## LT 416

## NTSC/PAL/SECAM PATTERN GENERATOR

INSTRUCTION MANUAL

## TABLE OF CONTENTS

GENERAL SAFETY SUMMARY ..... |

1. INTRODUCTION ..... 1-1
1.1 Scope of Warranty ..... -1-2
1.2 Operating Precautions ..... -1-2
1.2.1 Line Voltage and Fuse ..... 1-2
1.2.2 Reverse Voltage ..... 1-2
1.2.3 Installation ..... -1-2
1.2.4 Mechanical Shock ..... -1-3
1.2.5 Calibration ..... 1-3
1.2.6 Routine Maintenance ..... 1-3
2. SPECIFICATIONS ..... 2-1
2.1 GENERAL ..... 2-1
2.2 FEATURES ..... 2-1
2.3 Specifications ..... 2-2
2.3.1 Composite Video Signal Output ..... 2-2
2.3.2 Sync Signal ..... -2-3
2.3.3 Test Patterns. ..... -2-4
2.3.4 Y/ C Separation Output ..... -2-5
2.3.5 Y, B-Y, R-Y Output ..... 2-5
2.3.6 R, G, B Output ..... 2-6
2.3.7 RF Output ..... -2-6
2.3.8 Sound Output ..... -2-7
2.3.9 General Specifications ..... -2-7
3. PANEL DESCRIPTION ..... 3-1
3.1 Front Panel ..... 3-1
3.2 Rear Panel ..... 3-3
4. OPERATING PROCEDURE ..... 4-1
4.1 Turning Power On ..... 4-1
4.1.1 Connecting Power Plug ..... 4-1
4.1.2 Turning Power On ..... 4-1
4.1.3 Warm-Up Time ..... 4-1
4.2 Connection ..... 4-1
4.2.1 Cable ..... 4-1
4.2.2 Termination ..... 4-2
4.3 Color System Selection ..... 4-2
4.4 Composite Video Signal ..... 4-3
4.4.1 Variable VIDEO OUTPUT connector ..... 4-3
4.4.2 Fixed VIDEO OUTPUT Connector ..... 4-3
4.5 Component Video Signal ..... 4-3
4.5.1 Y, B-Y, R-Y Connectors (19) ..... 4-3
4.5.2 R, G, B, C.SYNC Connectors (20) ..... 4-3
4.6 Y/C Separation Signal ..... 4-4
4.6.1 Y/C OUTPUT Connector ..... 4-4
4.7 Audio Signal ..... 4-4
4.7.1 AUDIO OUTPUT Connector ..... 4-4
4.8 RF Signal ..... 4-4
4.8.1 OUTPUT Connector (18) ..... 4-4
4.8.2 Level knob ..... 4-4
4.9 Pattern Settings ..... 4-4
4.10 RF Channel Settings ..... 4-5
4.10.1 Setting Method ..... 4-5
4.10.2 Setting Procedure ..... 4-6
4.10.3 Selecting Channel ..... 4-7
4.10.4 Restriction by 「SYSTEM (9)」 ..... 4-7
4.10.5 RF Modulation ..... 4-7
4.10.6 RF Setting Example ..... 4-8
4.10.7 Sound Subcarrier Level Selection ..... 4-8
4.11 Battery Backup ..... 4-9
4.11.1 Backup Capability ..... 4-9
4.11.2 Battery ..... 4-9
4.11.3 Battery Life ..... 4-9
4.12 Fuse Replacement ..... 4-9
5. RF CHANNEL PLAN ..... 5-1
5.1 Broadcast System ..... 5-1
5.2 Broadcast System/Channel Plan for Country/ Region ..... 5-1
5.3 Channel Plan Table ..... 5-7
5.3.1 How to use Channel Plan Table ..... 5-7
5.3.2 Channel Plan Table ..... 5-8
6. MAINTENANCE ..... 5-20

## GENERAL SAFETY SUMMARY

## - To Avoid Personal Injury

It is recommended that only qualified personnel with technical knowledge use this instrument only after reading and fully understanding all functions of the instrument described this instruction manual.
This instrument is not designed and manufactured for consumers.
If you do not have enough knowledge on electricity, to avoid personal injury and prevent damage to this product, please be sure to use this product only under the supervision of an engineer who has sufficient knowledge about electronics.

- Precautions on Contents

Should you find the contents in this manual and any of its technical terms confusing, please feel free to contact your local LEADER agent.

- Symbols and Terms

Following terms and symbols indicate necessary warnings and cautions used in this manual and on the product are there for safe operation.

| $<$ Symbol $>$ | The sections where this symbol is marked in this manual or <br> instrument, if not correctly performed or practiced, could result in <br> personal injury or cause serious danger to the instrument. Misuse <br> could also produce unintentional movement to create an <br> operational impediment on the instrument or other products that <br> might be connected to it. <br> Be sure to refer to the safety precautions in this manual to safely <br> use the part of the instrument where the symbol is marked. |
| :---: | :--- |
| $<$ Term $>$ | Warning statements identify warning conditions that if disregarded <br> or not correctly performed or adhered to, could result in serious <br> personal injury or even loss of life. |
| $<$ WARNING |  |

## GENERAL SAFETY SUMMARY

Review the following safety precautions to avoid operator's injury and loss of life and prevent damage and deterioration to this instrument. To avoid potential hazards, use this product as specified.

## WARNING

## - Warnings on the Cases and Panels of the Instrument

Operator should not remove any cases or panel for any reasons. If you touch inside the instrument it could result personal shock or fire hazard. Refrain from spilling any liquid on or inserting anything flammables or piece of metal into the ventilation of the instrument. Such actions could cause fire, shock, malfunction and be an accident hazard while the power is on.

## Warnings on Power Line

- Make sure to connect only to the rated power line voltage. Excess voltage may cause fire.
Confirm the voltage of the commercial power line before connecting the AC power cord. The power frequency of the power line should be $50 / 60 \mathrm{~Hz}$.
- Warning on the Power Cord

Use only the optional power cord that is attached to this instrument. The use of the power cord other than that attached could cause fire hazard.
If the attached cord is damaged stop using it and contact your local LEADER agent. Should you use a damaged cord, it could cause a shock or create a fire hazard. When you pull out the cord be sure to hold it by plug and pull from the socket not by holding the cord wire.

## - Warning on Fuse

When the fuse is melted the instrument stops operation. If the fuse melted, turn off the power switch and disconnect the power plug from the socket. If you change the fuse while the cord is connected to the socket, it could cause a shock hazard. Only use the specified type and rated current and voltage fuses.
If the cause for melting fuse is unclear or if you suspect there is damage to the instrument or if you have no proper fuse at hand please contact your local LEADER agent.

## GENERAL SAFETY SUMMARY

WARNING

## Warning on Installation Environments

## - About the Operating Temperature Range

Operate the instrument between the temperature range of 0 to $40^{\circ} \mathrm{C}$. Operating the instrument at higher temperatures could cause a fire hazard.
Rapid changes of temperatures from cold to warm can create internal moisture or condensation and could damage the instrument. If there is a possibility of moisture condensation allow the instrument to sit for 30 minutes without the power on.

- About the Operating Humidity Range Operating humidity range is $\leq 90 \% \mathrm{RH}$.
Do not operate the instrument with wet hands. This could cause a shock and fire hazard.
- About the Operation in the Presence of Gasses

Operating the instrument in and near the presence or storage locations of flammable, explosive gasses or fumes could create an explosion and fire hazard. Do not operate the instrument anywhere near such environments.

## - Avoid Insertions

Do not insert metals or flammable objects or drop liquid on or into the instrument. To do so could cause fire, shock, malfunction and create a dangerous accident hazard.

## - Warning while Operating

While operating the instrument if smoke, fire, or a bad smell occurs, turn off the instrument at once for it could cause a fire hazard. When such a case occurs, turn off the power switch and pull the plug of the cord from the plug socket. Contact your local LEADER agent after confirming there is no fire.

## - Warning about Ground

The instrument has a ground terminal to avoid electric shock hazard and to protect the instrument from damage. Ensure that the product is properly grounded for safe operation.

## GENERAL SAFETY SUMMARY

## CAUTION

## Caution on Input/Output Terminals

Input Terminals are rated with a maximum input. Do not supply an input over the specified rating in the standard section of the instruction manual. Also, do not supply external power to Output terminal, this could cause the instrument to malfunction.

Please conform to the above warnings and cautions for safe operation. There are cautions in each area of this instruction manual, so please conform to each caution. If you have any questions about this manual, please feel free to contact your local LEADER agent.

- Caution when Not to Use the Instrument for a Long Time

Make sure to disconnect the power cord from the socket when you do not use the instrument for a long time.

## 1. INTRODUCTION

Thank you for purchasing Leader's measuring instruments.
Please read this instruction manual carefully to ensure correct and safe operation.
If you have any difficulties or questions on how to use the instrument after you have read this manual, please feel free to contact your local LEADER agent.

### 1.1 Scope of Warranty

This LEADER instrument has been manufactured under the strictest quality control guidelines.
LEADER shall not be obligated to furnish free service during the warranty period under the following conditions.

1. Repair of malfunction or damages resulting from fire, natural calamity, or improper voltage applied by the user.
2. Repair of an instrument that has been improperly repaired, adjusted, or modified by personnel other than a factory-trained LEADER representative.
3. Repair of malfunctions or damages resulting from improper use.
4. Repair of malfunctions caused by devices other than this instrument.
5. Repair of malfunctions or damages without the presentation of a proof of purchase or receipt bill for the instrument.

### 1.2 Operating Precautions

WARNING

### 1.2.1 Line Voltage and Fuse

Confirm that the power line voltage is correct before connecting the power cord.
The voltage range and fuse rating are indicated on the rear panel.
When replacing the fuse, turn the power switch off and disconnect the power cord from the mains.

| Voltage Range | Fuse |  |
| :---: | :---: | :---: |
|  | Rating | LEADER Parts Number |
| 90 to 250 V | T0.63AL, time-lag | 4363555005 |

### 1.2.2 Reverse Voltage

- Shorting the output connectors

Do not short any output connectors to prevent damage to the instrument.

- Do not apply external voltage to the output connectors. It can cause trouble.


### 1.2.3 Installation

Do not use the instrument in the following environments.

- High temperature environments

Do not place the instrument under direct sunlight or near a heater (e.g., stove).
Do not move the instrument from cold to warm environment abruptly, it may cause condensation.

Operating temperature range: 0 to $40^{\circ} \mathrm{C}$

- High humidity environments

Do not place the instrument in the high humidity environment (e.g., bathroom, near a humidor).
Operating humidity range: $\leq 90 \% \mathrm{RH}$

- Dusty environments


### 1.2.4 Mechanical Shock

Please be careful not to expose the instrument to other forms of severe mechanical shock as this product contains shock sensitive precise parts.

### 1.2.5 Calibration

When calibration or service is required, contact your local LEADER agent.

### 1.2.6 Routine Maintenance

When cleaning the instrument, do not use such solvents as thinner or benzol which will remove paint or damage the plastic surface. Use a soft cloth dampened with neutral detergent.
Do not drop water or detergent, or insert metal object into the instrument while cleaning. Otherwise, you run the risk of electrical shock or fire.

## 2. SPECIFICATIONS

### 2.1 GENERAL

Model LT 416 is a precision test-signal source which provides four color systems of NTSC, PAL, SECAM, and NTSC-4.43 for testing and adjusting all kind of video products such as TV, VTR etc.

In addition of a composite signal output, the generator provides a Y/C output and a component signal outputs (except SECAM) of Y/B-Y/R-Y and GBR so that it is suitable to a production line for video products of component system.
RF output is easily selected by setting channel number while the channels are preprogrammed by each countries.
15 test patterns including color bars, raster, convergence and circle satisfy the most desired applications.

### 2.2 FEATURES

- Conforms to four standards (i.e., NTSC, PAL, SACAM, NTSC-4.43)

This generator is ideal for adjusting and testing TVs, VTRs, and AV equipments.

## - S connector

An $S$ connector is provided to output $Y$ and $C$ signals for adjusting AV equipments with $S$ connector.

## - Component video signal output

This generator outputs the composite video signal and component video signal.
Since Y/B-Y/ R-Y or G/B/R is output, the generator allows test signals for component AV system adjustment and testing. (The SECAM color signals (B-Y, R-Y) are not output.)

## - RF setting

The channel plan based on the country system is provided for easier RF frequency setting.

## - Various test patterns

The 15 patterns including color bar and circle are provided for various adjustment and test processes.

### 2.3 Specifications

### 2.3.1 Composite Video Signal Output

(1) Color System:

NTSC, PAL, SECAM, NTSC-4.43
(2) Scanning Method

NTSC/ NTSC-4.43: 525-line interlace scanning
PAL/ SECAM: 625-line interlace scanning
(Progressive scanning can be performed for all color systems when the CIRCLE or CONVERGENCE pattern is selected.)
(3) Field frequency

NTSC:

PAL/ SECAM:

NTSC-4.43:
(4) Line frequency

NTSC:
PAL/ SECAM:
NTSC-4.43:
(5) Subcarrier Frequency

NTSC:
PAL:
NTSC-4.43:
(6) Video Generating System:
(7) Number of Quantitative Bits:
(8) Output Impedance:
(9) Output Level:
$59.94 \mathrm{~Hz} \pm 30 \mathrm{ppm}$
( $60.06 \mathrm{~Hz} \pm 30 \mathrm{ppm}$ for progressive scanning)
$50 \mathrm{~Hz} \pm 30 \mathrm{ppm}$
( $50.08 \mathrm{~Hz} \pm 30 \mathrm{ppm}$ for progressive scanning)
$59.94 \mathrm{~Hz} \pm 150 \mathrm{ppm}$
( $60.06 \mathrm{~Hz} \pm 150 \mathrm{ppm}$ for progressive scanning)
$15.734 \mathrm{kHz} \pm 30 \mathrm{ppm}$
$15.625 \mathrm{kHz} \pm 30 \mathrm{ppm}$
$15.734 \mathrm{kHz} \pm 150 \mathrm{ppm}$
$3.579545 \mathrm{MHz} \pm 30 \mathrm{ppm}$
$4.43361875 \mathrm{MHz} \pm 30 \mathrm{ppm}$
$4.43361875 \mathrm{MHz} \pm 50 \mathrm{ppm}$
(Progressive scanning can be selected when CIRCLE or CONVERGENCE patterns is selected.)
Digital system using 4 fsc sampling (without SECAM)

8 bits
$75 \Omega$
$1 \mathrm{Vp}-\mathrm{p} \pm 50 \mathrm{mVp}-\mathrm{p}$ (Between sync tip and 100 \% white)

0 to 1 Vp -p, continuous variable
(10) Setup Level:
(11) Output connector

> Variable output:

Fixed output:
(12) Number of Outputs:

NTSC: 0 \% ("7.5 \%" model optionally available)
PAL/SECAM/NTSC 4.43 : 0 \%

BNC
RCA jack ............. 1
1 each ................. 1

### 2.3.2 Sync Signal

(1) Sync Signal

Amplitude
NTSC/ NTSC-4.43: $\quad 286 \mathrm{mVp}-\mathrm{p} \pm 14 \mathrm{mVp}-\mathrm{p}$
PAL/ SECAM: $\quad 300 \mathrm{mVp}-\mathrm{p} \pm 15 \mathrm{mVp}-\mathrm{p}$
Horizontal Sync Width: $\quad 4.7 \mu \mathrm{~s} \pm 200 \mathrm{~ns}$ (same spec.)
Vertical Sync Width NTSC/ NTSC-4.43: 3H
PAL/ SECAM: 2.5 H
Vertical Blanking Period NTSC/ NTSC-4.43: 20H
PAL/ SECAM: 25 H
(2) Color Burst

Amplitude

| NTSC/ NTSC-4.43: | $286 \mathrm{mVp}-\mathrm{p} \pm 23 \mathrm{mVp}-\mathrm{p}$ |
| :--- | :--- |
| PAL: | $300 \mathrm{mVp}-\mathrm{p} \pm 24 \mathrm{mVp}-\mathrm{p}$ |

Number of Cycles

| NTSC: | 9 cycles |
| :--- | :--- |
| PAL: | 10 cycles |
| NTSC-4.43: | 11 cycles |

(3) SECAM Color Identification Signal

Amplitude
D'R Line:
$540 \mathrm{mVp}-\mathrm{p}+40 \mathrm{mVp}-\mathrm{p},-50 \mathrm{mVp}-\mathrm{p}$
D'B Line:
$500 \mathrm{mVp}-\mathrm{p} \pm 50 \mathrm{mVp}-\mathrm{p}$
(4) SECAM Color (Back porch on the horizontal blanking period)

Amplitude
D'R Line:
$215 \mathrm{mVp}-\mathrm{p} \pm 25 \mathrm{mVp}-\mathrm{p}$
D'B Line:
$167 \mathrm{mVp}-\mathrm{p} \pm 20 \mathrm{mVp}-\mathrm{p}$

### 2.3.3 Test Patterns

(1) Color Bar: 100/ 0/ 75/ 0 Full-field Color Bar
(2) Demodulator Pattern (Not output when the SECAM is selected)

PAL:

NTSC:
line $n: \quad R-Y,-(R-Y), B-Y,-(B-Y), R-Y,-(R-Y), B-Y$,
line $n+1: \quad-(R-Y), R-Y, B-Y,-(B-Y), R-Y,-(R-Y),-(B-Y)$,
line n :
line $\mathrm{n}+1$ :
-(B-Y)
$B-Y$
$I,-I, Q,-Q, I,-I, Q,-Q$
$-I, I, Q,-Q, I,-I,-Q, Q$
Combination of normal and reversed $B-Y$ and $R-Y$ for each line
Combination of normal and reversed $B-Y$, $R-Y, I$, and $Q$ for each line
R-Y, -(R-Y), B-Y, -(B-Y), R-Y, -(R-Y), B-Y,
(3) Multiburst

Frequency

NTSC/ NTSC-4.43:
PAL/ SECAM:
Amplitude:

| Frequency |  |
| :--- | :--- |
| NTSC/ NTSC-4.43: | $0.5,1.0,2.0,3.0,3.58,4.2 \mathrm{MHz}$ |
| PAL/ SECAM: | $0.5,1.0,2.0,4.0,4.8,5.5 \mathrm{MHz}$ |
| Amplitude: | $100 \%\left(^{*}\right)$ |

(4) Raster

Output eight colors in combination with red, green and, blue
Color: 100 \% white, yellow, cyan, green, magenta, red, blue, black
Amplitude:
Same as color bars
(5) Window

Window Amplitude:
100 \%(*)
(6) Step

10 equal steps from 0 mV to 700 mV white
(7) Circle Pattern: White circle pattern (with black fringe) on the convergence pattern
Color Burst: on/off selectable
Interlace/ Progressive: Selectable
(Flicker may occur on the border of convergence and circle patterns.)
(8) Convergence

Luminance Amplitude: 75 \%(*)
Number of Vertical Lines
NTSC/ NTSC-4.43: 17
PAL/ SECAM: 19

| Number of Horizontal Lines |  |
| :--- | :--- |
| NTSC/ NTSC-4.43: |  |
| PAL/ SECAM: | 14 |
| Horizontal Line Width: | 2 lines |
| Number of Dots |  |
| NTSC/ NTSC-4.43: | $16 \times 13$ |
| PAL/ SECAM: | $18 \times 14$ |
| Dot Pulse Vertical Width: | 2 lines |
| Color Burst: | On/ off selectable |
| Interlace/ Progressive: | Selectable |
| Notes on pattern specifications |  |
| Signal amplitude (100 \%) is as follows. |  |
| PAL/ SECAM: | $700 \mathrm{mVp-p}$ |
| NTSC/ NTSC-4.43: | $714 \mathrm{mVp}-\mathrm{p}$ |
| Accuracy: | Same as the composite signal |

### 2.3.4 Y/ C Separation Output

| Specifications: | Same as the composite signal |
| :--- | :--- |
| Output Impedance: | $75 \Omega$ |
| Connector: | S type |
| Number of Outputs: | 1 |

### 2.3.5 Y, B-Y, R-Y Output

Output Signal (*2): Y, B-Y, R-Y
Y Output Amplitude

| NTSC/ NTSC-4.43: | $714 \mathrm{mVp}-\mathrm{p} \pm 36 \mathrm{mV}$ |
| :--- | :--- |
| PAL: | $700 \mathrm{mVp}-\mathrm{p} \pm 35 \mathrm{mV}$ |

Sync Signal Amplitude

| NTSC/ NTSC-4.43: | $286 \mathrm{mVp}-\mathrm{p} \pm 14 \mathrm{mV}$ |
| :--- | :--- |
| PAL: | $300 \mathrm{mVp}-\mathrm{p}+15 \mathrm{mV}$ |

B-Y, R-Y Output Amplitude: $\quad 525 \mathrm{mVp}-\mathrm{p} \pm 26 \mathrm{mV}$
Output Impedance: $\quad 75 \Omega$
Connector: BNC
Number of Outputs: 1 each
(*2) B-Y and R-Y are output when the SECAM is selected;
Y is only output.

### 2.3.6 R, G, B Output

| Output Signal (*3): | R, G, B, C.SYNC |
| :--- | :--- |
| R, G, B Output Amplitude: | $700 \mathrm{mVp}-\mathrm{p} \pm 35 \mathrm{mV}$ (NTSC, PAL, |
|  | NTSC-4.43) |
| C.SYNC Output Amplitude: | C-MOS Level (NTSC, PAL, SECAM, |
|  | NTSC-4.43) |
| Output Impedance: | $75 \Omega$ |
| Connector: | BNC |
| Number of Outputs: | 1 each |

(Pulse noise may be superimposed $n$ the leading and trailing edges of the R, G and $B$ Sync signals.)
(*3) R, G, B are output when the SECAM is selected;
C.SYNC is only output.

### 2.3.7 RF Output

## System

NTSC: M
PAL:
B, D, G, H, I, K

SECAM:
B, D, G, H, K, L
(The RF is disabled when the NTSC-4.43 is selected)

Carrier Frequency Range:
Carrier Frequency Setting Method:
VHF and UHF
Direct setting using programmed country channel plan (Arbitrary frequency cannot be set)
Modulation Polarity:
Negative or Positive
Modulation System:
Double sideband
Sound Signal
Intercarrier Frequency:
$4.5,5.5,6.0,6.5 \mathrm{MHz}$
Modulation Signal:
$1 \mathrm{kHz} \pm 200 \mathrm{~Hz}$
Modulation System:
FM or AM
Output Voltage
VHF: At least 1 mVrms (into $75 \Omega$ )
UHF:
Number of Output:

At least 0.5 mVrms (into $75 \Omega$ )
1 ( $75 \Omega$, BNC)

Since a double sideband modulation system is used for the RF signal of the LT 416. such parameters as P/S ratio do not conform to the official standards.

Therefore, video noise or audio noise may appear on a TV monitor, etc. when the RF signal of the LT 416 is applied.

### 2.3.8 Sound Output

| Output Signal: | $1 \mathrm{kHz} \pm 100 \mathrm{~Hz}$, sine wave |
| :--- | :--- |
| Amplitude: | $1.2 \mathrm{Vp}-\mathrm{p}$ (into $600 \Omega$ ) |
| Output Impedance: | $600 \Omega$ |
| Number of Output: | 1 (RCA jack) |

### 2.3.9 General Specifications

Environmental Conditions
Operating Temperature:
0 to $40^{\circ} \mathrm{C}$
Operating Humidity:
Spec-Guaranteed Temperature:
Spec-Guaranteed Humidity:
Operating Environment:
Operating Altitude:
Overvoltage Category:
Pollution Degree:
Power Requirements:
Dimensions:
Weight:
Accessories:
$\leq 90 \% \mathrm{RH}$ (without condensation)
10 to $30^{\circ} \mathrm{C}$
$\leq 85 \%$ RH (without condensation)
Indoor use
Up to 2000 m
II
2
90 to 250 VAC, $50 / 60$ Hz Max. 15 W
426 (W) x 88 (H) $\times 300$ (D) mm (excluding projections)
4.6 kg

Power cord 1
Instruction manual 1

## 3. PANEL DESCRIPTION

Please refer to each item number described on Figure 3-1 and 3-2 for the described instruction after 4.OPERATING PROCEDURE.

### 3.1 Front Panel



Figure 3-1 Front Panel
(1) POWER switch

Push this switch in to apply power. Release this switch for turning power off.
(2) Pattern keys

Select the pattern.
(3) R, G, B keys

Set raster color when the raster pattern is selected. Eight colors can be set in combination with the keys pressed.
(4) PROGRESSIVE/ INTERLACE key

Select the scanning system when "CIRCLE" or "CONVERGENCE" is selected by using the "Pattern Keys (2)."
When the PROGRESSIVE is selected, the key LED light. When the INTERLACE is selected, the key LED goes off.
(5) BURST key

Selects the color burst on or off when "CIRCLE" or "CONVERGENCE" is selected by using the "Pattern Keys (2)." When the signal with color burst is output, the key LED lights; when the signal without color burst is output, the key

LED goes off.
In the SECAM system, this key is used to turn on or off the reference burst.
(6) COUNTRY/ CHANNEL (7) CHANNEL/ COUNTRY display (8) SELECT keys This block is used to control the RF frequency.
Press the COUNTRY/ CHANNEL (6) when selecting the TV channel number and country number.

When the COUNTRY LED light, the country number being selected is displayed on the CANNEL/ COUNTRY display (7).

When the CHANNEL LED light, the TV channel being selected is displayed on the CHANNEL/ COUNTRY display (7).

Use the SELECT (8) to select the country number and channel number.
The COUNTRY/ CHANNEL (6) is also used to turn on or off the sound subcarrier on the RF output.
(9) SYSTEM

Selects the color system.
(10) AUDIO OUTPUT connector

Outputs 1 kHz sine wave in fixed level.
RCA jack is used. Output impedance is $600 \Omega$.
(11) VIDEO OUTPUT connector

Outputs composite video signal in fixed level.
RCA jack is used. Output impedance is $75 \Omega$.
(12) Y/C OUTPUT connector

Outputs Y and C video signals in fixed level.
S connector is used. Output impedance for both Y and C is $75 \Omega$.
(13) VIDEO OUTPUT (14) LEVEL (15) OUTPUT

This group is used to control the composite video signal output level.
OUTPUT connector is BNC, and output impedance is $75 \Omega$.
The level is calibrated at the PRESET (detent) position.
The output level can be set from 0 V (MIN, immediately before the detent position) to the preset level (MAX) by rotating the OUTPUT LEVEL control.
(16) RF OUTPUT (17) LEVEL (18) OUTPUT

This group is used to control the RF output level.
OUTPUT connector is BNC, and output impedance is $75 \Omega$.
OUTPUT LEVEL control sets the output level. Clockwise rotation increases output level.

## 3.2

## Rear Panel

This section describes the rear panel according to Figure 3-2.


Figure 3-2 Rear Panel
(19) Y, B-Y, R-Y connectors

Output component video signal with fixed level. Luminance signal $(\mathrm{Y})$ and color difference signal (B-Y, R-Y) are output.
Output impedance of each connector is $75 \Omega$.
(20) R, G, B, C.SYNC connectors

Output RGB video signal and composite sync signal with fixed level. Output
impedance of R, G, and B connectors are $75 \Omega$. The C.SYNC is output in C-MOS level.
(21) Inlet

Connect the accessory power cord.
Usable AC voltage range is 90 to 250 V , universal.
(22) Fuse holder

The fuse rating is indicated on the rear panel. When replacing the fuse, rotate the fuse holder cap counterclockwise using a Phillips screwdriver to remove the cap.
(23) Ground terminal

This terminal is connected to the chassis, and is used for grounding.
(24) Serial number plate

Instrument serial number. Provide this number when contacting us.

## 4. OPERATING PROCEDURE

### 4.1 Turning Power On

### 4.1.1 Connecting Power Plug

Check the mains voltage and current capacity for correct before connecting the instrument.

### 4.1.2 Turning Power On

Always confirm that the instrument is not in a volatile or flammable environment before turning the power on.

### 4.1.3 Warm-Up Time

You should allow the instrument to warm up for at least 30 minutes.

### 4.2 Connection

### 4.2.1 Cable

Table 4-1 lists a cable to be used.

Table 4-1

| Output Connector | Signal | Connector | cable |
| :--- | :--- | :--- | :--- |
| (10) AUDIO OUTPUT | Sound | RCA | Shield wire |
| (11) VIDEO OUTPUT | Composite video | RCA | $75 \Omega$ coaxial cable |
| (12) Y/C OUTPUT | Y/C difference signal | S connector | S cable |
| (15) OUTPUT | Composite video | BNC | $75 \Omega$ coaxial cable |
| (18) OUTPUT | RF | BNC | $75 \Omega$ coaxial cable |
| (19) Y, B-Y, R-Y | Y | BNC | $75 \Omega$ coaxial cable |
|  | B-Y | BNC | $75 \Omega$ coaxial cable |
|  | R-Y | BNC | $75 \Omega$ coaxial cable |
| (20) R, G, B, C.SYNC | R | BNC | $75 \Omega$ coaxial cable |
|  | G | BNC | $75 \Omega$ coaxial cable |
|  | B | BNC | $75 \Omega$ coaxial cable |
|  | C.SYNC | BNC | Shield wire |

[^0]
### 4.2.2 Termination

When the equipment under test is connected, the cable end should be terminated with appropriate impedance for correct output level. Table 4-2 shows the output impedance and termination impedance for each connector.

Table 4-2

| Output Connector | Signal | Ternination |
| :--- | :--- | :--- |
| (10) AUDIO OUTPUT | Sound | $600 \Omega$ |
| (11) VIDEO OUTPUT | Composite video | $75 \Omega$ |
| (12) Y/C OUTPUT | Y/C difference signal | $75 \Omega$ |
| (15) OUTPUT | Composite video | $75 \Omega$ |
| (18) OUTPUT | RF | $75 \Omega$ |
| (19) Y, B-Y, R-Y OUTPUT | Y | $75 \Omega$ |
|  | B-Y | $75 \Omega$ |
|  | R-Y | $75 \Omega$ |
| (20) R, G, B, | R | $75 \Omega$ |
| C.SYNC OUTPUT | G | $75 \Omega$ |
|  | B | $75 \Omega$ |
|  | C.SYNC | C-MOS output |

### 4.3 Color System Selection

Pressing the SYSTEM key (9) selects the color system
(i.e., NTSC $\rightarrow$ PAL $\rightarrow$ SECAM $\rightarrow$ NTSC-4.43) sequentially. Lit LED indicates the selected system.
Pressing this key obtains the latest settings (e.g., pattern, RF frequency) related to each system.

### 4.4 Composite Video Signal

### 4.4.1 VIDEO OUTPUT connector

(1) Preset Output Level

When the OUTPUT LEVEL control (14) is set to PRESET position, the output level between sync tip and $100 \%$ white is 1 Vp -p (into $75 \Omega$ ).


Figure 4-1 Preset position
(2) Variable Output Level

The output level can be set from 0 V (MIN, immediately before the detent position) to the preset level (MAX) by rotating the OUTPUT LEVEL control (14). Clockwise rotation increases output level.

### 4.4.2 Fixed VIDEO OUTPUT Connector (11)

The output level between sync tip and $100 \%$ white is $1 \mathrm{Vp}-\mathrm{p}$ (into $75 \Omega$ ) regardless of the OUTPUT LEVEL control (14) setting.

### 4.5 Component Video Signal

### 4.5.1 $\quad$ Y, B-Y, R-Y Connectors (19)

Use the $\mathrm{Y}, \mathrm{B}-\mathrm{Y}, \mathrm{R}-\mathrm{Y}$ connectors (19) to output Luminance and color difference signals. Output levels are fixed regardless of the LEVEL control (14).
The SECAM color signals (B-Y, R-Y) are not output.

### 4.5.2 R, G, B, C.SYNC Connectors (20)

Use the R, G, B, C.SYNC connectors (20) to output R, $G$, and $B$ signals. The C.SYNC is used to synchronize the $R, G$, and $B$ signals. Output levels are fixed regardless of the LEVEL control (14).
The SECAM only outputs C.SYNC.

### 4.6 Y/C Separation Signal

### 4.6.1 Y/C OUTPUT Connector (12)

The Y/C OUTPUT connector (12) is used to connect an unit equipped with $S$ connector. Output level is fixed; same as the composite signal.

### 4.7 Audio Signal

### 4.7.1 AUDIO OUTPUT Connector (10)

The AUDIO OUTPUT connector (10) outputs audio signal.
The signal is $1 \mathrm{kHz}, 1.2 \mathrm{Vp}-\mathrm{p}$ (into $600 \Omega$ ) fixed. Pin jack is used.

### 4.8 RF Signal

### 4.8.1 OUTPUT Connector ${ }^{18}$

Use the OUTPUT connector (18) to output RF signal. This connector cannot be used when the NTSC 4.43 is selected.

### 4.8.2 Level Control (17)

Use the RF OUTPUT LEVEL control (17). to set output level.
Rotating the control clockwise increases RF output level; fully clockwise for maximum output level, and vise versa.


Figure 4-2 RF OUTPUT group

### 4.9 Pattern Settings

(1) Using Pattern Key (2)

Use the Pattern key (2) to select the pattern. Selected pattern key LED lights.
The DEM key is disable when the SECAM is selected.
(2) Raster Color Settings

The raster color can be selected in combination with the R, G, and B keys (3) when the RASTER pattern is selected by using the pattern key (2).
(Figure 4-3 shows the key combinations to select a green raster.)
Table 4-3 shows color and key combinations.
Table 4-3 Raster color and key combinations

|  | White | Black | Red | Green | Blue | Yellow | Cyan | Magenta |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| R Key | ON | OFF | ON | OFF | OFF | ON | OFF | ON |
| G Key | ON | OFF | OFF | ON | OFF | ON | ON | OFF |
| B Key | ON | OFF | OFF | OFF | ON | OFF | ON | ON |

[^1]

Figure 4-3 Key combinations to select green
(3) Interlace/Progressive Scanning Selection

The SCAN key (4) is used to select the scanning system when the CIRCLE or CONVERGENCE pattern is selected by using the Pattern key (2).

The key operation is toggled.
When the PROGRESSIVE is selected, the indicator lights. When the INTERLACE is selected, the indicator goes off.

If the TV screen becomes difficult to watch due to flickering, select PROGRESSIVE to reduce the amount of flicker.
(4) Color Burst, Reference Burst On/Off

The BURST key (5) is used to set the color burst or reference burst on or off when the CIRCLE or CONVERGENCE pattern is selected by using the Pattern key (2). The key operation is toggled.
The indicator lights when the burst is set on, and vise versa.
If the TV screen becomes difficult to watch due to the coloring of the vertical line edge, set the burst off to reduce this effect.
The BURST(5) key is used to set the color burst on or off when the NTSC, PAL, or NTSC 4.43 is selected by using SYSTEM key (9). The BURST (5) key is also used to set the reference burst on or off when the SECAM is selected by using SYSTEM key 9 .

### 4.10 RF Channel Settings

### 4.10.1 Setting Method

(1) About RF Output Settings

The combination of country number (COUNTRY) and channel (CHANNEL) is used for setting the RF output frequency and RF system (i.e., modulation system, sound subcarrier).

See 5.3 "Channel Plan Table" to select the desired RF frequency and RF system.

Note that arbitrary RF frequency and RF system cannot be set.
(2) Setting Procedure
$\bullet$ Use the COUNTRY/CHANNEL key (6), COUNTRY/CHANNEL display (7), and SELECT key (8) for setting RF system.

- The COUNTRY/CHANNEL key (6) operation is toggled.

The COUNTRY LED lights in country number setting mode; the CHANNEL LED lights in channel number setting mode.

- The CHANNEL/COUNTRY display ${ }^{7}$ ) shows the country number (COUNTRY LED on) or channel number (CHANNEL LED on).
- The SELECT key (8) is used to select the country number (COUNTRY LED on) or channel number (CHANNEL LED on).
Pressing Up key increments the number by one; Down key Decrements the number by one.
-Refer to Section 4.10.6, "Sound Subcarrier Level Selection" for detail.


Figure 4-4 RF control group

### 4.10.2 Setting Procedure

(1) About Country Number

A country number is attached to each channel plan. To select the channel plan of country or region to be set, select the corresponding number.
(2) Country Number Selection

Refer to Step (2) in Section 4.10.1, "RF Output Settings."
(3) Finding Desired Channel Plan

Example to set the channel plan of Germany VHF:
According to the Section 5.2, "Broadcast System/Channel Plan by Country/Region," the channel plan " 5 " will be obtained.

### 4.10.3 Selecting Channel

(1) About Channel Number

The channel number is displayed in two digits.
Alphanumeric characters are used for the channel numbers of some channel plan.
This generator converts alphanumeric channel number into numeric ones for display convenience.
Section "5.3, "Channel Plan Table" shows the correspondence between both types of numbers.
(2) Channel Number Selection

Refer to Step (2) in Section 4.10.1, "RF Output Settings."
(3) Numeric Channel Number

The actual channel number is displayed.
(4) Alphanumeric Channel Number

The actual channel number is converted into alphanumeric channel number and displayed.
Example: When the Australia VHF channel is selected, the actual channel number " 5 A " is converted into " 7 " and displayed.

### 4.10.4 Restriction by「SYSTEM (9)」

The color system must be selected by using SYSTEM key (9) before selecting the country number. Otherwise, the country number cannot be selected.

### 4.10.5 RF Modulation

A double sideband modulation system is used for the RF signal.

### 4.10.6 RF Setting Example

This section describes an example to set the FRANCE VHF FB channel.
(1) See Section 5.2, "Broadcast System/Channel Plan by Country/Region" and find "France. "According to the table, the SECAM system and country number " 25 " will be obtained.

| Finland | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Puerto Rico | NTSC | USA [VHF] | 0 | USA UHF | 1 |
| France | SECAM | FRANCE [VHF] | 25 | FRANCE [UHF] | 26 |
| Polynesia | SECAM | FOT [VHF] | 28 |  |  |
| Bulugaria | SECAM | OIRT [VHF](D) | 23 | CCIR UHF(K) | 24 |

(2) Refer to Section 5.3, "Channel Plan Table" and find the "SECAM FRANCE [VHF]" table.
(3) Select the SECAM by pressing the SYSTEM key (9).

SECAM FRANCE [VHF]

$\rightarrow$| Countries/Areas Number | 25 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | L |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| F A | 1 | 47.75 | 54.25 |
| F B | 2 | 55.75 | 62.25 |
| F C 1 | 3 | 60.50 | 67.00 |

(4) Press the COUNTRY/CHANNEL key © for the country selection mode (COUNTRY).
(5) Display " 25 " on the COUNTRY/CHANNEL display ${ }^{7}$ ) by pressing the SELECT key 8 .
(6) Press the COUNTRY/CHANNEL key (6) for the channel selection mode (CHANNEL).
(7) Display "2" on the COUNTRY/CHANNEL display ${ }^{7} 7$ by pressing the SELECT key ${ }^{8}$.

### 4.10.7 Sound Subcarrier Level Selection

The sound subcarrier signal is added to the RF signal when the instrument is shipped from the factory. The subcarrier level can be reduced about 20 dB .
To reduce the level, hold down the COUNTRY/CHANNEL key (6) until "oF" appears on the COUNTRY/CHANNEL display (7).
To obtain the original level, hold down the COUNTRY/CHANNEL key © until "on" appears on the COUNTRY/CHANNEL display (7).

A subcarrier noise may be superimposed on the RF signal. Set the subcarrier "oF," in this case.

### 4.11 Battery Backup

### 4.11.1 Backup Capability

This generator retains the setting conditions (e. g., system, pattern settings,country number,TV channel number) even when the power is turned off.
Data is retained about 14 days with a fully charged backup battery (ambient temperature: $\leq 40^{\circ} \mathrm{C}$, relative humidity: $\leq 80 \%$ ) ,

### 4.11.2 Battery

Rechargeable battery is used.

### 4.11.3 Battery Life

When backup period becomes short, the battery should be replaced. When replacing the battery, contact your local LEADER agent.

## WARNING

### 4.12 Fuse Replacement

When the fuse burns out, replace it according to the procedure below.
(1) Remove the power cord from the mains to prevent accident.
(2) Rotate the fuse holder cap counterclockwise using a Phillips screwdriver to remove the cap.
(3) Replace damaged fuse with new one.
(4) Use only the fuse of correct type and rating for replacement. Do not use such wire as copper lead. It can cause fire.
(5) After the fuse is replaced, mount the cap surely.
(6) Excessive tightening may broken the cap. If it is broken, the fuse holder must be replaced to prevent trouble. In this case, contact your local LEADER agent.

## 5. CHANNEL PLAN

### 5.1 Broadcast System

Table 5-1 lists the major parameters of the broadcast system.

Table 5-1 Major parameters of broadcasting system

| System | M | B | G | H | I | D, K | L |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Channel Bandwidth (MHz) | 6 | 7 | 8 | 8 | 8 | 8 | 8 |
| Sound Subcarrier Frequency (MHz) | 4.5 | 5.5 | 5.5 | 5.5 | 6 | 6.5 | 6.5 |
| Video Modulation Polarity | - | - | - | - | - | - | + |
| Sound Modulation System | FM | FM | FM | FM | FM | FM | AM |

### 5.2 Broadcast System/Channel Plan for Country/ Region

*Note that the contents with regard to the channel plan are only for your reference because estimated information is listed for some countries/regions.

Table 5-2 Broadcast System/Channel Plan by Country/Region

| Countries/Areas | Color <br> System | VHF |  | UHF |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | System | Co. No. | System | Co. No. |
| Afghanistan | PAL | CCIR VHF(B) | 5 |  |  |
| Albania | PAL | ITALY VHF | 14 | CCIR UHF(G) | 7 |
| Algeria | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Angola | PAL | ANGOLA VHF | 12 | CCIR UHF(G) | 7 |
| Australia | PAL | AUSTRALIA VHF | 15 | AUSTRALIA UHF | 16 |
| Austria | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Bahamas | NTSC | USA VHF | 0 |  |  |
| Bahrain | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Bangladesh | PAL | CCIR VHF(B) | 5 |  |  |
| Barbados | NTSC | USA VHF | 0 |  |  |
| Belgium | PAL | CCIR VHF(B) | 5 | CCIR UHF(H) | 8 |
| Belize |  |  |  |  |  |
| Benin | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Bermuda | NTSC | USA VHF | 0 |  |  |
| Bolivia | NTSC | USA VHF | 0 |  |  |
| Bosnia Herzegovina | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Botswana | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |


| Countries/Areas | Color System | VHF |  | UHF |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | System | Co. No. | System | Co. No. |
| Brunei | PAL | CCIR VHF(B) | 5 |  |  |
| Bulgaria | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Burkina Faso | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Burundi | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Cambodia | PAL | CCIR VHF(B) | 5 |  |  |
| Cameroun | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Canada | NTSC | USA VHF | 0 | USA UHF | 1 |
| Central Africa Republic | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Chad | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Chile | NTSC | USA VHF | 0 | USA UHF | 1 |
| China | PAL | CHINA VHF | 19 | CHINA UHF | 20 |
| CIS | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Congo | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Costa Rica | NTSC | USA VHF | 0 | USA UHF | 1 |
| Coto d'Ivoire | SECAM | IVORY COAST VHF | 27 | CCIR UHF(K) | 24 |
| Croatia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Cuba | NTSC | USA VHF | 0 | USA UHF | 1 |
| Cyprus | PAL | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Czecho | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Denmark | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Diego Garcia | NTSC | USA VHF | 0 |  |  |
| Djibouti | SECAM | FOT VHF | 28 |  |  |
| Dominica (Commonwelth. of) | NTSC | USA VHF | 0 |  |  |
| Dominica Republic | NTSC | USA VHF | 0 | USA UHF | 1 |
| Ecuador | NTSC | USA VHF | 0 | USA UHF | 1 |
| Egypt | PAL | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| El Salvador | NTSC | USA VHF | 0 | USA UHF | 1 |
| England |  |  |  | CCIR UHF(G) | 7 |
| Ethiopia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Fiji | PAL | CCIR VHF(B) | 5 |  |  |
| Finland | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| France | SECAM | FRANCE VHF | 25 | FRANCE UHF | 26 |
| French Polynesia | SECAM | FOT VHF | 28 |  |  |
| Gabonese | SECAM | FOT VHF | 28 | CCIR UHF(K) | 2 |
| Gambia | PAL | SOUTH AFRICAVHF(I) | 5 | CCIR UHF(I) | 7 |


| Countries/Areas | Color <br> System | VHF |  | UHF |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | System | Co. No. | System | Co. No. |
| Gernany | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Ghana | PAL | CCIR VHF(B) | 5 |  |  |
| Gibraltar | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Greenland | NTSC | USA VHF | 0 |  |  |
| Grenada |  |  |  |  |  |
| Guam | NTSC | USA VHF | 0 |  |  |
| Guatemala | NTSC | USA VHF | 0 | USA UHF | 1 |
| Guinea | SECAM | FOT VHF | 28 |  |  |
| Guyana | PAL |  |  | CCIR UHF(K) | 10 |
|  |  |  |  |  |  |
| Guyana-Bissau | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| Haiti | NTSC | USA VHF | 0 |  |  |
| Hawaii | NTSC | USA VHF | 0 |  |  |
| Hellenic Republic | PAL | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Holland | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Hong Kong | PAL |  |  | CCIR UHF(I) | 9 |
| Hungary | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Iceland | PAL | CCIR VHF(B) | 5 |  |  |
| India | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Indonesia | PAL | INDONESIA VHF | 11 |  |  |
| Iran | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Iraq | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Ireland | PAL | IRELAND VHF | 13 | CCIR UHF(I) | 9 |
| Israel | PAL | CCIR VHF(B) | 5 | CCIR UHF(I) | 9 |
| Italy | PAL | ITALY VHF | 14 | CCIR UHF(G) | 7 |
| Jamaica | NTSC | USA VHF | 0 |  |  |
| Japan | NTSC | JAPAN VHF | 2 | JAPAN UHF | 3 |
| Johnston Is. (USA) | NTSC | USA VHF | 0 |  |  |
| Jordan | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Kenya | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Korea | NTSC | USA VHF | 0 | USA UHF | 1 |
| Kuwait | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Lebanon | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Lesotho | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| iberia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |


| Countries/Areas | Color <br> System | VHF |  | UHF |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | System | Co. No. | System | Co. No. |
| Libya | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Luxembourg | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Macao Area | PAL |  |  | CCIR UHF(I) | 9 |
| Macedonia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Madagascar | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Malawi | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| Malaysia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Maldives | PAL | CCIR VHF(B) | 5 |  |  |
| Mali | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Malta | PAL | CCIR VHF(B) | 5 |  |  |
| Mauritania | SECAM | CCIR VHF(B) | 21 |  |  |
| Mauritius | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Mexico | NTSC | USA VHF | 0 | USA UHF | 1 |
| Micronesia | NTSC | USA VHF | 0 |  |  |
| Midway Is. (USA) | NTSC | USA VHF | 0 |  |  |
| Monaco | PAL |  |  | CCIR UHF(G) | 7 |
|  | SECAM | FRANCE VHF | 25 | CCIR UHF(G) | 7 |
| Mongolia | SECAM | OIRT VHF(D) | 23 |  |  |
| Morocco | SECAM | MOROCCO VHF(B) | 29 | CCIR UHF(G) | 22 |
| Mozambique |  |  |  | CCIR UHF(G) | 7 |
| Myanmar | NTSC | USA VHF | 0 |  |  |
| Namibia | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| Nepal | PAL | CCIR VHF(B) | 5 |  |  |
| New Caledonia | SECAM | FOT VHF | 28 |  |  |
| New Zealand | PAL | NEW ZEALAND VHF | 17 | CCIR UHF(G) | 7 |
| Nicaragua | NTSC | USA VHF | 0 | USA UHF | 1 |
| Niger | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Nigeria | PAL | CCIR VHF(B) | 5 | CCIR UHF(I) | 9 |
| North Korea | PAL | OIRT VHF(D) | 6 | CCIR UHF(K) | 10 |
| Norway | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Oman | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Pakistan | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Panama | NTSC | USA VHF | 0 | USA UHF | 1 |
| Papua New Guinea | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Philippines | NTSC | USA VHF | 0 | USA UHF | 1 |


| Countries/Areas | Color System | VHF |  | UHF |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | System | Co. No. | System | Co. No. |
| Poland | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Portugal | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Puerto Rico | NTSC | USA VHF | 0 | USA UHF | 1 |
| Qatar | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Romania | PAL | CCIR VHF(D) | 6 | CCIR UHF(K) | 10 |
| Rwanda | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Sao Tome \& Principe | PAL | CCIR VHF(B) | 5 |  |  |
| Saudi Arabia | SECAM | CCIR VHF(B) | 21 | CCIR UHF(G) | 22 |
| Seychelles | PAL | CCIR VHF(B) | 5 |  |  |
|  | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Sierra Leone | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Singapore | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Slovakia | SECAM | OIRT VHF(D) | 23 | CCIR UHF(K) | 24 |
| Slovenia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Somalia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| South Africa | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| Spain | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Srbije \& Montenegro | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Sri Lanka | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| St. Christopher \& Nevis |  |  |  |  |  |
| St. Lucia | NTSC | USA VHF | 0 |  |  |
| St. Vincent |  |  |  |  |  |
| Sudan | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Surinam | NTSC | USA VHF | 0 |  |  |
| Swaziland | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Sweden | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Swiss | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Taiwan Areas | NTSC | TAIWAN VHF | 4 |  |  |
| Tanzania | PAL | SOUTH AFRICA VHF(I) | 18 | CCIR UHF(I) | 9 |
| Thailand | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Togo | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Trinidad \& Tobago | NTSC | USA VHF | 0 |  |  |
| Tunisia | PAL | CCIR VHF(B) | 5 | CCIR VHF(B) | 7 |
| Turkey | SECAM | CCIR VHF(B) | 21 | CCIR VHF(B) | 22 |
|  | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Uganda | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |


| Countries/Areas | Color | VHF |  | UHF |  |
| :--- | :--- | :--- | ---: | :--- | ---: |
|  |  | System | Co. No. | System | Co. No. |
| United Arab Emirates | PAL | CCIR VHF(B) | 5 |  |  |
| USA | NTSC | USA VHF | 0 | USA UHF | 1 |
| Venezuela | NTSC | USA VHF | 0 |  |  |
| Viet Nam | PAL | CCIR VHF(D) | 6 | CCIR UHF(K) | 10 |
| Virginia Is. (USA) | NTSC | USA VHF | 0 |  |  |
| Western Samoa | NTSC | USA VHF | 0 |  |  |
| Yemen | PAL | CCIR VHF(B) | 5 | CCIR UHF(I) | 9 |
| Zaire | SECAM | FOT VHF | 28 | CCIR UHF(K) | 24 |
| Zambia | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |
| Zimbabwe | PAL | CCIR VHF(B) | 5 | CCIR UHF(G) | 7 |

### 5.3 Channel Plan Table

### 5.3.1 How to use Channel Plan Table



Table 5-1

### 5.3.2 Channel Plan Table

NTSC USA [VHF]

| Countries/Areas Number | 0 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 2 | 2 | 55.25 | 59.75 |
| 3 | 3 | 61.25 | 65.75 |
| 4 | 4 | 67.25 | 71.75 |
| 5 | 5 | 77.25 | 81.75 |
| 6 | 6 | 83.25 | 87.75 |
| 7 | 7 | 175.25 | 179.75 |
| 8 | 8 | 181.25 | 185.75 |
| 9 | 9 | 187.25 | 191.75 |
| 10 | 10 | 193.25 | 197.75 |
| 11 | 11 | 199.25 | 203.75 |
| 12 | 12 | 205.25 | 209.75 |
| 13 | 13 | 211.25 | 215.75 |

Table 5-2

NTSC USA [UHF]

| Countries/Areas Number | 1 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 14 | 14 | 471.25 | 475.75 |
| 15 | 15 | 477.25 | 481.75 |
| 16 | 16 | 483.25 | 487.75 |
| 17 | 17 | 489.25 | 493.75 |
| 18 | 18 | 495.25 | 499.75 |
| 19 | 19 | 501.25 | 505.75 |
| 20 | 20 | 507.25 | 511.75 |
| 21 | 21 | 513.25 | 517.75 |
| 22 | 22 | 519.25 | 523.75 |
| 23 | 23 | 525.25 | 529.75 |
| 24 | 24 | 531.25 | 535.75 |
| 25 | 25 | 537.25 | 54.75 |
| 26 | 26 | 543.25 | 547.75 |
| 27 | 27 | 549.25 | 553.75 |
| 28 | 28 | 555.25 | 559.75 |
| 29 | 29 | 561.25 | 565.75 |
| 30 | 30 | 567.25 | 571.75 |
| 31 | 31 | 573.25 | 577.75 |
| 32 | 32 | 579.25 | 583.75 |
| 33 | 33 | 585.25 | 589.75 |
| 34 | 34 | 591.25 | 595.75 |
| 35 | 35 | 597.25 | 601.75 |
| 36 | 36 | 603.25 | 607.75 |
| 37 | 37 | 609.25 | 613.75 |


| NTSC USA [UHF] |  | (cont'd) |  |
| :---: | :---: | :---: | :---: |
| Countries | /Areas Number |  |  |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 38 | 38 | 615.25 | 619.75 |
| 39 | 39 | 621.25 | 625.75 |
| 40 | 40 | 627.25 | 631.75 |
| 41 | 41 | 633.25 | 637.75 |
| 42 | 42 | 639.25 | 643.75 |
| 43 | 43 | 645.25 | 649.75 |
| 44 | 44 | 651.25 | 655.75 |
| 45 | 45 | 657.25 | 661.75 |
| 46 | 46 | 663.25 | 667.75 |
| 47 | 47 | 669.25 | 673.75 |
| 48 | 48 | 675.25 | 679.75 |
| 49 | 49 | 681.25 | 685.75 |
| 50 | 50 | 687.25 | 691.75 |
| 51 | 51 | 693.25 | 697.75 |
| 52 | 52 | 699.25 | 703.75 |
| 53 | 53 | 705.25 | 709.75 |
| 54 | 54 | 711.25 | 715.75 |
| 55 | 55 | 717.25 | 721.75 |
| 56 | 56 | 723.25 | 727.75 |
| 57 | 57 | 729.25 | 733.75 |
| 58 | 58 | 735.25 | 739.75 |
| 59 | 59 | 741.25 | 745.75 |
| 60 | 60 | 747.25 | 751.75 |
| 61 | 61 | 753.25 | 757.75 |
| 62 | 62 | 759.25 | 763.75 |
| 63 | 63 | 765.25 | 769.75 |
| 64 | 64 | 771.25 | 775.75 |
| 65 | 65 | 777.25 | 781.75 |
| 66 | 66 | 783.25 | 787.75 |
| 67 | 67 | 789.25 | 793.75 |
| 68 | 68 | 795.25 | 799.75 |
| 69 | 69 | 801.25 | 805.75 |
| 70 | 70 | 807.25 | 811.75 |
| 71 | 71 | 813.25 | 817.75 |
| 72 | 72 | 819.25 | 823.75 |
| 73 | 73 | 825.25 | 829.75 |
| 74 | 74 | 831.25 | 835.75 |
| 75 | 75 | 837.25 | 841.75 |
| 76 | 76 | 843.25 | 847.75 |
| 77 | 77 | 849.25 | 853.75 |
| 78 | 78 | 855.25 | 859.75 |
| 79 | 79 | 861.25 | 865.75 |
| 80 | 80 | 867.25 | 871.75 |
| 81 | 81 | 873.25 | 877.75 |
| 82 | 82 | 879.25 | 883.75 |
| 83 | 83 | 885.25 | 889.75 |

Table 5-3

NTSC JAPAN [VHF]

| Countries/Areas Number | 2 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 | 1 | 91.25 | 95.75 |
| 2 | 2 | 97.25 | 101.75 |
| 3 | 3 | 103.25 | 107.75 |
| 4 | 4 | 171.25 | 175.75 |
| 5 | 5 | 177.25 | 181.75 |
| 6 | 6 | 183.25 | 187.75 |
| 7 | 7 | 189.25 | 193.75 |
| 8 | 8 | 193.25 | 197.75 |
| 9 | 9 | 199.25 | 203.75 |
| 10 | 10 | 205.25 | 209.75 |
| 11 | 11 | 211.25 | 215.75 |
| 12 | 12 | 217.25 | 221.75 |

Table 5-4

NTSC JAPAN [UHF]

| Countries/Areas Number | 3 |  |  |
| ---: | ---: | ---: | :---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) |  | fs (MHz) 9 13

NTSC JAPAN [UHF]

| Countries/Areas Number | 3 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 39 | 39 | 627.25 | 631.75 |
| 40 | 40 | 633.25 | 637.75 |
| 41 | 41 | 639.25 | 643.75 |
| 42 | 42 | 645.25 | 649.75 |
| 43 | 43 | 651.25 | 655.75 |
| 44 | 44 | 657.25 | 661.75 |
| 45 | 45 | 663.25 | 667.75 |
| 46 | 46 | 669.25 | 673.75 |
| 47 | 47 | 675.25 | 679.75 |
| 48 | 48 | 681.25 | 685.75 |
| 49 | 49 | 687.25 | 691.75 |
| 50 | 50 | 693.25 | 697.75 |
| 51 | 51 | 699.25 | 703.75 |
| 52 | 52 | 705.25 | 709.75 |
| 53 | 53 | 711.25 | 715.75 |
| 54 | 54 | 717.25 | 721.75 |
| 55 | 55 | 723.25 | 727.75 |
| 56 | 56 | 729.25 | 733.75 |
| 57 | 57 | 735.25 | 739.75 |
| 58 | 58 | 741.25 | 745.75 |
| 59 | 59 | 747.25 | 751.75 |
| 60 | 60 | 753.25 | 757.75 |
| 61 | 61 | 759.25 | 763.75 |
| 62 | 62 | 765.25 | 769.75 |

Table 5-5

NTSC TAIWAN [VHF]

| Countries/Areas Number |  | 4 |  |
| :---: | :---: | :---: | :---: |
| RF System |  | M |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 7 | 7 | 175.25 | 179.75 |
| 8 | 8 | 181.25 | 185.75 |
| 9 | 9 | 187.25 | 191.75 |
| 10 | 10 | 193.25 | 197.75 |
| 11 | 11 | 199.25 | 203.75 |
| 12 | 12 | 205.25 | 209.75 |

Table 5-6

PAL CCIR(B)[VHF]

| Countries/Areas Number | 5 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 2 | 2 | 48.25 | 53.75 |
| 3 | 3 | 55.25 | 60.75 |
| 4 | 4 | 62.25 | 67.75 |
| 5 | 5 | 175.25 | 180.75 |
| 6 | 6 | 182.25 | 187.75 |
| 7 | 7 | 189.25 | 194.75 |
| 8 | 8 | 196.25 | 201.75 |
| 9 | 9 | 203.25 | 208.75 |
| 10 | 10 | 210.25 | 215.75 |
| 11 | 11 | 217.25 | 222.75 |
| 12 | 12 | 224.25 | 229.75 |

Table 5-7

PAL OIRT(D)[VHF]

| Countries/Areas Number | 6 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | D |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| R1 | 1 | 49.75 | 56.25 |
| R2 | 2 | 59.25 | 65.75 |
| R3 | 3 | 77.25 | 83.75 |
| R4 | 4 | 85.25 | 91.75 |
| R5 | 5 | 93.25 | 99.75 |
| R6 | 6 | 175.25 | 181.75 |
| R7 | 7 | 183.25 | 189.75 |
| R8 | 8 | 191.25 | 197.75 |
| R9 | 9 | 199.25 | 205.75 |
| R10 | 10 | 207.25 | 213.75 |
| R11 | 11 | 215.25 | 221.75 |
| R12 | 12 | 223.25 | 229.75 |

Table 5-8

PAL CCIR(G)[VHF]

| Countries/Areas Number | 7 |  |  |
| ---: | :---: | ---: | ---: |
| RF System |  | G |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 21 | 21 | 471.25 | 476.75 |
| 22 | 22 | 479.25 | 484.75 |
| 23 | 23 | 487.25 | 49.75 |
| 24 | 24 | 495.25 | 500.75 |
| 25 | 25 | 503.25 | 508.75 |
| 26 | 26 | 511.25 | 516.75 |
| 27 | 27 | 519.25 | 524.75 |
| 28 | 28 | 527.25 | 532.75 |
| 29 | 29 | 535.25 | 540.75 |
| 30 | 30 | 543.25 | 548.75 |
| 31 | 31 | 551.25 | 556.75 |
| 32 | 32 | 559.25 | 564.75 |
| 33 | 33 | 567.25 | 572.75 |
| 34 | 34 | 575.25 | 580.75 |
| 35 | 35 | 583.25 | 588.75 |
| 36 | 36 | 591.25 | 596.75 |
| 37 | 37 | 599.25 | 604.75 |
| 38 | 38 | 607.25 | 612.75 |
| 39 | 39 | 615.25 | 620.75 |
| 40 | 40 | 623.25 | 628.75 |
| 41 | 41 | 631.25 | 636.75 |
| 42 | 42 | 639.25 | 644.75 |
| 43 | 43 | 647.25 | 652.75 |
| 44 | 44 | 655.25 | 660.75 |
| 45 | 45 | 663.25 | 668.75 |
| 46 | 46 | 671.25 | 676.75 |
| 47 | 47 | 679.25 | 684.75 |
| 48 | 48 | 687.25 | 692.75 |
| 49 | 49 | 695.25 | 700.75 |
| 50 | 50 | 703.25 | 708.75 |
| 51 | 51 | 711.25 | 716.75 |
| 52 | 52 | 719.25 | 724.75 |
| 53 | 53 | 727.25 | 732.75 |
| 54 | 54 | 735.25 | 740.75 |
| 55 | 55 | 743.25 | 748.75 |
| 56 | 56 | 751.25 | 756.75 |
| 57 | 57 | 759.25 | 764.75 |
| 58 | 58 | 767.25 | 772.75 |
| 59 | 59 | 775.25 | 780.75 |
| 60 | 60 | 783.25 | 788.75 |
| 61 | 61 | 791.25 | 796.75 |
| 62 | 62 | 799.25 | 804.75 |
| 63 | 63 | 807.25 | 81.75 |
| 64 | 64 | 815.25 | 820.75 |
| 65 | 65 | 823.25 | 828.75 |
| 66 | 66 | 831.25 | 836.75 |
| 67 | 67 | 839.25 | 844.75 |
| 68 | 68 | 847.25 | 852.75 |
| 69 | 69 | 855.25 | 860.75 |
|  |  |  |  |
|  | $7 a b$ | 59 |  |

PAL CCIR(H)[UHF]

| Countries/Areas Number | 8 |  |  |
| :---: | :---: | ---: | ---: |
| RF System |  | H |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 21 | 21 | 471.25 | 476.75 |
| 22 | 22 | 479.25 | 484.75 |
| 23 | 23 | 487.25 | 49.75 |
| 24 | 24 | 495.25 | 50.75 |
| 25 | 25 | 503.25 | 508.75 |
| 26 | 26 | 511.25 | 516.75 |
| 27 | 27 | 519.25 | 524.75 |
| 28 | 28 | 527.25 | 532.75 |
| 29 | 29 | 535.25 | 540.75 |
| 30 | 30 | 543.25 | 548.75 |
| 31 | 31 | 551.25 | 556.75 |
| 32 | 32 | 559.25 | 564.75 |
| 33 | 33 | 567.25 | 572.75 |
| 34 | 34 | 575.25 | 580.75 |
| 35 | 35 | 583.25 | 588.75 |
| 36 | 36 | 591.25 | 596.75 |
| 37 | 37 | 599.25 | 604.75 |
| 38 | 38 | 607.25 | 612.75 |
| 39 | 39 | 615.25 | 620.75 |
| 40 | 40 | 623.25 | 628.75 |
| 41 | 41 | 631.25 | 636.75 |
| 42 | 42 | 639.25 | 644.75 |
| 43 | 43 | 647.25 | 652.75 |
| 44 | 44 | 655.25 | 660.75 |
| 45 | 45 | 663.25 | 668.75 |
| 46 | 46 | 671.25 | 676.75 |
| 47 | 47 | 679.25 | 684.75 |
| 48 | 48 | 687.25 | 692.75 |
| 49 | 49 | 695.25 | 700.75 |
| 50 | 50 | 703.25 | 708.75 |
| 51 | 51 | 711.25 | 716.75 |
| 52 | 52 | 719.25 | 724.75 |
| 53 | 53 | 727.25 | 732.75 |
| 54 | 54 | 735.25 | 740.75 |
| 55 | 55 | 743.25 | 748.75 |
| 56 | 56 | 751.25 | 756.75 |
| 57 | 57 | 759.25 | 764.75 |
| 58 | 58 | 767.25 | 772.75 |
| 59 | 59 | 775.25 | 780.75 |
| 60 | 60 | 783.25 | 788.75 |
| 61 | 61 | 791.25 | 796.75 |
| 62 | 62 | 799.25 | 804.75 |
| 63 | 63 | 807.25 | 812.75 |
| 64 | 64 | 815.25 | 820.75 |
| 65 | 65 | 823.25 | 828.75 |
| 66 | 66 | 831.25 | 836.75 |
| 67 | 67 | 839.25 | 844.75 |
| 68 | 68 | 847.25 | 852.75 |
| 69 | 69 | 855.25 | 860.75 |
|  |  |  |  |
|  | 7 | 5 |  |

PAL CCIR(I)[UHF]

| Countries/Areas Number |  | 9 |  |
| ---: | ---: | ---: | ---: |
| RF System |  | I |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 21 | 21 | 471.25 | 477.25 |
| 22 | 22 | 479.25 | 485.25 |
| 23 | 23 | 487.25 | 493.25 |
| 24 | 24 | 495.25 | 501.25 |
| 25 | 25 | 503.25 | 509.25 |
| 26 | 26 | 511.25 | 517.25 |
| 27 | 27 | 519.25 | 525.25 |
| 28 | 28 | 527.25 | 533.25 |
| 29 | 29 | 535.25 | 541.25 |
| 30 | 30 | 543.25 | 549.25 |
| 31 | 31 | 551.25 | 557.25 |
| 32 | 32 | 559.25 | 565.25 |
| 33 | 33 | 567.25 | 573.25 |
| 34 | 34 | 575.25 | 581.25 |
| 35 | 35 | 583.25 | 589.25 |
| 36 | 36 | 591.25 | 597.25 |
| 37 | 37 | 599.25 | 605.25 |
| 38 | 38 | 607.25 | 613.25 |
| 39 | 39 | 615.25 | 621.25 |
| 40 | 40 | 623.25 | 629.25 |
| 41 | 41 | 631.25 | 637.25 |
| 42 | 42 | 639.25 | 645.25 |
| 43 | 43 | 647.25 | 653.25 |
| 44 | 44 | 655.25 | 661.25 |
| 45 | 45 | 663.25 | 669.25 |
| 46 | 46 | 671.25 | 677.25 |
| 47 | 47 | 679.25 | 685.25 |
| 48 | 48 | 687.25 | 693.25 |
| 49 | 49 | 695.25 | 701.25 |
| 50 | 50 | 703.25 | 709.25 |
| 51 | 51 | 711.25 | 717.25 |
| 52 | 52 | 719.25 | 725.25 |
| 53 | 53 | 727.25 | 733.25 |
| 54 | 54 | 735.25 | 741.25 |
| 55 | 55 | 743.25 | 749.25 |
| 56 | 56 | 751.25 | 757.25 |
| 57 | 57 | 759.25 | 765.25 |
| 58 | 58 | 767.25 | 773.25 |
| 59 | 59 | 775.25 | 781.25 |
| 60 | 60 | 783.25 | 789.25 |
| 61 | 61 | 791.25 | 797.25 |
| 62 | 62 | 799.25 | 805.25 |
| 63 | 63 | 807.25 | 813.25 |
| 64 | 64 | 815.25 | 821.25 |
| 65 | 65 | 823.25 | 829.25 |
| 66 | 66 | 831.25 | 837.25 |
| 67 | 67 | 839.25 | 845.25 |
| 68 | 68 | 847.25 | 853.25 |
| 69 | 69 | 855.25 | 861.25 |
|  |  |  |  |
|  |  |  |  |

PAL CCIR(K)[UHF]

| Countries/Areas Number | 10 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | K |  |
| ch. No. | LED display | fv (MHz) |  |
| 21 | 21 | 471.25 | 477.75 |
| 22 | 22 | 479.25 | 485.75 |
| 23 | 23 | 487.25 | 493.75 |
| 24 | 24 | 495.25 | 501.75 |
| 25 | 25 | 503.25 | 509.75 |
| 26 | 26 | 511.25 | 517.75 |
| 27 | 27 | 519.25 | 525.75 |
| 28 | 28 | 527.25 | 533.75 |
| 29 | 29 | 535.25 | 541.75 |
| 30 | 30 | 543.25 | 549.75 |
| 31 | 31 | 551.25 | 557.75 |
| 32 | 32 | 559.25 | 565.75 |
| 33 | 33 | 567.25 | 573.75 |
| 34 | 34 | 575.25 | 581.75 |
| 35 | 35 | 583.25 | 589.75 |
| 36 | 36 | 591.25 | 597.75 |
| 37 | 37 | 599.25 | 605.75 |
| 38 | 38 | 607.25 | 613.75 |
| 39 | 39 | 615.25 | 621.75 |
| 40 | 40 | 623.25 | 629.75 |
| 41 | 41 | 631.25 | 637.75 |
| 42 | 42 | 639.25 | 645.75 |
| 43 | 43 | 647.25 | 653.75 |
| 44 | 44 | 655.25 | 661.75 |
| 45 | 45 | 663.25 | 669.75 |
| 46 | 46 | 671.25 | 677.75 |
| 47 | 47 | 679.25 | 685.75 |
| 48 | 48 | 687.25 | 693.75 |
| 49 | 49 | 695.25 | 701.75 |
| 50 | 50 | 703.25 | 709.75 |
| 51 | 51 | 711.25 | 717.75 |
| 52 | 52 | 719.25 | 725.75 |
| 53 | 53 | 727.25 | 733.75 |
| 54 | 54 | 735.25 | 741.75 |
| 55 | 55 | 743.25 | 749.75 |
| 56 | 56 | 751.25 | 757.75 |
| 57 | 57 | 759.25 | 765.75 |
| 58 | 58 | 767.25 | 773.75 |
| 59 | 59 | 775.25 | 781.75 |
| 60 | 60 | 783.25 | 789.75 |
| 61 | 61 | 791.25 | 797.75 |
| 62 | 62 | 799.25 | 805.75 |
| 63 | 63 | 807.25 | 813.75 |
| 64 | 64 | 815.25 | 821.75 |
| 65 | 65 | 823.25 | 829.75 |
| 66 | 66 | 831.25 | 837.75 |
| 67 | 67 | 839.25 | 845.75 |
| 68 | 68 | 847.25 | 853.75 |
| 69 | 69 | 855.25 | 861.75 |
|  |  |  |  |
|  |  |  |  |

Table 5-12

PAL INDONESIA [VHF]

| Countries/Areas Number | 11 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 A |  | $* 44.25$ | $* 49.75$ |
| 2 | 2 | 55.25 | 60.75 |
| 3 | 3 | 62.25 | 67.75 |
| 4 | 4 | 175.25 | 180.75 |
| 5 | 5 | 182.25 | 187.75 |
| 6 | 6 | 189.25 | 194.75 |
| 7 | 7 | 196.25 | 201.75 |
| 8 | 8 | 203.25 | 208.75 |
| 9 | 9 | 210.25 | 215.75 |
| 10 | 10 | 217.25 | 222.75 |
| 11 | 11 | 224.25 | 229.75 |

Table 5-13
※ 1 A channel can not be select.

## PAL IRELAND [VHF]

| Countries/Areas Number | 13 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | I |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| A | 1 | 45.75 | 51.75 |
| B | 2 | 53.75 | 59.75 |
| C | 3 | 61.75 | 67.75 |
| D | 4 | 175.25 | 181.25 |
| E | 5 | 183.25 | 189.25 |
| F | 6 | 191.25 | 197.25 |
| G | 7 | 199.25 | 206.25 |
| H | 8 | 207.25 | 213.25 |
| J | 9 | 215.25 | 221.25 |

Table 5-15

PAL ANGOLA [VHF]

| Countries/Areas Number | 12 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | I |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 | 1 | $* 43.75$ | $* 49.25$ |
| 2 | 2 | 52.25 | 58.25 |
| 3 | 3 | 60.25 | 66.25 |
| 4 | 4 | 175.25 | 181.25 |
| 5 | 5 | 183.25 | 189.25 |
| 6 | 6 | 191.25 | 197.25 |
| 7 | 7 | 199.25 | 205.25 |
| 8 | 8 | 207.25 | 213.25 |
| 9 | 9 | 215.25 | 221.25 |
| 10 | 10 | 223.25 | 229.25 |

Table 5-14
CH No. 1 can not be select.
PAL ITALY [VHF]

| Countries/Areas Number | 14 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| A | 1 | 53.75 | 59.25 |
| B | 2 | 62.25 | 67.75 |
| C | 3 | 82.25 | 87.75 |
| D | 4 | 175.25 | 180.75 |
| E | 5 | 183.25 | 189.75 |
| F | 6 | 192.25 | 197.75 |
| G | 7 | 201.25 | 206.75 |
| H | 8 | 210.25 | 215.75 |
| H1 | 9 | 217.25 | 222.75 |
| H2 | 10 | 224.25 | 229.75 |

Table 5-16

PAL AUSTRALIA [VHF]

| Countries/Areas Number | 15 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 0 | 1 | 46.25 | 51.75 |
| 1 | 2 | 57.25 | 62.75 |
| 2 | 3 | 64.25 | 69.75 |
| 3 | 4 | 86.25 | 91.75 |
| 4 | 5 | 95.25 | 100.75 |
| 5 | 6 | 102.25 | 107.75 |
| 5 A | 7 | 138.25 | 143.75 |
| 6 | 8 | 175.25 | 180.75 |
| 7 | 9 | 182.25 | 187.75 |
| 8 | 10 | 189.25 | 194.75 |
| 9 | 11 | 196.25 | 201.75 |
| 10 | 12 | 209.25 | 204.75 |
| 11 | 13 | 216.25 | 221.75 |

Table 5-17
PAL NEW ZEALAND [VHF]

| Countries/Areas Number | 17 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 | 1 | 45.25 | 50.75 |
| 2 | 2 | 55.25 | 60.75 |
| 3 | 3 | 62.25 | 67.75 |
| 4 | 4 | 175.25 | 180.75 |
| 5 | 5 | 182.25 | 187.75 |
| 6 | 6 | 189.25 | 194.75 |
| 7 | 7 | 196.25 | 201.75 |
| 8 | 8 | 203.25 | 208.75 |
| 9 | 9 | 210.25 | 215.75 |
| 10 | 10 | 217.25 | 222.75 |
| 11 | 11 | 224.25 | 229.75 |

Table 5-19
PAL SOUTH AFRICA [VHF]

| Countries/Areas Number | 18 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | I |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 4 | 4 | 175.25 | 181.25 |
| 5 | 5 | 183.25 | 189.25 |
| 6 | 6 | 191.25 | 197.25 |
| 7 | 7 | 199.25 | 205.25 |
| 8 | 8 | 207.25 | 213.25 |
| 9 | 9 | 215.25 | 221.25 |
| 10 | 10 | 223.25 | 229.25 |
| 11 | 11 | 231.25 | 237.25 |
| - | - | - | - |
| 13 | 13 | 247.43 | 253.43 |

PAL AUSTRALIA [UHF]

| Countries | /Areas Number |  |  |
| :---: | :---: | :---: | :---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 28 | 28 | 527.25 | 532.75 |
| 29 | 29 | 534.25 | 539.75 |
| 30 | 30 | 541.25 | 546.75 |
| 31 | 31 | 548.25 | 553.75 |
| 32 | 32 | 555.25 | 560.75 |
| 33 | 33 | 562.25 | 567.75 |
| 34 | 34 | 569.25 | 574.75 |
| 35 | 35 | 576.25 | 581.75 |
| 36 | 36 | 583.25 | 588.75 |
| 37 | 37 | 590.25 | 595.75 |
| 38 | 38 | 597.25 | 602.75 |
| 39 | 39 | 604.25 | 609.75 |
| 40 | 40 | 611.25 | 616.75 |
| 41 | 41 | 618.25 | 623.75 |
| 42 | 42 | 625.25 | 630.75 |
| 43 | 43 | 632.25 | 637.75 |
| 44 | 44 | 639.25 | 644.75 |
| 45 | 45 | 646.25 | 651.75 |
| 46 | 46 | 653.25 | 658.75 |
| 47 | 47 | 660.25 | 665.75 |
| 48 | 48 | 667.25 | 672.75 |
| 49 | 49 | 674.25 | 679.75 |
| 50 | 50 | 681.25 | 686.75 |
| 51 | 51 | 688.25 | 693.75 |
| 52 | 52 | 695.25 | 700.75 |
| 53 | 53 | 702.25 | 707.75 |
| 54 | 54 | 709.25 | 714.75 |
| 55 | 55 | 716.25 | 721.75 |
| 56 | 56 | 723.25 | 728.75 |
| 57 | 57 | 730.25 | 735.75 |
| 58 | 58 | 737.25 | 742.75 |
| 59 | 59 | 744.25 | 749.75 |
| 60 | 60 | 751.25 | 756.75 |
| 61 | 61 | 758.25 | 763.75 |
| 62 | 62 | 765.25 | 770.75 |
| 63 | 63 | 772.25 | 777.75 |
| 64 | 64 | 779.25 | 784.75 |
| 65 | 65 | 786.25 | 791.75 |
| 66 | 66 | 793.25 | 798.75 |
| 67 | 67 | 800.25 | 805.75 |
| 68 | 68 | 807.25 | 812.75 |
| 69 | 69 | 814.25 | 819.75 |

Table 5-18

PAL CHINA [VHF]

| Countries/Areas Number | 19 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | D |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 | 1 | 49.75 | 56.25 |
| 2 | 2 | 57.75 | 64.25 |
| 3 | 3 | 65.75 | 72.25 |
| 4 | 4 | 77.25 | 83.75 |
| 5 | 5 | 85.25 | 91.75 |
| 6 | 6 | 168.25 | 174.75 |
| 7 | 7 | 176.25 | 182.75 |
| 8 | 8 | 184.25 | 188.75 |
| 9 | 9 | 192.25 | 198.75 |
| 10 | 10 | 200.25 | 206.75 |
| 11 | 11 | 208.25 | 214.75 |
| 12 | 12 | 216.25 | 222.75 |

Table 5-21

PAL CHINA [UHF]

| Countries/Areas Number |  | 20 |  |
| :---: | :---: | :---: | :---: |
| RF System |  | D |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 13 | 13 | 471.25 | 477.75 |
| 14 | 14 | 479.25 | 486.75 |
| 15 | 15 | 487.25 | 493.75 |
| 16 | 16 | 495.25 | 501.75 |
| 17 | 17 | 503.25 | 509.75 |
| 18 | 18 | 511.25 | 517.75 |
| 19 | 19 | 519.25 | 525.75 |
| 20 | 20 | 527.25 | 533.75 |
| 21 | 21 | 535.25 | 541.75 |
| 22 | 22 | 543.25 | 549.75 |
| 23 | 23 | 551.25 | 557.75 |
| 24 | 24 | 559.25 | 565.75 |
| 25 | 25 | 607.25 | 613.75 |
| 26 | 26 | 615.25 | 621.75 |
| 27 | 27 | 623.25 | 629.75 |
| 28 | 28 | 631.25 | 637.75 |
| 29 | 29 | 639.25 | 645.75 |
| 30 | 30 | 647.25 | 653.75 |
| 31 | 31 | 655.25 | 661.75 |
| 32 | 32 | 663.25 | 669.75 |
| 33 | 33 | 671.25 | 677.75 |
| 34 | 34 | 679.25 | 685.75 |
| 35 | 35 | 687.25 | 693.75 |
| 36 | 36 | 695.25 | 701.75 |
| 37 | 37 | 703.25 | 709.75 |
| 38 | 38 | 711.25 | 717.75 |
| 39 | 39 | 719.25 | 725.75 |
| 40 | 40 | 727.25 | 733.75 |
| 41 | 41 | 735.25 | 741.75 |
| 42 | 42 | 743.25 | 749.75 |
| 43 | 43 | 751.25 | 757.75 |
| 44 | 44 | 759.25 | 765.75 |
| 45 | 45 | 767.25 | 773.75 |
| 46 | 46 | 775.25 | 781.75 |
| 47 | 47 | 783.25 | 789.75 |
| 48 | 48 | 791.25 | 797.75 |
| 49 | 49 | 799.25 | 705.75 |
| 50 | 50 | 807.25 | 813.75 |
| 51 | 51 | 815.25 | 821.75 |
| 52 | 52 | 823.25 | 829.75 |
| 53 | 53 | 831.25 | 837.75 |
| 54 | 54 | 839.25 | 845.75 |
| 55 | 55 | 847.25 | 853.75 |
| 56 | 56 | 855.25 | 861.75 |
| 57 | 57 | 863.25 | 869.75 |

Table 5-22

SECAM CCIR(B)[VHF]

| Countries/Areas Number | 21 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 2 | 2 | 48.25 | 53.75 |
| 3 | 3 | 55.25 | 60.75 |
| 4 | 4 | 62.25 | 67.75 |
| 5 | 5 | 175.25 | 180.75 |
| 6 | 6 | 182.25 | 187.75 |
| 7 | 7 | 189.25 | 194.75 |
| 8 | 8 | 196.25 | 201.75 |
| 9 | 9 | 203.25 | 208.75 |
| 10 | 10 | 210.25 | 215.75 |
| 11 | 11 | 217.25 | 222.75 |
| 12 | 12 | 224.25 | 229.75 |

Table 5-23

SECAM CCIR(G)[UHF]

| Countries/Areas Number | 22 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | G |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 21 | 21 | 471.25 | 476.75 |
| 22 | 22 | 479.25 | 484.75 |
| 23 | 23 | 487.25 | 492.75 |
| 24 | 24 | 495.25 | 500.75 |
| 25 | 25 | 503.25 | 508.75 |
| 26 | 26 | 511.25 | 516.75 |
| 27 | 27 | 519.25 | 524.75 |
| 28 | 28 | 527.25 | 532.75 |
| 29 | 29 | 535.25 | 540.75 |
| 30 | 30 | 543.25 | 548.75 |
| 31 | 31 | 551.25 | 556.75 |
| 32 | 32 | 559.25 | 564.75 |
| 33 | 33 | 567.25 | 572.75 |
| 34 | 34 | 575.25 | 580.75 |
| 35 | 35 | 583.25 | 588.75 |
| 36 | 36 | 591.25 | 596.75 |
| 37 | 37 | 599.25 | 604.75 |
| 38 | 38 | 607.25 | 612.75 |
| 39 | 39 | 615.25 | 620.75 |
| 40 | 40 | 623.25 | 628.75 |
| 41 | 41 | 631.25 | 636.75 |
| 42 | 42 | 639.25 | 644.75 |
| 43 | 43 | 647.25 | 65.75 |
| 44 | 44 | 655.25 | 660.75 |
| 45 | 45 | 663.25 | 668.75 |
| 46 | 46 | 671.25 | 676.75 |
| 47 | 47 | 679.25 | 684.75 |
| 48 | 48 | 687.25 | 692.75 |
| 49 | 49 | 695.25 | 700.75 |
| 50 | 50 | 703.25 | 708.75 |
| 51 | 51 | 711.25 | 716.75 |
| 52 | 52 | 719.25 | 724.75 |
| 53 | 53 | 727.25 | 732.75 |
| 54 | 54 | 735.25 | 740.75 |
| 55 | 55 | 743.25 | 748.75 |
| 56 | 56 | 751.25 | 756.75 |
| 57 | 57 | 759.25 | 764.75 |
| 58 | 58 | 767.25 | 772.75 |
| 59 | 59 | 775.25 | 780.75 |
| 60 | 60 | 783.25 | 788.75 |
| 61 | 61 | 791.25 | 796.75 |
| 62 | 62 | 799.25 | 804.75 |
| 63 | 63 | 807.25 | 812.75 |
| 64 | 64 | 815.25 | 820.75 |
| 65 | 65 | 823.25 | 828.75 |
| 66 | 66 | 831.25 | 836.75 |
| 67 | 67 | 839.25 | 844.75 |
| 68 | 68 | 847.25 | 852.75 |
| 69 | 69 | 855.25 | 860.75 |
|  |  |  |  |
|  |  |  |  |

Table 5-24

SECAM OIRT(D)[VHF]

| Countries/Areas Number | 23 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | D |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| R1 | 1 | 49.75 | 56.25 |
| R2 | 2 | 59.25 | 65.75 |
| R3 | 3 | 77.25 | 83.75 |
| R4 | 4 | 85.25 | 91.75 |
| R5 | 5 | 93.25 | 99.75 |
| R6 | 6 | 175.25 | 181.75 |
| R7 | 7 | 183.25 | 189.75 |
| R8 | 8 | 191.25 | 197.75 |
| R9 | 9 | 199.25 | 205.75 |
| R10 | 10 | 207.25 | 213.75 |
| R11 | 11 | 215.25 | 221.75 |
| R12 | 12 | 223.25 | 229.75 |

Table 5-25

SECAM CCIR(K)[UHF]

| Countries/Areas Number | 24 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | K |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 21 | 21 | 471.25 | 477.75 |
| 22 | 22 | 479.25 | 485.75 |
| 23 | 23 | 487.25 | 493.75 |
| 24 | 24 | 495.25 | 501.75 |
| 25 | 25 | 503.25 | 509.75 |
| 26 | 26 | 511.25 | 517.75 |
| 27 | 27 | 519.25 | 525.75 |
| 28 | 28 | 527.25 | 533.75 |
| 29 | 29 | 535.25 | 541.75 |
| 30 | 30 | 543.25 | 549.75 |
| 31 | 31 | 551.25 | 557.75 |
| 32 | 32 | 559.25 | 565.75 |
| 33 | 33 | 567.25 | 573.75 |
| 34 | 34 | 575.25 | 581.75 |
| 35 | 35 | 583.25 | 589.75 |
| 36 | 36 | 591.25 | 597.75 |
| 37 | 37 | 599.25 | 605.75 |
| 38 | 38 | 607.25 | 613.75 |
| 39 | 39 | 615.25 | 621.75 |
| 40 | 40 | 623.25 | 629.75 |
| 41 | 41 | 631.25 | 63.75 |
| 42 | 42 | 639.25 | 645.75 |
| 43 | 43 | 647.25 | 653.75 |
| 44 | 44 | 655.25 | 661.75 |
| 45 | 45 | 663.25 | 669.75 |
| 46 | 46 | 671.25 | 677.75 |
| 47 | 47 | 679.25 | 685.75 |
| 48 | 48 | 687.25 | 693.75 |
| 49 | 49 | 695.25 | 701.75 |
| 50 | 50 | 703.25 | 709.75 |
| 51 | 51 | 711.25 | 717.75 |
| 52 | 52 | 719.25 | 725.75 |
| 53 | 53 | 727.25 | 733.75 |
| 54 | 54 | 735.25 | 741.75 |
| 55 | 55 | 743.25 | 749.75 |
| 56 | 56 | 751.25 | 757.75 |
| 57 | 57 | 759.25 | 765.75 |
| 58 | 58 | 767.25 | 773.75 |
| 59 | 59 | 775.25 | 781.75 |
| 60 | 60 | 783.25 | 789.75 |
| 61 | 61 | 791.25 | 797.75 |
| 62 | 62 | 799.25 | 705.75 |
| 63 | 63 | 807.25 | 813.75 |
| 64 | 64 | 815.25 | 821.75 |
| 65 | 65 | 823.25 | 829.75 |
| 66 | 66 | 831.25 | 837.75 |
| 67 | 67 | 839.25 | 845.75 |
| 68 | 68 | 847.25 | 853.75 |
| 69 | 69 | 855.25 | 861.75 |
|  | 7 |  |  |

SECAM FRANCE [VHF]

| Countries/Areas Number | 25 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | L |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| FA | 1 | 47.75 | 54.25 |
| FB | 2 | 55.75 | 62.25 |
| FC1 | 3 | 60.5 | 67 |
| FC | 4 | 63.75 | 70.25 |
| F1 | 5 | 176 | 182.5 |
| F2 | 6 | 184 | 190.5 |
| F3 | 7 | 192 | 198.5 |
| F4 | 8 | 200 | 206.5 |
| F5 | 9 | 208 | 214.5 |
| F6 | 10 | 216 | 222.5 |

Table 5-27

SECAM FRANCE [UHF]

| Countries/Areas Number | 26 |  |  |
| ---: | ---: | ---: | ---: |
| RF System |  | L |  |
| ch. No. | LED display | fv (MHz) |  |
| 21 | 21 | 471.25 | 477.75 |
| 22 | 22 | 479.25 | 486.75 |
| 23 | 23 | 487.25 | 493.75 |
| 24 | 24 | 495.25 | 501.75 |
| 25 | 25 | 503.25 | 509.75 |
| 26 | 26 | 511.25 | 517.75 |
| 27 | 27 | 519.25 | 525.75 |
| 28 | 28 | 527.25 | 533.75 |
| 29 | 29 | 535.25 | 541.75 |
| 30 | 30 | 543.25 | 549.75 |
| 31 | 31 | 551.25 | 557.75 |
| 32 | 32 | 559.25 | 565.75 |
| 33 | 33 | 567.25 | 573.75 |
| 34 | 34 | 575.25 | 581.75 |
| 35 | 35 | 583.25 | 589.75 |
| 36 | 36 | 591.25 | 597.75 |
| 37 | 37 | 599.25 | 605.75 |
| 38 | 38 | 607.25 | 613.75 |
| 39 | 39 | 615.25 | 621.75 |
| 40 | 40 | 623.25 | 629.75 |
| 41 | 41 | 631.25 | 637.75 |
| 42 | 42 | 639.25 | 645.75 |
| 43 | 43 | 647.25 | 653.75 |
| 44 | 44 | 655.25 | 661.75 |
| 45 | 45 | 663.25 | 669.75 |
| 46 | 46 | 671.25 | 677.75 |
| 47 | 47 | 679.25 | 685.75 |
| 48 | 48 | 687.25 | 693.75 |
| 49 | 49 | 695.25 | 701.75 |
| 50 | 50 | 703.25 | 709.75 |
| 51 | 51 | 711.25 | 717.75 |
| 52 | 52 | 719.25 | 725.75 |
| 53 | 53 | 727.25 | 733.75 |
| 54 | 54 | 735.25 | 741.75 |
| 55 | 55 | 743.25 | 749.75 |
| 56 | 56 | 751.25 | 757.75 |
| 57 | 57 | 759.25 | 765.75 |
| 58 | 58 | 767.25 | 773.75 |
| 59 | 59 | 775.25 | 781.75 |
| 60 | 60 | 783.25 | 789.75 |
| 61 | 61 | 791.25 | 797.75 |
| 62 | 62 | 799.25 | 705.75 |
| 63 | 63 | 807.25 | 813.75 |
| 64 | 64 | 815.25 | 821.75 |
| 65 | 65 | 823.25 | 829.75 |
| 66 | 66 | 831.25 | 837.75 |
| 67 | 67 | 839.25 | 845.75 |
| 68 | 68 | 847.25 | 853.75 |
| 69 | 69 | 855.25 | 861.75 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Table 5-28

SECAM IVORY COAST [VHF]

| Countries/Areas Number |  | 27 |  |
| ---: | ---: | ---: | ---: |
| RF System |  | K |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| 1 |  | $* 43.25$ | $* 49.75$ |
| 2 | 2 | 52.25 | 58.75 |
| 3 | 3 | 60.25 | 66.75 |
| 4 | 4 | 175.25 | 181.75 |
| 5 | 5 | 183.25 | 189.75 |
| 6 | 6 | 191.25 | 197.75 |
| 7 | 7 | 199.25 | 205.75 |
| 8 | 8 | 207.25 | 213.75 |
| 9 | 9 | 215.25 | 221.75 |

Table 5-29
CH No. 1 can not be select.

## SECAM MOROCCO [VHF]

| Countries/Areas Number |  | 29 |  |
| ---: | ---: | ---: | ---: |
| RF System |  | B |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| M4 | 4 | 163.25 | 168.75 |
| M5 | 5 | 171.25 | 176.75 |
| M6 | 6 | 179.25 | 184.75 |
| M7 | 7 | 187.25 | 192.75 |
| M8 | 8 | 195.25 | 200.75 |
| M9 | 9 | 203.25 | 208.75 |
| M10 | 10 | 211.25 | 216.75 |

Table 5-31

SECAM FOT [VHF]

| Countries/Areas Number | 28 |  |  |
| :---: | ---: | ---: | ---: |
| RF System |  | K |  |
| ch. No. | LED display | fv (MHz) | fs (MHz) |
| K4 | 4 | 175.25 | 181.75 |
| K5 | 5 | 183.25 | 189.75 |
| K6 | 6 | 191.25 | 197.75 |
| K7 | 7 | 199.25 | 205.75 |
| K8 | 8 | 207.25 | 213.75 |
| K9 | 9 | 215.25 | 221.75 |

Table 5-30

## 6. MAINTENANCE

The LT 416 is designed to provide stable performance when used properly.If the instrument requires adjustment or calibration after extended use,be sure to contact your nearest LEADER agent.

## 所含有毒有害物质信息

## 部件号码：LT 416

此标志适用于在中国销售的电子信息产品，依据2006年2月28日公布的


《电子信息产品污染控制管理办法》以及 SJ／T11364－2006《电子信息产品污染控制标识要求》，表示该产品在使用完结后可再利用。数字表示的是环境保护使用期限，只要遵守与本产品有关的安全和使用上的注意事项，从制造口算起在数字所表示的年限内，产品不会产生环境污染和对人体，财产的影响。
产品适当使用后报废的方法请遵从电子信息产品的回收，再利用相关法令。
详细请咨询各级政府主管部门。

产品中有毒有害物质或元素的名称及含量

| 部件名称 <br> Parts | 有毒有害物质或元素 |  |  | Hazardous Substances in each Part |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \text { 铅 } \\ (\mathrm{Pb}) \end{gathered}$ | $\begin{gathered} \text { 汞 } \\ (\mathrm{Hg}) \end{gathered}$ | $\begin{gathered} \hline \text { 镉 } \\ \text { (Cd) } \end{gathered}$ | $\begin{gathered} \hline \text { 六价铬 } \\ (\mathrm{Cr}(\mathrm{VI})) \end{gathered}$ | 多溴联苯 （PBB） | 多溴二苯醚 （PBDE） |
| 实装基板 | $\times$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ |
| 主体部 | $\times$ | $\bigcirc$ | $\times$ | $\bigcirc$ | $\bigcirc$ | 0 |
| 开关电源 | $\times$ | 0 | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ |
| 线材料一套 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | $\bigcirc$ |
| 外筐 | 0 | 0 | 0 | 0 | 0 | O |
| 附件 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | O | O |
| 包装材 | O | O | O | 0 | 0 | O |
| 电池 | O | O | O | 0 | O | O |
|  |  |  |  |  |  |  |
| 备注） <br> O：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ／T11363－2006 规定的限量要求以下。 <br> X：表示该有毒有害物质或元素至少在该部件的某一均质材料中的含量超出SJ／T11363－2006标准规定的限量要求。 |  |  |  |  |  |  |


[^0]:    * Do not apply $\pm 1 \mathrm{~V}$ (DC or AC peak) or higher external voltage to the output connectors.

[^1]:    * ON : LED lights. OFF : LED goes off.

