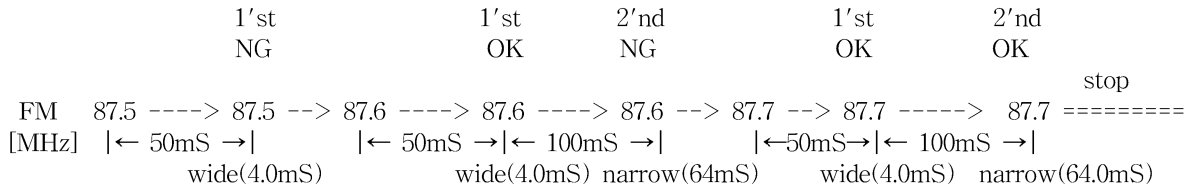
AUTO STOP and IF COUNTER

1. Principal function
   Detecting A-STOP signal or Counting IF

2. Input ports and keys to be used.
   IF-IN/A-STOP INPUT, STOP SELECT jumper

3. Function
   a. The stop signal is checked as condition of stopping for the seek tuning and the memory scan.

   b. In case the STOP SELECT jumper is set.
      b-1. The intermediate frequency (IF) is counted on the IF-IN/A-STOP INPUT.
      b-2. It is judged to be station when the IF-IN/A-STOP INPUT is inputted IF in specified range.
      b-3. If the IF counted is in wide range, after 100mS the IF is counted on same receiving frequency again.
           If the IF counted is in narrow range, it is judged to be the station.



   c. In case the STOP SELECTIF jumper is no set.
      c-1. The SD signal is checked on the IF-IN/A-STOP INPUT.
      c-2. It is judged to be station when the IF-IN/A-STOP INPUT is inputted "H".
      c-3. If the SD signal is "H" after 100mS the SD signal is checked on same receiving frequency again.
           If the SD signal is "H" again, it is judged to be the station.

   d. Setting value of IF check

BAND	REFERENCE FREQUENCY (Hz)	First counting (WIDE)		Second counting (NARROW)	
		DETECTED WIDTH (Hz)	GATE TIME (mS)	DETECTED WIDTH (Hz)	GATE TIME (mS)
MW	5 k	450k ± 12.0k	4.0	450k ± 3.0k	4.0
	3 k				
FM/TV	6.25 k / 3.125 k	10.7M ± 80k	4.0	10.7M ± 15k	64.0
LW	1 k	450k ± 2.4k	4.0	450k ± 0.6k	4.0

PRESET MEMORY

1. Principal function
   Calling and writing in preset memory.

2. Input ports and keys to be used.
   [M1]~[M5], [+5/+10], [MEMO UP], [MEMORY] key, RANDOM jumper, METER ENABLE jumper.

3. Function
   a. In case the RANDOM jumper is set, the preset memory is random memory method.
      In case it is no set, the preset memory is fixed memory method.

   b. Number of preset memory is shown bellow

	FIXED	RANDOM	
FM/AM	10/10	15	Station
FM/AM/TV (LW)	10/10/5	15	"
FM/AM/SW-A or -B	10/5/5	15	"
FM/AM/SW1/SW2	5/5/5/5	10	"
FM/AM/LW/SW	5/5/5/5	10	"

   c. The ch1~ch5 of preset memory is called when [M1]~[M5] was pushed.
      The ch6~ch15 is called when [M1]~[M5] key is pushed after pushing [+5/+10] key.

   d. The "5" of ch number is flashed for 5 seconds when [+5/+10] key is pushed.

   e. The ch6~ch10 can be called by pushing [M1]~[M5] key during "5" is flashed, and the ch11~ch15 can be called by when during "10" of ch number flashed.

   f. The preset memory is called in order every pushing [MEMO UP] key. The preset memory is called in order by 500mS step when [MEMO UP] key is pushing contine.

   g. When [MEMORY] key is pushed, the memory mode is set. The "MEMO" mark is flashed in the memory mode.

   h. The memory mode is released automatically after 5 seconds.

   i. A receiving frequency is written in the preset memory, by pushing [M1]~[M5], [+5/+10] key in the memory mode. A preset memory number is fixed by the way which is same as calling preset memory.

   j. The preset memory number can be selected by pushing [MEMORY] key in memory mode.
      The receiving frequency is written in the preset memory selected by pushing [MEMORY] key in the memory mode.

   k. The tracking data is as shown bellow.

Without METER ENABLE jumper

BAND	DATA1	DATA2	REMARK
F M	78.0	88.0	JPN. world
	70.0	88.0	E-Europe
	90.1	98.1	other
M W	603	999	9k
	600	1000	10k
L W	164	209	
T V	6ch	7ch	USA
	4ch	12ch	JAPAN
S W	6.50	10.00	SW-A
	5.00	7.00	SW-B
	3.00	4.50	SW 1
	10.00	16.00	SW 2

With METER ENABLE jumper

BAND	DATA1	DATA2	REMARK
S W	7.10	11.65	SW-A
	5.00	7.10	SW-B
	3.20	4.75	SW 1
	11.65	17.55	SW 2

The data as shown above is written in the preset memory in the other of changing band.

SLEEP

1. Principal function
   The power is off when sleep time pass.

2. Input ports and keys to be used.
   [SLEEP] key.

3. Function
   a. When [SLEEP] key is pushed, sleep function is on and sleep time is indicated on LCD for 10 seconds.

   b. The power is on, if [SLEEP] key is pushed when power is off.

   c. The power is off when sleep time pass.

   d. The initial sleep time is 60 minutes.

   e. The sleep time is up/down by pushing [UP] / [DOWN] key during sleep time is indicated.

   f. The sleep time can be changed from 10 minutes to 90 minutes.

   g. The power and sleep function is off, if [SLEEP] key is pushed when sleep function is on.

   h. The sleep function is only off, if [POWER] key is pushed when sleep function is on.

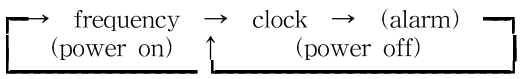
CLOCK

1. Principal function
   The clock is displayed and the clock is adjusted.

2. Input ports and keys to be used.
   [MODE], [MEMORY/ADJ.], [DUAL] key, 12/24, DUAL disable jumper.

3. Function
   a. The clock is 12H-clock in case 12/24 jumper is set. While the jumper is no set, it is 24H-clock.

   b. The display is changed as shown below every pushing [MODE] key.



   c. The clock and alarm display return back to frequency display automatically after 5 seconds, in case power is on.

   d. The alarm display return back to clock display automatically after 5 seconds, in case power is off.

   e. The dual clock is enable in case DUAL disable jumper is no set.

   f. The dual clock is displayed in stead of normal clock by pushing [DUAL] key during normal clock is displayed. The minutes of dual clock and one of clock is same.

   g. The time adjustment mode is set when [MEMORY/ADJ.] key is pushed in the time display.

   h. The time display is flashed in the time adjustment mode.

   i. The time adjustment mode is released automatically after 5 seconds.

   j. The minute can be adjusted by pushing [UP/M-ADJ.] key in the time adjustment mode.
   While the hour can be adjusted by pushing [DOWN/H-ADJ.] key.
   In case of dual clock, only hour can be adjusted.

   k. The hour and minute are adjusted by 1 push / 1 step. If the key is pushing continue for more than 500mS, the minute is adjusted by 1 minute / 150mS, the hour is adjusted by 1 hour / 250mS.

   l. The time adjustment mode is continue when the power is off by sleep function.

   m. The second of clock is reset when [MEMORY/ADJ.] key is pushed in the time adjustmnet mode of clock.

ALARM

1. Principal function
   The power is on or the buzzer is outputted, by alarm timer.

2. Input ports and keys to be used.
   [MODE], [ALARM ON/OFF] key, ALARM disable jumper RADIO/ALARM, ALARM OUTPUT

3. Function
   a. The alarm timer function is enable in case the ALARM disable jumper is no set.

   b. The display is changed to alarm time when [MODE] key is pushed in the clock display.

   c. The "ALARM" mark is flashed at 1 Hz in the alarm time display.

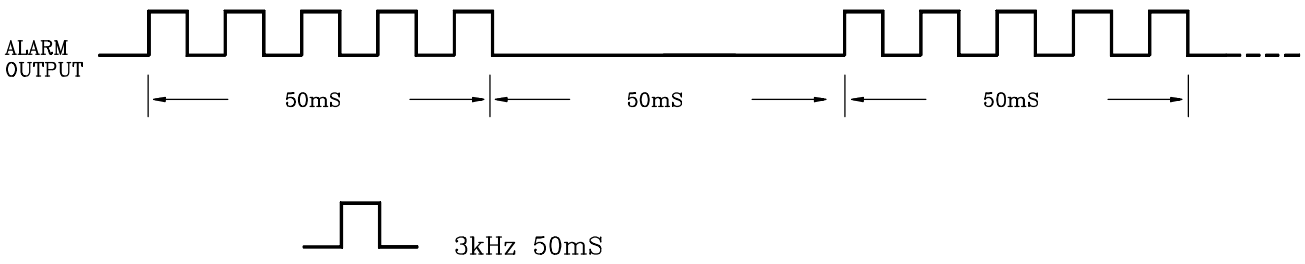
   d. The alarm time can be adjusted by the way of time adjustment.

   e. The on and off of alarm timer is switched by every pushing [ALARM ON/OFF] key.

   f. The "ALARM" mark is on when alarm timer is on.

   g. The action as shown below is executed, when the time rearch on alarm time in case alarm timer is on.

      ① In case the ALARM/RADIO INPUT is "H", the buzzer sound is outputted on ALARM OUTPUT.



      ② In case the ALARM/RADIO INPUT is "L", the power is on. But, if power is already on, the state is kept.

   h. The buzzer sound can be stopped by only pushing [ALARM ON/OFF] key.

   i. The alarm timer is not work during time adjustment mode (ALARM, CLOCK).