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D-Cam Clip-On

OPERATORS MANUAL

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1 GENERAL SAFETY INFORMATION

The information that follows, together with local site regulations, must be studied by personnel concerned with the operation or maintenance of the equipment, to ensure awareness of potential hazards.

WARNING- RF Power Hazard : High levels of RF power are present in the unit. Exposure to RF or microwave power can cause burns and may be harmful to health.

Switch off supplies before removing covers or disconnecting any RF cables, and before inspecting damaged cables or antennas.

Avoid standing in front of high gain antennas (such as a dish) and never look into the open end of a waveguide or cable where RF power may be present.

Users are strongly recommended to return any equipment that requires RF servicing to Gigawave.

WARNING- GaAs / BeO Hazard : Certain components inside the equipment contain Gallium Arsenide and Beryllium Oxide that are **toxic substances**. Whilst safe to handle under normal circumstances, individual components **must not** be cut, broken apart, incinerated or chemically processed. In the case of Beryllium Oxide, a white ceramic material, the principal hazard is from the dust or fumes, which are carcinogenic if ingested, inhaled or entering damaged skin.

Please consult your local authority before disposing of these components.

CAUTION- Tantalum Capacitors: When subjected to reverse or excess forward voltage, ripple current or temperature these components may rupture and could potentially cause personal injury.

CAUTION: This system contains MOS devices. Electro-Static Discharge (ESD) precautions should be employed to prevent accidental damage.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.21

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

1.1 Health & Safety

Exposure to Non Ionising (RF) Radiation/Safe Working Distances

The safe working distance from a transmitting antenna may be calculated from the relationship:

$$D = \sqrt{\frac{P_T \cdot G_R}{4\pi \cdot w}}$$

in which D = safe working distance (metres)

PT = transmitter or combiner power output (watts)

GR = antenna gain ratio = anti log (gain dBi ÷ 10)

w = power density (watts/square metre)

The RF power density value is determined by reference to safety guidelines for exposure of the human body to non-ionising radiation. It is important to note that the guidelines adopted differ throughout the world and are from time-to-time re-issued with revised guidelines. A maximum power density limit of 1mw/cm² is to be applied when calculating minimum safe working distances.

Important Note: It must be remembered that any transmitting equipment radiating power at frequencies of 100 KHz and higher, has the potential to produce thermal and athermal effects upon the human body.

To be safe:

- a) Operators should not stand or walk in front of any antenna, nor should they allow anyone else to do so.
- b) Operators should not operate any RF transmitter or power amplifier with any of its covers removed, nor should they allow anyone else to do so.

The unit is supplied with a 4dBi antenna that is fitted to the rear of the camera. The FCC RF Exposure Evaluation has determined that a 20cm minimum safety distance must be maintained between the antenna and all persons in the area.

Use of the unit with an external mast mounted antenna and / or power amplifier requires separate RF Exposure Evaluation.

1.2 Maximum RF Power Density Limits

The RF Radiation Power Density limit figure recommended by Gigawave is based upon guideline levels published in:

- a. IEEE standard C95.1 1999 - IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 KHz to 300 GHz.
- b. Guidelines for Limiting Exposure to Time-varying Electric, Magnetic & Electromagnetic Fields (up to 300 GHz) published in 1998 by the Secretariat of the International Commission on Non-Ionising Radiation Protection (ICNIRP).

Both documents define guideline RF power density limits for "Controlled" and "Uncontrolled" environments. An uncontrolled environment is defined as one in which the person subjected to the RF radiation may be unaware of and has no control over the radiation energy received. The uncontrolled environment conditions can arise, even in the best regulated operations and for this reason the limits defined for the uncontrolled environment have been assumed for the Gigawave recommended limit.

1.3 Issue Status

Issue	Date	Changes
1	12/05/05	Initial Issue

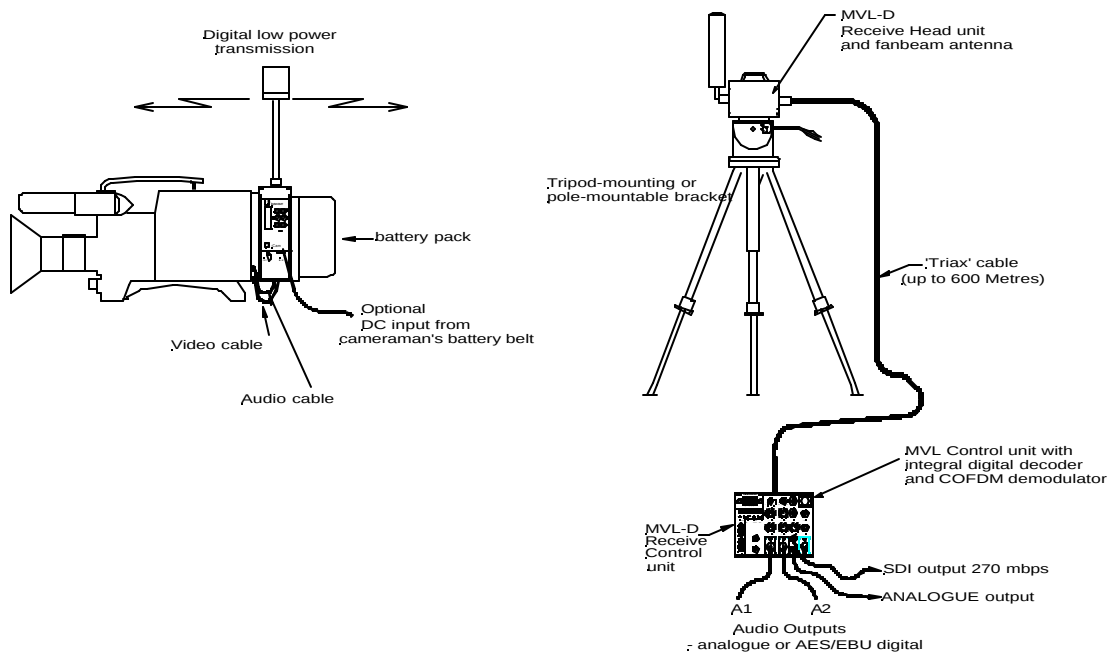
2 INTRODUCTION

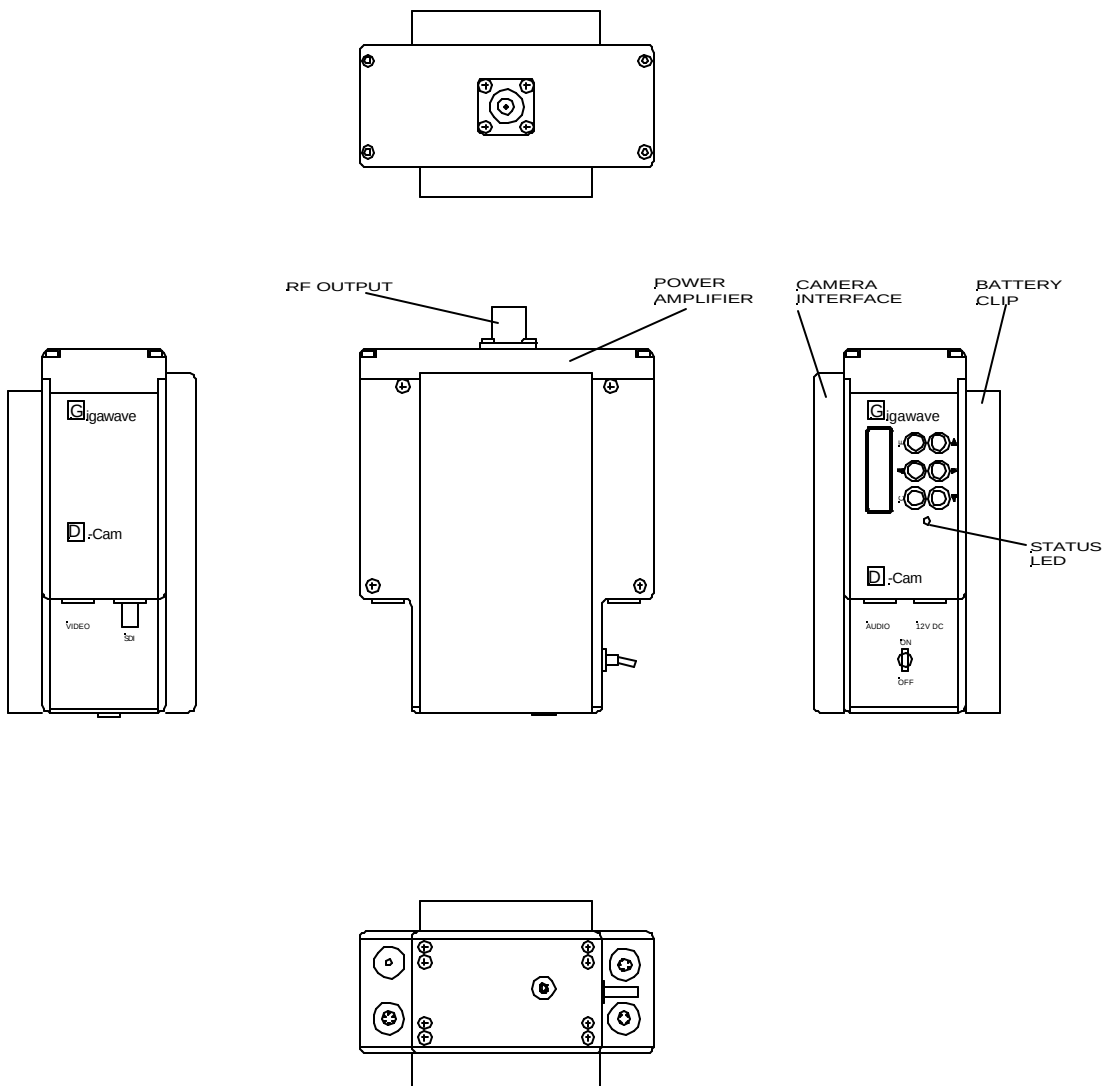
This manual is to be used in conjunction with the D-Cam Clip-On unit (CCAM-0104) which replaced the original 0101 & 0102 variants. The upgrade from 0101 to 0102 added the extra feature of an SDI input. The upgrade from 0102 to 0104 added the extra features of frequency selection to 0.5MHz increments. For details of the receiver please refer to the relevant manual.

The Gigawave D-Cam Clip-On Wireless Camera system is designed for all applications, both indoor and outdoor, in which a mobile camera is essential to the televised programme production. The unique modular design of the Gigawave D-Cam Clip-On ensures complete flexibility to change compression and modulation techniques to suit each individual task required, from low delay or to the most rugged of RF signal paths.

The system is comprised of the Clip-On transmitter that contains an audio encoder, video encoder, COFDM modulator, power supplies and an RF power amplifier. Attached directly to this transmitter is an omni-directional antenna.

At the receive site the MVL-D two-box digital Receiver is used. No external decoders or demodulators are required with this Receiver. The MVL-D is a two box rugged portable system developed from proven technology from the analogue MVL series of Receivers and Transmitters.





External Views of the D-Cam Clip-On

3 SYSTEM OPERATION

3.1 Camera Interfaces

The D-Cam Clip-On can be supplied with one of three battery and camera interfaces:

- Sony 'V' Block / IDX
- Anton Bauer Gold Mount
- PAK

These provide a flexible and versatile mounting system suitable for a wide range of cameras and battery options.

The D-Cam Clip-On is first mounted onto the camera rear battery interface. If required, an appropriate battery can then be docked onto the rear of the D-Cam Clip-On transmitter. The video and audio cables must then be connected between the camera and the D-Cam Clip-On, see 3.4.3 for details of the hardware configuration via the Control Panel.

If a battery is docked onto the rear of the D-Cam Clip-On, no external DC power lead is required. This is only required to provide power to the D-Cam Clip-On and camera if a battery belt / external power supply is used.

Care should be taken to prevent damage to an external power supply if a battery is docked, as current can be taken FROM the Power Connector See 5.1.4.

3.2 Operator Controls / Menus

The D-Cam Clip-On is configured using an LCD display and six push buttons. These are arranged as four navigation buttons (? ? ? ?), **Enter** and **Clear**.

The **Enter** button is used to store the modified parameter in non-volatile memory, this parameter will then be used to configure the D-Cam Clip-On and will also become the default value when next powered on.

The **Cancel** button can be used to exit a menu without storing the parameter in memory.

Various menu levels are provided to allow the operator to access the different hardware and operating parameters:

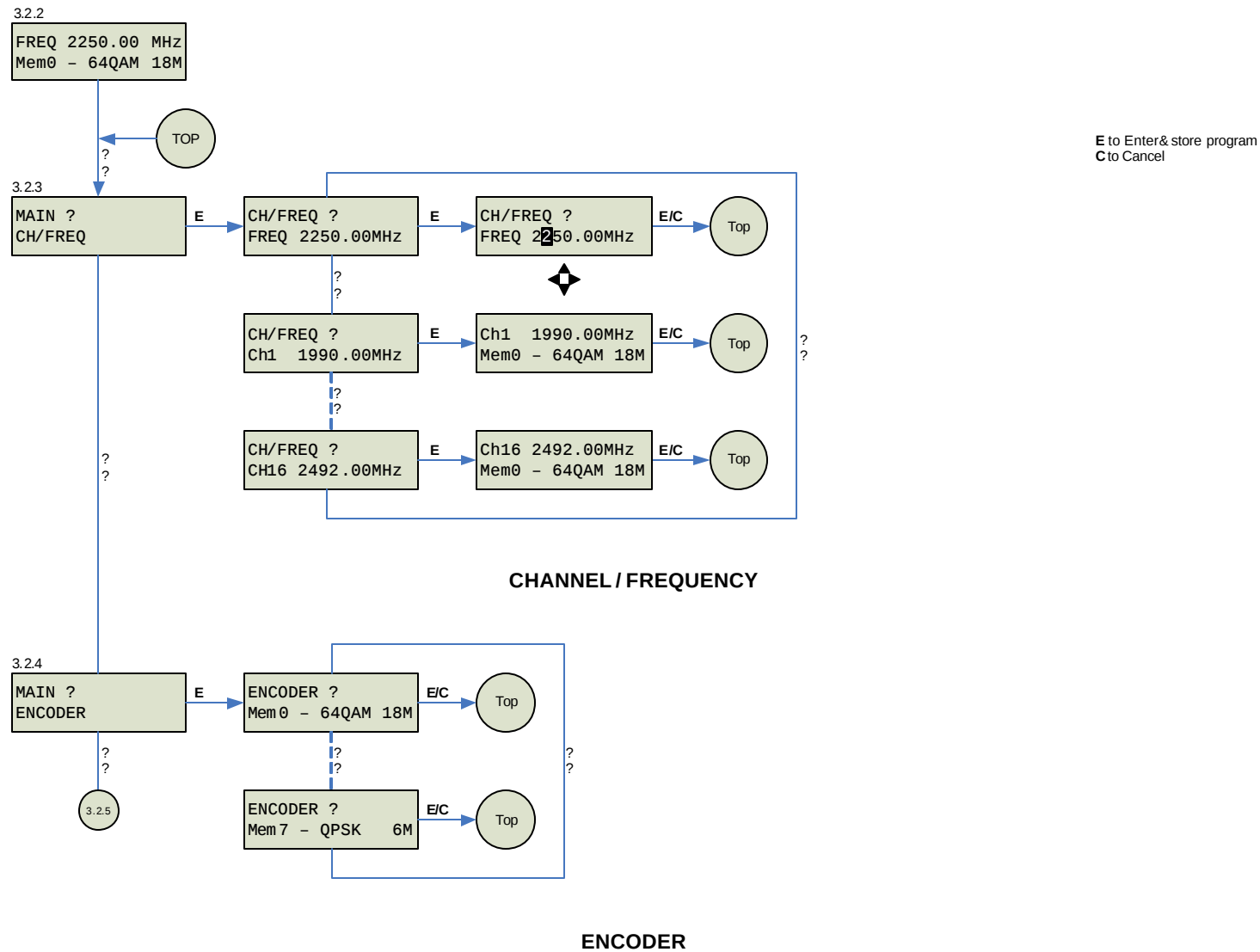
3.2.1 Initialisation Menu

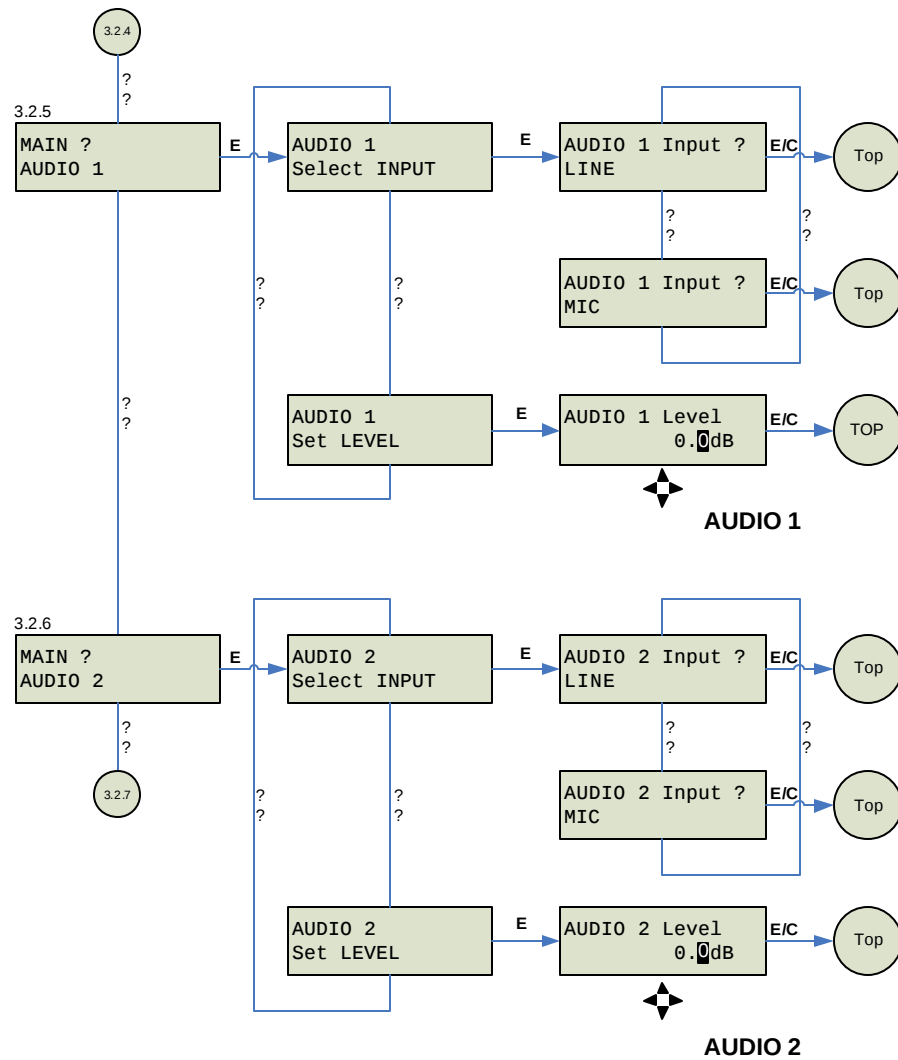
At switch on the status of the initialisation is displayed. If any errors are found with the initialisation of the major functions; Video, Audio, Encoder and Modulator; an error message will be displayed. During initialisation the Status LED will be off.

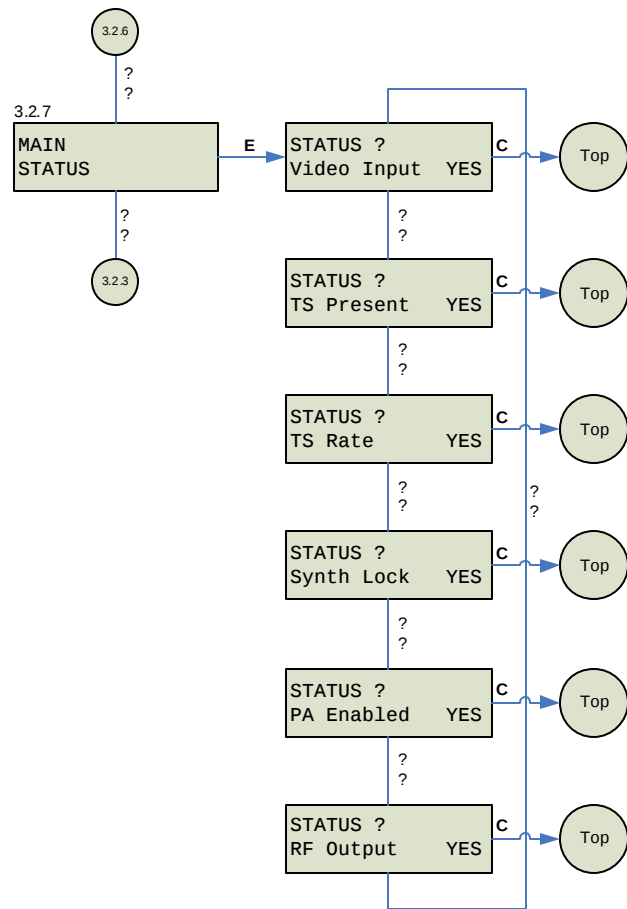
3.2.2 Main Menu

This is the display screen during normal operation of the D-Cam Clip-On and indicates the Tx frequency, Memory option (or Manual frequency) and the current Encoder memory settings. The ? ? buttons are used to select the required sub-menus; Ch/Freq, Encoder, Audio1, Audio2 and Status, the **Enter** button is then used to select. The ? ? buttons are used to display the current operational state.

During normal operation the Status LED will be green indicating 'healthy' state of the D-Cam Clip-On.







STATUS

3.2.3 Ch / Frequency Menu

This menu is used to select one of the sixteen pre-channels (CH1 – Ch16) or ‘manual’ frequency. The ‘Man’ setting allows control of the transmit frequency in 0.5MHz steps within preset limits. These limits can be confirmed using the Remote PC Interface See **6.2** for details.

The **Enter** button allows the ? ? buttons to select the required digit, the ? ? buttons then select the required value. The **Enter** button then stores the value and returns to the Main menu.

3.2.4 Encoder Menu

Using the ? ? buttons, this menu is used to select the required MPEG encoder operating parameters. These are held in eight non-volatile memories (0 – 7). The display will also indicate the modulation mode (QPSK, 16QAM, 64QAM) and the transport stream data rate.

A separate sheet is supplied defining the settings programmed into the D-Cam Clip-On unit.

3.2.5 Audio 1 Menu

The Audio menus are split into two levels: Select Input and Set Level.

The ? ? buttons and **Enter** are used to select the required audio sub menu.

The audio input can be set for either Line or Mic input; selecting Mic gives a fixed +20dB gain.

There is also a level adjustment providing a +/- 20dB in 0.5dB steps. This level adjustment is intended to cater for variations in camera audio output levels, it is NOT intended to use these adjustments to set microphone sound level. It is assumed that the mic pre-amp and limiter within the camera is used for this purpose.

3.2.6 Audio 2 Menu

As 3.2.5 above but for setting the Audio 2 input and level.

3.2.7 Status Menu

The status menu is used to confirm the condition of the D-Cam Clip-On. If the Status LED is red indicating a fault or warning, the Status menu will indicate the nature of the problem.

The ? ? buttons are used to scroll through the various functions:

Video Input	- a valid video input is present
TS Present	- the MPEG encoder is generating Transport Stream
TS Rate	- TS data rate matches the modulator data rate
Synth Locked	- the RF synthesiser is locked to correct frequency
PA Enabled	- the RF PA is powered or disabled
RF Output	- greater than +14dBm is present on the output

3.3 Status Monitoring

There is a red/green 'status' LED indicating the condition of the D-Cam Clip-On, if a fault or warning exists the LED will indicate Red and the Status menu will indicate the nature of the fault / warning. During initialisation of the unit the Status LED will be off.

The Status LED flashes RED to indicate a warning. This is due to:

No Video Input.	Check the camera is switched on and the video lead is correctly connected
The PA is turned off.	To disable the RF Power Amplifier the C and ? are pressed as the D-Cam Clip-On is switched on. This allows the transmit frequency to be checked before the PA is switched on.

3.4 System Configuration – Engineering Menu

The Engineering menu provides the method of hardware configuration. No user adjustments or setup is provided internally.

The engineering menu is entered by pressing the **?** and **'C'** buttons simultaneously for ~10seconds, then releasing the **'C'** button.

3.4.1 Prog Channels

Each of the sixteen frequency channels can be independently allocated the required frequency in 1MHz steps.

The **??** buttons are used to select the Channel to be assigned. The **Enter** button then allows the four **????** to edit the required frequency. The **Enter** button then stores the value and returns to the Main menu.

3.4.2 FW Inventory

The firmware version for the encoder and main unit controller can be obtained from this menu

3.4.3 Video Input

The D-Cam Clip-On can accept CVBS via the BNC input, or CVBS, YC, YUV via the six pin LEMO Video input.

SDI digital video can also be input via the BNC 75Ω connector if required this can also be used to input CVBS analogue video.

Note: The CVBS LEMO input (Pin 1 & 2) is paralleled with the BNC input when CVBS is selected; only connect to either one of these inputs or an incorrect signal level may result.

All the routing is controlled by the controller according to the required selected option. The **??** buttons are used to select the required video input type. The **Enter** button then stores the value and returns to the Main menu.

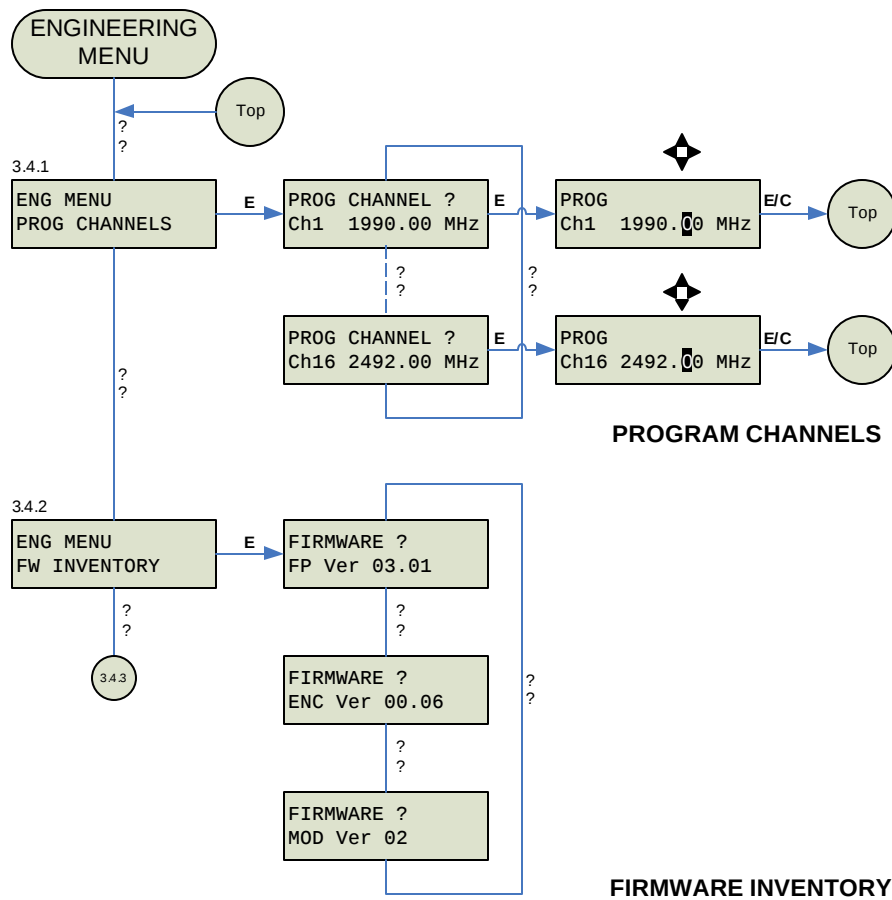
3.4.4 Video Format

The ? ? buttons are used to select the required video input format of either PAL (625/50) or NTSC (525/60).

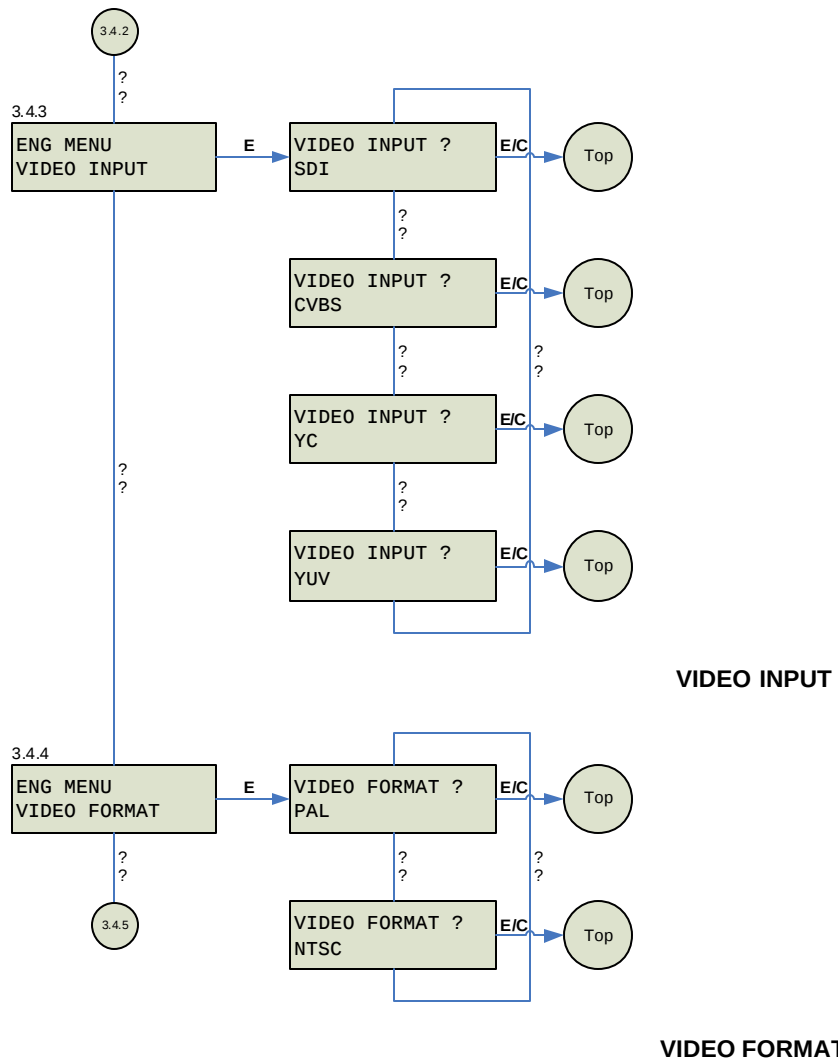
The Enter button then stores the value and returns to the Main menu.

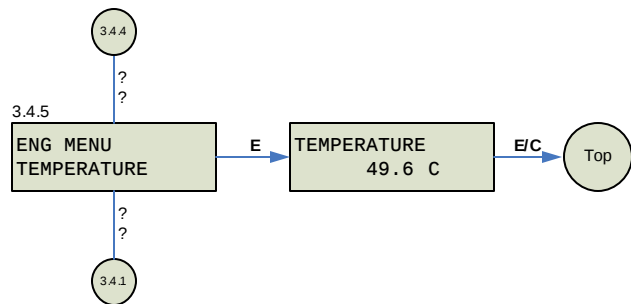
3.4.5 Temperature

A display in degrees Celsius of the internal temperature of the D-Cam Clip-On controller.



E to Enter & store program
C to Cancel





TEMPERATURE

4 PREPARING FOR OPERATION

EQUIPMENT PREPARATION

Before leaving the equipment base to undertake an operation it is recommended that the following equipment checks be made.

4.1 The D-Cam Clip-On Camera Back

Check that the Camera Adapter is securely fastened to the camera.

Check that the batteries to be used are fully charged and that an emergency spare battery is available and fully charged.

Confirm the correct frequency is selected 3.2.3.

Confirm the correct Encoder mode of operation is selected. 3.2.4

Confirm the correct Audio level I is selected 3.2.5 & 3.2.6

Confirm the correct Video input type is selected. 3.4.3

If the camera is to be used with a cable-connected antenna, ensure that the cable is in good condition, paying particular attention to the quality of the end connectors and their assembly status. If extension cables are required, make sure that the cable connectors are compatible, or that the necessary back-back connectors are to hand.

To enable the frequency to be checked without transmitting RF power the D-Cam Clip-On can be powered up with the PA disabled.

To disable the RF Power Amplifier the **C** and **?** are pressed as the D-Cam Clip-On is switched on.

4.2 The Receiving Equipment

The receiving equipment produces two audio channels, analogue and AES3; an SDI and composite video outputs. Audio and video cables of sufficient total length to connect between the Receiver and decoder installations must be acquired. If extension cables are necessary, ensure that the connectors are compatible and of good quality to avoid problems at site.

Check that the receiving antenna/Receiver interfaces are clean and free from dust and other unwanted materials.

If tripods are to be used to mount the equipment, make sure that some means of securing the tripod or of weighting it down is provided. Gusty wind conditions may put installations at risk, particularly when parabolic antenna dishes are to be used.

Make sure that all batteries to be used are fully charged and whenever possible, provide a spare with the cable to connect it to the Receiver.

Check that the Receiver channel frequencies are compatible with those of the D-Cam Clip-On Transmitter and set the channel selector switch to the channel number required. The Receiver is labelled with channel number and frequency information. As a precaution, set the manually selectable frequency of the Receiver to the working frequency then close and refasten the selector switch window assembly.

The Receiver Head unit should be set with its channel selector switch set to SLAVE and the manual frequency selection set to the channel frequency to be operated.

The Receiver Head and Control units may be operated at distances up to 600 metres apart. Gigawave triax cable is supplied in standard lengths of 100 and 200 metres and will plug together to create the lengths required. Check that the necessary lengths of triax interconnecting cable are available and that the cable and cable connectors are in serviceable condition.

Unless built to a specific customer requirement, the MVL Receive Control unit will be equipped for two analogue audio channels or one AES3 output. Check that the audio to be used by the Wireless Camera is set to the correct input levels.

Whenever practical, set up the system and trial it before leaving for site to ensure that all components of the system are working. Checking at base, where adjustments and corrective actions can be made, will pay off when setting up at site.

5 D-Cam Clip-On Transmitter

The D-Cam Clip-On is based upon the highly successful Gigawave D-Cam dockable Wireless Camera system. Internally, it is very different!

Gigawave engineers have completely redesigned the D-Cam to compress all the circuitry on from five circuit boards onto two. This greatly reduces space and weight compared with the original D-Cam product.

The result is a Digital Wireless Camera system, which has exceptional RF performance, is well-balanced and easy to use.

The D-Cam Clip-On contains four circuit board assemblies:

- Audio / Video Encoder PBAB-TDAV-0102
- COFDM Modulator PBAB-TDVM-0302
- RF Power Amplifier PBAB-TDPA-0801
- Display / System Controller PBAB-TDDB-0101

The superior RF performance of the D-Cam Clip-On when combined with a MVL-D Series Receiver is such that it requires only a single receive point with Fanbeam antenna for most normal OB locations, including sports stadiums.

5.1 Connector Pin Outs

5.1.1 SDI / CVBS Video BNC

Either SDI or composite video, blanking & sync (CVBS) input. Switched via controller dependant upon Video Input Selection. See 3.4.3

75Ω BNC connector

5.1.2 Video Connector

Composite (CVBS) / YC / YUV

6Pin Lemo Plug FGG.1B.306.CLAD62Z

Pin	CVBS	YC	YUV
1	0V	Y(0v)	Y(0v)
2	CVBS	Y	Y
3		C(0v)	U(0v)
4		C	U
5			V(0v)
6			V

5.1.3 Audio Connector

Line / Mic Hi Z

5 Pin Lemo Plug FGG.1B.305.CLAD62Z

Pin	Function	Notes
1	0V (Screen)	Analogue 47kOhm differential
2	Ch1 +	
3	Ch1 -	
4	Ch2 +	
5	Ch2 -	

5.1.4 Power Connector

9-18V DC 18W (Clip-On power only)

This connector can be used to take power from the docked battery (5A Max) to power external cameras if the D-Cam Clip-On is not docked directly to the camera, or feed power into the D-Cam Clip-On and then forward into the camera.

Note: A diode is fitted to prevent the external power supply from 'back feeding' into the battery.

The power switch is used to control the D-Cam Clip-On only. The power supply to the camera is always available from the battery interface or external power connector. The camera on/off switch should therefore be used to control the camera independently.

4 Pin Lemo Plug FGG.1B.304.CLAD62Z

Pin	Function
1	0V
2	0V
3	+12V
4	+12V

5.1.5 Remote Connector

RS232. 19200 Baud, 8 bit, 1 stop, No parity

4 Pin Lemo Plug FGG.0B.304.CLAD62Z

Pin	Function
1	0V
2	Tx (Data out from unit)
3	Rx (Data into unit)
4	0V

5.2 Audio / Video Encoder

The Encoder board consists of the following main functions:

- SDI to Digital deserialiser. Converts the SMPTE-259M-C serial digital video input to an 8 bit parallel digital video bus.
- Analogue to Digital Video Converter, 10-bit over sampling ADC. Takes either Composite Video (75 ?, 1v p-p) (CVBS); YC or YUV inputs in either PAL / NTSC format and converts to an 8-bit parallel digital video bus.
- Analogue to Digital Audio Converter, 48kHz, 24 bit
Two high impedance analogue inputs. Audio 1 (or left channel). Audio 2 (or right channel). The two channels are first buffered by a variable gain stage to cater for either Mic or Line level inputs. A switchable 20dB stage is also included to cater for low level Mic inputs. The two audio channels are then converted into an I²S serial data stream.
- FPGA. Selects the required 8 bit-parallel digital video bus from either the SDI deserialiser or the video ADC for input to the MPEG2 encoder, a relay is used to route the input from the BNC (either SDI or CVBS) to either the deserialiser or ADC.
- Microcontroller. Writes control data and reads status data to/from the MPEG2 Encoder.
- MPEG2 Encoder
A suite of MPEG2 compliant compression techniques, where the data bit rate is reduced by processing over multiple picture frames. The absolute picture (Intra frame) is interleaved with pictures that are created using difference data (Predicted frame) with Bi-directionally predicted frames (4:2:2 Only) in conjunction with motion compensation; thus low data rates down to 6 Mbps, can be achieved.

A set of encoding parameters is loaded into the encoder at power up. These are selected from one of the 'preset' encoder memories. See 3.2.4
- DC Power Supplies
Switching DC/DC converters are used to generate the various supplies from the incoming 9-18V battery supply. These include 2.5, 3.3V, 5V, 8V and +/-5V supplies.

There are no field replaceable parts on the Encoder board. If a fault occurs with the board, contact Gigawave for technical assistance.

5.3 COFDM Modulator

“Coded Orthogonal Frequency Division Multiplexing – a modulation scheme which is used by the DVB digital television system.”

The COFDM modulator has been designed to take its input from the MPEG2 encoder. This Transport stream is then modulated directly to the 2.5GHz band. This method reduces the occurrence of intermodulated harmonic frequencies and requires less upconvertors to reduce microphony.

The COFDM modulator RF output is via the SMB connector. This output is then fed into the power amplifier, via the short RF cable. The nominal RF output level is –9dBm of the Modulator.

The modulator is automatically configured to match the data rate of the MPEG2 Encoder as defined by the selected parameter set. 3.2.4

The modulator can support the following modulation schemes / data rates:

Mode	Code Rate	Guard Interval	TS Data Mux Rate
64 QAM	1/2	1/32	18.096257
64 QAM	1/2	1/32	18.096257
16 QAM	1/2	1/32	12.064171
16 QAM	1/2	1/32	12.064171
QPSK	3/4	1/32	9.048128
QPSK	3/4	1/32	9.048128
QPSK	1/2	1/32	6.032086
QPSK	1/2	1/32	6.032086

There are no field replaceable parts on the COFDM modulator. If a fault occurs with the board please contact Gigawave for technical assistance.

5.4 Power Amplifier

The function of the power amplifier is to amplify the signal from the COFDM modulator to a suitable level for transmission via the N-type connector into the antenna. The amplifier is required to be highly linear to accommodate the multiple carrier signal formats employed for digital system operation, with very low distortion (low intermodulation between carriers). The nominal output power is +20dBm (100mW) across the 2.2 – 2.7GHz band. Nominal overall gain is 29dB, thus the nominal RF input level is –9dBm. The amplifier operates from a single +8 Volt supply. Nominal operational supply current is 700mA.

The status of the PA is provided by LEDs to monitor RF output level (green) and DC present (red) and also monitored by the main controller and displayed as the status monitoring menu. See 3.3.

To ensure good RF practices when power is applied to the D-Cam Clip-On Camera back, always make sure that there is a suitable load or antenna connected to the RF output.

5.5 Front Panel

The Front Panel consists of a microcontroller, 16-character by 2-line LCD display, operator switches and interface circuits.

The Front Panel is the main system controller for the unit. All configuration of the unit hardware is from this board. An I²C two-wire interface is used to communicate with all other intelligent devices within the unit. This carries the command data and reads back status data from all boards within the unit. At power-up this board initialises all the other boards and during normal operation monitors all the major functions and reports any problems as part of the unit status.

All configuration parameters, video settings, audio settings, MPEG encoder parameters, frequencies etc; are held on this board. The MPEG parameter set required (one of sixteen) is selected via the Front Panel by the operator. These parameter sets are held in the non-volatile memory of the front panel unit and can only be upgraded by the factory.

5.5.1 Default Parameter Set

Mem	Part Number	Rate (Mbit/s)	COFDM Mode	MPEG	Video Rate (Mbit/)	Video LPF	Low Delay Mode	Audio Rate (kbit/)
0	PBSW-TDVP - 0303-05-00	18.096257	64-QAM, 1/2, 1/32	422P@ML, GOP4	16.59	No	No	192
1	PBSW-TDVP - 0303-05-01	18.096257	64-QAM, 1/2, 1/32	SP@ML, infinite GOP,	11.81	No	Yes	192
2	PBSW-TDVP - 0303-05-02	12.06417	16-QAM, 1/2, 1/32	MP@ML, GOP4	10.00	Yes	No	192
3	PBSW-TDVP - 0303-05-03	12.06417	16-QAM, 1/2, 1/32	SP@ML, Infinite GOP, Intra-slice	8.00	Yes	Yes	160
4	PBSW-TDVP - 0303-05-04	9.048128	QPSK 3/4, 1/32	422P@ML, GOP4	7.79	Yes	No	192
5	PBSW-TDVP - 0303-05-05	9.048128	QPSK 3/4, 1/32	SP@ML, Infinite GOP, Intra-slice	6.00	Yes	Yes	192
6	PBSW-TDVP - 0303-05-06	6.032086	QPSK 1/2, 1/32	SP@ML, Infinite GOP	4.94	Yes	No	128
7	PBSW-TDVP - 0303-05-07	6.032086	QPSK 1/2, 1/32	MP@ML, GOP4	4.94	Yes	No	192

6 System Monitoring / Setup

Using a PC running Hyper Terminal or other terminal emulator, the D-Cam Clip-On can be configured without the use of the operator controls and LCD display. The current configuration can also be obtained via this RS232 interface.

When the D-Cam Clip-On is under the control of the Remote Interface the operator controls will not function when a menu has been entered.

Set the terminal emulation for RS232, 19200 Baud, 8bit, 1 stop, No parity. A simple menu is used to configure the appropriate D-Cam Clip-On parameter.

6.1 Main Menu

```
*****
GIGAWAVE Ltd
D-CAM
CLIPON UNIT
PBSW-TDDB-0102-03
*****

MAIN MENU
c : Program Channels
g : Gigawave Menu
h : Help
m : MPEG PSET
s : Dump Setup
u : Unit Name
>
```

The 'Gigawave Menu' is intended for Gigawave personnel only. A password is required to allow us of these features.

All other menus are entered by pressing the appropriate key. At any point 'h' can be used to print the available options.

6.2 Program Channels

```
CHANNEL MENU  
  
L : List All Channels  
  
P : Program Channel  
  
h : Help  
  
x : Exit  
  
>
```

'**L**'ist is used to display the current channel / frequency allocation. '**P**'rogram is used to assign a new frequency to one of the sixteen channels. This is an alternative method from using the Operator Controls and System Configuration / Engineering Menu 3.4.1

6.2.1 List All Channels

```
CHANNEL FREQUENCIES LIST  
  
Ch1  2200 MHz  
Ch2  2225 MHz  
Ch3  2250 MHz  
Ch4  2275 MHz  
Ch5  2300 MHz  
Ch6  2325 MHz  
Ch7  2350 MHz  
Ch8  2375 MHz  
Ch9  2400 MHz  
Ch10 2425 MHz  
Ch11 2450 MHz  
Ch12 2475 MHz  
Ch13 2500 MHz  
Ch14 2525 MHz  
Ch15 2550 MHz  
Ch16 2575 MHz  
  
>
```

6.2.2 Program Channel

>p

PROGRAM CHANNEL FREQUENCY

Enter Channel 1 ->16 : 1

Enter Frequency in MHz : 2345

>

The Ch number (1-16) is first selected; then a four digit frequency. This frequency input is range checked to confirm that the input frequency is valid

'L'ist can then be used to display the current channel allocation.

6.3 Dump Setup

***** CLIPON SETUP *****

UNIT NAME : this is new name

DISPLAY BOARD SW Ver : 02.03

ENCODER BOARD SW Ver : 00.06

FREQUENCY SETUP :

Range : 2200->2600 MHz

Ch1 2345 MHz

Ch2 2225 MHz

Ch3 2250 MHz

Ch4 2275 MHz

Ch5 2300 MHz

Ch6 2325 MHz

Ch7 2350 MHz

Ch8 2375 MHz

Ch9 2400 MHz

Ch10 2425 MHz

Ch11 2450 MHz

Ch12 2475 MHz

Ch13 2500 MHz

Ch14 2525 MHz

Ch15 2550 MHz

Ch16 2575 MHz

Man 2600 MHz

AUDIO SETUP :

Offset : 12.5 dB

Min : -20.0 dB

Max : 20.0 dB

I/P 1 LINE 0.0 dB

I/P 2 LINE 0.0 dB

VIDEO I/P : PAL CVBS

>

This provides a complete listing of the current configuration, this can then be 'cut & paste ' and saved to form a record of the unit configuration.

6.4 Unit Name

UNIT NAME MENU

r : Read Unit Name

n : Enter New Unit Name (16 characters)

h : Help

x : Exit

>r : this is a new na

>n : this is new name

>r : this is new name

>

The 'Unit Name' is displayed on the LCD display at power-up. It is intended to allow operators to assign a unique ID for the D-Cam Clip-On e.g. RF Cam#1. This name can be up to sixteen characters long, one line of the LCD display. All sixteen characters must be entered, spaces are used to complete the line as required.