Deviser

DS1151B
Operation   Manual
Ver 1.1

The best selection
Part Number:
DK210101151

Warranty

The instrument is warranted for a period of 18 months since the date of shipment, when used under normal operating conditions and within the service conditions. The obligation of DEVISER arising from a warranty claim shall be limited to repairing or at its option, replacing without charge, any assembly or component (except batteries).

Deviser shall have no responsibility for any defect or damage caused by improper use, improper maintenance or for any product which has been repaired or altered by any one other than DEVISER or its authorized service center.

Buyer shall prepay shipping charges and insurance for products returned for warranty service. Deviser or its authorized service center shall pay costs for return of products to buyers.

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1 General Introduction

1.1 INTRODUCTION

The *DS1151B* Signal Level Meter is designed for cable system, and provides you with favorite features for reduced cost.

It can measure and display the amplitude of the carriers singly, as a group (up to 12 channels), or as a full span(at most 150 channels). Especially, the occasional disturbance can be detected by the peak-hold level measurement feature in LEVEL and SPECTRUM mode. The Analogue channel, QAM and FM channel can be set and tested efficiently, it also supports C/N measurement, voltmeter function, spectrum, auto test and data logging. It is easy for *DS1151B* to obtain a report of installation data via PC or printer.

The meter is favorite, has many functions and is easy to use in a wide range of conditions.

1.2 EQUIPMENT

*Charger.	DS10030
*RF connector	P.110628J8J F-F
*Operator's manual .	DK210101185
*Data cable	P.3100805L9
*Serial printer cable.	P.310075L25
*Com Software	DK401101182
*Package	PK100151182

The following options are also available:

*Parallel printer adapter:	0115005
*Noise source:	DS5032
*Reserve signal generator	DS5103 DS5112

1.3 FEATURES

The following features are provided by *DS1151B*

* Level Test
* Channel Spectrum Scanning (up to 150 channels)
* Frequency Spectrum
* Tilt/Level list (up to 12 channels)
* C/N
* Data Logging
* Auto Test
* Limit Test
* Voltmeter Feature

* Printer Output by serial or parallel printer
* QAM Measurement
* Remote test
* Multiple User Plan
* Intelligence Power Management
* Fast Charge during 3 hours
* Alphanumeric Inputting
* Fast Setup

LEVEL TEST

The *DS1151B* takes accurate signal level test on analogue TV, QAM and single frequency channel. When turned to a channel, the levels of video and audio, $\triangle$V /A also with the peak-hold level and $\triangle$Peak–Peak value can be easy displayed. To get more details of a channel, a single channel SPECTRUM mode is supported at level function.

Eight base channel plans and up to five user plans are provided. You can determine the user plan automatically by a special fast building mode.

The test data of level measurement can be saved and printed out to a serial or parallel printer.

CHANNEL SPECTRUM SCANNING

A full span of audio and video carriers can be displayed efficiently. You can zoom in or out for 5 levels to observe the overall flatness and amplitude of your system. By using marker, you can change the scanned channels and read out the test data of video and audio carriers. At most 150 channels are supported in SCAN mode.

It is easy to save the scanning data or print it out in report format.

FREQUENCY SPECTRUM

Frequency spectrum is applied ranging form 2.5 MHz to 62.5 MHz, or according to selected user plan. To determine the problem of disturbance, the peak-hold level spectrum can be enabled, and two curves are displayed in one screen. One is for the real test spectrum, another is for the peak-hold level spectrum. You can read out the test data and frequency by marker and delta maker function. Especially, the data of frequency spectrum could be saved and printed out.

TILT/LEVEL LIST

To fast check the flatness and amplitude, the

TILT/LEVEL LIST function is favorite for you. The level of up to 12 channels can be displayed as spectral graph or in level table by pressing the *TILT* button. You can save or print the test data of TILT/LEVEL LIST measurement as you like.

C/N
C/N test on line is supported by the meter. To get the more accurate C/N data, the method of shutting off carrier is enabled.

DATA LOGGING
Up to 110 files can be saved in one meter depending on the size of the saved files.

You can select and save the test data of LIMIT TEST, LEVEL mode, SCAN mode, SPECTRUM mode, TILT mode or all of them in one file. The file name can be determined directly to define the saved contents, and the saved files can be transmitted to PC for data analysis.

AUTO TEST
DS1151B provides a convenient way to automatic test the cable system according to test commands edited by user. You can select the test items including LEVEL,

SPECTRUM, LIMIT and TILT. Automated tests can be executed immediately and the test data will be saved automatically.

LIMIT TEST
You can fast check the cable system by the limit test function. Each enabled channel will be tested according to the limits set by user, and marked by pass /fail indicators. Limit test results are video level, audio level, $\triangle$V/A, and pass/fail indicator can be viewed on the LCD screen.

VOLTMETER
The problem of power supplies or drops can be found out by a built-in voltmeter of *DS1151B* with voltages ranging from 0 to 100V.

PRINTER OUTPUT
You can get a hardcopy of the saved file by a serial or parallel printer, and the measured data can be printed in report format. It is useful to document a problem.

QAM MEASUREMENT
The instrument is capable of measuring the actual power of QAM signal, and showing the shape of the

modulation wave. This function takes it enable to detect the flatness of the QAM signal and found out the problem of the digital transmission system.

MULTIPLE USER PLAN
You can build up to five user plans in one instrument. It makes it easy to quickly select the correct user plan for the cable system at which you are working.

INTELLIGENCE POWER MANAGEMENT
To conserve battery life, the difference power supplying method is used for difference working condition. The instrument can work with the built-in battery for 6 hrs on maximum power supply status. When working in power saving mode, part circuits of the meter will power down automatically.

FAST CHARGE
The meter has the capability to full charge the battery during 3hrs. A specified charger is used, and the charging time, temperature, voltage and charging current are detected when charging. The charging process will be stopped automatically as soon as the full charge is detected.

2 Product Description

2.1 INTRODUCTION

DS1151B is a lightweight, easy to use level meter. Before the first using you must become familiar with its controls.

RF INPUT PORT

LCD

Soft Key

Digit And Function Key

Power Switch

Up And down Key

RS232 Interface

Charge Socket

2.2 GETTING ACQUAINTED WITH THE KEYPAD

Soft Buttons

There are three soft buttons (*F1, F2* and *F3*) located on the right top of the instrument. They are used to access the functions represented by the icons displayed on the bottom of the display.

Power ON/OFF

Turns the instrument on and off

Arrow Buttons.

The *UP* and *DOWN* buttons can be used to move the marker or change the values.

2nd Button

The keypad is put into a second function after pressing the *2nd* button, and some keys perform as alphanumerical keys.

C/N.   Enter Carrier-to-Noise measurement Mode.

FILE.   To save or Load a file by pressing the button.

LEVEL   Enter the level measure mode

SCAN   Channel spectrum scanning

SPECT   Enter frequency spectrum

TILT   Toggles between tilt and level list mode

LIMIT   Limit test for all active channels

AUTO   Automated test according to the commands

SET   Enter the fast setup and full setup mode

Alphanumeric Input

The keypad will be put into a alphanumeric keypad by pressing *2nd* button. The keys labeled on one numeral and up to three characters can perform as alphanumeric keys. To access a numeral or a character you can repeatedly pressing the key. Once the desired numeral or character is input and displayed, move the cursor to the next place by pressing *F3* key. The *F2* key performs backspace function. Be sure to confirm the entry by pressing the *F1*(ENTER) key.

2.3 DISPLAY DESCRIPTION

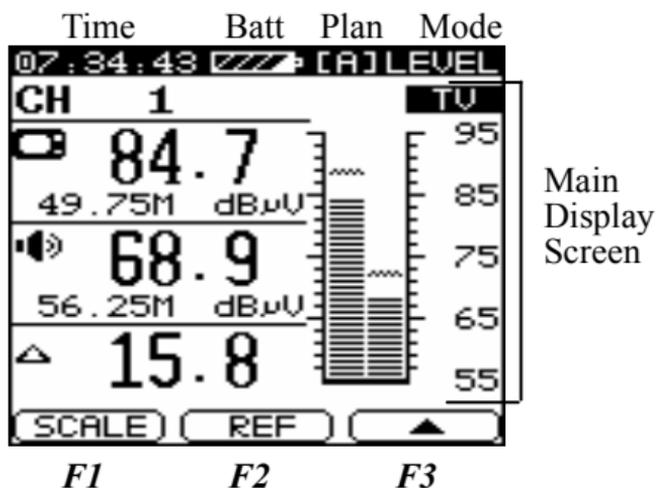Most display contains the following sections or features:

Figure 2-1

3
**Using
The Instrument**

3.1 INTRODUCTION

Now you can use the *DS1151B* according to the description of chapter 3. Each measurement mode can be accessed via buttons on the keypad, and it will be discussed with detailed descriptions on how to perform the measurement. But before the test operation, It is important to make the meter to be compatible with your cable system by learning your user plan at first.

3.2 LEARN USER PLAN

The measurement is performed depending on proper user plan. It includes three elements as following.

*Channel number
*Channel format (TV, single freq, DIGI)
*Carriers (video and audio)

DS1151B can learn up to five user plans depending on the cable system and storing it as built-in plans. To build

a user plan by operating step-by-step as following.

1. Connect the instrument with the cable system.
2. Operating as following:

    SET+ CHANNEL PLAN

    The screen displays as figure 3-1

```
18:56:44 ▱▱▱ [A]SETUP
 > SELECT USER PLAN
   CHAN NUM DISPLAY
   LEARN USER PLAN
   EDIT USER PLAN
   TILT/LEVEL LIST
   LOAD DEFAULT
   PRIOR MENU
 ┌─────────────────────┐
 │PLAN  A       CCIR   │
 │PRESS ⇧ OR ⇩ KEY     │
 └─────────────────────┘
[ENTER][  ▼  ][  ▲  ]
```

Figure 3-1

Highlight SELECT USER PLAN option, and press
UP or *DOWN* button to select a user plan (A, B, C, D,
E) which will be built.

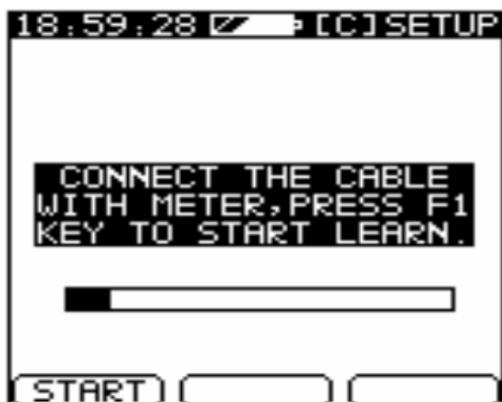3. Select LEARN USER PLAN option, the LCD
   displays as figure 3-2.

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Figure 3-2

4. Press *F1* to enter the next menu with the instrument connected to the cable system. Then select a base channel plan to build the user plan. Refer to figure 3-3.

Figure 3-3

DS1151B is capable of identifying which channels are on the cable plant. It takes it easy to quickly generate a customized user plan. After above the new user plan will be saved automatically. For more details, you can view the section 4.5.

3.3 LEVEL MEASUREMENT

Press *LEVEL* button to enter LEVEL mode. The level test is able for analog TV, digital channel, single frequency channel and frequency level measurement.

ANALOG CHANNEL LEVEL

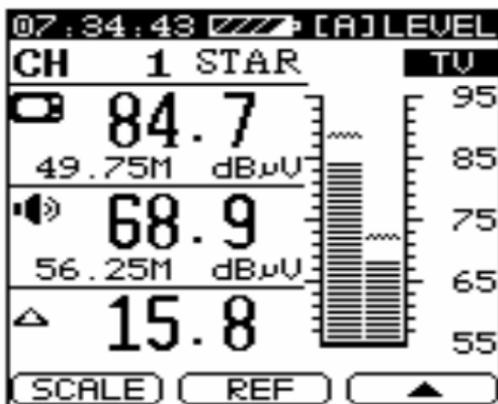The video level, audio level and Δ V/A can be measured and displayed in data.

Figure 3-4

An analogue channel can be defined in FAST SETUP mode by pressing *SET* button in LEVEL mode. And the TV indicator will be shown on the right top of the screen in channel LEVEL mode.

DIGITAL CHANNEL LEVEL

DS1151B is capable of measuring the average power of digital channel with QAM or QPSK modulation. A digital channel with the center and BW can be defined in FAST SETUP mode by pressing *SET* button.

Figure 3-5

FREQUENCY CHANNEL LEVEL

You can define a frequency channel in FAST SETUP mode with specified center and span, the peak level in the frequency span can be measured and displayed in large size as figure 3-6.

Figure 3-6

The delta frequency and delta level between peak level point and center frequency point will be shown in small size on the bottom of the screen.

MEASUREMENT OF PEAK-HOLD LEVEL

You can read out the peak-hold level in data by pressing *F2*(PEAK) button. The instrument will start to calculate the peak-hold value and display it with $\boxed{P}$ indicator.

MEASUREMENT OF PEAK-TO-PEAK VALUE

The peak-to-peak value can be calculated and displayed by pressing *F2*(△ p-p) key with $\boxed{\Delta}$ indicator shown.

TUNING BY CHANNEL

When you tuned the meter to a channel, the channel number, type and label of the tuned channel will be

displayed on the top of the screen. Use the *UP* and *DOWN* buttons, you can tune the channel according to the selected user plan. To tune to a desired channel directly, you can press the alphanumeric keys directly after pressing the *2ⁿᵈ* key. The standard(alphanumeric) channel number and EIA(numeric) channel number are enabled for the meter.

EDITING USER PLAN
The user plan is a critical element to operating the meter. To make the meter to be more compatible with your cable system, you can edit the channel of the selected user plan. Press *SET* button in channel level mode.


```
20.50.02 ⊘⊘ ⋮[B]SETUP
    <CHANNEL PLAN B>
EIA NUMBER:        201
STANDARD NUMBER:   R1
LABEL OF CHAN:
ACTIVE STATUS:     ENA
TYPE:              TV
FREQUENCY:   13.25MHz
AUD OFFSET:   5.50MHz
SAVE AND EXIT
```
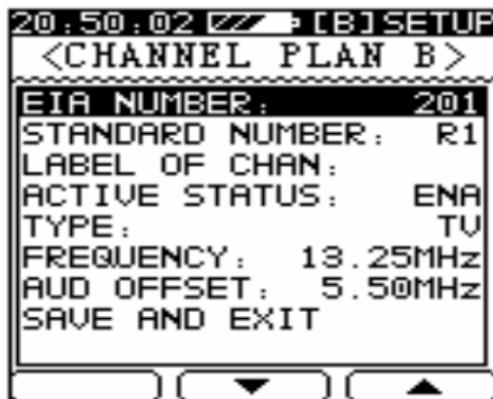
Figure 3-7

The EIA and standard channel number, label, type and carrier frequency(BW) can be edit, and the

measurement of the channel can be disabled or enabled by selecting the ACTIVE STATUS item. For more details, refer to the section 4.5.

TUNING BY FREQUENCY
The *F1* key toggles between channel and frequency level mode. The *UP* and *DOWN* buttons can be used to tune the measured frequency according to step size specified in fast SETUP mode. The step size is ranging from 10kHz, 100kHz, 1MHz, 10MHz or channel step. You can use numeric keys to enter the desired frequency directly.
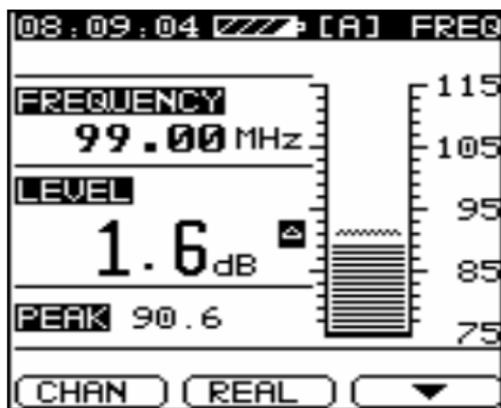

Figure 3-8

The built-in speaker will work depending on the setup. The volume can be tuned by 4 levels, or mute.The

FAST SETUP mode can be accessed by pressing **SET** button in FREQUENCY tuned mode.

Figure 3-9

REFERENCE LEVEL AND SCALE

Press **F3** to enter the next soft key menu, the LCD display as following:

Figure 3-10

The scale of analog graph can be adjusted cycled from 1,2,5,10dB. To adjust the reference level, press **F2(**REF), the button icon will be displayed as REF. Use the **UP** and **DOWN** keys to adjust the reference level of analog graph. To exit from the adjusting reference level mode by pressing **F2** button again.

SINGLE CHANNEL SPECTRUM

To observe the spectrum of single channel or frequency, press *LEVEL* button again, the spectrum will be displayed with the specified center and span. The channel number will be shown on the bottom of the spectrum graph. If the *LEVEL* button is pressed in single frequency mode, the channel number will be displayed as "----", and the center is defined same as the tested frequency.

To tune the center by moving the marker to the end of the viewing range. The level and frequency of marked point can be read out in data immediately with the moving of the marker. Refer to figure 3-11.
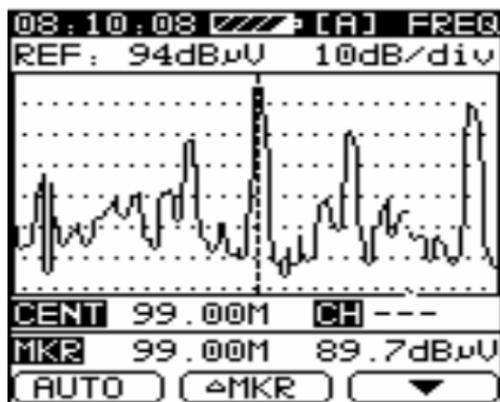

Figure 3-11

To adjust the reference level and scale by pressing

F3(▼) to enter the next soft key menu.

Figure 3-12

Press *F1*(scale) repeatedly to change the scale ranging from 1,2,5,10dB. Press *F2*(REF) to enter reference level adjusting mode with the icon being shown as REF. Adjust the reference level by pressing *UP* and *DOWN* keys. Press *F2*(REF) again to exit from the mode.

3.4 FULL SCAN
To quick test the flatness and amplitude of all carries in the cable system by pressing *SCAN* button, a spectral graph of the selected user plan is displayed as following.
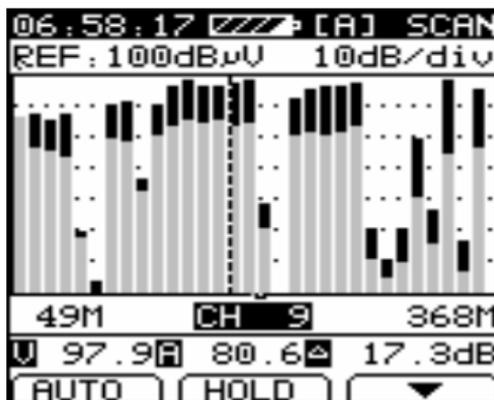

Figure 3-13

The meter will scan the full span of the cable system according to the selected user plan.

The measurement data of up to 120 channels will be displayed in the viewing range. To extend the viewing range by moving the marker to the end of the viewing range. You can read out the level and channel number with the moving of the marker.

The audio level and video level will be displayed by one bar with difference contrast. The contrast of video level graph is darker than audio level.

To freeze scanning process by pressing *F2*(STOP) button. The graph is retained even if the cable is disconnected with the meter. To resume scanning, press *F2* (TRIG). To move the vertical marker to the desired channel, you can use the *UP* and *DOWN* keys, or tune directly by using alphanumeric keys in *2nd* keypad.

The measurement data and channel number of the marked channel will be displayed. To read out the frequency of the marked channel, press *SET* button to enter the FAST SETUP of SCAN mode and set the MARKER DISPLAY option to be "FREQ".

THE REFERENCE LEVEL AND THE SCALE

The reference level and the scale appear on the top of the spectral graph. To adjust the two parameters quickly by pressing *F1*(AUTO) button, the reference level and scale will be adjusted automatically to get optimal scope.

Press *F3*(▼) to enter the next soft key menu, you can prefer to set the reference level and scale. The desired scale (1,2,5,10dB) can be selected by pressing *F1*(scale) repeatedly. To tune the reference level by pressing *F2*(REF), the icon REF will be shown, and the reference level can be adjusted by using *UP* and *DOWN* keys. Press *F2*(REF) again to exit from the reference level adjusting mode.

ZOOM IN AND OUT

The *DS1151B* supports 5 levels of magnification. To zoom in or out by pressing *SCAN* button repeatedly. The spectral graph will zoom in on or out from the marked channel.

LIMIT DISPLAY

Enter the FAST SETUP mode of scanning function by pressing *SET* button.

Set the LIMIT DISPLAY item to be ON status, the limit will be displayed in spectral graph as shadow. You can check that the carrier levels are within limits. Refer to figure 3-14.
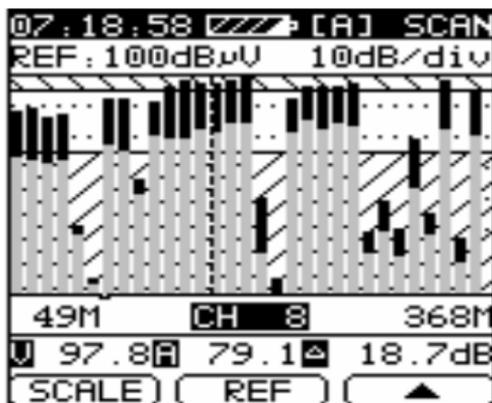

Figure 3-14

EDIT LIMIT

You can set the parameters of limit by selecting LIMIT EDIT option in FAST SETUP mode. The minimum video level (40dBμV to 120dBμV), maximum video level (40 to 120dBμV), maximum delta video level (2dB to 30dB), maximum V/A(5dB to 30dB) and minimum △V/A(0dB to 15dB) can be selected by yourself. Refer to figure 3-15.
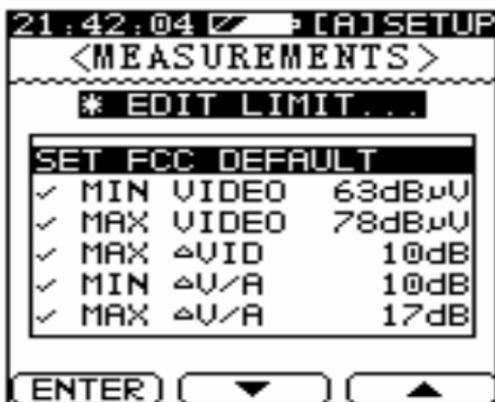
Figure 3-15

After all parameters is determined, select SAVE AND EXIT to save the setup and return to the previous menu.

3.5 FREQUENCY SPECTRUM

The *DS1151B* is capable to measure the frequency spectrum with spans ranging from 2.5 to 62.5 MHz. A special full span can be set, and the *DS1151B* does as the spectrum measurement according to the selected user plan. The amplitude of each video carriers will be sampled and displayed.

To do the absolute spectrum measurement by pressing **SPECT** button with transmission option being set as "OFF". The screen displays as figure 3-16.
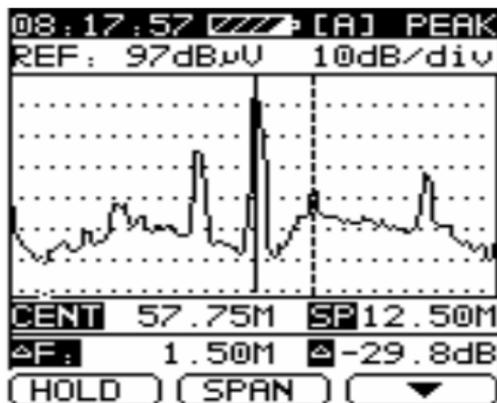
Figure 3-16

RELATIVE MEASUREMENT

The *DS1151B* enables you to do the relative spectrum test. The loss insertion for cable, branch line, distributor, amplifier and filter can be test simply through the function. The *DS1151B* utilizes the signal of your CATV system or noise generator to achieve this.

The TRANSMISSION option needs to be set as "ON" status to perform the relative spectrum measurement.
Scroll to MEASUREMENT line in SETUP mode. The screen displays as following by pressing *F1*(ENTER). Scroll to TRANSMISSION line and set the option as "ON" status by pressing *UP* and *DOWN* buttons. The 'ON' indicates that the relative spectrum measurement is enabled once pressing the *SPECT* key. Otherwise the absolute spectrum measurement is enabled.

Figure 3-17

Once selecting the "ON", the screen shows as fig3-18.

Figure 3-18

You have the option to build the new spectrum reference data by pressing *F1*(YES). To use the original zero reference data by pressing *F2*(NO). If you select to

build a new zero reference data by pressing *F1*(YES). The *DS1151B* displays following prompt:

Figure 3-19

To build a new zero reference data according to the signal of CATV system, you need to connect the cable with the RF input port of the meter. You may have a noise generator (such as DS5032). You can connect the noise generator with the meter and power on the noise generator.

Press *F1*(ENTER), the *DS1151B* scans the amplitude automatically according to the video carriers of selected user plan. The span of spectrum measurement will be set as full span of selected user plan. After building the new zero reference data, the *DS1151B* displays the following prompt:
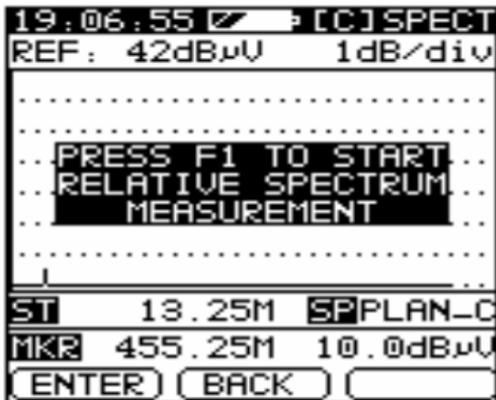
Figure 3-20

Press **F1**(ENTER), the *DS1151B* will perform the relative spectrum measurement according to the new zero reference data saved in memory.
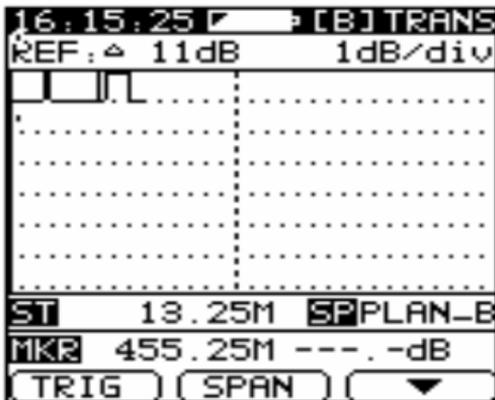

Figure 3-21

The "REF" indicates △dB to show the delta level between the reference line and the zero reference data.

The relative measurement level of each frequency point can be read out in data by moving the marker line.

The zero reference data remains in the memory even when turn off the meter. You can do a new relative spectrum measurement anytime by pressing *SPECT* button. To resume the absolute spectrum measurement by putting the TRANSMISSION option into OFF status.

CENTER AND SPAN
To change the center frequency directly by pressing *2nd* button to put the keypad into alphanumeric keypad, directly input the desired center and press *F1*(ENTER) to confirm the entry. The center frequency can be increased or decreased by moving the marker line to the end of the viewing range.

You can press *F2*(SPAN) to change the sweeping bandwidth. The span cycles through 2.5, 6.25, 12.5, 25, 62.5M and full span. When the full span is selected, the span is displayed as the label of selected user plan (A,

B,C,D or E), the start frequency will be displayed instead of center frequency, and it can not be changed.

FREEZE SWEEPING
You may want to freeze the sweeping to study the graph, simply press *F1*(HOLD), the sweeping process will be stopped on current sweeping point. To resume the sweeping process, press *F1*(TRIG).

REFERENCE LEVEL AND SCALE
To adjust the reference level and scale by pressing *F3*(▼) to enter the next soft key menu.

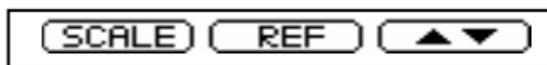$$\boxed{\text{SCALE}}\ \boxed{\text{REF}}\ \boxed{\blacktriangle\blacktriangledown}$$

Figure 3-22

You can change the scale by repeatedly pressing the *F1*(SCALE) button. The scale cycles through 1dB, 2dB, 5dB and 10dB. To adjust the reference level, you can press *F2*(REF) button, and the soft key icon is displayed as REF .In this mode, the *UP* and *DOWN* keys can be used to tune the reference level, and the graph will be redrew with the adjusting. To exit from the mode by pressing *F2*(REF) again.

You may wish to set the reference level and the scale

automatically, simply press *F3*(▼▲) in figure 3-21. The new soft key menu displays as figure 3-23. To automatically adjust the reference level and scale by pressing *F1*(AUTO).

```
( AUTO )  ( ⌂MKR )  (   ▲   )
```

Figure 3-23

MARKER AND DELTA MARKER
The amplitude and frequency of each measured point can be read out in data through the marker line. To tune the marker by *UP* and *DOWN* arrow buttons. You can also set a delta marker to read out the delta value of two specified frequency points.

To set a delta marker, switch the soft key menu to figure 3-23 by repeatedly pressing the *F3* button. Move the marker line to the desired frequency point at first, press *F2*(△MKR), a delta marker line will be active and be shown on the point which the marker is placed. Now you can move the marker line to another desired frequency point by using *UP* and *DOWN* buttons, and the delta frequency and delta level between the two frequency points can be shown on the bottom of the screen.
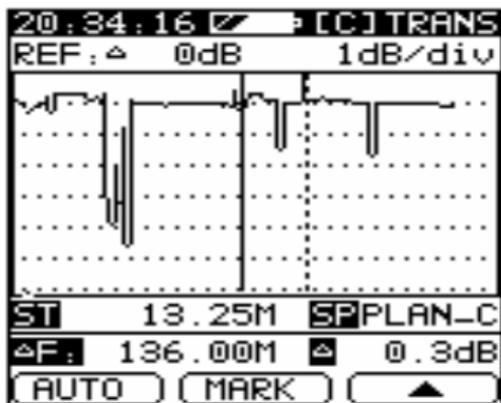
Figure 3-24

PEAK-HOLD LEVEL MEASUREMENT

You can do the peak-hold measurement in SPECTRUM mode by pressing *SPECT* key again.
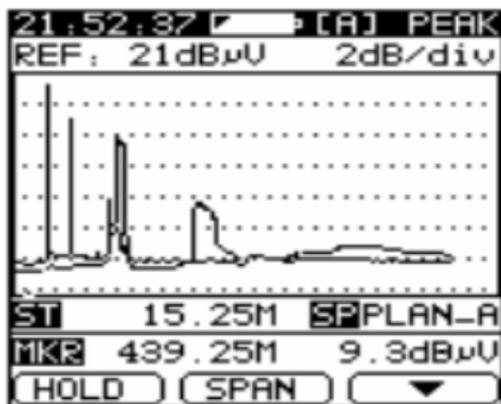

Figure 3-25

The "PEAK" will be displayed in the title line. The

peak-hold curve will be displayed with the real test one. The peak-hold curve will be shown in darker wave, and the measurement data of peak-hold curve can be read out though the marker in PEAK-HOLD MEASUREMENT mode.

To make a fresh peak-hold curve by pressing *SET* button to enter the FAST SETUP mode. Select the FRESH P-H DATA option, the original peak-hold curve will be deleted, and the *DS1151B* will restart calculating the new peak-hold data.

3.6 TILT/LEVEL LIST

To fast check the flatness and the gain distribution of the cable system, press *TILT* button to enter the TILE/LEVEL LIST mode. You can fast test up to twelve specified channels and read out the measurement data in spectral graph or data.

TILT MODE

Press the *TILT* button, the screen displays as figure 3-25. All of the tilt channels will be sampled and be displayed as spectral graph. The level of the lowest and highest channel is displayed. And the tilt value is displayed on the bottom of the spectral graph.
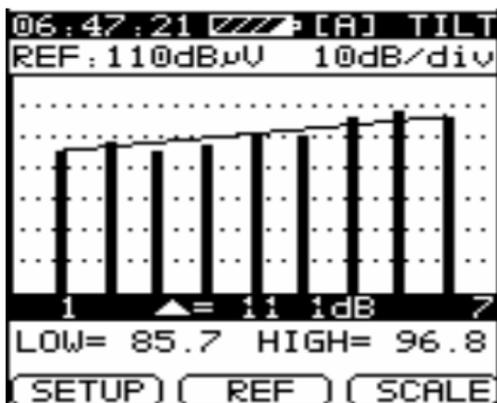
Figure 3-26

Before do the TILT measurement, at least four tilt channels must be enabled, Otherwise the following prompt will pop out.

> PLEASE SELECT FOUR
> OR MORE CHANNELS !
> PRESS F1 TO SETUP!

Press *F1*(SETUP) to set the tilt channels. The *F2*(▼) and *F3*(▲) buttons can be used to highlight the channels, and resume the selection by pressing *F1*(ENTER). The " √ " indicator will be shown to mark the enabled channel. To disable the channels, highlight the channel and press *F1*(ENTER) again, the " √ " will disappear. The channel number of the enabled channels will be shown in the bottom box according to the frequency carriers.

Figure 3-27

After the setup, press **TILT** button to start the TILT measurement, and the TILT setup will be saved automatically.

The scale can be changed by repeatedly pressing F3(SCALE) button. To adjust the reference level of graph, press F2(REF) button to enter the adjusting reference level mode. Press **UP** and **DOWN** buttons to increase or decrease the reference level. To exit from the mode by pressing **F2**(REF) button again.

LEVEL LIST MODE

The TILT button toggles between TILT mode and LEVEL LIST mode. You can read out the measuring level of TILT channels in data.
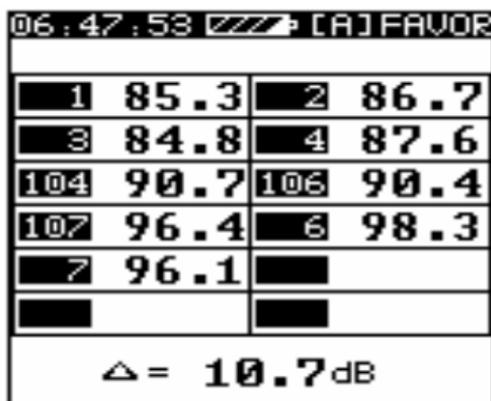
Figure 3-28

3.7 LIMIT TEST

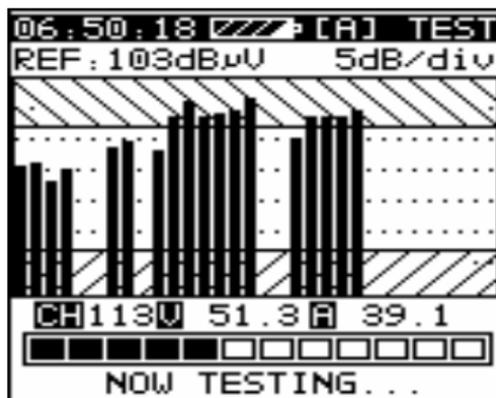The *DS1151B* is capable of fast checking the cable system by the specified test limits.

Figure 3-29

Press *LIMIT* button, the amplitude of each channel of selected user plan is checked one by one. The channel number, video level and audio level will be shown with the measuring process.

NOTE:
THE *DS1151B* CHECKS THE ANALOGUE CHANNEL ONLY IN THE LIMIT TEST MODE.

TEST RESULTS LIST
After the limit test scanning, the general test results of cable system will be listed as following:

Figure 3-30

The test items are consist of minimum video level, maximum video level, maximum delta video level, minimum $\triangle$V/A, maximum $\triangle$V/A and maximum $\triangle$ADJ channels.

To observe the test results of each channel, press
F1(LIST), the screen displays as following.

Figure 3-31

Highlight the desired channel by *F2* and *F3* buttons,
and press *F1*(ENTER) to observe the limit test detail.

Figure 3-32

The video level, audio level and $\triangle$V/A of highlighted channel are shown on the top of the screen, and the limit test results of each test item are displayed on the bottom of the screen.

EDIT LIMIT

You can edit the limit setup in SETUP mode. To enter the limit editing mode by pressing **SET**+ MEASUREMENT + LIMIT SETUP + EDIT LIMIT

The screen displays as following:
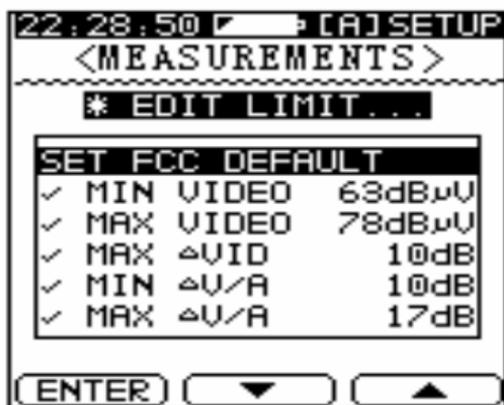
Figure 3-33

Select the limit test item by using **F2** (▼)and **F3** (▲)buttons, the highlighted limit item can be enabled or disabled by pressing **F1**(ENTER). The " √ " indicates that the limit test item will be performed in limit test mode. You can input the desired limit value in *2ⁿᵈ* keypad, or by **UP** and **DOWN** buttons.

3.8 AUTO TEST

The *DS1151B* can be set to perform automated level measurement sequentially. The measurement process can be programmed and saved in a project. At most seven projects can be programmed and stored. Once you running a project, the programmed test item will be executed sequentially, the measurement data can be shown on the screen, and after all the measurement data will be stored into a file automatically.

CONFIGURING AN AUTO TEST

You can enter the auto test menu by pressing *AUTO* button. The existing projects are listed on the screen. The *DS1151B* can store up to seven projects. You can highlight the desired project by pressing *UP* and *DOWN* buttons. The highlighted project can be executed by pressing *F1*(START).To delete a highlighted project by pressing *F2*(DEL).

You may wish to study the measurement process of the highlighted project, simply press *F3*(INFO), the measurement items of the selected project will be listed as figure3-34. The *UP* and *DOWN* buttons are used to select the item, The test details can be shown by pressing *F1*(ENTER). To return to the previous menu by pressing *F3*(BACK).

Figure 3-34

The screen displays as figure3-35 when moving the cursor down to a blank row. Your *DS1151B* will guide you step by step to build a new project.

Figure 3-35

Be sure to press *F1*(NEW) to create a new project. You must name the new project at first. Press *F1*(NAME) or

2nd button to put the keypad into alphanumeric keypad mode and input the name of the project.

Figure 3-36

After determining the name of the project, press *F2*(NEXT) to perform the step 2.

figure 3-37

The auto test includes four types measurement LEVEL

TEST, FREQUENCY SPECTRUM, LIMIT TEST and TILT measurement.

The " √ " indicates the measurement that can be executed in auto test process. Select the desired measurement type by *UP* and *DOWN* buttons, and disable or enable it by pressing F1(ENTER) key. To enter the STEP 3 by press *F2* (NEXT)

Figure 3-38

The enabled measurement items will be listed on the screen. Select and highlight the measurement item by pressing *UP* and *DOWN* buttons and press *F1*(ENTER) key to edit the test procedure.

You can select which channel can be tested in LEVEL item of auto test procedure. Move the cursor by *UP* and *DOWN* buttons and disable or enable the measured channels by pressing *F1*(ENTER). The channel marked by " √ " will be tested in LEVEL item of auto test

procedure. Be sure to confirm the entry by pressing *F3*(BACK) button.
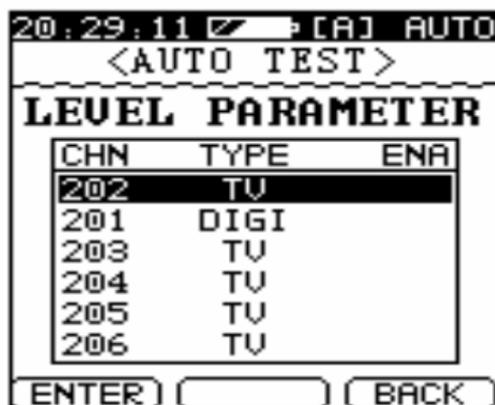
Figure 3-39

Select SPECTRUM in figure 3-38,you can configure the center frequency and bandwidth of spectrum item.

Figure 3-40

Input the center frequency by *2nd* keypad. The bandwidth can be set by *F1*(ENTER) button. To confirm the entry by pressing *F3*(BACK) key.

Select the LIMIT item in figure3-38, the meter will enter the limit setup menu. Press *F1*(ENTER) to set the limit automatically according to the FCC standard when the SET FCC DEFAULT option being highlighted.
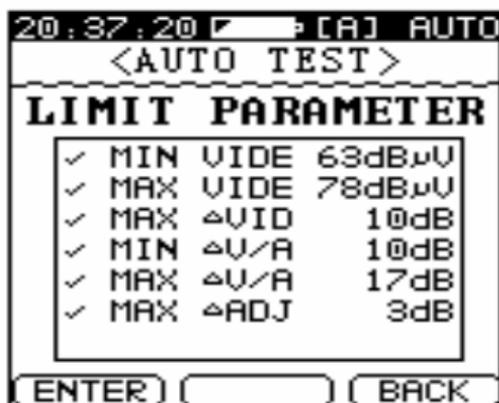
Figure 3-41

Use the *F2*(▼) and *F3*(▲) to move the cursor. The enabled limit test items are marked by " √ " indicators. To disable it by pressing *F1*(ENTER). The limits can be increased or decreased by pressing *UP* and *DOWN* keys. To confirm the entry by pressing *F3*(BACK) button.

To set the measured tilt channels of auto measurement by selecting TILT item in figure 3-38. The screen

displays as following, confirm the entry by pressing **F3**(BACK) button.

Figure 3-42

After configuring the auto test, you can start the auto test procedure by pressing **F1**(START).

Figure 3-43

The auto test results will be stored as a file. You may wish to save the programmed project only, simply start the auto test procedure by pressing *F1*(START), then exit from the auto test procedure by pressing *F1*(EXIT), then the programmed project will be stored with the input name.

If your *DS1151B* is capable of automatically measuring for 24 hours (option), you can press *F2*(24H) in figure 3-43 to do the setup of auto measurement for 24 hours.

PERFORMING THE AUTO TEST

To execute a stored project by pressing *AUTO* button. Refer to 3-44.

```
21:41:24 ⌐  ⌐[A] AUTO
      <AUTO TEST> ·
─────────────────────
NAME     DATE     TIME
47    10/00/02 20:57



─────────────────────
(START) ( DEL ) ( INFO )
```

Figure 3-44

You can highlight the desired project by pressing *UP* and *DOWN* buttons and start the auto test procedure by

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pressing **F1**(START).

The programmed measurement item will be executed and displayed the test procedure on the screen. When the auto test procedure is completed, the test results will be stored automatically, and your *DS1151B* will display a list of stored files of auto test procedures that are available for viewing and printing.

VIEW THE AUTO TEST RESULTS
The auto test results is saved as a file with "*" indicator displayed beside the file name. The files can be recalled by pressing **FILE** button. The existing files will be listed with the file name, date and time.

Figure 3-45

Highlight the desired file by pressing **UP** and **DOWN**

buttons, press *F3* (LOAD) to view the stored contents.

Figure 3-46

The file name, user plan and measurement items which have been executed will be listed. The auto test is executed according to the user plan showed in the screen. You can select the desired measurement item by pressing *UP* and *DOWN* buttons, and study the measurement data by pressing F1(LIST) or F2(VIEW) button. If a proper printer is connected with the instrument, the measurement data of the desired file can be printed immediately by pressing F3(PRINT) button.

The *F2*(VIEW) button can be used to view the measurement graph of spectrum measurement or limit test when the correlated item being highlighted. To exit the viewing mode of figure 3-47 by pressing *FILE*

button on the keypad. The *DS1151B* will return to figure 3-46.

```
21:52:12 ⌐   :[A]SPECT
REF: 12dBμV      1dB/div
........................
........................
........................
........................
........................
........................
........................
CENT 650.00M  SP 2.50M
MKR 650.00M    8.8dBμV
( AUTO )( ⌐MKR )(   ▲   )
```
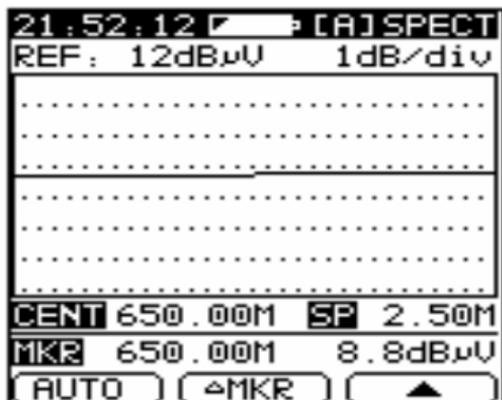
Figure 3-47

You can list the test data by pressing *F1*(LIST) key. The figure3-48 is the list of LIMIT TEST item.

```
21:56:33 ⌐   :[A] LOAD
LIMIT TEST DATA  dBμV
CHN   TYPE   LVL   P/F
202    TV           ×
201    DIGI   22.3   -
203    TV      8.3   ×
204    TV      8.3   ×
205    TV      8.4   ×
206    TV      8.5   ×
207    TV      8.6   ×
208    TV      8.6   ×
( BACK )(   ▼   )(   ▲   )
```

Figure 3-48

The stored spectrum data can be listed as figure 3-49. To

return to figure3-46 by pressing *F1*(BACK).

Figure 3-49

The *DS1151B* lists the TILT MEASUREMENT data as figure 3-50.

Figure 3-50

The LEVEL MEASUREMENT data is listed as figure

3-51.
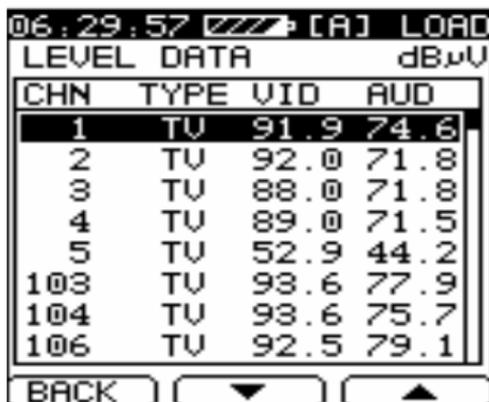
Figure 3-51

3.9 SAVE AND LOAD

DS1151B supplies 32K bytes memory space to store the measurement data. The measurement data of LEVEL mode, SCAN mode, TILT, LIMIT TEST, and frequency SPECTRUM can be saved in one file. The system distributes differenc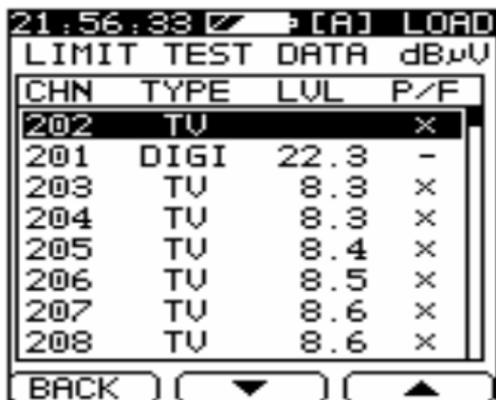e memory size for file that includes difference measurement data. Up to 110 files can be saved in the *DS1151B* depending on the size of saved files.

THE FILE DIRECTORY

Press *FILE* button to enter the menu, you are presented with a directory of existing files.

Figure 3-52

The stored files are labeled by file names, date and time. The file which is saved in AUTO TEST procedure is marked with "*" indicator.

You can highlight the desired file by using *UP* and *DOWN* buttons. To delete the highlighted file, press *F2*(DEL) button, and the system will release the distributed memory space of the deleted file.

STORING A FILE

Press *F1*(NEW) button to store the current measurement data into a file. A screen will appear to enable you to define the file name. The current selected user plan and current measurement data that can be stored will be displayed. Refer to figure 3-53.

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Figure 3-53

The file name can be defined by using alphanumeric key after pressing *2nd* key. Use *F2*(▼) and *F3*(▲) to scroll to the desired measurement data to which you want to save. The ON/OFF label appears with the measurement data to flag the storing selection, and the label can be changed by pressing *UP* and *DOWN* buttons. The measurement data marked by ON can be saved. To store the file by pressing *F1*(OK). Before storing, be sure to enter the file name.

NOTE:
1. Only the test data of the measurement that has been performed can be displayed and saved.
2. At least one measurement item must be enabled, otherwise the saving operation can not be performed.

VIEWING A FILE

You are able to recall a stored file and view or print out it, and adjust the display setting the same as viewing a real measurement. Use the *UP* and *DOWN* buttons to scroll to a file line to which you wish to view, and press *F3*(LOAD) to view the file. See the section3.8 to find out how to access the existing files.

NOTE：How to save the current status?
If you would like to enter the precious measuring menu with the expected setup when switching on again, please PRESS "FILE" KEY TWICE to save it before power off.

3.10 VOLTAGE METER

To perform the voltmeter function by pressing
    SET + MEASUREMENT + VOLTAGE
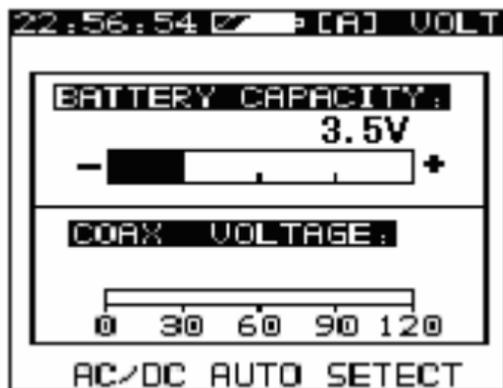
Figure 3-54

In the interface the battery energy and the coaxial cable voltage can be tested at the same time. Each voltage can be shown as a column graph. The battery energy displays as a voltage. When the battery voltage is lower than 3.2V, a prompt will be displayed, the instrument will automatically shut down after a while. The voltage of the coaxial cable is tested with the AC/DC judging automatically.

3.11 C/N

Connect the cable system with the instrument and press the *C/N* key to enter the C/N mode. The carrier level and the C/N ratio will be tested and displayed on the

screen. To improve the C/N measurement accuracy, you can shut off the carrier at this time, and the instrument will test the noise level according to the status and get the new C/N ratio.


```
07:32:40 ⚡⚡⚡▶[A]    C/N
CH    1
FREQ         49.75MHz
LEVEL        88.2dBµV
C/N =        44.0 dB

SHUTDOWN CARRIER TO
INCREASE PRECISION.
```
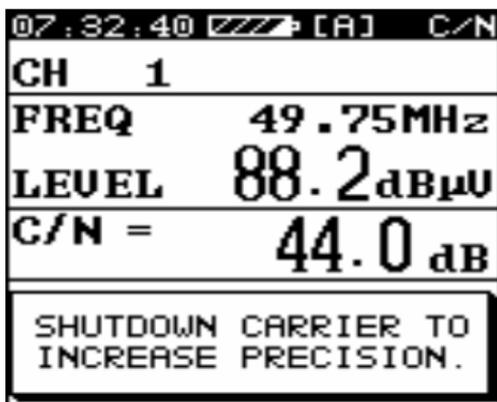
Figure 3-55

To test the C/N ratio, the input level of carrier must be higher than 85dBµV.

3.12 PRINT

The meter provides you the function of printing the data you have saved and tested in the LEVEL, SCAN, SPECTRUM and TILT mode. You can review the result through the printing report. And the system can print files by several models of printer. The printer you want to use should be set in the SETUP mode. You can select one of 4 types of printers, includes CANON BJ-N,

LQ1600K, LQ300 and HP-III. Refer to figure 3-56.


```
17:42.11 ☑ ⬛[B]SETUP
      <GENERAL>
~~~~~~~~~~~~~~~~~~~~~~
  * SELECT PRINTER

  ✓ CANON BJ-N
    EPSON LQ1600K
    EPSON LQ300
    HP  Ⅲ


 [ENTER] [  ▼  ] [  ▲  ]
```

Figure 3-56

The more printer supporting software will be supplied by DEVISER, the user can download the new software form the website www.deviser.com.cn , and upgrade the software of the instrument through the communication port using the data cable and PC.

To connect to the serial printer (such as EPSON LQ300),you need a serial printer cable (5pin~25pin,P.310075L25).

To connect to the parallel printer, a data cable , parallel printer adapter (option)and a standard printer cable are needed. For more connecting details, you can view the PRINTER SETUP section of chapter 4 and 6.

TILT   REPORT

****

<TILT>   UNIT: dB μ V

CHAN	TYPE	LEVEL
1	TV	69.8
5	TV	79.8
11	TV	89.0
122	TV	83.2

4 SETUP

4.1 INSTRUCTION

You can easily configure the *DS1151B* by using the SETUP. To access the SETUP mode by pressing **SET** button.

The *DS1151B* has two SETUP mode, one is FAST SETUP mode, another is FULL SETUP mode. The FAST SETUP mode can be entered by pressing **SET** key in the measurement mode. The items of FAST SETUP mode is correlated with the specified measurement mode.

To enter the FULL SETUP mode, you may press the **SET** button for up to two times, this brings up the FULL SETUP menu as figure4-1.

Use **F2**(▼) and **F3**(▲) to scroll to the option to which you desired. Press **F1**(ENTER) to select the display.

Figure 4-1

INFORMATION: General information of the *DS1151B*, includes manufactory, version and the setup status.

GENERAL: The setup includes backlight, data and time, power management, display contrast and printer selection.

MEASUREMENT: The setup for measurement includes level units, limit setup, voltage measurement, relative spectrum measurement and some other.

CHANNEL PLAN: The setup for channel plan includes user plan selection, learn and edit user plan and tilt channel setup.

4.2 INFORMATION

Display the information of the instrument. The

information page can be page up and down by pressing
F2(▼) and *F3*(▲) buttons to view the more details.

Figure 4-2

Repeatedly press the *F2*(▼), the display lists the setup
of the *DS1151B* in three pages.

Figure 4-3

4.3 GENERAL

Use the GENERAL setup to configure the general parameters of the *DS1151B*.

Figure 4-4

The active parameters of the highlighted option are displayed on the bottom of the screen.

BACKLIGHT

The backlight function is designed to satisfy the difference requirement. You can set the backlight to be always on or to be shut off anytime. And the backlight can be set and work in intelligence power saving mode. It can be set to shut off after specified time for the inactive keypad, and the backlight will be turned on once any key being pressed.

```
       5 MINUTES
PRESS ⇧ OR ⇩ KEY
```

Figure 4-5

To configure the backlight parameter by pressing *UP* and *DOWN* buttons. You may set the backlight parameter to be ON, OFF, 3 minutes, 5 minutes, 10 minutes and 30 minutes.

LCD CONTRAST

The LCD contrast is difference in difference temperature environment. To get the optimal viewing, you may adjust the LCD contrast by pressing *UP* and *DOWN* buttons.

```
PRESS ⇧ OR ⇩ KEY
```

Figure 4-6

SHUTDOWN TIME

To save the power, the instrument can be set to shutdown automatically for inactive keypad after 3 minutes, 5 minutes, 10 minutes or 30 minutes. For some special measurement that will be performed for long time, the SHUTDOWN TIME option must be disabled by setting the option to be "ON".

ON
PRESS ⇧ OR ⇩ KEY

Figure 4-7

If the shutdown function is enabled, after the specified time with inactive keypad, a prompt will be displayed ahead of 20 seconds before the shutdown of the *DS1151B*. And the measurement process will be stopped.
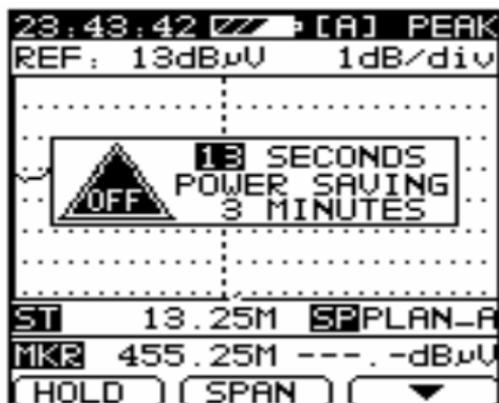

Figure 4-8

You can read out the remaining time in seconds. And the setup of SHUTDOWN is displayed. Press any other buttons except *UP* and *DOWN* on the keypad to recall the original display. Of course you may change the SHUTDOWN parameter efficiently by pressing *UP* and *DOWN* keys.

TEMPERATURE UNIT

You can read out the internal temperature of the *DS1151B* in centigrade or Fahrenheit unit specified by the TEMPERATURE UNIT option. Use the *UP* and *DOWN* buttons to adjust the setup.

```
              °C
PRESS ⇧ OR ⇩ KEY
```

Figure 4-9

DATE &TIME

Highlight the option and press *F1*(ENTER) to set the date and time.

```
19:11:17 ▮  ▸[A]SETUP
       <GENERAL>
      ✱ DATE & TIME

    ENTER NEW DATA:
    Y/M/D 2010/00/09
    ENTER NEW TIME:
        19:11:17

 ( ENTER )( ▼ )( ▲ )
```

Figure 4-10

You can adjust displaying order of the date to any desired order (Year/Month/Date, Month/Date/Year or Date/Month/Year) by pressing *UP* or *DOWN* button when the date option is highlighted.

Scroll to the option to which you wish to set by pressing *F2*(▼)and *F3*(▲) buttons. To input the desired date and time by pressing numeric keys in *2nd* keypad.

NOTE:
The first two digits of year is fixed as 20, you only need to input the last two digit of year.

PRINTER SETUP
You can select the printer type in the screen.

Figure 4-11

The enabled printer can print out the stored files in report format through the communication port. The *DS1151B* supports 4 models of printer as following:

PRINTER MODEL	HARDCOPY PORT	MANUFACTORY
LQ1600K	PARALLEL	EPSON
LQ300	SERIAL	EPSON
BJ-N	PARALLEL	CANON
HP-III	PARALLEL	HP

The new software which can support more printers will be supplied by Deviser. You can download the software from the Deviser website (http://www.deviser.com) and upgrade the meter through the communication port by using the data cable (P.3100805L9) and the PC.

To connect to the serial printer (such as LQ300), you need a serial printer cable (Deviser part number P.310075L25). To connect to the parallel printer, a data cable, parallel printer adapter (option, part number 0115005) and a standard printer cable are needed. For more details, you can view the chapter 6.

LCD TEST
The LCD can be tested through the option. You can press *F1*(ENTER) repeatedly to make the screen display

as all white, all black, vertical stripe and checker board step by step.

4.4 MEASUREMENT

The measurement parameters can be accessed and set in the display.

Figure 4-12

TRANSMISSION

The frequency spectrum measurement can be performed to test the transmission character of the circuit parts or your system through relative measurement set by TRANSMISSION option.

Figure 4-13

When the option is set as ON, the relative spectrum measurement can be performed in SPECT mode. The zero reference data can be built up according to the prompt displayed in the screen when setting the option as ON. When the option is set as OFF, the absolute spectrum measurement can be performed in SPECT mode. For more details, you can view the section 3.4.

LEVEL UNITS
You can set the *DS1151B* to test for dB μ V, dBmV or dBm by pressing *UP* and *DOWN* buttons.

```
          dBμV
PRESS ⇧ OR ⇩ KEY
```

Figure 4-14

FREQ TEST SETUP
FREQ TEST SETUP menu is same as the FAST SETUP of FREQ LEVEL mode, refer to figure 4-15.

You can use the *UP* and *DOWN* buttons to adjust the frequency tuning step size ranging from 10KHz, 100KHz, 1MHz, 10MHz, or setting the step size as channel step of current selected user plan.

The volume of built-in speaker can be increased or

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decreased by pressing *UP* and *DOWN* buttons. To shut off the speaker when the level is too low in FREQ LEVEL mode, you can configure the MUTE FOR NOISE option as YES status.

Figure 4-15

SCAN SETUP

The SCAN SETUP displays as the FAST SETUP of SCAN measurement mode. It includes LIMIT SETUP and MARKER DISPLAY options. Refer to figure 4-16.

The limits can be displayed as shadow in SCAN graph by setting the LIMIT DISPLAY option in YES status. You can set the marked channel to be labeled as channel number or frequency in SCAN mode by configuring the MARK DISPLAY option as "CHN" or "FREQ".

Figure 4-16

To edit the test limits, you can highlight the EDIT LIMIT option and press *F1*(ENTER), the screen displays as figure 4-17.
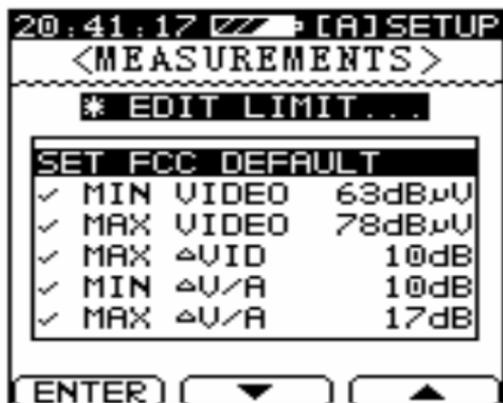

Figure 4-17

The test limits can be set according to FCC requirement

by selecting SET FCC DEFAULT option and pressing F1(ENTER).

Item	Limit
Minimum Video level	63dB μ V
Maximum Video level	78 dB μ V
Maximum delta Video level	10 dB
Minimum △ V/A	10dB
Maximum △ V/A	17dB
Maximum △ ADJ	3dB

FCC standard

To set the test limit as you desired, you can scroll to the correlated limit item to which you wish to adjust by pressing *F2*(▼)and *F3*(▲) buttons, and increase or decrease the limit value by using *UP* or *DOWN* keys.

After completing the setup of test limits, be sure to confirm the entry by selecting the SAVE AND EXIT option and pressing *F1*(ENTER).

NOTE:
THE LIMIT TEST CAN BE PERFORMED TO CHECK THE ANALOG CHANNELS ONLY. THE *DS1151B* CAN'T DO THE LIMIT CHECK FOR OTHER TYPES OF CHANNEL.

For more details of LIMIT SETUP by viewing EDIT LIMIT of section 3.4 and EDIT LIMIT of section 3.7.

FRESH P-H DATA

When performing the FREQUENCY SPECTRUM measurement, the *DS1151B* calculates the peak-hold level and displays the peak-hold level waveform in peak-hold level measuring mode. To fresh the peak-hold data of spectrum measurement, you can highlight the option and press *F1*(ENTER) to confirm the operation.

4.5 CHANNEL PLAN

The *DS1151B* performs the measurement according to the channel plan configuration of the user plan.

Figure 4-18

It is the most important setup of the *DS1151B* to measure the cable system quickly and efficiently. The screen displays as figure 4-18 when entering the channel plan setup menu.

SELECT USER PLAN

Up to five user plans can be built and saved in the meter to support the measurement for difference cable system plant. The user plans are labeled as A, B, C, D, E. The current selected user plan can be determined by pressing *UP* and *DOWN* buttons. Refer to figure 4-19.

```
PLAN  B      CCIR
PRESS ⇧ OR ⇩ KEY
```

Figure 4-19

The base channel plan which is used to built the user plan will be displayed on the top right of figure 4-19.

The label of the current selected user plan is displayed in the title line on the top of the screen, and it will be changed as well as the setting.

```
20:44:30 ⊑⊒ [B]SETUP
```

Figure 4-20

The meter will do the measurement according to the selection of the user plan.

CHAN NUM DISPLAY

You can set the channel number to be displayed in EIA(numeric) mode or STANDARD(alphanumeric) mode by pressing UP and DOWN buttons with the CHAN NUM DISPLAY option being highlighted.

Figure 4-21

After the selecting, the *DS1151B* will show the channel number as you desired in any measurement mode. The EIA(numeric) channel number and STANDARD (alphanumeric) channel number can be entered and edited in EDIT USER PLAN option.

LEARN USER PLAN

You can build and stored up to five user plans in one meter. After purchasing the *DS1151B* you should build the user plan before the first measuring to make the meter to be compatible with your cable system.

Use the following step-by-step procedures to build a new user plan.

1. Press *F1*(ENTER) to start the procedure of learning user plan with the LEARN USER PLAN option being highlighted. The screen displays as figure 4-22.
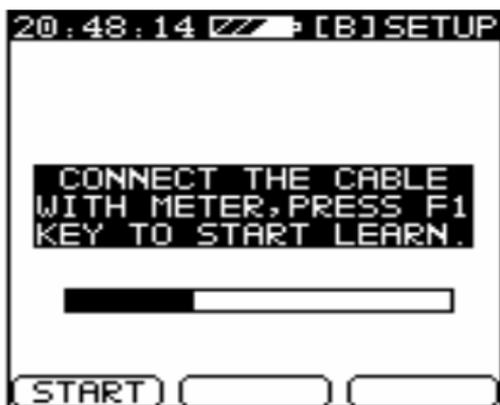

Figure 4-22

2. Connect the cable with the *DS1151B*, and press *F1*(ENTER) to confirm the operation.

3. The base channel plans came with the meter are listed. You can select one from the eight channel plans to build the user plan.

Figure 4-23

4. Using *F2*(▼)and *F3*(▲) buttons to highlight a desired base channel plan, and press *F1*(ENTER) to proceed the learning procedure.

5. The *DS1151B* start to search for active channels and display the channel number of which channel

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being checked. The meter will store the new user plan after completing the procedure, and enter the LEVEL measurement mode automatically. For more details you can view the section 3.2.

NOTE:
The channels whose amplitude is higher than 45dBμV will be enabled in user plan. The meter searches for analog channels only when building the user plan. If the number of channels whose amplitude is higher than 45dBμV is less than three, all channels of the base channel plan will be enabled to build the user plan.
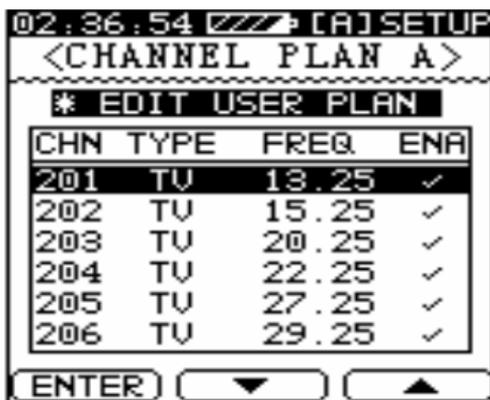
EDIT USER PLAN
The user plan consist of elements as following:

EIA(numeric) channel number
Standard (alplanumeric) channel number
Channel Label
Channel type (Analogue, DIGI, SINGLE FREQ)
Carrier frequency
Activation status

Each element can be edited manually. An accurate user

plan is essential for testing the cable system.

Enter the EDIT CHANNEL PLAN screen by pressing *F1*(ENTER) in figure4-18 when the EDIT CHANNEL PLAN option being highlighted, the screen displays as following:

Figure 4-24

Highlight the desired channel and press F1(ENTER) to edit the channel. Refer to figure 4-25.

Highlight the desired item by pressing *F2*(▼)and *F3*(▲) buttons and enter the desired value by *UP*, *DOWN* or alphanumeric keys.

You can enter the label of channel as "B4U" by alphanumeric keys, and the label will be displayed in

channel level measurement graph. Be sure to store the entry by performing the SAVE AND EXIT item.
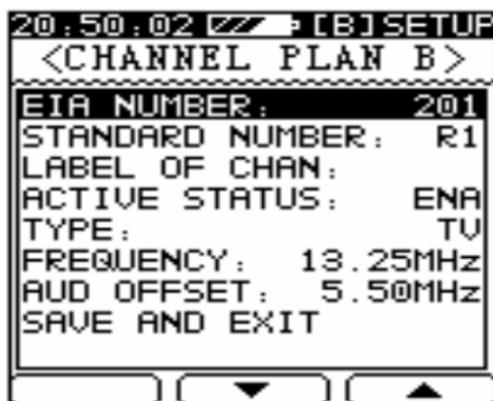


```
20:50:02 ▱ ∎[B]SETUP
  <CHANNEL PLAN B>
EIA NUMBER:        201
STANDARD NUMBER:    R1
LABEL OF CHAN:
ACTIVE STATUS:     ENA
TYPE:               TV
FREQUENCY:   13.25MHz
AUD OFFSET:   5.50MHz
SAVE AND EXIT
```

Figure 4-25

For more details, you can viewing the EDIT USER PLAN of section 3.3.

TILT/LEVEL LIST

Up to twelve channels can be tested in TILT/LEVEL LIST measurement mode. To set the tilt channels you can press the *F1*(ENTER) when the TILT/LEVEL LIST option being highlighted, or press *SET* button in TILT/LEVEL LIST measurement mode. Refer figure4-26.

Highlight the desired channel by pressing *F2*(▼)and *F3*(▲)buttons, and enable or disable the channel by

pressing the *F1*(ENTER) button. The " √ " indicator is shown to mark the enabled channel.

Figure 4-26

The *DS1151B* will assign the channel and display the channel number in the bottom box of the screen by the order according to the frequency.

NOTE:
IF THERE IS TWELVE CHANNELS HAVE BEEN ENABLED, THE ENABLING OPERATION WILL BE INACTIVE.

For more details you can view the TILT/LEVEL LIST section 3.6.

LOAD DEFAULT

You may wish to recall the manufactory setup to correct the error configure caused by error operation. Select the option and press *F1*(ENTER), the default setup will be recalled to overwrite the error setup.

5 POWER SUPPLY

The built-in 3.6V 3.5AH Ni-MH battery supplies the power for the instrument. It can be used continuously for above 6 hours on condition that it is fully charged. When the voltage of the battery drops below 3.3V, the battery indicator in the title line flashes at the top of the display screen. When the voltage of the battery is lower than 3.2V, the instrument will shut down automatically, and you must charge it for about 3 hours.

NOTE:
THE INSTRUMENT IS EQUIPPED WITH Ni-MH BATTERY, ONLY THE CHARGER(PW320111030) SPECIFIED FOR THE INSTRUMENT CAN BE USED TO CHARGE THE BATTERY! THE INSTRUMENT CAN NOT BE CHARGED BEYOND 10 ℃ ~35 ℃ , OTHERWISE THE BATTERY WILL BE DAMAGED.

The intelligence technology is used in power management. For difference work mode, the difference power managing method is used to save the power. Part of the circuits will be shut down in power saving mode. The working time is above 6 hrs in the highest power cost mode with full charged built-in battery. When the voltage of the battery drops below 3.2V, the battery indicator of title line will flash to indicate the user that the voltage of the battery is too low and the red light beside the charge socket will flash. You should charge the battery immediately. If the voltage of the battery drops below 3.2V, the instrument will shut off automatically.

A specified charger is used to charge the battery. To full charge the battery, the charge time is about 3 hrs. Plug the DC plug into the charge socket, and power on the meter, the charging procedure is executed, and the meter detects the charger type at first, then begin the charging process. The charging curve and battery energy will be shown as figure 5-1. If the power adapter is error or the battery is full charged when begin charging process, the prompt will be displayed as following.

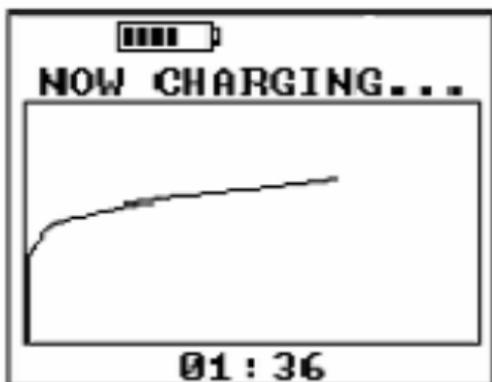> FULL CHARGED BATTERY
> OR ERROR POWER ADAPTER

Figure 5-1

*Battery—B.1100603R5(3.6V,3.6AH Ni-MH battery)
*AC charger—PW320111030

NOTE:
1. USE ONLY THE ADAPTER SUPPLIED WITH THE INSTRUMENT. ANY OTHER ADAPTER WILL DAMAGE THE UNIT.
2. THE *DS1151B* MUST BE TURNED ON TO PERFORM THE CHARGING OPERATION, AND THE SCREEN SHOWS AS FIGURE 5-1.

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6 PORT

The instrument can communicate with a PC or a printer through the 5 Pin communication port. Refer to figure 6-1.

Figure 6-1

1 ---- TXD 2 ---- RXD
3 ---- NC . 4 ----+5V
5 ---- GND

Communication software is supplied by manufactory. Connect the instrument with the PC by data cable and run the software. You can remotely control the instrument to do the measurement and the measurement data will be displayed as graph on the PC monitor.

  *Data cable—P.3100805L9

  (5 pins Din connector to 9 pins D-sub connector)

The windows OS environment is needed to run the software.

The serial printer such as LQ300 and parallel printer are supported by the instrument. The measurement data can be printed out in report format.

NOTE:

ONLY THE EXISTING FILE CAN BE PRINTED.

A serial printer cable is supplied with the instrument.

  *Serial printer cable—P.310075L25

  (5pins Din connector to 25pins D-sub male connector)

Connect the Din connector end to the instrument and D-sub connector to the printer, select the right printer type, enter the LOAD mode and select the desired file to begin the printing operation.

To print the report by parallel printer, a parallel printer adapter and data cable are needed.

  *Parallel printer adaptor--0115005

  (9pins D-sub connector to 25pins D-sub connector)

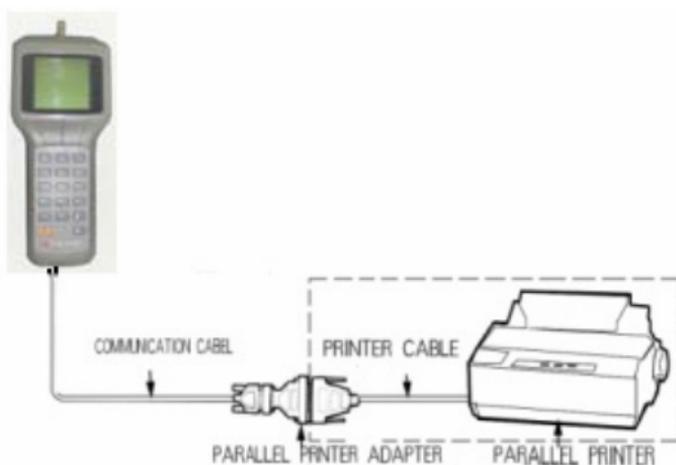Connect the instrument with the parallel printer as following:

Figure 6-2

Select the printer type and saved file to begin the printing operation.

Appendix A
Specification

Frequency:

Range: 5(46)MHz ~ 870MHz
Accuracy: $\pm 50 \times 10^{-6}$ (20℃$\pm$5℃)
Resolution: 10kHz

Channel Type:

Analogue TV: TV
Digital TV: QAM QPSK
FM channel: SIGL

Level Measurement

Range: 30dBμV~120dBμV
Accuracy: LEVEL$\pm$1.5dB (10℃-30℃) ($\geqslant$35dBμV)
                . $\pm$3dB   (0℃-40℃)
                SCAN($\pm$2dB) 10℃-30℃
Resolution: 0.1dB
Input
impedance: 75 Ω   (unbalance, BNC or F type connector)

Channel Scan

Number of channels:	150 channels max.
Scanning speed:	10 channels / s
Scale:	1,2,5,10 dB/div
Zoom:	1X, 2X, 3X, 4X,5X five levels of magnification

Frequency spectrum

Bandwidth:	2.5MHz, 6.25MHz, 12.5MHz, 25MHz, 62.5MHz
Scale:	1,2,5,10 dB/div

Carrier noise ratio (C/N):

Input range:	Over 85dBμV (25dBmV)
Range:	20 dB ~50dB max.(depending on inputting level)
Accuracy:	±2dB
Resolution:	0.1dB

Digital Channel (average) Power

Bandwidth:	0.28 MHz ~9.99MHz
Center frequency:	In the range of the measured
Digital modulation:	QAM, QPSK

Tilt measurement:

Number of channels: 4~12
Resolution: 0.1dB

Limit line:

Min video	40 dBµV ~120dBµV
Max video	40 dBµV ~120dBµV
Max△video	2 dB ~30dB
Min△V/A	0 dB ~15dB
Max△V/A	5 dB ~30dB
Max△ADJ	0 dB ~20dB

Trunk Voltage measurement:

Input range:	0 V ~100V (AC/DC)
Accuracy:	±1V
Resolution:	0.1V

Others:

Storage:	32K byte
Communication Port:	RS 232C
Printer:	Canon and Epson
Audio Output:	Built-in speaker
Dimensions:	218mm×95mm×49mm
Weight:	600g
Display:	128×128LCD with backlight

Power supply

Battery:	3.6V 3.5AH Ni-MH battery
Charger:	AC 90 V ~240V 50/60Hz
	1.8A 7V(max)
Work time:	Average 6~8 hours
	(full charged battery)
Charge time:	Less than 3 hrs

Accessories:

Charger:	DS10030 Charger	1pc
RF connector:	Type F-F .	1pc
Operation manual:	DK210101185	1pc
Data cable:	P.3100805L9	1pc
Serial printer cable:	P.310075L25	1pc
Com Software	DK401101182	
Package	PK100151182	1pc