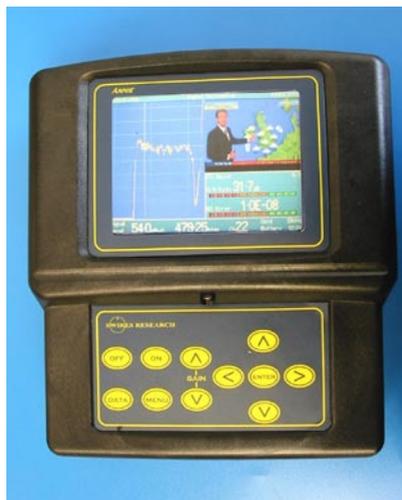


Operator's Manual for 'Annie 204' Digital /Analogue Spectrum Analyser



- Nylon carry case with light hood
- Mains battery charger
- Car charging lead
- Manual
- Stereo Headphones
- USB A to B type lead
- BNC & 3.5mm jack to Scart lead
- Signal Records - activated

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Setup Menu

Page 21/22 Setup menu
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Page 24. Useful information
Page 25. Signal Records / Favourites software

Congratulations

Thank you for purchasing the 'ANNIE 204', the latest Swires Research Television Spectrum Analyser.

We have designed this new model in order to meet with all the current needs of the CATV/SMATV systems engineer. With this latest Spectrum Analyser we have successfully fulfilled our design brief, which from the outset was to produce an instrument that is easy to operate, with the minimum of controls.

A Different Approach...

We started manufacturing instruments with LCD displays as early as 1984. It has always been our belief that solid state displays with inherent low current consumption are preferable to fragile cathode ray tubes. Swires have always designed and produced the high performance RF tuner modules used in our instruments.

Current spectrum display of digital multiplex being viewed.
(Either analogue or digital carrier can be viewed)



Live TV programme
– once signal is locked.

Channel information includes TV channel identity, signal to noise (SNR\ MER) and BER. In the case of Satellite, recognition the received Global position.

Typical triple screen display

Terrestrial Operation

Getting started...Terrestrial operation.

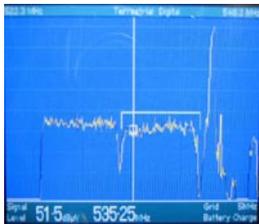
Press the ON key . Once the screen has initialised, which takes 10 seconds a spectrum display will appear.

At this point if you require the satellite band press the ON key once more.

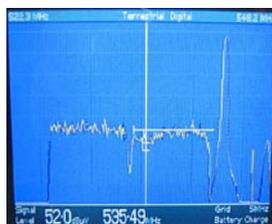
You can 'toggle' between terrestrial and satellite bands by pressing the ON key. (See page 11 for satellite operation.)

Usually the full band of relevant coverage is displayed, when either the terrestrial or satellite band is first switched on (Unless the 'boot up favourite' facility is being used – see page 8).

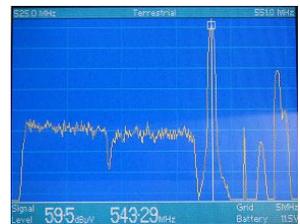
Use the up arrow key to zoom in on a selected carrier as in the pictures below.



1a. Correct digital tuning



1b. Off tune



2. Correct analogue tuning

Place the vertical cursor over a carrier using the Left or Right keys from the 5 –way 'joystick' –see pictures above. The correct position for Digital measurements is when the channel marker becomes an inverted 'U' around the top of the digital carrier as in picture 1a above.

If the cursor lock facility is ON the frequency cursor is always correctly tuned when stepping from channel to channel on either digital or analogue channels.

Signal strength of a carrier

Once the cursor is over a carrier, for analogue or digital, the signal strength is shown on the status bar – bottom left hand side.

A clever feature of the Annie 204 is that the signal level is **always** correct for both analogue and digital signals.



The unit of measurement can be either dB μ V or dBmV selected in the Set up Menu. (Menu , Set up Menu , set display to dB μ V / dBmV).

Terrestrial Operation

Pre/Post Viterbi error correction applied to DTT and DTS signal carriers

From Version 2.1 software for the Annie 204 has now got the added feature of checking the 'raw' state of the received signal (Pre-Viterbi) or the corrected (error corrected) state of the received signal.

This applies to both digital terrestrial (DTT) and digital satellite (DTS) signal carriers.

There is a toggle command in the Setup Menu.

When set to Pre viterbi the BER figure could possibly become erratic in its readings. Hence this is the signal in its raw form - no error correction applied by decoding circuit. When set to Post viterbi the SNR and BER figures will be more stable due to the fact that error correction is being applied within the decoding circuit. This is how the end users TV set shows the signal.

Why have both Pre and Post Viterbi?

We at Swires have always advocated that its better to see the signal in its rawest form rather than seeing how good the decoder chip is.

A pre correction BER figure for both Satellite and terrestrial could be as poor as $1.0 \text{ E-}02$.

With Error correction applied these figures will improve, some better than others. $1.0 \text{ E-}02$ could become $1.0 \text{ E-}05$ for satellite and an even bigger improvement for Terrestrial could be achieved. $1.0\text{E-}07$ or 08 is possible.

When in the triple screen mode you can see where viterbi is currently see picture below.

Pre/Post viterbi indication _____
on triple screen.



Terrestrial Operation

Setting the Cursor Lock Facility (UHF channels 21 - 69 only)

Default is 'ON'

Using this feature allows you to 'step' in 7/8MHz channel increments instead of frequency mode. In the UK version only the UHF bands 4 and 5. are enabled.

To measure VHF frequencies on the UK version this feature will need to be turned OFF. Align the vertical cursor over the carrier as in picture 1a on page 4. If you are measuring standard UHF bands 4/5 terrestrial channels it is quicker to leave this feature set to ON.

Setting the Cursor Lock Facility - ON

From the spectrum display press the MENU key on the keypad. A drop-down menu appears on screen. Use the up/down arrow keys to highlight 'set Cursor lock...'. Select Channels and press the ENTER key once again – 'Cursor locked to channels appears on the screen for 2 seconds. The vertical cursor will now 'step' in channel mode across the UHF band 4/5. While in 'cursor lock mode' the current 'active' channel is indicated on the status bar (current position of the vertical frequency cursor). **You will need to switch off this facility to be able to measure the carriers on non-standard frequencies- see below.**

Setting the Channel/cursor Lock Facility - Off

To deactivate and return to frequency mode for measuring VHF bands or non channelised frequencies press, the MENU key and highlight 'Set Cursor Lock...' using the up/down arrow keys.

Press the ENTER key. Select OFF from the three choices and press the ENTER key once more.

The frequency cursor is now in Frequency mode. You will need to Zoom OUT using the DOWN key to view the whole spectrum – 30 to 860 MHz. Using the Left arrow key move into the region of frequencies required. Zoom in using the UP arrow key to fine tune your selected frequency. See also Page 10 'toggle stored favourites'.

Terrestrial Operation

Obtaining a Picture and Data

Once you have the cursor over a carrier using the procedure as described on page 4 press the data key on the keypad.

If an **analogue** carrier is being examined horizontal and vertical synchronisation should be locked and a picture resolved. If the RED overload warning is ON attenuation should be added using the 'DOWN' GAIN key, otherwise an analogue picture may not be obtainable. Once you have a locked picture on the triple screen as figure 2 below, to view a full screen picture press the data key again.

If a **digital** carrier is being examined - once all three parameters are locked and a signal to noise figure is shown – a picture should be resolved. If no picture is evident and you have the 'channel lock' function off, use the left or right keys to move the frequency cursor slightly – if a BER (bit error ratio) figure also appears, a picture should soon follow. To view a full screen picture press the data key again.

A bar graph indicates very clearly the quality of the signal –Red, Amber, or Green.

■ Green = Good ■ Amber = Marginal ■ Red = Poor

Use the UP/DOWN keys to step through pictures within the multiplex being viewed. If the multiplex contains more than 1 channel a fraction figure will also be shown for example $\frac{1}{4}$. This indicates the number of the digital channel and the total number of available channels within the multiplex.

One Screen ALL relevant information you require!



Digital Terrestrial operation shown .
Channel identification and number of channels within multiplex

Signal to noise figure.
Min SNR,(MER) on 64 QAM 23dB
Bit error ratio figure 2E-04 Minimum

Figure 2

Terrestrial Operation

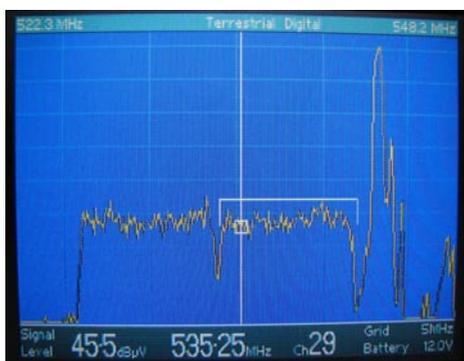
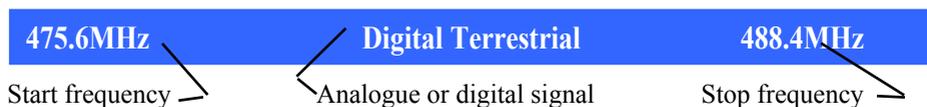
Adjusting the 'Gain' to View Waveforms

The Annie 204 has the capability of adding up to 64dB of attenuation (in 1dB steps) to the incoming signals. There is no need to add or subtract any attenuation to RF readings as this is done automatically. Initially always set the gain to bring the signals to approximately 3/4 of the screen height by pressing and holding the up or down arrow key for a few seconds. If the overload warning is flashing at the bottom of the screen add attenuation by pressing the down gain key

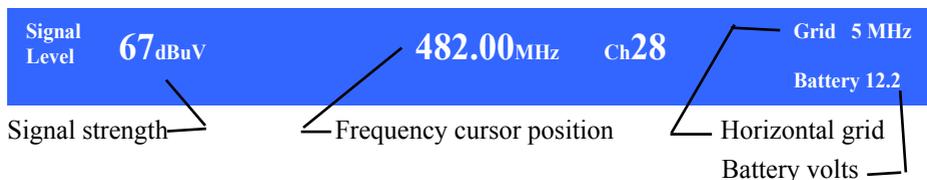
The Status Bar Displays

There are two 'status bars' on the screen of Annie 204 at all times, upper and lower.

The Upper Status Bar - Spectrum Analyser Mode

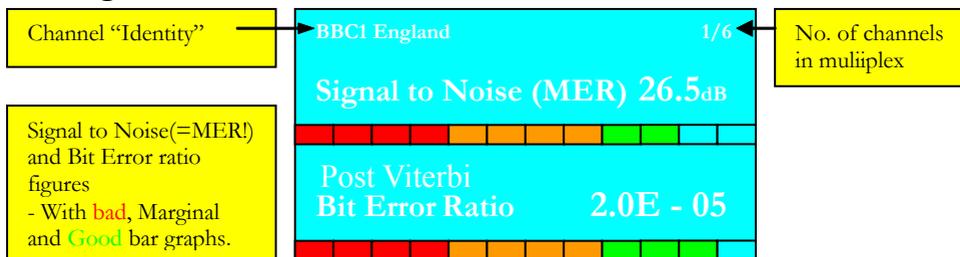


The Lower Status Bar - Spectrum Analyser Mode



Terrestrial Operation

The Digital Terrestrial Data screen.



Measurement of signal to noise /(Modulation Error Ratio-MER)

The measurement of signal to noise (SNR) on the Annie 204 is implemented **within** the carrier being actually measured. This form of 'in channel' measurement is extracted from the decoding process and is known as Modulation error ratio, MER for short.

* "MER can be regarded as a more accurate form of Signal to Noise ratio measurement that will give an indication of the quality of the signal".

* visit our web site www.swires.com/technical /are all your bits in place for a more detailed explanation of Modulation Error Ratio.

Measurement of Bit Error Ratio (BER)

The measurement of bit error ratio(BER) is extracted from the decoding process on terrestrial transmissions. We give the post viterbi figure, after correction figure which on Digital Terrestrial signals appears more stable .The higher the figure ie E-07, E-08 the less errors are occurring. The worst BER threshold as recommended by the Digital Television group (DTG) is <2.0E-04. (See page 5 for error correction settings)

The Vertical Grid

The Vertical grid on the spectrum display is approximately 5dB/Division. Therefore, for example, you can instantly measure on screen the difference between analogue sound and vision.

At any time you can move to the next channel up or down using the left or right <>arrow keys. (Assuming the Channel lock facility is ON).

The Horizontal Grid

The horizontal grid on the spectrum display is determined by the amount of zoom you are currently using. Minimum is 1MHz/Division, Maximum is 50 MHz/Division. Use the up/down arrow keys to adjust the amount of zoom applied.

Terrestrial Operation

Storing a Favourite Setting.

Up to 100 favourite settings can be stored in the memory to be retrieved at a later date. To store any current display as a favourite press the MENU key and using the up/down arrow keys, highlight 'store favourite'. A sub menu opens giving you 100 allocations in groups of 10. Select where you want to allocate your 'favourite' using the ENTER key .

Booting up with a Favourite Setting

The instrument can be set to start up with any previously stored favourite channel or selected spectrum display. This saves time if you are on a familiar signal feed. Whether Satellite or terrestrial it is selected from the Set up menu under the heading 'Boot up favourite'



Figure 3

CAUTION: If the boot up favourite is set to a satellite channel the Line powering will be ACTIVE ! Do not plug in a terrestrial feed until you have pressed the 'ON' key to toggle to terrestrial operation. This will deactivate the line powering voltage.

Recalling a Favourite Channel or Spectral range

Any of the 100 favourite channels (or spectrally scanned waveforms i.e. full coverage of your local transmitter or DAB / FM band etc.)* that have previously been stored can quickly be recalled to the screen of the spectrum analyser.

This can be either a single carrier or full band coverage whether terrestrial or satellite band is selected.

*There are a total of 200 favourites – 100 for terrestrial and 100 for satellite.

Press the MENU key and highlight the 'recall favourite' option on the drop-down menu. Press the ENTER key again and a further drop-down menu with allocations in groups of 10 appears. Press ENTER and Select a previously stored 'favourite' that you want to retrieve. Press the ENTER key and it will be displayed on the screen of the spectrum analyser.

Terrestrial Operation

To toggle through your stored 'Favourite' settings.

There is now the capability to step through any stored favourites (channels or bands of frequencies) by selecting 'SET CURSOR LOCK' from the drop down menu. You have in terrestrial mode 3 choices (2 in satellite mode).

Set cursor lock... OFF

Favourites

Channels (UHF Channels 21 to 69)



Select 'Favourites' using the UP/DOWN keys from the Joystick and press the ENTER key.

You will be returned back to the Spectrum Display. Using the LEFT or RIGHT keys from the joystick will toggle the spectrum display through any 'stored' favourite set ups saved in the instrument.

The current favourite Identity is shown on the status bar at the bottom of the screen highlighted in GREEN as shown in the picture.

This feature is helpful when commissioning a system and you want to quickly 'toggle' through the channels before finishing .



Tip.

It is best to rename your favourites using a PS/2 type keyboard or this can be done on the instrument, but is a bit more time consuming.

A mini PS/2 type keyboard is available direct from Swires R & D as an optional Extra.

To change the name of any of your stored favourites.

From the main drop down menu select the 'setup menu' and press the Enter key.

Use the DOWN arrow key to move through the menu to highlight 'Rename Favourites'-press the ENTER key. Again move through the menu to the selected bank of 10 favourites you wish to rename and press the ENTER key again. Select the one you wish to rename and either plug in a PS2 keyboard (recommended) or use the UP/DOWN,LEFT and RIGHT keys to edit the name of the favourite in question.

Any PC compatible PS/2 keyboard should work.

Please note if you plug in a PS2 keyboard to edit the name press the 'backspace' key several times to remove the current text. Sometimes characters are added before being deleted – keep pressing the backspace key until all the current characters are erased. Now add your channel or spectral display name as you would normally on a computer.

Terrestrial Operation

Line powering for masthead amplifiers

13volts is available from the BNC RF input socket to power up masthead amplifiers or active switches. It is activated from the Terrestrial drop down menu -**13v line power**. Use the ENTER key to select. It is indicated on the TOP status bar –shown in **RED**.

The Line Powering voltage will be present on the RF input until switched off from the menu! - even if the instrument is switched off and back on.

- Deactivate from the drop down menu when no longer required.

Video input BNC socket

A video input BNC socket is located on the top connection panel. To activate the video monitor socket.open from the drop down menu EXTERNAL VIDEO IN. Any other key except the ENTER key exits from the facility.

Video output BNC socket

Anything that is on the screen of the Annie 204 can be displayed on any external composite video compatible monitor –including the spectrum display. The socket is always active –except when the video In socket is being used.

Set fine scan ON/OFF

This feature has been included to compliment the spectrum analyser in a wide span mode -30 to 860MHZ.

Analogue carriers tend to be not fully captured due to the resolution and speed of the scan of the TFT screen. With the Fine scan mode activated (ON) the sweep time is increased to fully capture all carriers. This **ONLY** applies on terrestrial bands and sweep time is only increased on Maximum bandwidth coverage- no zoom condition. As soon as you zoom in to an area of frequencies the sweep rate reverts to ‘realtime’ speed.

This feature can be activated by pressing the menu key in terrestrial mode and use the UP/DOWN keys to highlight ‘SET FINE SCAN’ on/off. Press the ENTER key to activate/deactivate.

Terrestrial Operation

Digital Multiplex List

This feature allows for a complete scan of the UHF band, searching for and listing digital multiplexes. A complete scan of the channels 21 to 69 takes approximately 40seconds.

To activate a scan press the MENU key and a sub menu will be displayed. Toggle down and select 'multiplex list. A further drop-down menu appears listing all available multiplexes. (If none are displayed move to 'clear and rescan') To highlight a chosen option, use the up/down arrow keys. Press the ENTER key. A full scan of the UHF bands 4 and 5, taking approximately 40 seconds need only be done once, if you stay within a known single transmitter range.

When viewing a multiplex from the triple screen display, the list of multiplexes has the following quality indicator:

 Green = Good  Amber = Marginal  Red = Poor

To move the spectrum display to any of the multiplexes in the list after scanning, use the up/down arrow keys to make a selection from the list. If the 'quality of signal' box is showing green or amber: Press the ENTER key. Zoom in two levels by pressing the up arrow key. Press the data key and a locked signal should be apparent if the 'quality of signal' box is showing green or amber.

Storing a Spectrum Trace

A feature of this model is the facility to store up to 5 traces to allow for information to be viewed or overlaid on the current spectrum display. This feature is more useful for identifying satellite 'signatures' –but can be used for terrestrial band also.

Once you have on the screen of the spectrum analyser the trace to be stored, press the MENU key. A drop-down menu appears. Use the up/down arrow keys to highlight the 'store trace' option in the menu and press the ENTER key. A further drop-down menu is displayed with a previously stored trace or blank if none have been stored to date.

Select the next available allocation or overwrite an unwanted trace by highlighting it using the up/down keys. Once it has been stored the trace number is colour coded. With each stored trace in the list a different colour is used. Unallocated traces appear in grey. A total of five overlay traces can be stored.

Terrestrial Operation

Recalling a Stored Trace

To recall a stored trace or to overlay it on a current spectrum display, press the MENU key. A drop-down menu appears. Select 'recall trace' using the up/down arrow keys. Press the ENTER key.

A further drop-down menu lists all stored traces. Use the up/down keys to select the trace you wish to recall. The trace will overlay a current spectrum display – even if you have zoomed in or out since storing the trace. If the stored trace, (usually shown in red) is the same as the current trace on display, it will emulate the zoom applied.

To remove the overlay select 'recall stored trace' and select 'clear all traces'.

Peak Hold Facility

The instrument incorporates a maximum reading 'freeze' function known as peak hold.

When looking for transient signals, such as radar interference, activating the peak hold allows you to 'capture' the peak signal. You can determine the frequency and amplitude of the nuisance signal and possibly eliminate it.

To activate the 'peak hold' facility from the spectrum display screen press the MENU key and the drop-down menu is displayed. Use the up/down arrow keys to highlight 'Peak hold on' and press the ENTER key. 'Peak hold on' flashes up in the centre of the spectrum display for 2 seconds. Peak hold will now remain activated until it is deactivated or the instrument is switched off. The next time the instrument is switched on the 'Peak Hold' setting will have defaulted to off.

Setting the Audio Volume

To set the audio volume for the headphones press the MENU key to view the drop-down menu. Using the up/down arrow keys, highlight 'audio volume' and press the ENTER key.

A bar graph appears on the screen. (see figure 4)

Use the left arrow key to decrease, or the right key to increase the audio level. You will not be able to hear the level changing so move the bar a small amount each time. Check the audio level by viewing a picture and checking you have the required level using the headphones.

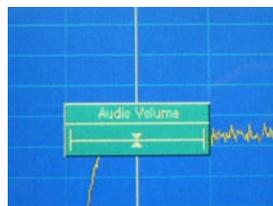


Figure 4

Satellite Operation

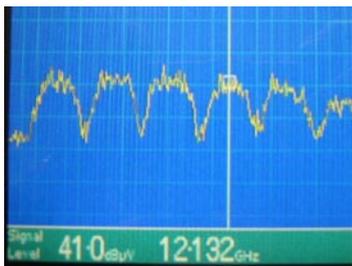
Getting started...

Press the ON key. Once the screen has initialised a spectrum display of the full terrestrial VHF/UHF band is displayed. (Assuming no boot up favourite is in operation –see page 8.)

At this point if you require the satellite band press the ON key once more. You can ‘toggle’ between terrestrial and satellite bands by repeated presses of the ‘ON’ key.

Initially, when viewing the terrestrial or satellite band, the full band of relevant coverage is shown. (Unless the boot up favourite facility is used – see page 8).

To set the band of operation required press the MENU key on the keypad. The satellite drop down menu appears. Use the up/down arrow keys to move to either :



- a/ LNB Vertical Low band (no 22KHz)
- b/ LNB Vertical High band(with 22KHz on)
- c/ LNB Horizontal low band (no 22KHz)
- d/ LNB Horizontal High band(with 22KHz on)

Select the required band and press the ENTER key. Use the up arrow key to zoom in on a selected carrier.

Figure 5

The satellite band frequencies will be shown in fundamental gigahertz frequencies as soon as line powering is activated. This makes it easier to look up new satellite transponder frequencies – so that no error is made in the translation to IF frequencies. This is also a quick way of doing the conversion – if you need to.

Please be aware that once the ‘line powering’ facility is activated as indicated above, the next time the satellite band mode is entered the ‘line powering’ will automatically default to the last setting used. The current setting is indicated on the upper status bar in the centre of the screen (see page 15) and also within the drop-down menu by two arrow heads either side of the current setting. This saves time if you are going from point to point on a SMATV system or looking for a specific fault.

When the line powering voltage has been activated as described above, place the vertical cursor in the middle of a carrier (see figure 5) using the left or right arrow keys. Press the data key to obtain a picture.

Satellite Operation

The Vertical Grid

The vertical grid is approximately 5dB/Division. The difference between RF level of Analogue and Digital carriers can be measured on screen instantly.

At any time you can move to the next channel up or down in frequency by using the left or right \diamond arrow keys.

The Horizontal Grid

The horizontal grid is determined by the amount of zoom you are currently using. The minimum is 1MHz/division and the maximum is 50 MHz/Division.

Obtaining a locked Picture and Data

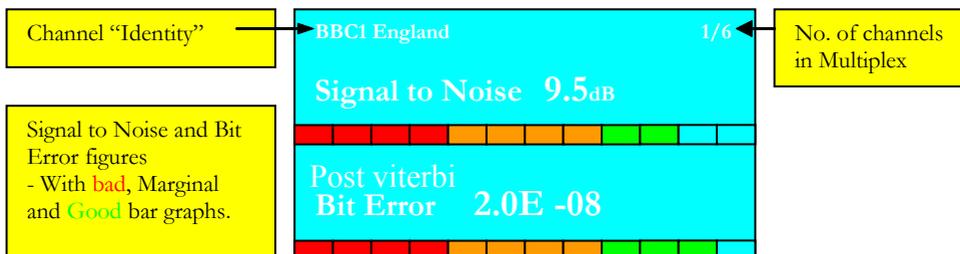
Once you have the cursor over a carrier (see figure5, page 15), press the data key on the keypad.

When attempting to lock onto a satellite carrier it may be necessary to move the frequency cursor either left or right of the centre of the transponder to obtain a locked signal. This can be done by either reverting back to the spectrum display or using the LEFT/RIGHT keys directly from the triple screen display. As soon as a Signal to Noise and BER figure are achieved a locked picture should appear. (Some carriers also 'encrypt' the data packet which produce the SNR/BER figures!). If a picture is still not evident it is possible that all channels in the transponder are encrypted or are 'data' carriers. Annie 204 will report 'only encrypted channels found'.

If the transponder is 'in the clear' a picture should be decoded. To view a full screen picture press the data key again. Use the up/down keys to step through pictures being viewed within the Multiplex.

A bar graph is displayed which indicates the quality of the signal

■ Green/Good ■ Amber/Marginal ■ Red/Poor



Satellite Operation

Adjusting the ‘Gain’ to view waveforms

The Annie 204 has the capability of adding up to 64dB of attenuation (in 1dB steps) to the incoming signals. There is no need to add or subtract any attenuation to RF readings as this is done automatically. Initially always set the gain to maximum by pressing the up arrow key. If the overload warning is flashing at the bottom of the screen add attenuation by pressing the down arrow key keeping the waveform you are measuring 2/3rd of the way up the screen for best results. Adding too much attenuation will give a poor analogue picture and will prevent digital carriers from locking.

Storing a Favourite Setting

Up to 100 favourite settings can be stored to memory and retrieved at a later date. ALL parameters are stored and once recalled, the instrument will switch to the relevant band of operation.

To store a current display as a favourite press the MENU key and using the up/down keys and using the arrow keys highlight ‘store favourite’. Press the ENTER key. A sub menu opens displaying the option of up to 100 allocations in groups of 10. Select where you want to allocate your ‘favourite’ using the up/down arrow keys, highlight the selection and press the ENTER key. The display will return to the spectrum analyser screen.

Recalling a ‘Favourite’ Setting

Any of the 100 favourite settings that have been stored can be quickly displayed on the spectrum analyser.



Figure 6

*There are a total of 200 favourites – 100 for terrestrial and 100 for satellite.

Press the MENU key and highlight the ‘recall favourite’ option on the drop down menu. Press the ENTER key again and a further drop-down menu with allocations in groups of 10 appears. Select in the memory a previously stored ‘favourite’ that you want to retrieve. Press the ENTER key and it will be displayed on screen.

Satellite Operation

To 'toggle' through your stored 'Favourites'.

There is now the capability to step through any stored favourites or bands of frequencies by selecting 'SET CURSOR LOCK' from the drop down menu. You have in satellite mode 2 choices.

Set cursor lock... OFF (which moves the cursor left or right in Frequency)
Favourites (rotates around your stored favourites.)

Select 'Favourites' using the UP/DOWN keys from the Joystick and press the ENTER key.

You will be returned back to the Spectrum Display. Using the LEFT or RIGHT keys from the joystick will toggle the spectrum display through any 'stored' favourite setups saved in the instrument.

The current favourite Identity is shown on the status bar at the bottom of the screen highlighted in **GREEN**.

Tip.

It is best to rename your favourites using a standard computer PS/2 type keyboard or this can be done on the instrument, but is a bit more time consuming.

A mini PS/2 type keyboard is available direct from Swires R & D as an Optional Extra.

To change the name of any of your stored favourites -Using the Optional Keyboard.

From the main drop down menu select 'setup menu' and press the Enter key. Select the 'Favourite' to be renamed. Attach the keyboard and Press the BACKSPACE key several times to remove 'Favourite xx'. Rename the preset with appropriate lettering .

TIP. Please remember that when using the 'toggle favourites' only 6 characters are shown on the status bar at the bottom of the screen. Keep this in mind while editing names of your favourites.

To switch between two satellite feeds for IRS systems.

A DiseqC A/B switch is available for switching between two satellites on IF distribution

'9 wire' IRS switch systems. The switch is activated from the drop- down menu.

- 'Select Satellite B' (or A if already set to B). Either polarity or High/Low band is available on BOTH satellites A or B setting.

Satellite Operation

Setting the Audio Volume

To set the audio volume for the headphones press the MENU key to open the drop-down menu. Using the up/down arrow keys, highlight 'audio volume' in the menu and press the ENTER key.

A bar graph appears on the screen (see figure 7), Use the left arrow key to decrease, or the right key to increase the audio level. You will not be able to hear the level changing so move the bar a small amount each time. Check the audio level by viewing a picture and checking the level is correct using the headphones.



Figure 7

Hints and Tips

1. Using **Store traces** to find a satellite 'signature'.

When recalling to the screen a previously stored trace of a full satellite band –swing the dish until an identical overlay is obtained. You should then quickly find the required satellite. Each of the 5 stored traces can be used for different satellites.

Alternatively, use the trace overlay feature to plot your progress on a downfeed or network before and after a multiswitch.

2. Using the **zoom** facility to speed up getting the vertical frequency on to a carrier:

If you have zoomed in on a particular carrier signal and you want to move to the next one (and it's not a stored favourite) a quicker way to move the vertical frequency cursor is to widen the span of frequencies being viewed by pressing the down key (zoom out) on the arrow keys, move the cursor using the left or right keys to the carrier to be measured and press the up key to zoom in on the required carrier.

3. Storing a satellite transponder to a favourite, stores all relevant settings, i.e. 13/18volts 22KHz on or off plus current gain setting.

4. **Analogue satellite carriers will read +15dB high** –this is because the ANNIE 204 has been calibrated for Digital signals in the Satellite band of operation.

This ONLY applies to Satellite band Analogue signals – Terrestrial signals ALWAYS read the correct RF values whether Digital OR Analogue.

Set up menu

Operating instructions refer to both terrestrial and satellite operation. The main functions of the instrument are accessed via the MENU key, by highlighting the set-up menu and by using the up/down arrow keys. Press the ENTER key .

- Set for external monitor.** Activate this setting to correct for differences in screen position when using an external video monitor.
- Auto power OFF.** Sets the instrument to switch off at a pre-determined time if no key presses are detected. It is accessed via the drop down menu – select SETUP MENU – select AUTO POWER OFF...Options are:-
a/ Disabled, b/5minutes or c/ 30 minutes
- Set unit of measurement** Set to either dB microvolts (dBuV) or dB millivolts (dBmV).
- Boot up favourite** Sets the instrument to start up with any previously stored favourite.
- Rename traces** The five overlay trace displays can be renamed. Use either the arrow keys to navigate through the alphabet – using the right key (11) to move to the next character. Or a PS/2 type PC keyboard can be plugged into the 6 pin mini Din connector on the top panel.
- Rename favourites** Stored favourite presets can be renamed using either the arrow keys to navigate through the alphabet –using the right key (11) to move to the next character. Or the Optional PS/2 type PC keyboard available from Swires R & D can be plugged into the 6 pin mini Din connector on the top panel.
- Battery warning** The battery low warning is factory set to 10.0volts. But will switch off at 9volts. A warning banner will appear on the screen. Press the ENTER key to continue but charge the battery as soon as possible.

Set up menu-continued

- RF input warning** Indicates that a voltage is being detected on the RF input – from an external line powering source. When switching from satellite to terrestrial operation a RF input warning is displayed. Although the voltage from the instrument is automatically turned off a residual voltage may remain until a load is applied in the form of an antenna or long coaxial feed.
- RF overload warning** A warning can be activated that flashes on screen in **RED** if the recommended operating level is exceeded.
- DEFAULT = ON** If the overload warning is visible on the screen (on the bottom status bar) an analogue picture may not be obtained – add attenuation using the ‘down’ GAIN key (**6**) on the keypad.
- Country tables** This sets the cursor lock facility to operate with correct channel spacing within the UHF band of operation. for the correct country location
- Current settings are a/UK (8MHz spacing)
B/ Australia(7MHz spacing)
- Pre Viterbi - see page 5** To see the signal quality prior to error correction being applied select pre Viterbi from the setup menu on either Terrestrial or satellite operation. (No Error correction)
- Post Viterbi - see page 5** To see the signal quality after error correction being applied select Post Viterbi from the setup menu on either Terrestrial or satellite operation. (Error correction applied)
DEFAULT for Terrestrial and satellite operation.

Specifications

Frequency coverage	Terrestrial : 30 –860MHz, satellite: Ku band 10.7GHz to 12.75GHz (IF 950 to 2150MHz.)
Operating system	Analogue PAL I (other systems available please specify when ordering. Digital Terrestrial (DTT) plus Digital satellite (DTS) decoding. NB. Free to air (FTA) only.
Level measurement	Minimum 20dB μ V (-40dBmV) and maximum 110dB μ V (+50dBmV). Can be set to dB μ V or dBmV within setup menu. Pre/Post Viterbi error correction for BER measurements. Selected in the Setup menu. Spurious signals \leq 30dB μ V (terminated in 75ohm).
Screen	14.6cm (5.82inch) TFT full colour
Accuracy	Terrestrial $< +1.5$ dB, Satellite $< +2.0$ dB
Keypad	Cursor frequency accuracy –full span less than 50KHz Tactile, hard wearing and splash proof keypad.
Case	Glass fibre reinforced polycarbonate, aluminium back plate. Size: 250mm wide X 270mm high X 85mm deep.
Connectors	Single RF input (30-2150 MHz) BNC 75ohm. Video IN/Out BNC 75 ohm. USB data connector type ‘B’ External keyboard – PS/2 connector Stereo Headphone socket 3.5mm. Charger socket 2.1mm dc type.
Line powering	13V for Terrestrial, 13 or 18 volts + switchable 22 KHz tone for satellite operation
Nylon carrying case	weatherproof nylon carry case with integral light hood.
Weight	Less than 3.8kg including battery and carrying case.
Power	Combined external mains to +15v DC power supply and charger, fitted with 2.1mm plug (centre +ve). Battery life 2.5 hours.
Operating Temperature	from 0°C to +40°C For bench use remove the instrument from the nylon carry

Usefull information

www.swires.com	Our website has useful technical papers and product data sheets
www.Lyngsat.com	A source of up to date satellite information
www.cai.org.uk	Confederation of Aerial Industries
www.dtg.org.uk	Digital Television Group
www.bbc.co.uk/reception	BBC Reception Advice 08700 100 123
www.freeview.co.uk	Customer information 08708 80 99 80
	Free coverage check line 08000 93 54 44

Guideline TV outlet figures for terrestrial

Minimum SNR (**MER) terrestrial multiplexes	23dB for 16 QAM 26dB for 64 QAM (ITV)
Minimum Digital signal level at TV point	45dB μ V
Maximum Analogue signal level at TV point	80dB μ V
Maximum Digital signal level at TV point	65dB μ V
Minimum Bit Error Ratio (BER)	<2.0 E-04 (Pre Viterbi)
Maximum 'slope' on any Multiplex	7dB(vertical gradient on analyser=5dB)

Guideline figures for satellite

Minimum signal at receiver:	50dB μ V
Maximum signal at receiver:	75dB μ V
Minimum SNR (MER) figure:	8dB
Minimum Bit Error Ratio (BER): (Pre Viterbi)	<2.0 E-03

Signal Records / Favourites programme

The signal records software has been introduced as a fast and convenient way of collecting and storing data for commissioning purposes. The data is stored in your Annie 204 for subsequent downloading and printing on a PC using windows XP. This software also includes 'Favourites' software that allows the setting up and editing of favourite settings. These can then be downloaded to your instrument.

A CD is supplied with the instrument.

Sample print out is shown below:-

SIGNAL RECORDS - BLOCK 1																			
Analogue Transmitter					Analogue Channel 5 Transmitter					Digital Transmitter					Satellite Position				
CRYSTAL PALACE					CRYSTAL PALACE					Crystal Palace					Satellite Pos				
SIGNAL LEVELS (dBuV)																			
Terrestrial Analogue					Terrestrial Digital					Low Band Satellite (MHz.)					High Band Satellite (MHz.)				
Service	A1	A2	A3	A4	A5	Mux 1	Mux 2	Mux A	Mux B	Mux C	Mux D	Local Oscillator - 9750MHz				Local Oscillator - 10650MHz			
Transmission Channel	25	33	23	30	37	22	25	28	29	32	34	107.4 (1024) Freq	107.0 (1240) Freq	106.0 (1200) Freq	106.0 (1000) Freq	11868 (10650) Freq	12208 (10650) Freq	13058 (10650) Freq	13868 (10650) Freq
Programme	RR02	RR02	TV1	Chk	RR	Max 1	Max 2	Max A	Max B	Max C	Max D	Sat1	Sat2	Sat3	Sat4	Sat5	Sat6	Sat7	Sat8
OFF-AIR 48uV CN BER	50	60	66	67	62	53	52	54	50	46	45	59	60	70	69	66	61	62	67
Launch 48uV CN BER	0	1	1	1	1	31	31	29	31	29	29	10	10	9	9	9	10	9	9
OFF-AIR 33uV CN BER	55	68	60	68	64	53	52	54	50	46	44	59	70	70	69	69	61	62	67
Launch 33uV CN BER	0	1	1	1	1	32	32	30	31	28	29	10	9	10	9	9	10	9	9
RESIDENTIAL RECORDS																			
Dwelling 1	68	68	66	67	64	63	62	64	60	46	46	59	70	70	68	66	61	62	67
Dwelling 2																			
Dwelling 3																			
Dwelling 4																			
Dwelling 5																			
Dwelling 6																			
ENGINEER'S COMPLETION																			
I certify that the completed data is correct and that the system has been fully tested and is working to specification																			
SIGNED					Engineer's Name					DATE									
For and on behalf of					Highgrade Aerial Services										Produced by SW 662 Ar/No 234 Signal Records © Copyright 2005 - Swire Research Limited				