TANDBERG
Television

ST.TM.E9200.8
Issue 8
ENGLISH (UK)

INSTRUCTION MANUAL

Alteia and Alteia ***plus***

Professional Receivers and Decoders

Software Version 2.1 (and later)
[Demultiplexer App Code Version]
M2/PDU/942, M2/P8R/942, M2/PSR/932,
M2/PSR/942, M2/PTR/94x, M2/PTRE/94x
and Options

Typical Alteia *plus* Satellite Receiver

ENGLISH (UK)

READ THIS FIRST!

If you do not understand the contents of this manual
DO NOT OPERATE THIS EQUIPMENT**.**

Also, translation into any EC official language of this manual can be made available, at your cost.

ITALIANO

LEGGERE QUESTO AVVISO PER PRIMO!

Se non si capisce il contenuto del presente manuale
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È anche disponibile la versione italiana di questo manuale, ma il costo è a carico dell'utente.

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LÄS DETTA FÖRST!

Om Ni inte förstår informationen i denna handbok
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LUE ENNEN KÄYTTÖÄ!

Jos et ymmärrä käsikirjan sisältöä
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AVANT TOUT, LISEZ CE QUI SUIT!

Si vous ne comprenez pas les instructions contenues dans ce manuel
NE FAITES PAS FONCTIONNER CET APPAREIL.

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Udstyret må ikke betjenes
MEDMINDRE DE TIL FULDE FORSTÅR INDHOLDET AF DENNE HÅNDBOG.
Vi kan også for Deres regning levere en dansk oversættelse af denne håndbog.

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LESEN SIE ZUERST DIESEN HINWEIS!

Sollte Ihnen der Inhalf dieses Handbuches nicht klar verständlich sein, dann
BEDIENEN SIE DIESE GERÄTE NICHT!

Eine Übersetzung des Handbuches in diese Sprache ist gegen Berechnung lieferbar.

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ΔΙΑΒΑΣΤΕ ΠΡΩΤΑ ΑΥΤΟ!

Αν δεν καταλάβετε το περιεχόμενο αυτού του βοηθήματος/εγχειριδίου
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Επίσης, αυτό το εγχειρίδιο είναι διαθέσιμο σε μετάφραση σε αυτή τη γλώσσα και μπορείτε να το αγοράσετε.

ESPAÑOL

LEA ESTE AVISO PRIMERO!

Si no entiende el contenido de este manual
NO OPERE ESTE EQUIPO.

Podemos asimismo suministrarle una traducción de este manual al (idioma) previo pago de una cantidad adicional que deberá abonar usted mismo.

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TANDBERG TELEVISION LTD

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HAMPSHIRE, SO30 4DA
UNITED KINGDOM

Registered Company Number 03695535

List of Contents

About this Manual

Introduction

This manual provides instructions and information for the installation and operation of the Alteia. It should be kept in a safe place for reference for the life of the equipment. Further copies of this manual can be ordered from the address shown on *page vi*. If passing the equipment to a third party, also pass on the relevant documentation.

Revisions

It is not intended that this manual is amended by the issue of individual pages. Any revision will be by a complete reissue.

Issues of this Manual

Issues of this manual are listed below:

Issue	Date	Software Version (Demux App Code Ver. Menu #13 Page 11)	Comments
1	Sept 1998	1.0	Initial release.
2	Feb 1999	2.1	Covers v2.1 of the Demux board. Reflects rev 15 and 16 of Alteia requirement document. LS Data added. HS Data added after v2.1. User defined languages added.
2r1	Mar 1999	2.1	New model added (M2/PSR/932C). Note added that CA is not available with Terrestrial (PTR) models.
3	Sept 1999	2.1 – 2.3	Reflects up to rev 28 of Alteia requirement document.
4	Jun 2000	2.1 to 2.5	Text, graphics and menu updates. Alteia *plus* models added.
5	Sept 2000	2.1 – 2.6	Reformatted to corporate style. BISS entries added. New Video fail mode (no syncs) added. M2/PDU/942C added.
5r1	Oct 2000	2-1 – 2.6	References to PAL-M removed.
6	June 2001	2-1 – 2.8	References to PAL-M added for M2/…/942D variants. BISS Mode-E entry added. M2/PTRE/948C included.
6r1	Aug 2001	2.1 – 2.8	Rearrangement of Preliminary Pages. Addition of copyright *Patent Declaration* on page v.
7	Oct 2001	2.1 – 2.8	FEC and Symbol rates updated. Minor text changes. Additional Frame Sync information.
8	Jul 2002	2.1 – 2.9	Updates for M2/PTRE/948CVL (Voyager Lite).

The following associated manuals are also available:

- ST.TS.E9200: Remote Control Protocol
- ST.QR.E9200: Alteia Receivers and Decoders Quick Reference Guide
- ST.QR.Director.E9200: Using the Alteia Receiver with Director

Acknowledgements

General

All best endeavours have been made to acknowledge registered trademarks and trademarks used throughout this manual. Any notified omissions will be rectified in the next issue of this manual.

Some trademarks may be registered in some countries but not in others. In general, the situation in the UK will prevail throughout TANDBERG Television Limited manuals.

Registered trademarks and trademarks used are acknowledged below and marked with their respective symbols. However, they are not marked within the text of this manual.

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Patent Declaration

Refers to Alteia plus M2/xxx/942C units with PAL-M compatibility and all M2/xxx/942D units.

This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovison, and is intended limited pay-per-view used only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

Warnings, Cautions and Notes

Heed Warnings

All warnings on the product and in the operating instructions should be adhered to. The manufacturer can not be held responsible for injuries or damage where warnings and cautions have been ignored or taken lightly.

Read Instructions

All the safety and operating instructions should be read before this product is operated.

Follow Instructions

All operating and use instructions should be followed.

Retain Instructions

The safety and operating instructions should be retained for future reference.

WARNINGS...

WARNINGS GIVE INFORMATION WHICH, IF STRICTLY OBSERVED, WILL PREVENT PERSONAL INJURY OR DEATH, OR DAMAGE TO PERSONAL PROPERTY OR THE ENVIRONMENT. THEY ARE BOXED AND SHADED FOR EMPHASIS, AS IN THIS EXAMPLE, AND ARE PLACED IMMEDIATELY PRECEDING THE POINT AT WHICH THE READER REQUIRES THEM.

CAUTIONS...

Cautions give information that if strictly followed, will prevent damage to equipment or other goods. They are boxed for emphasis, as in this example, and are placed immediately preceding the point at which the reader requires them.

NOTES...

Notes provide supplementary information. They are highlighted for emphasis, as in this example, and are placed immediately after the relevant text.

EMC Compliance

This equipment is certified to the EMC requirements detailed in *Annex B, Technical Specification*. To maintain this certification, only use the leads supplied or if in doubt contact Customer Services.

Contact Information

TANDBERG Television Customer Services

Support Services

Our primary objective is to provide first class customer care that is tailored to your specific business and operational requirements. All levels are supported by one or more service performance reviews to ensure the perfect partnership between TANDBERG Television and your business.

Levels of Support

All TANDBERG Products and Systems are designed and built to the highest standards and are covered under a comprehensive 12 month warranty.

- For standalone equipment, then TANDBERG Television **BASIC Advantage** is the value for money choice for you.
  BASIC provides you with year-by-year Service long after the warranty has expired.
- For systems support you can choose either **Gold** or **Silver Advantage**. These packages are designed to save you costs and protect your income through enlisting the help of TANDBERG Television support specialists.
- **VOYAGER Advantage** is the truly mobile service solution. This provides a service specifically designed to keep you mobile and operational.

Where to Find Us

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Germany:	+49 8996 999 870
Poland:	+48 58 3000 940
Internet Address:	http://www.tandbergtv.com

Technical Training

Training Courses

TANDBERG Television provides a wide range of training courses on the operation and maintenance of our products and on their supporting technologies. TANDBERG can provide both regularly scheduled courses and training tailored to individual needs. Courses can be run either at your premises or at one of our dedicated training facilities.

Where to Find Us

For further information on TANDBERG Television's training programme please contact us:

International Telephone: +44 23 8048 4229
International Facsimile +44 23 8048 4467

E-mail Address:

training@tandbergtv.com
Internet Address http://www.tandbergtv.com

Customer Services and Technical Training Postal Address

Tandberg Television
Unit 2
Strategic Park
Comines Way
Hedge End
Southampton
Hampshire
SO30 4DA
United Kingdom

Return of Equipment

If you need to return equipment for repair, please contact the Customer Services Helpdesk on +44 (0) 23 8048 4455. A Returns Authorisation Number (RAN) will be issued and full details of the unit will be logged. Please ensure the RAN number is clearly marked on the packaging of the unit. The unit should then be sent to the following address:

Tandberg Television – Customer Services
Unit 1
Strategic Park
Comines Way
Hedge End
Southampton
Hampshire
SO30 4DA
United Kingdom

Chapter 1

Introduction

Contents

List of Figures

List of Tables

1.1 Scope of this Manual

1.1.1 Who Should Use this Manual

This manual is written for operators/users of the Alteia and Alteia *plus* range of Professional Receivers and Decoders. It describes the unit's functions and operation. The manual is written to assist in the installation and day-to-day care and operation of the unit. Maintenance information requiring the covers to be removed is not included.

> CAUTION...
>
> Removing the covers of this equipment may invalidate the warranty.

1.1.2 What this Manual Describes

Identifying the Equipment

The Receivers and Decoders are designated by the marketing codes shown in *Table 1.2.*

Figure 1.1: Front View of an Alteia plus Satellite Receiver

> NOTE...
>
> Alteia *plus* products are identified by having Marketing codes ending in /94xB or /94xC.

The Marketing Code and fitted options are displayed as part of the System Menu (#13) accessed through the LCD display. The Marketing Code is defined by the following fields:

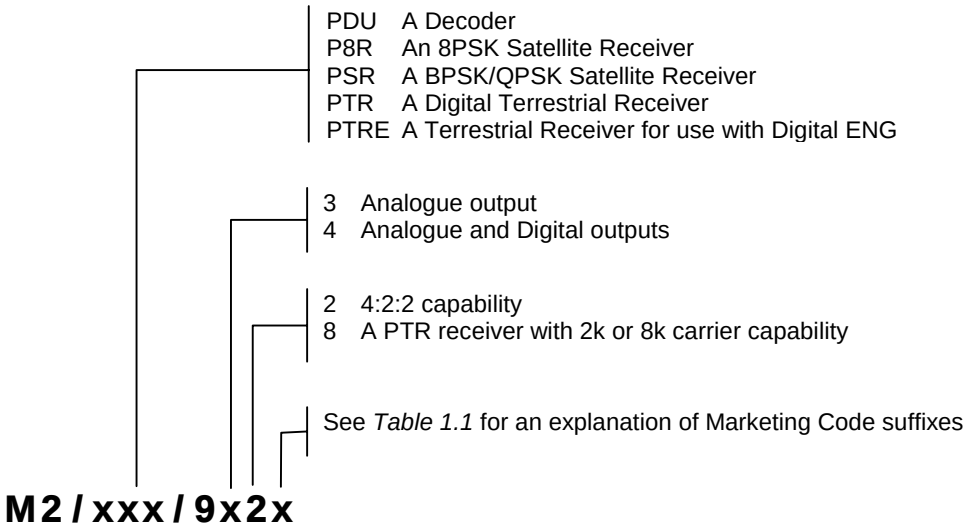


Figure 1.2: Make-up of Alteia Marketing Codes

Marketing Code Suffixes

Table 1.1 describes the meaning of the Marketing Code Suffixes.

Table 1.1: Marketing Code Suffixes

Suffix	Models Affected	Description
none	Alteia	Base model
A	Alteia	Incorporates RS-422 High-speed Data output
B	Alteia *plus*	Optional enhanced feature set enabled (from s/w version 2.4).
C	Alteia *plus* (not M2/PSR/932C)	Optional enhanced feature set enabled and improved SDI jitter performance when frame synchronized, see *Table 1.2* (from s/w version 2.5)
	Alteia (M2/PSR/932C only)	4 L-band inputs, see *Table 1.4*.
D	M2/PDU/942D M2/PSR/942D M2/P8R/942D	As suffix C models but with PAL-M operation fully supported.

Software Versions

This manual has been written to cover the functions of software **versions 2.9 and later**. This can be checked using the System Menu (#13) pages. These are described in *Annex C, Menus.*

Table 1.2: Models and Software Versions Covered by this Manual

Marketing Code	Part Number	Description	S/W Ver	Video / Audio Output Format
M2/PDU/942	E9203	Decoder with 4:2:0/4:2:2 capability (byte-mode input only). PAL-M is not supported.	2.2	Analogue and Digital
M2/PDU/942B	E10051	Decoder with 4:2:0/4:2:2 capability with a set of optional enhanced features. Byte-mode input only. PAL-M is not supported.		
M2/PDU/942C	E10057	Decoder with 4:2:0/4:2:2 capability with a set of optional enhanced features and improved jitter performance when frame sync'd. Byte-mode input and single packet burst mode input. PAL-M is not supported.	2.5→	
M2/PDU/942D	E10091	Decoder with 4:2:0/4:2:2 capability with a set of optional enhanced features and improved jitter performance when frame sync'd. Byte-mode input and single packet burst mode input. PAL-M operation is fully supported.	2.8→	
M2/P8R/942A	E10047	8PSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability and RS-422 high-speed data output. PAL-M is not supported.	2.3→	Analogue and Digital
M2/P8R/942C	E10071	8PSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability with a set of optional enhanced features and improved jitter performance when frame sync'd. PAL-M is not supported.	2.5→	Analogue and Digital
M2/P8R/942D	E10092	8PSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability with a set of optional enhanced features and improved jitter performance when frame sync'd. PAL-M operation is fully supported.	2.8→	Analogue and Digital

Marketing Code	Part Number	Description	S/W Ver	Video / Audio Output Format
M2/PSR/932	E9200	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability. PAL-M is not supported.	2.2	Analogue only
M2/PSR/932C[1]	E10012	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability. PAL-M is not supported.	2.2	Analogue only
M2/PSR/942	E9201	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability. PAL-M is not supported.	2.1	Analogue and Digital
M2/PSR/942A	E10014	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability and RS-422 high-speed data output. PAL-M is not supported.	2.2	Analogue and Digital
M2/PSR/942B	E10021	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability with a set of optional enhanced features. PAL-M is not supported.	2.4→	Analogue and Digital
M2/PSR/942C	E10056	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability with a set of optional enhanced features.and improved SDI jitter performance when frame sync'd. PAL-M is not supported.	2.5→	Analogue and Digital
M2/PSR/942D	E10090	BPSK/QPSK Satellite Receiver with 4:2:0/4:2:2 capability with a set of optional enhanced features.and improved SDI jitter performance when frame sync'd. PAL-M operation is fully supported.	2.8→	Analogue and Digital
M2/PTR/942	E9241	Digital Terrestrial Receiver with 4:2:0/4:2:2 capability (2K). PAL-M is not supported.	→ 2.2	Analogue and Digital
M2/PTR/948A	E10050	Digital Terrestrial Receiver with 4:2:0/4:2:2 capability and RS-422 high-speed data output (2K and 8K). PAL-M is not supported.	2.3→	Analogue and Digital
M2/PTRE/942[2]	E10011	Digital ENG Receiver with 4:2:0/4:2:2 capability. PAL-M is not supported.	2.2→	Analogue and Digital
M2/PTRE/948C	E10068	Digital ENG Receiver with 4:2:0/4:2:2 capability, RS-422 high-speed data output and improved SDI jitter performance when frame sync'd. 70 MHz IF input. PAL-M is not supported.	2.5.4 Only	Analogue and Digital
M2/PTRE/948CVL	E10068 +LINA	Digital ENG Receiver with 4:2:0/4:2:2 capability, for use with Voyager Lite, complete with Linear Audio M2/PRO/LINA (linear audio software switch)	2.9	Analogue and Digital

See *Table 1.5* for a history of software enhancements and *Table B.1* in *Annex B* for the availability of the various models.

Table 1.3: Main Features of the Decoder Range

Marketing Code	Inputs	Input Data-rate	Coding	Digital Outputs
M2/PDU/942[B]	DVB-SPI, ASI-Copper, ASI-Fibre (byte-mode only)	Up to 54 Mbit/s	4:2:0/4:2:2	✓
M2/PDU/942C[D]	DVB-SPI, 2 x ASI-Copper. Byte-mode input and single packet burst mode input supported.	Up to 100 Mbit/s	4:2:0/4:2:2	✓

[1] M2/PSR/932C has 4 x L-band inputs.
[2] Used with the E5100 and E6100 Encoders (Digital ENG) – see Manuals ST.TM.E10065 and ST.TM.E10016.

Table 1.4: Main Features of the Receiver Range

	Marketing Code	Inputs	Input Frequency	Input Symbol rate	Coding	Digital Outputs
Satellite 8PSK	M2/P8R/942A[C][D]	2 x L-Band	950 – 2150 MHz	8PSK: 3.0 – 30.0 MSym/s (FEC $^{5}/_{6}$) 3.0 – 24 MSym/s (FEC $^{8}/_{9}$) (will operate up to 28.125) QPSK: 1.0 – 43.0 MSym/s	4:2:0/4:2:2	✓
Satellite BPSK, QPSK	M2/PSR/932	2 x L-Band	950 – 2150 MHz	1.0 – 44.5 MSym/s	4:2:0/4:2:2	
	M2/PSR/932C	4 x L-Band	950 – 2150 MHz	1.0 – 44.5 MSym/s	4:2:0/4:2:2	
	M2/PSR/942[A][B][C][D]	4 x L-Band	950 – 2150 MHz	1.0 – 44.5 MSym/s	4:2:0/4:2:2	✓
Terrestrial	M2/PTR/942 M2/PTR/948[A]	1 x UHF 1 x Baseband	Channels 21 – 68 4.571 MHz (centre)	4.98 – 31.67 MSym/s	4:2:0/4:2:2	✓
	M2/PTRE/942	1 x 70 MHz I/P	70 MHz	4.98 – 31.67 MSym/s	4:2:0/4:2:2	✓
	M2/PTRE/948C	1 x 70 MHz I/P	70 MHz	4.98 – 31.67 MSym/s	4:2:0/4:2:2	✓
	M2/PTRE/948CVL	1 x 70 MHz I/P	70 MHz	4.98 – 31.67 MSym/s	4:2:0/4:2:2	✓

> NOTE...
> All models have analogue outputs as standard.

Table 1.5 describes the change in functions with software update.

Table 1.5: Software Version Updates

Software Release	Marketing Code	Explanation
2.1.x	All	Added HS Data Functions, Added VITS standards.
2.2.x	All	Closed Caption now correctly passed in the VBI in 3:2 pulldown. Dolby Digital AC-3 supported Supports automatic decoding of MPEG-2-only transport streams.
	M2/PDU/942	Decoder supported.
	M2/PSR/932	Satellite Receiver with 2 L-band inputs supported.
	M2/PSR/942A	Satellite Receiver with 2 Mbit/s High-speed Synchronous Data supported.
	M2/PTRE/942	Digital ENG Model supported.
2.3.x	All	DVB Subtitles supported.
	M2/P8R/942:	Model Supported.
2.4	All with suffix B	2 Mbit/s RS-422 Synchronous Data and enhanced functions supported.
2.5	All with suffix C	2 Mbit/s RS-422 Synchronous Data and enhanced functions supported and improved SDI jitter performance when frame sync'd.
2.54	M2/PTRE/948C	70 IF MHz input functionality added.
2.8	B and C variants. D variants.	Alteia *plus* added to titles throughout. BISS functionality added. Additional freeze frame option (no syncs) added. Linear Audio to year 2000 specification. As B and C variants plus PAL-M operation is fully supported.
2.9	M2/PTRE/948CVL	Alteia *plus* for Voyager Lite.

1.2 Summary of Features

1.2.1 Main Features

All Models

The Receivers and Decoders are fully compliant with the appropriate sections of the MPEG-2[3], DVB-S[4], DVB-T[5] and DSNG[6] specifications. The Alteia and Alteia *plus* range offers the following features:

- Multiple RF Inputs (Satellite Receivers)
  - ✧ L-band Alteia (Satellite) Receivers have either 2 or 4 inputs (dependent on model). These are numbered 1, 2, 3, 4
  - ✧ An Over-air force retune command can be received from the Director system.

> NOTES...
> 1. The Director system GUI counts the inputs from zero (i.e. 0, 1, 2, 3).
> 2. Director prior to version 3 assumed the use of RF input 1 for most commands. Director versions 3 and onward allow selection of the RF input.

- Front Panel Controls and Indications:
  - ✧ A three row LCD display provides information and allows operator choice entry
  - ✧ Rotary switches and pushbuttons provide the control interface in conjunction with the LCD display
  - ✧ Operator defined top-level status screen is displayed as the default
  - ✧ LEDs provide status information
- Service Selection:
  - ✧ Chosen from a menu list of available services carried in the currently received transport stream (TS)
  - ✧ Up to 20 pre-selected choices stored within the unit
- Video Decoding:
  - ✧ 4:2:0 mode support video resolutions up to 720 pixels x 576 active lines (25 frame/s) or 720 pixels x 480 active lines (30 frame/s)
  - ✧ 4:2:2 mode support video resolutions up to 720 pixels x 608 active lines (25 frame/s) or 720 pixels x 512 active lines (30 frame/s)
  - ✧ Support for the following composite video outputs; PAL-B, -G, -I, -N Combination, -N Normal, –M (PAL-M fully supported on D variants only) and NTSC-M (with pedestal or without)
  - ✧ A video test point is available at the front panel
- Audio Decoding:
  - ✧ Sampling rates 32, 44.1, 48 kHz

[3] Moving Pictures Expert Group: MPEG-2 specification ISO 13818.
[4] European Digital Video Broadcasting (DVB) Project. EN 300 421 Digital broadcasting systems for television, sound and data services: Framing structure, channel coding and modulation for the 11/12 GHz satellite service.
[5] European Digital Video Broadcasting (DVB) Project. EN 300 744 Digital broadcasting systems for television, sound and data services: Framing structure, channel coding and modulation for the terrestrial television.
[6] European Digital Video Broadcasting (DVB) Project : EN 301 210 Digital broadcasting systems for television, sound and data services: Framing structure, channel coding and modulation for digital satellite news gathering (DSNG) and other contribution applications by satellite.

- ✧ All MPEG-2 data rates
- ✧ Audio test points available at the front panel

- Data:
  - ✧ Low Speed Data: RS-232 asynchronous (up to 19.2 kbit/s)
- Conditional Access/Scrambling:
  - ✧ Remote Authorisation System (RAS) version I or II[7]
  - ✧ EBU Basic Interoperable Scrambling System (BISS)[7]
  - ✧ NDS VideoGuard
- Transport Stream Output:
  - ✧ DVB-SPI connector provides a semi-decrypted, fully decrypted or non-decrypted output stream. An ASI Copper and Optical output option is available
  - ✧ Semi-decrypted, encrypted, decrypted (depends on CA used)
- Director System:
  - ✧ Over-air remote control is available if the Alteia is used as part of a Director system (Over-air software downloading, Re-start, Tuning and Retuning etc.)
- Vertical Blanking Interval (VBI) signalling support:
  - ✧ Support for Closed Captions and ITS/VITS/VITC
  - ✧ DVB Subtitles (from software release 2.3)
- Remote Control:
  - ✧ RS-232 or RS-485
  - ✧ When the remote control is active, front panel control is disabled but status information is still available (protocol is available from TANDBERG Television Limited)
- Clock/Calendar:
  - ✧ Available to UTC and local time
  - ✧ Constantly updated when locked to a valid transport stream

Enhanced Features (Alteia *plus*)

- Transport Stream Demultiplexing
  - ✧ Maximum capability is 100 Mbit/s
- Video Decoding
  - ✧ Maximum Video Demultiplexing capability of 50 Mbit/s
- Audio
  - ✧ Audio embedding in the digital video output
  - ✧ Supports the TANDBERG Television interpretation of SMPTE 302M-1998 (linear audio) as specified in the applicable detailed specification [Option]. Either SMPTE 302M-1998 or SMPTE 302M-2000 can be supported in S/W ver 2.8 and later but not together.
- Data (also available on models with an A suffix)
  - ✧ High Speed Data: RS-422 synchronous (up to 2.048 Mbit/s)

[7] RAS I or II is not available for Terrestrial Receiver or Digital ENG models (M2/PTR[E]/942[A], M2/PTR[E]/948[A]).

- Vertical Blanking Interval (VBI) signalling support [Option]
  - ✧ World System Teletext (WST)
  - ✧ Video Programming System (VPS)/Programme Delivery and Control (PDC)
  - ✧ Wide Screen Signalling (WSS)
  - ✧ Neilson Coding AMOL 1 and AMOL 2
  - ✧ Vertical Interval Time Code (VITC)
  - ✧ Video Index
  - ✧ Inverted Teletext (v2.6 and later)
- Error Data Handling (EDH)
  - ✧ EDH is supported on the SDI (digital video) output
- Frame Synchroniser [Option]
- Options
  - ✧ Purchasable options are available to enhance the functionality of the unit – see *Chapter 5, Options*

1.2.2 Inputs

These are model specific, details appear later in this chapter.

1.2.3 Outputs

Transport Stream Output

One 25-way D-type connector carrying the decoded transport stream in DVB-SPI format.

The following restrictions apply to the transport stream output of the M2/PDU/942C[D] Decoder model:

- The SPI output is only available if the input to the Decoder is SPI. The Decoder does not act as an ASI to SPI converter.
- If the ASI output option card is used (see *Chapter 5, Options*) the output mode depends on the input mode. If the input mode is SPI, the ASI output is byte-mode. If the input is ASI, the ASI output is single packet burst mode.

Video Outputs

M2/PSR/932[C]

- Two analogue composite video outputs carried on BNC connectors.

M2/PDU/942[B][C][D],
M2/P8R/942A[C][D],
M2/PSR/942[A][B][C][D],
M2/PTR/942,
M2/PTR/948[A],
M2/PTRE/942,
M2/PTRE/948C
M2/PTRE/948CVL

- One analogue composite video output carried on a BNC connector.
- One ITU-R BT.656 digital video output carried on a BNC connector.

Audio Outputs

M2/PSR/932[C]

- Four analogue audio outputs carried on XLR connectors. Depending on the input, these are menu configurable to allow up to two stereo, two dual-mono, four mono channels or a mix of these. The channels can carry different languages.

M2/PDU/942[B][C][D], M2/P8R/942A[C][D], M2/PSR/942[A][B][C][D], M2/PTR/942, M2/PTR/948[A], M2/PTRE/942, M2/PTRE/948C M2/PTRE/948CVL

- Two digital audio outputs carried on XLR connectors. Depending on the input, these are menu configurable to allow two stereo, two dual-mono, four mono digital channels or a mix of these. This configuration leaves two XLR connectors (left-hand) unused. The channels can carry different languages.

OR

- One digital output plus one analogue stereo/dual-mono output. Depending on the input, these are menu configurable to allow two stereo, two dual-mono, four mono analogue/digital channels or a mix of these. This configuration leaves one XLR connector (left-hand) unused. The channels can carry different languages.

OR

- Four analogue audio outputs carried on XLR connectors. Depending on the input, these are menu configurable to allow up to two stereo, two dual-mono, four mono channels or a mix of these. The channels can carry different languages.

Data Outputs

- RS-232 asynchronous low-speed data output carried on a 9-way, D-type connector.
- RS-422 synchronous 2 Mbit/s high-speed data output carried on a 15-way D-type connector. Available on Alteia *plus* models only.

Alarm Output

Alarm and failure monitoring is carried out within the equipment. This produces a summary alarm signal that lights the general front-panel **ALARM** LED. The Alarm conditions also drive auxiliary relays each providing a contact at the rear of the unit. The operator can define (using the Alarm Menu pages) which alarm conditions drive the relay and also the general front-panel **ALARM** LED. This is described in *Chapter 4, Alarms* and *Annex C, Menus*.

1.2.4 Conditional Access and Scrambling

The following Conditional Access and Scrambling options are available for the Alteia and Alteia *plus* range of Satellite Receivers, Decoders and M2/PTRE/948C Terrestrial Receivers.

- No Conditional Access
- Basic Interoperable Scrambling System (BISS) only
- VideoGuard and BISS
- Remote Authorisation System (RAS) and BISS
- VideoGuard, RAS and BISS

1.3 The Decoder

1.3.1 Typical Applications

The M2/PDU/942[B][C][D] Decoder is a component of TANDBERG Television's range of equipment. It is designed for use by broadcasters and distributors of video and audio services. It can be used, for example, as a transport stream monitor on the output of a compression system or to decode signals received over a telecommunications network, as shown below.

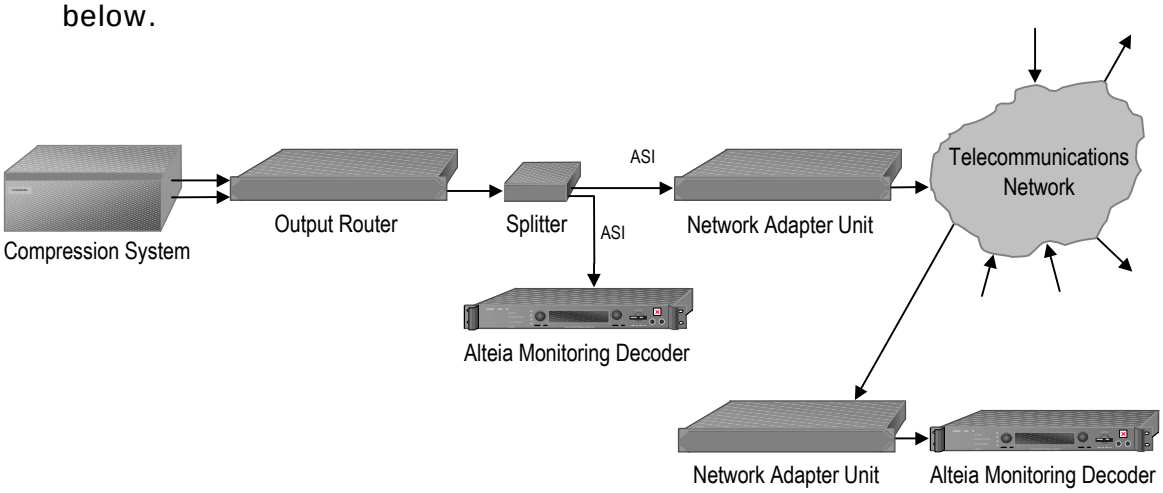


Figure 1.3: Typical Decoder Applications

1.3.2 What the Decoder Does

The front-end DVB-SPI and ASI interfaces are used to present a transport stream in the format required by the internal decoder circuitry.

The Decoder can be used to receive an input signal from a variety of sources. No error correction is supported at the input of the unit; if it is to receive signals via a telecom network, a level of Quality of Service should be negotiated with the Telecom Network Provider.

The Decoder is configured to select a single video service and other audio/data components from the multiple services on the incoming transport stream and present them at the output.

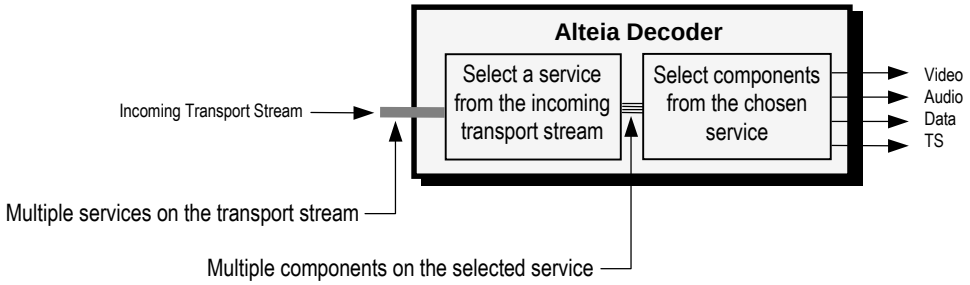


Figure 1.4: What The Decoder Does

1.3.3 Input Connections

The Decoder has the following inputs:

- M2/PDU/942B: DVB-SPI (parallel) and ASI (byte-mode only) copper and fibre-optic interfaces for operation up to 54 Mbit/s
- M2/PDU/942[C][D]: DVB-SPI (parallel) and 2 x ASI (byte-mode and single packet burst mode) copper interfaces for operation up to 100 Mbit/s

1.4 The Satellite Receiver

1.4.1 Models Covered

The following Receivers are covered in this section:

- M2/P8R/942A[C][D] (8PSK)
- M2/PSR/932[C] (BPSK/QPSK)
- M2/PSR/940 (BPSK/QPSK)
- M2/PSR/942[A][B][C][D] (BPSK/QPSK)

1.4.2 Typical Satellite System

The Alteia Satellite Receiver is a component of the MPEG-2/DVB compliant range of TANDBERG Television equipment. It is designed for use by broadcasters and distributors of video, audio and data services over satellite.

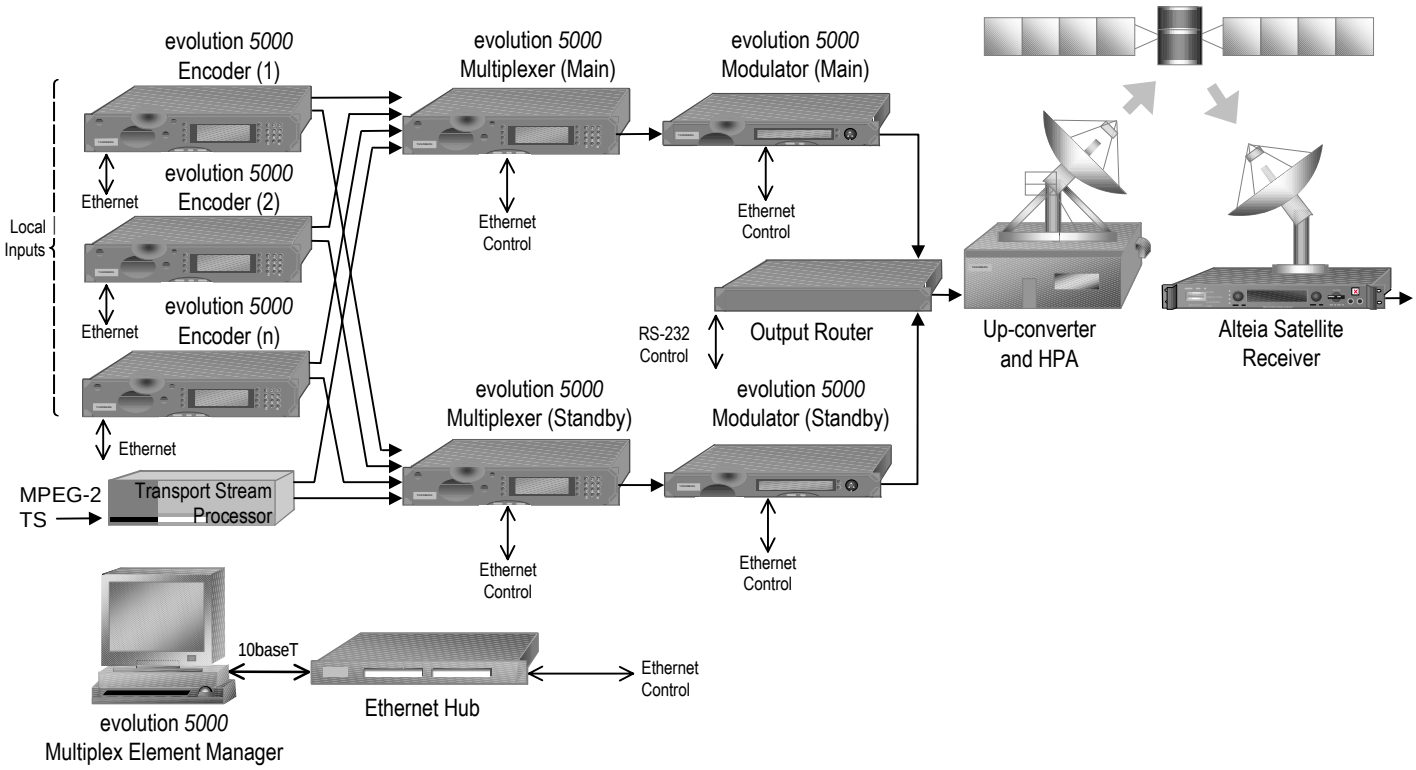


Figure 1.5: Typical Satellite System

1.4.3 What the Satellite Receiver Does

The Receiver can be tuned to a specified satellite channel frequency and polarisation. Referring to *Figure 1.6*, the input is down-converted via a Low-Noise Block (LNB) to provide an L-band input to the Receiver. The front-end tuning is microprocessor controlled with a frequency synthesised local oscillator. A software tuning and acquisition algorithm resolves translation errors (mainly due to the LNB).

The signal is then passed to a demodulator that recovers the signal using soft-decision decoding. The resulting stream is Reed-Solomon decoded and descrambled to provide inputs to the decoder circuit. The received channel may contain multiple services, therefore the Receiver's demultiplexer is configured to select a single video service and other audio/data components and present them at the output.

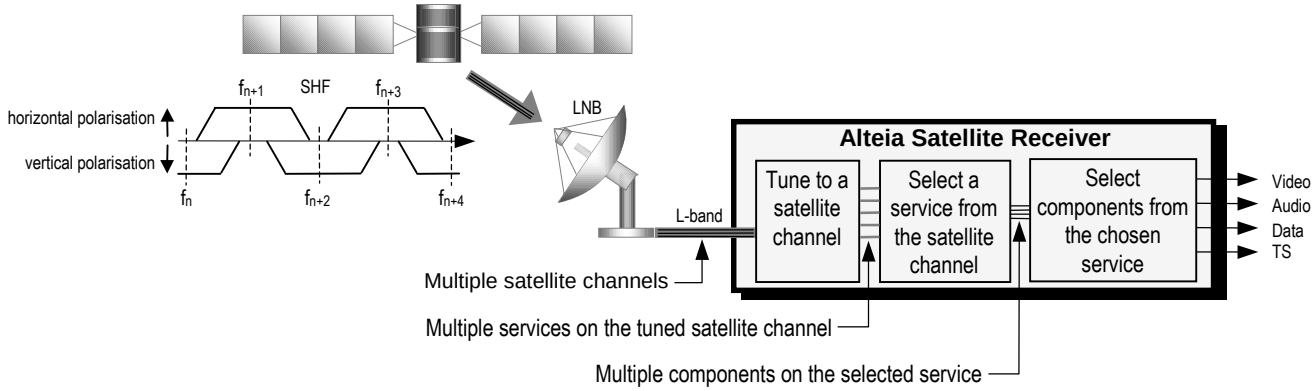


Figure 1.6: What the Satellite Receiver Does

1.4.4 Over-air Software Download (Director)

The Alteia Satellite Receiver is shipped with the appropriate firmware installed, but it is designed to allow replacement of this code by new versions of software transmitted over-air. The new code is downloaded as a background task in the same transport stream as used for the normal transmission of services. *Figure 1.7* shows the system required for this function. The existing software continues to function during the download process. Once all the new code has been received, installed and validated, it is loaded into the active memory and becomes the operating firmware for the Receiver.

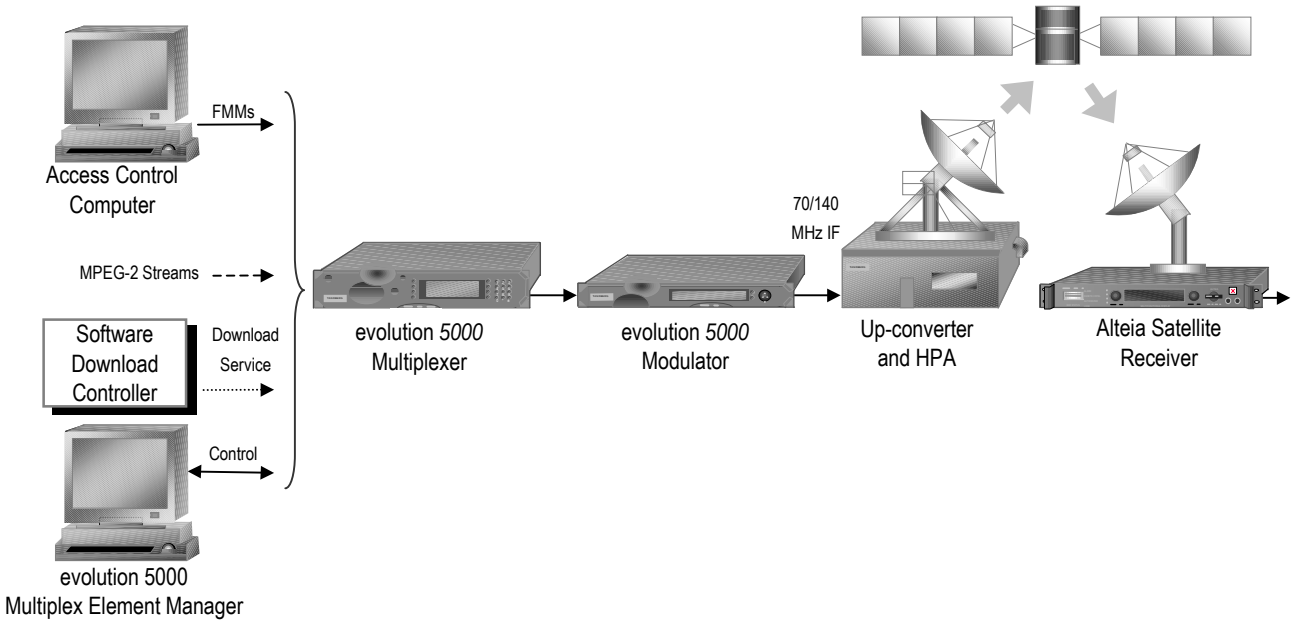


Figure 1.7: Typical Over-air Download Arrangement

1.4.5 Input Connections

The Satellite Receiver interfaces directly to the Low-Noise Block (LNB). It accepts an intermediate frequency (IF) input in the band 920 - 2150 MHz (M2/PSR models), and 950 - 2150 MHz (L-band; M2/P8R models), for operation in the specified symbol-rate range (see *Annex B, Technical Specification*). The unit can provide dc power and polarisation switching to the LNB.

1.5 The Terrestrial Receiver

1.5.1 Typical Terrestrial Arrangement

The M2/PTR/942 or/948[A] Terrestrial Receiver is a component of TANDBERG Television's range of equipment. It is designed for use by broadcasters and distributors of video and audio services. Typically, the Terrestrial Receiver is used for monitoring the output of a terrestrial transmitter. This is illustrated in *Figure 1.8*.

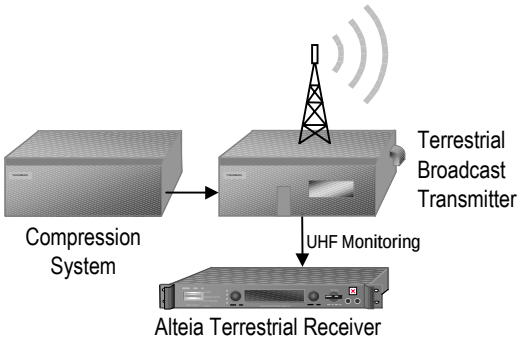


Figure 1.8: Typical Terrestrial Broadcast Monitoring Arrangement

1.5.2 What The Terrestrial Receiver Does

The Terrestrial Receiver can be tuned to a specified channel. The received channel may contain multiple services, therefore the Receivers demultiplexer is configured to select a single video service plus other audio/data components and present them at the output.

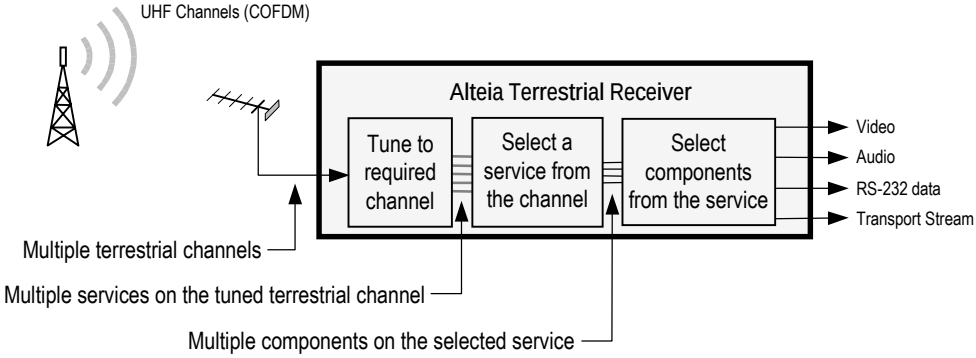


Figure 1.9: What the Terrestrial Receiver Does

1.5.3 Input Connections

The Terrestrial Receiver has UHF and Baseband COFDM interfaces. They operate between 4.98 and 31.67 MSymbol/s.

> NOTE...
> Because the Alteia is used for monitoring, it is fitted with an internal 20 dB attenuator.

1.6 The Digital ENG Receiver

1.6.1 Typical Digital ENG System

The Digital ENG Receiver is a component of TANDBERG Television's range of equipment. *Figure 1.10* shows a typical use of the Digital ENG Receiver, however, the radio path may vary from that shown given that the Digital ENG can be used in static or mobile configurations.

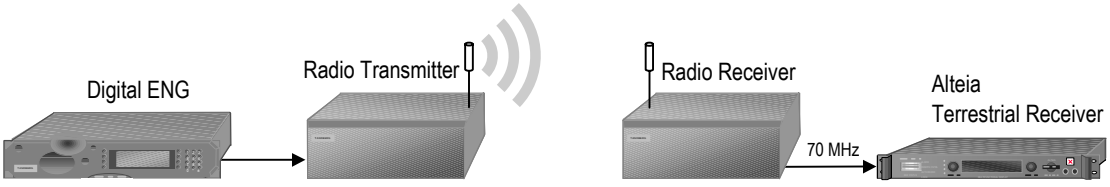


Figure 1.10: Typical Digital ENG Contribution System

1.6.2 Input Connections

The Digital ENG Receiver has a 70 MHz COFDM interface that operates between 4.98 and 31.67 MSymbol/s.

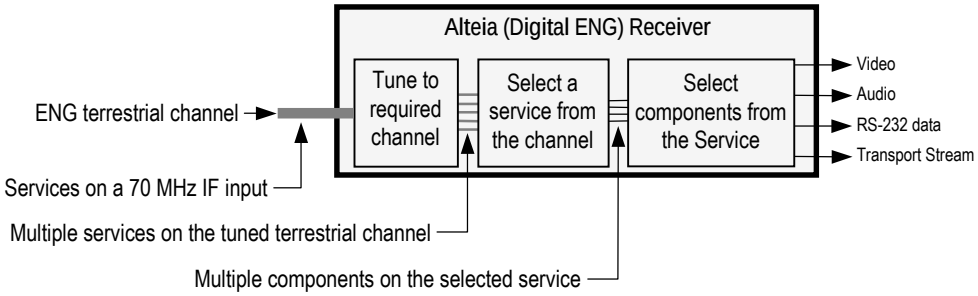


Figure 1.11: What the Digital ENG Receiver Does

1.7 Alteia Control Modes

1.7.1 Introduction

The Alteia is designed for unattended operation. Once set up, it requires no further attention except to ensure the fan is working. There are up to three control modes associated with the Receiver (Local, Remote and Over-air control depending on the options fitted). The unit remains in the chosen control mode until another mode is requested.

1.7.2 Local Control (via the Front Panel)

Normal (non-edit) State

To gain Local control of the Alteia, go to Menu #13, page 1. Select and save **Local Only**. The Normal state is the usual operating condition of the Alteia. In this state, the MENU control can be used to scan the first page in each of the menus. The SELECT control, steps through the pages of the displayed menu.

Edit State

Local Control mode allows parameters to be entered and chosen using the EDIT button and MENU/SELECT switches.

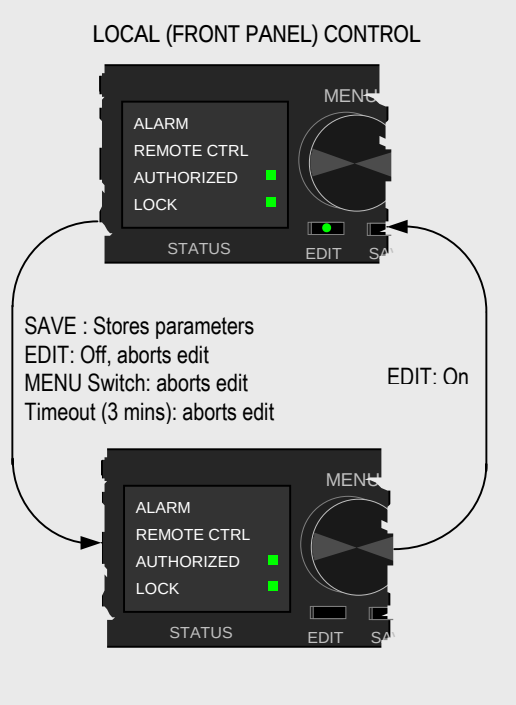


Figure 1.12: Local Control – Front Panel

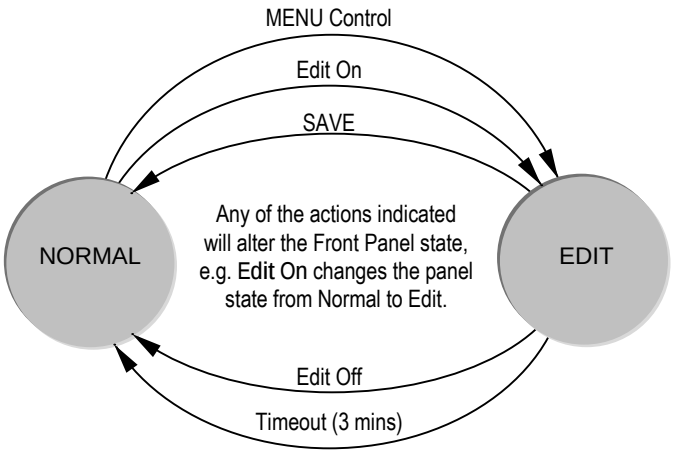


Figure 1.13: Front Panel States

1.7.3 Remote Control

The unit enters this state when the **R CTRL RS-232/485** port receives a configuration change command or the **Remote** control mode is selected on page 1 of the System Menu (#13). During this state, local commands are ignored. The **REMOTE CTRL** LED on the front panel remains lit to indicate that the control mode is **Remote**.

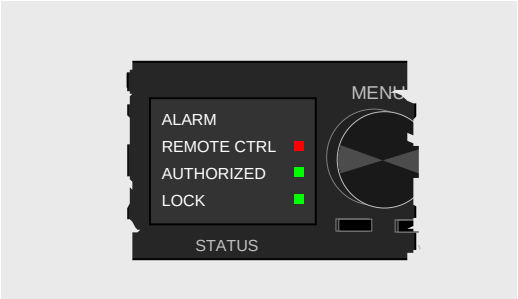


Figure 1.14: Remote Control Mode

If a modem is connected to the connector at the rear panel, it must be set to run at 9600 baud. A separate manual (ST.TS.E9200) is published which details the control protocol and syntax. This enables the user to develop software for PC remote control and is available from TANDBERG Television Limited on request.

1.7.4 Director Over-air Control

With the VideoGuard Conditional Access software installed and a valid smart card inserted, an Alteia Satellite Receiver can be put into Over-air control mode. The following commands, except the control mode are then ignored:

- LOCAL (Menu #13: Page 1 or CMO:LOM)
- REMOTE (CMO:RCM)

The Alteia can be put into a LOCAL LOCKOUT condition. Once in this condition, there are two ways to recover control:

- Cancelling the LOCAL LOCKOUT using an over-air command
- Entering a PIN number via the System Menu (#13)

Either of these actions puts the Receiver into LOCAL control mode

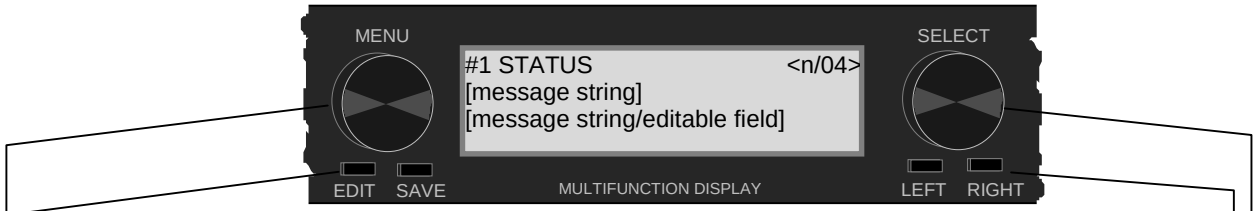
1.8 Guided Tour

1.8.1 Construction

The Receiver is constructed using a screened self-ventilated modular system; all operational inputs and outputs are via rear-panel connectors (monitor outputs are available at the front panel). The unit may be operated freestanding or mounted in a 19 inch rack. 2U rack height is required, 1U for the equipment and a 1U ventilation panel above it.

1.8.2 Front Panel Controls

The front panel is fitted with a number of controls that are used to set up and monitor the unit. Information on the use of these controls is given in *Chapter 3, Operating the Equipment Locally. Figure 1.15* describes the controls.



EDIT / SAVE Buttons

Button	Description
EDIT	Pressing this for more than ½ second puts the unit in Local Control: Edit mode. A cursor appears below the currently selected menu item. Pressing this button a second time reverts the unit to Normal mode. If there is no activity in this mode for five minutes, the unit reverts to Normal mode. On power-up, pressing the EDIT button invokes the front panel test mode.
SAVE	Used in EDIT mode, pressing this button saves any changed parameters and the unit reverts to Normal mode. This button has no effect when in Normal mode.

LEFT / RIGHT Buttons

Mode	Description
Menu Selection	To enter the Engineering Menu (#14), press the RIGHT button while rotating the MENU control clockwise from menu #13, System.
Local	In the EDIT state, the LEFT / RIGHT button moves the cursor to the left / right.
Director	Pressing the RIGHT button on power-up runs the inactive code stored in FLASH memory and makes it the active code from that point. The RIGHT button will blink while the change is in progress. Updating of the front panel software after a software download is indicated by the LEFT button blinking. The updating could take ten minutes and should not be interrupted.

MENU Control

Mode	Description
Normal	Scrolls through the local control and status Menus. These are described in *Annex C*.

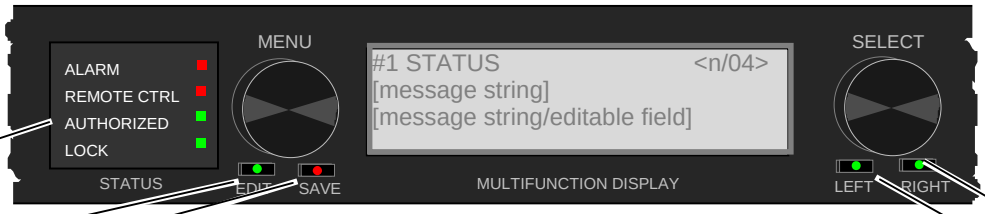
SELECT Control

Mode	Description
Local	The SELECT control selects the pages of the group selected by the MENU control. In EDIT mode, the SELECT control is used to scroll through options or increment values on an editable page in a Menu group.

Figure 1.15: Front Panel Controls

1.8.3 Front Panel LEDs

Figure 1.16 shows the position and function of the LEDs on the front panel. Some LEDs are dual colour. See *Chapter 6, Preventive Maintenance and Fault-finding* for details of how to test the front panel LEDs.



SAVE Button LED

Mode	Colour	Description
Normal	—	Not used.
Edit	Red	Lit when in EDIT mode if any parameters have been changed.

LEFT Button LED (Local Control mode)

State	Colour	Description
Normal	—	Not used.
Edit	Green	Lit in EDIT mode, on an editable page, if the cursor is not under the left-most character.

EDIT Button LED

Mode	Colour	Description
Power-up	Green	Indicates that the unit is initialising.
Edit	Green	Lit, by pressing the button, to indicate that unit is in EDIT mode if a displayed menu has an editable parameter.

RIGHT Button LED (Local Control mode)

State	Colour	Description
Normal	—	Director only: On power-up, press the RIGHT button to run the inactive code stored in FLASH memory. This then becomes the active code. Press the RIGHT button and turn the SELECT control to access the ENGINEERING menu.
Edit	Green	Lit in EDIT mode, on an editable page, if the cursor is not under the right-most character.

STATUS Indicators

LED	Colour	Description
ALARM	Red	Summary alarm indication - see *Chapter 4, Alarms*.
REMOTE CTRL	Red	Lit when the unit is in Remote or Director, Over-air control mode.
AUTHORIZED	Red	Lit when the selected programme is not authorised under conditional access or a BISS encoded stream is received with no Control Word.
	Green	Lit when an authorized VideoGuard, RAS or BISS encrypted signal is received.
	Blinking	Green LED blinks when incoming stream is encrypted using RAS1.
LOCK	Green	Lit when the unit has locked to the incoming signal.
	Red	Lit when the unit has not locked to the incoming signal.

Figure 1.16: Alteia Front Panel Indicators

The LEDs on the front panel indicate the equipment status. The two LED colours used in this equipment are red and green. Red indicates a fault condition, e.g. a missing or faulty input signal. All red alarm LEDs should be off for correct operation, although some may be on during power-up.

> NOTE...
>
> The REMOTE LED is the exception to this as it is ON (red) to indicate that the unit is in either REMOTE or Director OVER-AIR control mode.

Green indicates correct conditions and correct system functioning.

1.8.4 Bit Error Ratio Meter

All Alteia models excluding the M2/PDU/9xx variants are fitted with a Bit Error Ratio (BER) status meter. This gives an indication of the robustness of the incoming signal.

The meter shows BER in a range between 10^{-1} and 10^{-5}. The red line displayed on the meter indicates that the BER is high and decoding may be prevented. As the needle moves to the right (further into the green area of the scale), fewer errors are being received due to fading, interference etc.

Figure 1.17: BER Status Meter

> NOTES...
>
> 1. Models M2/PTR/9xx (Terrestrial Receivers) dynamically display the current Post-Viterbi BER value on the front panel BER meter.
> 2. Models M2/PDU/9xx (Decoders) are not fitted with a BER meter.

1.8.5 Audio and Video Monitoring

Three connectors provide monitoring points for the analogue video and the two analogue, audio output channels.

Figure 1.18: Audio and Video Monitoring

1.8.6 Conditional Access and Scrambling Options

VideoGuard

There is a slot on the front panel to allow the insertion of a Conditional Access (CA) card for the VideoGuard system.

RAS 1 and 2

With the appropriate configuration, the Alteia fully descrambles Remote Authorisation System (RAS) input transport stream. The ability to decrypt all the components in any other transport stream is a function of the specific CA system decryption.

BISS (ver 2.8 and Later)

Please contact TANDBERG Television Customer Services regarding the use of BISS equipment.

> NOTE...
> Conditional Access is not available in M2/PTR models.

1.8.7 Rear Panel

Inputs and outputs to the unit, except monitoring, are taken via the rear panel. *Figure 1.19* shows a typical Satellite Receiver rear panel.

Connector descriptions are given in *Chapter 2, Installing the Equipment.*

Figure 1.19: Alteia Satellite Receiver Rear Panel

Chapter 2

Installing the Equipment

Contents

List of Figures

List of Tables

2.1 Read This First!

2.1.1 Handling

The Alteia must be handled and installed carefully and thoughtfully to prevent safety hazards and damage.

2.1.2 Installing the Equipment

Ensure the personnel designated to fit the unit have the appropriate skills and knowledge. If in any doubt, contact Customer Services (see *Preliminary Pages* for contact details).

Installation of the product should follow these instructions, and should only use installation accessories recommended by the manufacturers. When rack-mounted, this equipment must have shelf supports in addition to the front panel fixings.

Do not use this product as a support for any other equipment.

2.1.3 Lifting

Although this product only weighs approximately 4 kg (8.8 lbs), in some circumstances it might be awkward to lift. In which case, do not attempt to lift or move it without proper assistance or equipment. If in doubt, get help.

2.2 Preliminary Checks

2.2.1 Mechanical Inspection

Inspect the equipment for damage-in-transit. If in doubt, please contact TANDBERG Television Customer Services (see *Preliminary Pages*).

WARNING...

REMOVING THE COVERS OF THIS EQUIPMENT MAY INVALIDATE ANY WARRANTIES, CAUSE A SAFETY HAZARD OR/AND AFFECT THE EMC PERFORMANCE. CHECK WITH TANDBERG TELEVISION CUSTOMER SERVICES.

2.2.2 Moving the Equipment Safely

Do not place this product on an unstable cart, stand, bracket, or table. The product may fall, causing serious injury and serious damage to the product. Use only with a cart, stand, bracket or table recommended by TANDBERG Television Ltd.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn. Do not move or carry the equipment whilst it is still connected to the supply or other leads, is live, or is in operation.

2.3 Installing the Equipment

2.3.1 Fixing

The Alteia is designed for fixed use only and has been shipped with fixing brackets suitable for a standard 19 inch rack. When installed in a rack, it should be secured using the fixing brackets. In addition, support shelves must be used to reduce the weight on the brackets. Ensure it is firmly and safely located and it has an adequate flow of free-air.

A freestanding unit should be installed on a secure horizontal surface where it is unlikely to be knocked or its connectors and leads disturbed.

2.3.2 Ventilation

Openings in the Covers

Openings in the cabinet are provided for ventilation. These ensure reliable operation of the product and protect it from overheating. These openings must not be blocked or covered.

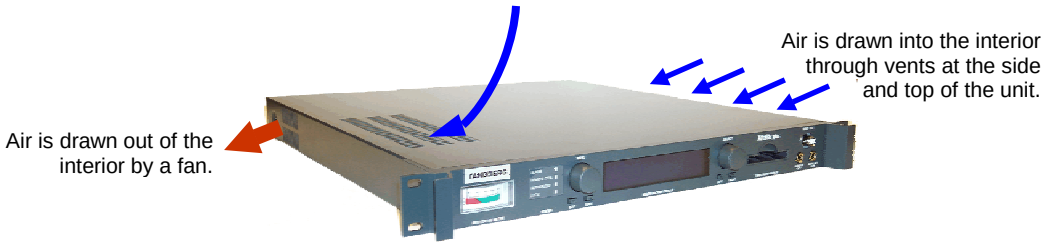


Figure 2.1: Air flow Through the Equipment

Care in Positioning

CAUTIONS...

1. The fan contained within this unit is not fitted with a dust/insect filter. Pay attention to the environment in which it is to be used.
2. Do not install units so that the air intake of one aligns with the outlet on another. Provide baffles and adequate spacing.

The Alteia should never be placed near or over a radiator or other source of heat. It should not be placed in a built-in installation such as a rack unless proper ventilation is provided and the instructions have been adhered to.

Allow at least 50 mm free air space at each side of the equipment to ensure adequate cooling. Units in racks can be stacked with a 1U ventilation panel between. Racks containing stacked equipment may need additional air handling to keep the operating ambient temperature within specified limits.

Protection from Moisture

Do not install this equipment in areas of high humidity or where there is a danger of water ingress.

2.3.3 Installing Cables - Safety

Power supply cables should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cables at plugs, convenience receptacles, and the point where they exit from the appliance.

Do not run ac power cables in the same duct as signal leads. Do not move or install equipment whilst it is still attached to the mains supply. Ensure safety and ESD precautions are observed whilst inter-connecting equipment.

2.3.4 Outdoor Antenna (Receivers Only)

Lightning Protection

WARNING...

IF THE RECEIVER HAS BEEN SUBJECT TO A LIGHTNING STRIKE OR POWER SURGE WHICH HAS STOPPED IT WORKING, DISCONNECT THE POWER IMMEDIATELY. DO NOT REAPPLY POWER UNTIL IT HAS BEEN CHECKED FOR SAFETY. IF IN DOUBT, CONTACT TANDBERG TELEVISION CUSTOMER SERVICES.

Where appropriate, ensure this product has an adequate level of lightning protection. Alternatively, during a lightning storm or when it is left unattended and unused for long periods of time, unplug it from the supply outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power line surges.

NOTE...

Terrestrial Receivers (M2/PTR[E]) are fitted with a 20 dB RF input attenuator.

Power Lines

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits.

WARNING...

WHEN INSTALLING AN OUTSIDE ANTENNA SYSTEM, EXTREME CARE SHOULD BE TAKEN TO AVOID TOUCHING POWER LINES OR CIRCUITS AS CONTACT WITH THEM MAY BE FATAL.

2.4 EMC Compliance Statements[1]

2.4.1 EN 55022/AS/NZS 3548

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures to prevent interference.

2.4.2 FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

2.5 AC Supply Operating Voltage, Fusing/Safety Information

2.5.1 AC Power Supply

The Alteia operates from an auto-ranging mains power supply (100-120 Vac or 220-240 Vac 50/60 Hz nominal) and is designed for use in ambient air temperature in the range 0°C to +40°C. There are no links etc. to be altered for operation from different supply voltages. The full Technical Specification is given in *Annex B, Technical Specification*.

WARNINGS...

1. THE ALTEIA SHOULD ONLY BE OPERATED FROM THE TYPE OF POWER SOURCE INDICATED ON THE MARKING LABEL. IF YOU ARE NOT SURE OF THE TYPE TO YOUR BUSINESS, CONSULT YOUR APPLIANCE DEALER OR LOCAL POWER COMPANY. DO NOT OVERLOAD WALL OUTLETS AND EXTENSION CORDS AS THIS CAN RESULT IN A RISK OF FIRE OR ELECTRIC SHOCK. AC SUPPLY.
2. THE ALTEIA RANGE OF RECEIVERS AND DECODERS ARE NOT FITTED WITH AN AC POWER ON/OFF SWITCH. ENSURE THE SUPPLY SOCKET OUTLET IS INSTALLED OR LOCATED NEAR THE EQUIPMENT SO THAT IT IS ACCESSIBLE.

[1] The EMC information was correct at the time of manufacture. The EMC tests were performed with the Technical Earth attached.

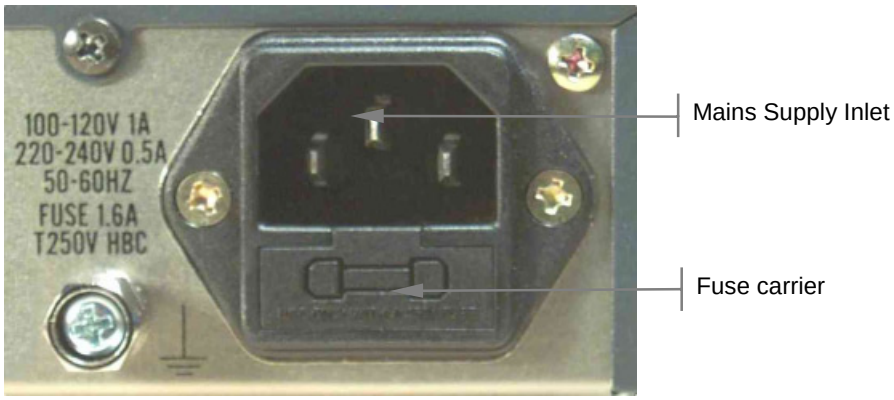


Figure 2.2: AC Power Inlet and Fuse

Table 2.1: Fuse Information

Item	Specification
Fuse	Single pole, fitted in live conductor in power input filter at rear of unit.
Fuse type	5 mm x 20 mm anti-surge (T) HBC, IEC127 (sheet v)
Fuse rating	1.6 A
Fuse rated voltage	250 Vac
Power lead connector fuse (if appropriate)	5 A

NOTE...

See *Annex B, Technical Specification* for more fuse information.

2.5.2 AC Power Supply Cord

General

A two-metre mains supply cord is supplied with this product. It is fitted with a moulded plug suitable to the address of the recipient customer.

NOTE...

The Alteia is not fitted with an ac power supply ON/OFF switch. Ensure that the socket-outlet supplying the equipment is installed near the equipment so that it is easily accessible.

Wire Colours

The wires in the supply cord are coloured as shown in *Table 2.2*.

Table 2.2: Supply Cord Wiring Colours

	UK (BS 1363)	EUROPE (CEE 7/7)	USA (NEMA 5-15P)
Earth:	Green-and-yellow	Green-and-yellow	Green
Neutral:	Blue	Blue	White
Live:	Brown	Brown	Black

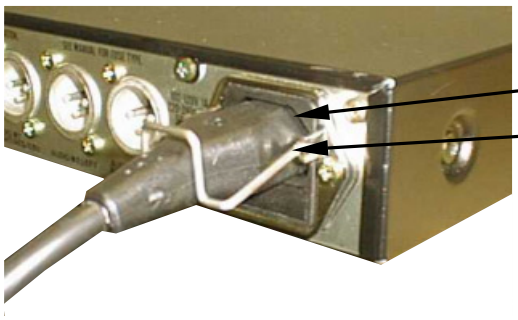
If the colours[2] do not correspond with the coloured markings identifying the terminals in a locally supplied plug, proceed as in *Table 2.3*. The inclusion of *Table 2.3* is for reference.

Table 2.3: Non Standard Supply Cord Wire Colours

Wire Colour (UK)	Action
green-and-yellow	...must be connected to the terminal in the plug which is marked with the letter E or the safety earth symbol ⏚ or coloured green or green-and-yellow.
blue	...must be connected to the terminal in the plug which is marked with the letter N or coloured black.
brown	...must be connected to the terminal in the plug which is marked with the letter L or coloured red.

2.5.3 Use of the Mains Cable Retaining Clip (if fitted)

Ensure the retaining clip is present before powering the unit.



NOTE...

The mains cable retainer assembly is not fitted from unit serial number 4800.

Figure 2.3: Mains Cable Retaining Clip

WARNINGS...

3. ATTEMPTING TO CONNECT THE CABLE TO THE MAINS INLET WITH THE RETAINING CLIP NOT PRESENT MAY, IN SOME CIRCUMSTANCES, LEAD TO A SAFETY HAZARD.
4. IF THE MAINS CABLE RETAINER ASSEMBLY ALWAYS IS FITTED, ENSURE THE CLIP IS PRESENT BEFORE CONNECTING THE POWER LEAD TO THE UNIT.

2.5.4 Connecting the Equipment to the AC Power Supply

As there is no mains power switch fitted to this unit, ensure the local ac power supply is switched OFF before connecting the supply cord.

Connect the mains lead to the Alteia and then to the local supply.

2.6 Technical Earth Connection

The terminal marked ⏚ at the rear panel is a Technical Earth It is provided to:

1. Ensure all equipment chassis fixed within a rack are at the same technical earth potential. To do this, connect a wire between the Technical Earth terminal and a suitable point on the rack

[2] BS 415 : 1990 - Safety Requirements for Mains-operated Electronic and Related Apparatus for Household and Similar General Use.

2. Eliminate the migration of stray charges when connecting between equipment.

The Technical Earth provides a suitable connection between the Alteia and the installation to give a low impedance path at normal operating frequencies.

NOTE...

Early versions were not fitted with a Technical Earth connection.

Technical Earth Post

Figure 2.4: Location of the Technical Earth

2.7 Signal Connections

2.7.1 General

CAUTION...

It is strongly recommended that the terminal marked ⏚ at the rear panel of the equipment is connected to a site Technical Earth before any external connections are made and the equipment is powered. This limits the migration of stray charges.

All signal connections are made via the rear panel. A typical rear panel is shown in *Figure 2.5*. The connections are also shown schematically in *Figure 2.7*. A full technical specification is given in *Annex B*.

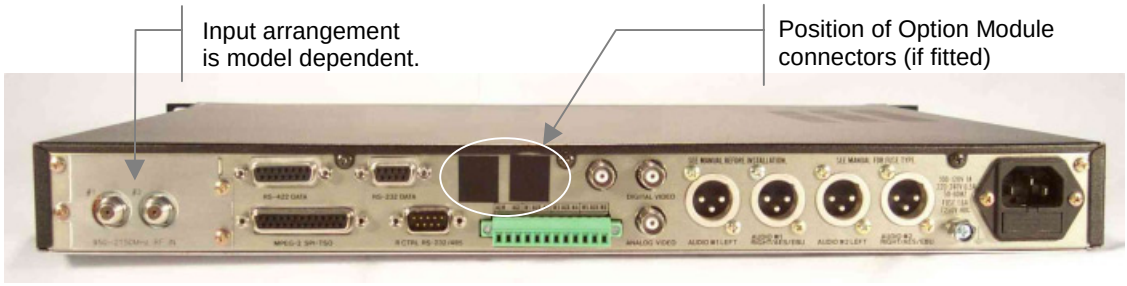


Figure 2.5: 8PSK Satellite Receiver Rear Panel

Figure 2.6 shows the input panel of a QPSK/BPSK Satellite Receiver.

Figure 2.6: QPSK/BPSK Input Panel

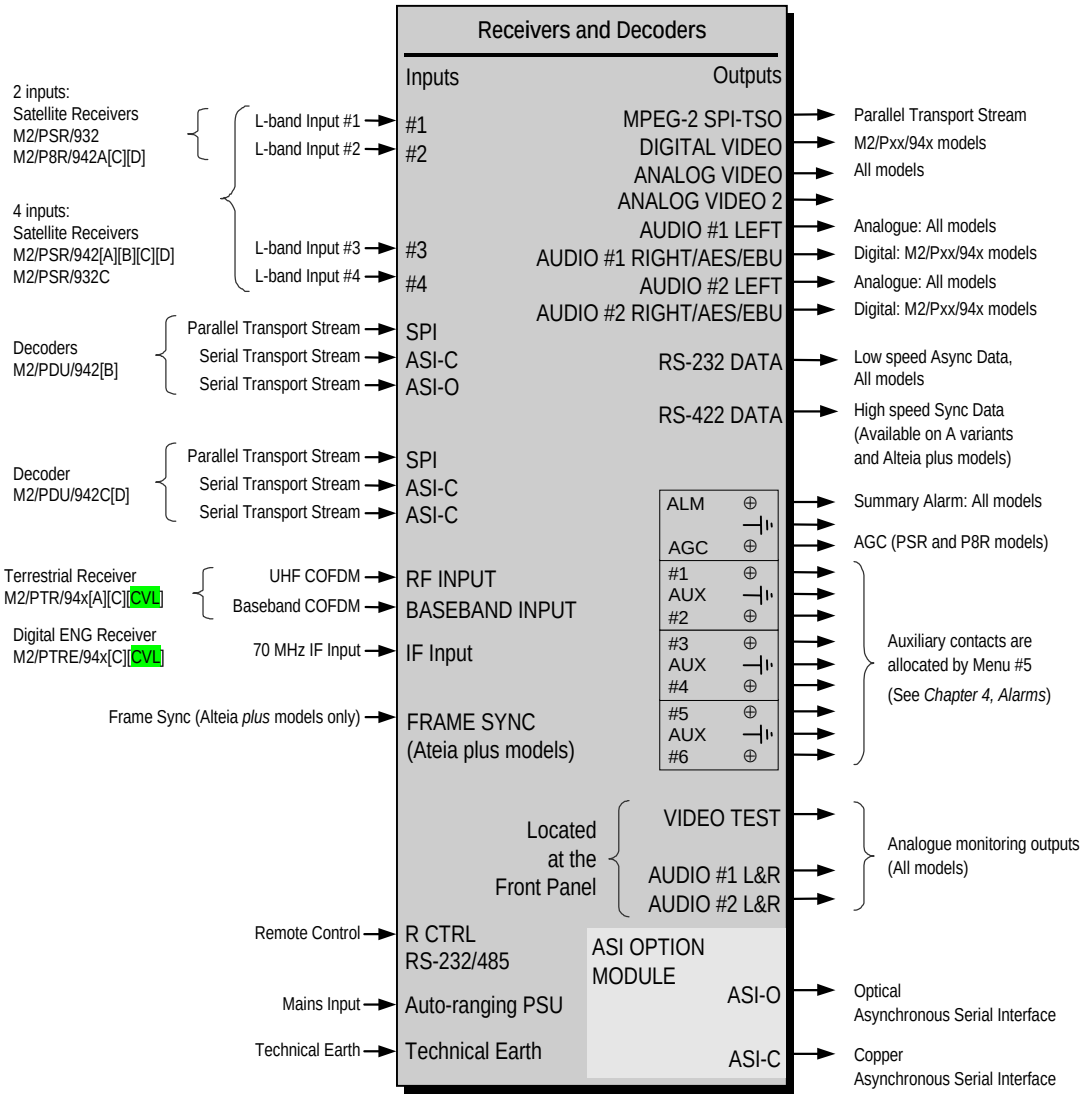


Figure 2.7: Alteia and Alteia plus Connections

2.7.2 Input Connectors, By Alteia Model

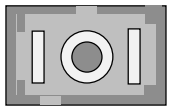
PDU Decoder

Models Covered

Table 2.4 applies to models M2/PDU/942 and M2/PDU/942B only.

ASI Fibre-optic Input

This port is used to provide an ASI compliant fibre-optic connection at a fixed line transmission rate of 270 Mbit/s.



This input is activated through the Decoder Input menu #4. The specification for this connector is given in *Table B.12*.

WARNING...
LASER: CLASS I LASER PRODUCT
DO NOT LOOK INTO THE APERTURE.
LOOKING INTO THE APERTURE COULD CAUSE DISCOMFORT TO YOUR EYE.

NOTE...
The Class 1 LASER warning is as defined in paragraph 5.2 of EN 60825-1 1994.

Table 2.4: DVB-ASI Fibre-optic Connector

Item	Specification
Connector type	SC type
Connector designation	ASI-O
Fibre optic cable	Multimode 65.2/125 μm
Cable attenuation	1.5 dB/km at 1300 nm maximum
Cable length	≤2.66 km

ASI Copper Input

Provides a DVB compliant copper connection on the M2/PDU/942[B][C][D] models.

This input is activated through the Decoder Input menu #4. The specification for this connector is given in *Table B.13*.

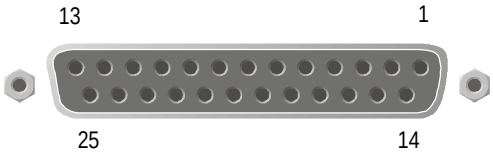
The input is byte-mode only for M2/PDU/942[B]. It is byte-mode and single packet burst mode for M2/PDU/942C[D].

Table 2.5: DVB-ASI Copper Connector

Item		Specification
Connector type		BNC, Female 75 Ω
Connector designation		ASI-C
Cable specification		capable of transmitting a maximum frequency of 850 MHz
Pin	Centre Shield	Signal Ground/Chassis

DVB-SPI Transport Stream In

This connector on the models M2/PDU/942[B][C][D], provides a DVB-SPI parallel input. For DVB parallel working, connect the input Transport Stream to the appropriate transport input connector.



This input is activated through the Decoder Input menu #4. The specification for this connector is given in *Table B.11*.

Table 2.6: DVB-SPI Parallel Input Connector

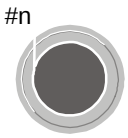
Item	Specification	
Connector Type	25-way, D-type female	
Connector Designation	DVB SPI	
Pin-outs:	Pin 1 — BYTE_CLOCK (+)	Pin 14 — BYTE_CLOCK (-)
	Pin 2 — 0V	Pin 15 — 0V
	Pin 3 — DATA_7 (+)	Pin 16 — DATA_7 (-)
	Pin 4 — DATA_6 (+)	Pin 17 — DATA_6 (-)
	Pin 5 — DATA_5 (+)	Pin 18 — DATA_5 (-)
	Pin 6 — DATA_4 (+)	Pin 19 — DATA_4 (-)
	Pin 7 — DATA_3 (+)	Pin 20 — DATA_3 (-)
	Pin 8 — DATA_2 (+)	Pin 21 — DATA_2 (-)
	Pin 9 — DATA_1 (+)	Pin 22 — DATA_1 (-)
	Pin 10 — DATA_0 (+)	Pin 23 — DATA_0 (-)
	Pin 11 — DVALID (+)	Pin 24 — DVALID (-)
	Pin 12 — PKT_SYNC (+)	Pin 25 — PKT_SYNC (-)
	Pin 13 — PROT GND	

P8R Satellite Receiver QPSK/8PSK

Models

Table 2.7 applies to models M2/P8R/942[A][B][C][D]

#1 - #2 (L-band Inputs)



Connect the L-band output of a suitable LNB to the Type F connector either directly or via a suitable attenuator giving adequate consideration to lightning and surge protection - see *Section 2.3.4, Outdoor Antenna*. The active input is chosen using the Satellite Input Menu (#4).

In most cases an attenuator will not be required, but one should be used where:

- The required input signal exceeds the specified maximum permissible level (-25 dBm).
- The downlead is a short length of low-loss cable and the LNB in use has a poor return loss (7 dB min).
- The Receiver is receiving one of many carriers in a multi-carrier FDM system and the required signal is close to the specified maximum permissible level.

The specification for this connector is given in *Table B.14.*

Table 2.7: QPSK/8PSK Connector (P8R Satellite Receiver, L-band)

Input		Specification
Connector type		F type, Female
Connector designation		Two connectors: #1 to #2
Pin:	Centre	RF Input
	Shield	Ground/Chassis
LNB Supply		Refer to Caution box below
Impedance		75 Ω

CAUTIONS...

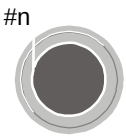
1. The Receiver provides dc power to drive an LNB, via the active L-band input connector. Do not connect equipment other than an LNB to this connector. Failure to do this may result in damage to the external equipment.
2. The F-type connector is not suitable for repeated connection and disconnection. If it is intended to use the Receiver in this way, fit a sacrificial connector and make connections to it.

PSR Satellite Receiver QPSK /BPSK

Models

Table 2.8 applies to models M2/PSR/9xx[A][B][C][D]

#1 - #4 (L-band Inputs)



Connect the L-band output of a suitable LNB to the Type F connector either directly or via a suitable attenuator giving adequate consideration to lightning and surge protection - see *Section 2.3.4, Outdoor Antenna*. The active input is chosen using the Satellite Input Menu (#4).

In most cases an attenuator will not be required, but one should be used where:

- The required input signal exceeds the specified maximum permissible level (-25 dBm).
- The downlead is a short length of low-loss cable and the LNB in use has a poor return loss (7 dB min).
- The Receiver is receiving one of many carriers in a multi-carrier FDM system and the required signal is close to the specified maximum permissible level.

The specification for this connector is given in *Table B.15.*

Table 2.8: QPSK Connector (PSR Satellite Receiver, L-band)

Input		Specification
Connector type		F type, Female
Connector designation		Four connectors: #1 to #4 (M2/PSR/932C, M2/PSR/942[A][B][C][D]) Two connectors: #1 to #2 (M2/PSR/932)
Pin:	Centre	RF Input
	Shield	Ground/Chassis
LNB Supply		Refer to Caution box below
Impedance		75 Ω

CAUTIONS...

1. The Receiver provides dc power to drive an LNB, via the active L-band input connector. Do not connect equipment other than an LNB to this connector. Failure to do this may result in damage to the external equipment.
2. The F-type connector is not suitable for repeated connection and disconnection. If it is intended to use the Receiver in this way, fit a sacrificial connector and make connections to it.

PTR Terrestrial Receiver

RF Input

Table 2.9 applies to models M2/PTR/942 and M2/PTR/948[A]

A BNC socket provides a connection for the UHF output of a suitable aerial to the RF INPUT connector. This model has a 20 dB attenuator fitted to the input of the tuner. It should be removed if greater sensitivity is required.

RF INPUT

This input is activated through the Terrestrial Receiver Input menu #4. The specification for this connector is given in *Table B.19*.

Table 2.9: RF Input Connector (PTR Terrestrial Receiver)

Item		Specification
Connector type		BNC Female
Connector designation		RF INPUT
Pin:	Centre	RF Input
	Shield	Ground/Chassis
Impedance		50 Ω (nominal)

Baseband Input

A single-ended, 75 Ω BNC socket on the M2/PTR/942 and M2/PTR/948[A] models, provides a baseband input of 7.612 MHz bandwidth with a centre frequency of 4.571 MHz. The specification for this connector is given in *Table B.21*.

BASEBAND INPUT

Table 2.10: Baseband Input Connector (Terrestrial Receiver)

Item		Specification
Connector type		BNC Female
Connector designation		BASEBAND INPUT
Pin:	Centre	RF Input
	Shield	Ground/Chassis
Impedance		50 Ω (nominal)

PTRE Digital ENG Receiver

IF Input

Table 2.11 applies to models M2/PTRE/942, M2/PTRE/948C and M2/PTRE/948CVL

A BNC socket provides a connection for the IF output of a suitable SHF radio Receiver to the IF INPUT connector, either directly or via a suitable attenuator giving adequate consideration to lightning and surge protection - see *Section 2.3.4, Outdoor Antenna*.

IF INPUT

In most cases an attenuator is not required. One should be used if the wanted input level or the adjacent channel PAL signals are greater than 20 dBm.

This input is activated through the Digital ENG Input menu #4. The specification for this connector is given in *Table B.22*.

Table 2.11: IF Input Connector (PTRE Digital ENG)

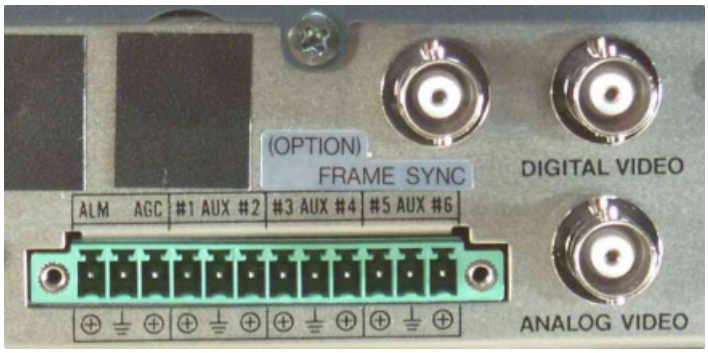
Item		Specification
Connector type		BNC Female
Connector designation		IF INPUT
Pin:	Centre	RF Input
	Shield	Ground/Chassis
Impedance		75 Ω (nominal)

Frame Sync Connector (Alteia *plus* Only)

This is a purchasable option (M2/PRO/SYNC) for Alteia *plus* models.

Frame sync is an input that will accept a video signal containing burst and sync at either 525 or 625 line standard (the line standard must match that of the video signal being decoded). The decoded video in the Alteia *plus* is locked to a local video source at a head-end or other installation where multiple units are working together. It ensures that a number of IRDs are running at the same frame rate since they would all be locked to a common reference. The Frame Sync is activated through the Video menu #6 if the option has been purchased.

The specification for this connector is given in *Table B.23*.



FRAME SYNC (OPTION)

Figure 2.8: FRAME SYNC Connector, Location

CAUTION...

The frame sync input is high impedance and can be daisy-chained with a termination at the last unit. However, the signal quality should then be verified at the last unit.

Table 2.12: Frame Sync Connector Specification

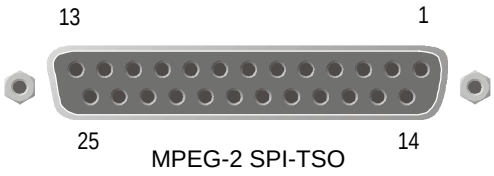
Item		Specification
Connector type		BNC Female
Connector designation		FRAME SYNC
Connections:	Pin	Analogue sync pulse (black level) or composite video signal
	Shield	Ground/Chassis
Impedance		High

2.7.3 Output Connectors, By Connector Type

Transport Stream Output

This connector provides a DVB-SPI parallel Transport Stream output.

The specification for this connector is given in *Table B.24*.



NOTES...

1. For the M2/PDU/942C model: the SPI output is only valid if the input to the Decoder is also of SPI format, otherwise it is invalid and unusable. The Decoder does not act as an ASI to SPI converter.
2. An ASI output option module is available, see *Chapter 5, Options*.

Table 2.13: DVB-SPI Parallel Transport Stream Output Connector

Item	Specification	
Connector Type	25-way, D-type, Female	
Connector Designation	MPEG-2 SPI-TSO	
Pin-outs:	Pin 1 — BYTE_CLOCK (+)	Pin 14 — BYTE_CLOCK (-)
	Pin 2 — 0V	Pin 15 — 0V
	Pin 3 — DATA_7 (+)	Pin 16 — DATA_7 (-)
	Pin 4 — DATA_6 (+)	Pin 17 — DATA_6 (-)
	Pin 5 — DATA_5 (+)	Pin 18 — DATA_5 (-)
	Pin 6 — DATA_4 (+)	Pin 19 — DATA_4 (-)
	Pin 7 — DATA_3 (+)	Pin 20 — DATA_3 (-)
	Pin 8 — DATA_2 (+)	Pin 21 — DATA_2 (-)
	Pin 9 — DATA_1 (+)	Pin 22 — DATA_1 (-)
	Pin 10 — DATA_0 (+)	Pin 23 — DATA_0 (-)
	Pin 11 — DVALID (+)	Pin 24 — DVALID (-)
	Pin 12 — PKT_SYNC (+)	Pin 25 — PKT_SYNC (-)
	Pin 13 — PROT GND	

Digital Video Output

Table 2.14 applies to M2/Pxx/94x Models only.

This BNC socket provides a digital video output.

Video control is through the Video menu #6. The specification for this connector is given in *Table B.26*.

DIGITAL VIDEO

Table 2.14: Digital Video Output Connector

Item		Specification
Connector type		M2/Pxx/93x models: not included M2/Pxx/94x models: 1 x BNC, Female
Output format		ITU-R BT.656
Connector designation		DIGITAL VIDEO
Pin:	Centre	Video output
	Shield	Ground/Chassis
Impedance		75 Ω

Analogue Video Output

This BNC socket provides an analogue composite video output. The output standard is configured using the Video Menu (#6). The specification for this connector is given in *Table B.25*.

ANALOG VIDEO

Table 2.15: Analogue Video Output Connector

Item		Specification
Connector type		Alteia models: 2 x BNC, Female - both carry the same video signal. Alteia *plus* models: 1 x BNC, 75 Ω, Female – carrying Video, the 2nd BNC is the FRAME SYNC connector if the option is purchased, else it is VIDEO OUT 2.
Output format		625 = PAL-B, -G, -I, -M (fully supported on D variants only) -N Combination or N Normal 525 = NTSC-M with pedestal, -M without pedestal (chosen in Menu #6)
Connector designation		ANALOG VIDEO, VIDEO OUT 2
Pin:	Centre	Video output
	Shield	Ground/Chassis
Impedance		75 Ω

Video Out 2

Where the Frame Sync option has not been purchased, this connector is a second video output identified as VIDEO OUT 2. The specifications in *Table 2.15* apply to this connector.

VIDEO Out 2

Video Test Connector, Front Panel

VIDEO TEST

This BNC socket provides an analogue composite video test output. The output format is the same as the analogue video output on the rear panel.

The specification for this connector is given in *Table B.27*.

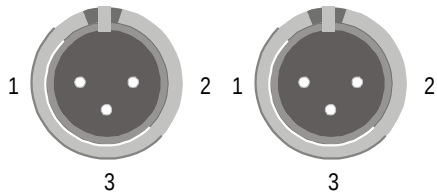
Table 2.16: Video Test Connector, Front Panel

Item		Specification
Connector type		BNC, 75 Ω, Female
Output format		As the rear panel analogue video output (chosen by menu)
Connector designation		VIDEO TEST
Connection:	Pin	Video output
	Shield	Ground/Chassis
Impedance		75 Ω

Analogue Audio Outputs

Four XLR male connectors provide two stereo channels. Each connector carries a single channel of a stereo pair. The output can be varied according to service and unit configuration.

Audio control is through the Audio menu #8. The specification for this connector is given in *Table B.28*.



AUDIO #1(2) LEFT

AUDIO #1(2) RIGHT/AES/EBU

Table 2.17: Analogue Audio Output Connector (XLR)

Item	Specification
Connector type	XLR, Male
Connector designation	AUDIO #1 LEFT, AUDIO #1 RIGHT AUDIO #2 LEFT, AUDIO #2 RIGHT
Pin Connections	Pin 1 External of cable (shield/ground) Pin 2 Live (Hot/+ve phase) Pin 3 Return (Cold/-ve phase)
Nominal output impedance	50 Ω
Load impedance	≥600 Ω balanced

Digital Audio Outputs

Table 2.18 applies to M2/Pxx/942[A][B][C][D] Models only.

Two XLR male connectors provide two stereo channels. The output can be formatted according to the received service and unit configuration.

Audio control is through the Audio menu #8. The specification for this connector is given in *Table B.29*.

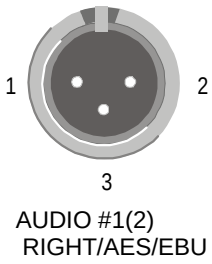


Table 2.18: Digital Audio Output Connector (XLR)

Item	Specification
Connector type	XLR, Male
Connector designation	AUDIO #1 RIGHT/AES/EBU AUDIO #2 RIGHT/AES/EBU
Pin Connections	Pin 1 Xternal of cable (shield/ground) Pin 2 Live (Hot/+ve phase) Pin 3 Return (Cold/-ve phase)
Nominal output impedance	50 Ω
Load impedance	110 Ω balanced

Units with Digital Audio outputs are also capable of providing Analogue Audio. The connectors are arranged as shown in *Figure 2.9*. Choice of output is made using the Audio Menus (#8).

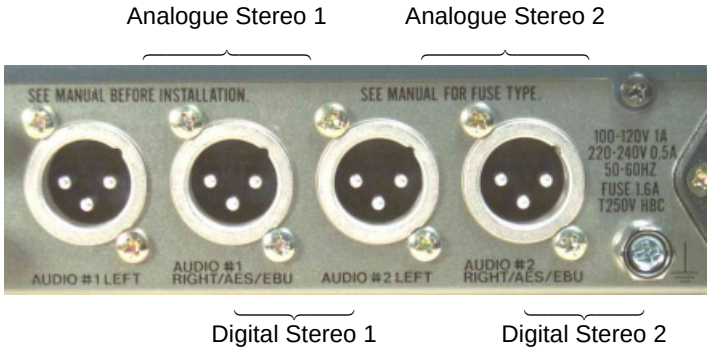


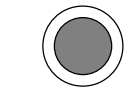
Figure 2.9: Arrangement of Digital and Analogue Audio Connectors

> NOTE...
> When the digital output is used, the corresponding Audio-left connector is unused.

Further information regarding the AES/EBU digital outputs can be found in *Table B-29* and *Table C-19*.

Audio #1, #2 L&R (Front Panel)

This is a ¼" jack socket, which provides an analogue audio monitoring output. The format of this output is the same as the analogue audio output at the rear of the unit.


AUDIO #1 (#2)
L&R

The specification for this connector is given in *Table B.30*.

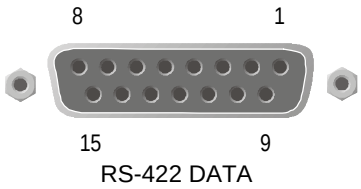
Table 2.19: Audio Monitor, Front Panel

Item		Specification
Connector type		¼" jack socket
Output format		Same as the rear panel, analogue audio output (chosen by menu).
Connector designation		AUDIO #1 (#2) L&R
Connections:	Tip Ring Collar	Audio Left output Audio Right output Screen/Ground (chassis)
Impedance		600 Ω

2.7.4 Control Connectors

RS-422 Data

The connector provides a synchronous serial communications interface for the reception of high-speed synchronous data.



RS-422 DATA

The status of the data output on this connector is given in the Data menu #11.
The specification for this connector is given in *Table B.33.*

> NOTE...
> The RS-422 High-speed Synchronous Data output is available on all models except M2/PSR/932C and those without a suffix letter.

> CAUTION...
> Pins 2 and 9 of the RS-422 15-way D-type are used for field upgrade. Connection to these pins by equipment not supplied by field service personnel could result in damage to the unit.
> Always ensure that RS-422 cables are connected according to the pin-outs described in *Table 2.20.*

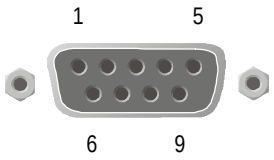
Table 2.20: RS-422 High-speed Data Connector

Item	Specification	
Connector type	15-way D-type, Female	
Connector designation	RS-422 DATA	
Pin-outs	Pin 1 — Ground Pin 4 — DATA (+) Pin 6 — CLOCK (+)	Pin 8 — GROUND Pin 11 — DATA (-) Pin 13 — CLOCK (-)

RS-232 Data

A 9-way, D-type female connector provides an asynchronous serial communications interface for the reception of low-speed data.

The status of the data output on this connector is given in the Data menu #11. The specification for this connector is given in *Table B.32.*



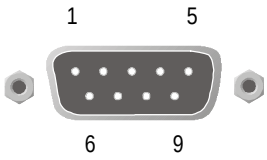
RS-232 DATA

Table 2.21: RS-232 Low-speed Data Connector

Item	Specification
Connector type	9-way D-type, Female
Connector designation	RS-232 DATA
Standards	RS-232 DATA
Configuration	DCE
Pin-outs	Pin 1 — Not used Pin 2 — Receive Data (RxD) Pin 3 — Not Used Pin 5 — Ground Pin 6 — Not used Pin 7 — Not used Pin 8 — Not used Pin 9 — Not used

Remote Control

Connect a PC to the connector labelled R CTRL RS-232/485 at the rear panel of the equipment. The System Menu (#13, page 4) is used to switch between the RS-232 and RS-485 input standards. *Page 6-6*, *Section 6.4.7* refers to this connector.



R CTRL RS-232/485

The specification for this connector is given in *Table B.36.*

The Remote Control Protocol is published in manual ST.TS.E9200.

Table 2.22: Remote Control Connector

Item	Specification				
Connector type	9-way D-type, Male				
Connector designation	R CTRL RS-232/485				
	RS-232			RS-485	
Pin-outs	Pin		Direction	Pin	
	1	Data Carrier Detected (DCD)	Input	1	Not connected
	2	Receive Data (RxD)	Input	2	Not connected
	3	Transmit Data (TxD)	output	3	Not connected
	4	Data Terminal Ready (DTR)	output	4	Rx
	5	Ground	—	5	Ground
	6	Data Set Ready (DSR)	input	6	Not Tx
	7	Request to Send (RTS)	output	7	Tx
	8	Clear to Send (CTS)	input	8	Not Rx
	9	Not connected	—	9	Not connected

Auxiliary Relays Interface

The Auxiliary Relays interface is carried on a 12-way socket that has an accompanying screw-terminal fanning-strip. The interface primarily consists of a number of relays. Each relay provides a contact that is taken to the interface connector. An internal jumper sets the contact to be normally-open (default) or closed to ground. Alarm Menu #5 allocates alarms to the relay contacts.

Alteia Satellite Receivers have an AGC connector that provides an output voltage referenced to ground for use with automatic antenna pointing systems. The voltage is an isolated sample of the Receiver's AGC. Shorting this output to ground does not affect the unit's performance.

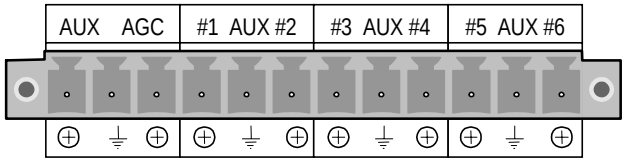


Table 2.23: Auxiliary Relays Interface

Item		Specification
Connector Designation		12-Way Screw-terminal Connector
ALM	⊕	Summary Alarm output
AGC	⊕	Sample of the Receivers AGC. Can be used as an input to an antenna pointing system. (Does not apply to M2/PDU/942 or M2/PTRE/942[A][C] models)
#1	⊕	These outputs can be associated with a specific alarm by using the Alarm Menu (#5) pages. This is described in *Chapter 4*, Alarms.
AUX		
#2	⊕	
#3	⊕	
AUX		
#4	⊕	
#5	⊕	
AUX		
#6	⊕	

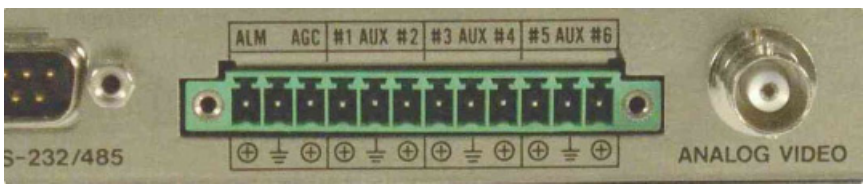


Figure 2.10: Aux Relay Interface with Cable Connector Removed

2.7.5 Option Module Connectors

Option Modules are described in *Chapter 5, Options*.

Chapter 3

Operating the Equipment Locally

Contents

List of Figures

List of Tables

3.1 Powering the Equipment

3.1.1 Switching On

> CAUTION...
>
> This equipment should not be operated unless the cooling fan is working and there is a free-air flow around the unit.

Connect the signal inputs and ac power supply to the Alteia and switch on. After a short period of initialisation and the Alteia gaining lock, the unit powers up in Normal mode. This is the usual operating condition and is indicated by the (Signal) Lock LED being ON and the Remote Control LED being OFF.

The Lock LED will be GREEN if a signal is present and RED if there is no signal.

3.1.2 Front Panel Over-air Download (Director)

The Front Panel software can be updated following an Over-air software download. Under instruction from an Over-air Restart command, the current (active) Front Panel software code is checked against the corresponding code in the main receiver software. If the two are different, the Front Panel code embedded in the downloaded software is loaded to become the current (active) version. The previous version is retained in flash memory as inactive.

The LED in the LEFT button flashes to indicate that download is in progress. The process may take ten minutes to complete.

> CAUTION...
>
> Do not interrupt the update while it is in progress. To do so may render the update ineffective.

3.1.3 Front Panel Software Manual Switch

During start-up, the unit executes the Front Panel software residing in the active flash chip.

The unit can be forced to make the inactive (previous) Front Panel software the current software. Pressing the RIGHT button on the Front Panel, as the receiver is powered-up, forces the Alteia to boot using the alternative software. The LED on the RIGHT button flashes during this process.

Check the software version to ensure the previously inactive software is now active.

The process is permanent; the previously inactive software becomes active and vice-versa.

3.1.4 Power-up Operating Modes

If the EDIT button is pressed (and held until the name ALTEIA appears in the display) as power is applied, the Alteia enters the Front Panel test mode (see *Chapter 6, Preventive Maintenance and Fault-finding*).

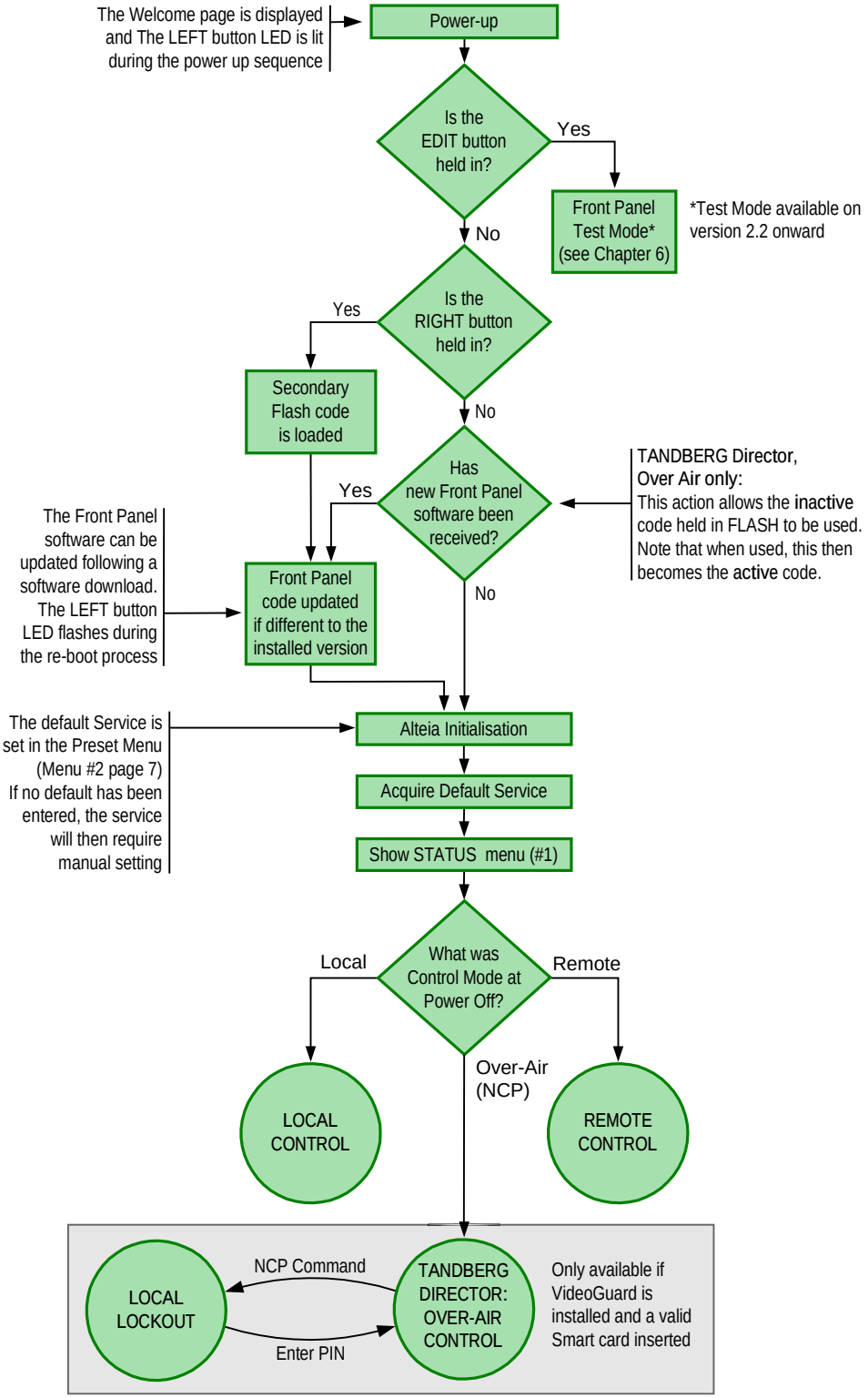


Figure 3.1: Power-up Operating Mode

3.1.5 Front Panel Controls and Pushbuttons

Front Panel items are described in *Chapter 1, Section 1.8*, *Guided Tour.*

If any Front Panel controls or buttons are not used for about three minutes, the display then reverts to Menu #1, page 1; any unsaved edits are lost.

3.2 Using the Local Controls

3.2.1 LCD Menu Descriptions

Detailed LCD menu descriptions are given in *Annex C, Menus*. This Chapter concentrates on describing the use of the menus for local operation.

3.2.2 Selecting a Menu Option

Some items shown in line 3 of the front panel LCD display have a set number of options. An example of this is the VIDEO OUTPUT SOURCE (Menu #6, page 9) which has a number of preset Video Test Patterns associated with it.

Use the following steps as a general guide to selecting an option.

Table 3.1: Selecting a Menu Option

Step	Action	Result
1.	Select the menu and display the required selection.	Normally there is only one selectable item. If there is more than one, use the RIGHT and LEFT buttons as described in *Table 3.2*.
2.	Press the EDIT button on the front panel.	The button LED will come on to show the Alteia is in EDIT mode.
3.	Use the SELECT control to step through the options.	This action scrolls through the options in a continuous loop.
4.	Press the SAVE button to store the option or press EDIT to cancel the selection and return to the source menu.	

3.2.3 Entering a Menu Value

Some items shown in line 3 of the front panel LCD display have a user-entered value. An example of this is the KU BAND FREQUENCY (Satellite Receiver Menu #4, selection 4) in which the RF input frequency has to be entered. Use the following steps as a general guide to entering a value.

Table 3.2: Entering a Menu Value

Step	Action	Result
1.	Select the menu and display the required selection.	
2.	Press the EDIT button on the front panel.	The button LED will come on to show the Alteia is in EDIT mode.
3.	Use the RIGHT or LEFT button to move the cursor to the required digit.	Each button has an in-built LED that turns on if the button function is appropriate to the displayed information.
4.	Change the value by using the SELECT control	
5.	Press the SAVE button to store the option.	

3.3 Setting up the Input (Menu #4)

3.3.1 Satellite Receiver

Table 3.3 applies to models M2/PSR/9xx[A][B][C][D] and M2/P8R/942[A][B][C][D]. It steps through the setting up of the Satellite Receiver using menu #4. The transmission parameters must be known before starting.

Table 3.3: Tuning the Satellite Receiver

Step	Action	Result
1.	Go to Menu #4, page 3 and select the RF Input[1].	The receiver takes its signal from the input specified. Ensure that the input you choose is connected to the required source.
2.	Go to Menu #4, page 6, select the Polarisation and the Modulation Mode. Press SAVE.	
3.	Go to Menu #4, page 7, select the LNB Type and enter the LNB Local Oscillator Frequency. Press SAVE.	If the LNB is set to NONE, the LO frequency appears as a set of dashes. If NORMAL, the LO frequency is the current value. If set to DUAL, the LO frequency displayed is the lowest.
4.	If the LNB type is DUAL, go to page 8 and enter the LO FREQ 2 TYPE and switchover frequency (SW OVR FREQ). Press SAVE.	A DUAL LNB has two LO frequencies, switching between them is by 22 kHz tone.
5.	Go to Menu #4, page 4 and enter the Satellite Channel Frequency. Press SAVE.	This sets up the RF stage in the receiver.
6.	Go to Menu #4, page 5, select the FEC Rate and enter the Symbol Rate. Press SAVE.	This sets up the overhead rates.
7.	The Tuner should now be locked to the incoming transport stream[2].	At this stage, the TUNER LOCK LED should light and the BER meter operate to show that the Receiver has picked up the signal.

[1] RF input 1 is recommended for use as the main input.
[2] If the transport stream is MPEG-2 –only, menus #2 and #3 page 1 show the service ID and not the service name.

3.3.2 Terrestrial Receiver

Table 3.4 applies to models M2/PTR/942 and M2/PTR/948[A].

Table 3.4: Tuning the Terrestrial Receiver

Step	Action	Result
1.	Go to Menu #4, page 8 and ensure the SIGNAL DEGRADATION mode is switched OFF.	This is a test mode that degrades the picture by a known amount. The status of the SIGNAL DEGRADATION mode is shown in line 1 of page 1 (DEG ON | DEG OFF).
2.	Go to Menu #4, page 12 and choose the appropriate INPUT.	
3.	Go to Menu #4, page 2 and choose the UHF CHANNEL and required OFFSET.	This starts the tuning process. The guard interval will automatically set itself (this can be checked on page 3).
4.	Go to Menu #4, page 3 and set the GUARD INTERVAL and OFDM CARRIER MODE to suit the system hardware.	This automatically sets the channel spacing (can be checked on page 6).
5.	If hierarchy is present (check on page 11), select the priority multiplex required.	The final SAVE action will LOCK the receiver to the chosen incoming stream.

CAUTION...

(Does not apply to Version 2.3 and later.)

When using the combination 64QAM, 3/4 FEC, 1/32 Guard Interval and 204 packet length (29.454545 Mbit/s), the demodulator may not always lock up correctly following switch on or after a brief loss of signal. This will be apparent from a higher than expected BER or lack of video. Normal lock up is achieved by disconnecting and reconnecting the input.

3.3.3 Digital ENG Receiver (to version 2.5.4)

Table 3.5 applies to model M2/PTRE/942 and 948C (to version 2.5.4). The M2/PTRE/948C also allows a **70 MHz IF – Normal** or **70 MHz IF – Inverted** input to be selected through Menu #4.

Table 3.5: Setting up the Digital ENG Receiver

Step	Action	Result
1.	Go to Menu #4, page 8 and ensure the SIGNAL DEGRADATION mode is switched OFF.	This is a test mode that degrades the picture by a known amount. The status of the SIGNAL DEGRADATION mode is shown in line 1 of page 1 (DEG ON | DEG OFF).
2.	Go to Menu #4, page 12 and choose the BASEBAND.	
3.	Go to Menu #4, page 3 and set the GUARD INTERVAL to suit the system hardware.	This automatically sets the OFDM CARRIER MODE (can be checked on page 4).
4.	If hierarchy is present (check on page 11), select the priority multiplex required.	The final SAVE action will LOCK the receiver to the chosen incoming stream.

3.3.4 Digital ENG Receiver (from version 2.8.3)

Set-up

Table 3.6 applies to model M2/PTRE/948C and 948CVL (from version 2.8.3). The M2/PTRE/948C and M2/PTRE/948CVL also allow a **70 MHz IF – Normal** or **70 MHz IF – Inverted** input to be selected through Menu #4.

Table 3.6: Setting up the Digital ENG Receiver

Step	Action	Result
1.	Go to Menu #4, page 8 and ensure the SIGNAL DEGRADATION mode is switched OFF.	This is a test mode that degrades the picture by a known amount. The status of the SIGNAL DEGRADATION mode is shown in line 1 of page 1 (DEG ON | DEG OFF).
2.	Go to Menu #4, page 12 and choose the appropriate INPUT.	
3.	Go to Menu #4, page 14 and choose the appropriate UHF FREQ. (Only if UHF has been selected in Step 2.)	
4.	Go to Menu #4, page 6, select the Polarisation and the Modulation Mode. Press SAVE.	Select Channel Coding Type.
5.	If hierarchy is present (check on page 11), select the priority multiplex required.	The final SAVE action will LOCK the receiver to the chosen incoming stream.
6.	Go to Menu #4, page 3 and set the GUARD INTERVAL to suit the system hardware.	This automatically sets the OFDM CARRIER MODE (can be checked on page 4).
7.	Go to Menu #4, page 2 and set the SPECTRUM INVERSION to either INVERTED or NORMAL.	
8.	Go to Menu #4, page 4 and set the OFDM CARRIER MODE to suit the system hardware.	Select according to the number of carriers in use.

Auto Mode

Steps 6, 7 and 8 can be automated by using **AUTO-MODE**. **AUTO-MODE** provides for a simple one-shot setting, where all the channel parameters are not known. Setting **AUTO-MODE** to **ON** in Menu #4, Page 15 will cause the unit to hunt for the correct Guard Interval, Spectral Inversion and Carrier Mode (FFT). This process can take some time to obtain lock, but allows simplified set-up.

Once lock has been achieved the relevant pages will display the actual parameters found and **AUTO-MODE** will revert to **OFF**.

> NOTE...
>
> This is a single shot / one time set-up facility. It does not automatically regain lock on a channel parameter change. If a parameter change is made, AUTO-MODE will have to be reset to ON to obtain a lock, or settings will have to be changed manually.

3.3.5 Decoder

Table 3.7 applies to models M2/PDU/942[B][C][D]

Table 3.7: Setting up the Decoder

Step	Action	Result
1.	Go to Menu #4, page 2 and select the required input.	This sets the input for the Alteia input. If Auto is chosen, ensure that the signal is only routed to one connector at a time.
2.	Press the SAVE button to store the option.	

3.4 Service Configuration (Menu #3)

3.4.1 Selecting a Service

Setting Up a Service

Each transport stream may contain many Services. Menu #3 allows a Service to be chosen as current and the profile of its components to be specified.

Table 3.8: Selecting a Service

Step	Action	Result
1.	Go to Menu #3, page 1 and select the required Service. The EDIT mode cannot be entered unless there are available Services.	This page shows the total number of Services available in the incoming transport stream. Use EDIT and SELECT to select the required Service.
2.	Press SAVE.	This stores the Service as the Current Service.

Setting Up the Power-up Service

Menu #2 allows a Service to be chosen as the Power-up default.

Table 3.9: Selecting a Power-up Service

Step	Action	Result
1.	Go to Menu #2, page 3 and select the required Service (or last valid service).	This sets the service to which the Alteia configures on power-up.
2.	Press SAVE.	This stores the service as the power-up service.

3.4.2 Selecting the Preferred Component Language

Pages 2 to 4 of Menu #3 allow the default languages for the audio channels and subtitles to be specified. The Alteia uses the default languages, if it can't find these, then the first language specified in the PMT is used. Menu #3 is used to override the choice.

Table 3.10: Selecting the Preferred Component Language

Step	Action	Result
1.	Go to Menu #3, page 2, 3 or 4 as required.	This displays the currently decoded languages.
2.	Select the required language/s for each of the streams.	Use EDIT and SELECT to select the required language. For the audio modules, if the incoming audio is a Dolby Digital stream and Dolby Digital is not enabled, the language will not appear on the list.
3.	Press SAVE to store the choice.	The language profile is now set.

3.4.3 Selecting the Audio Component

Introduction

There are two methods of selecting the audio components to be decoded by the Alteia. These are:

- Automatic selection using defaults
- Manual or remote selection for each individual service

The Alteia has two independent audio decoders. Each decoder can output a stereo pair or two mono-audio channels. Each decoder uses the language descriptor within the Service Information (SI) to select the required audio component. Therefore, all audio components must have a different language descriptor name. If the language for a number of components is the same, it is possible to manually select the required one. However, automatic selection will only choose the first instance of that name.

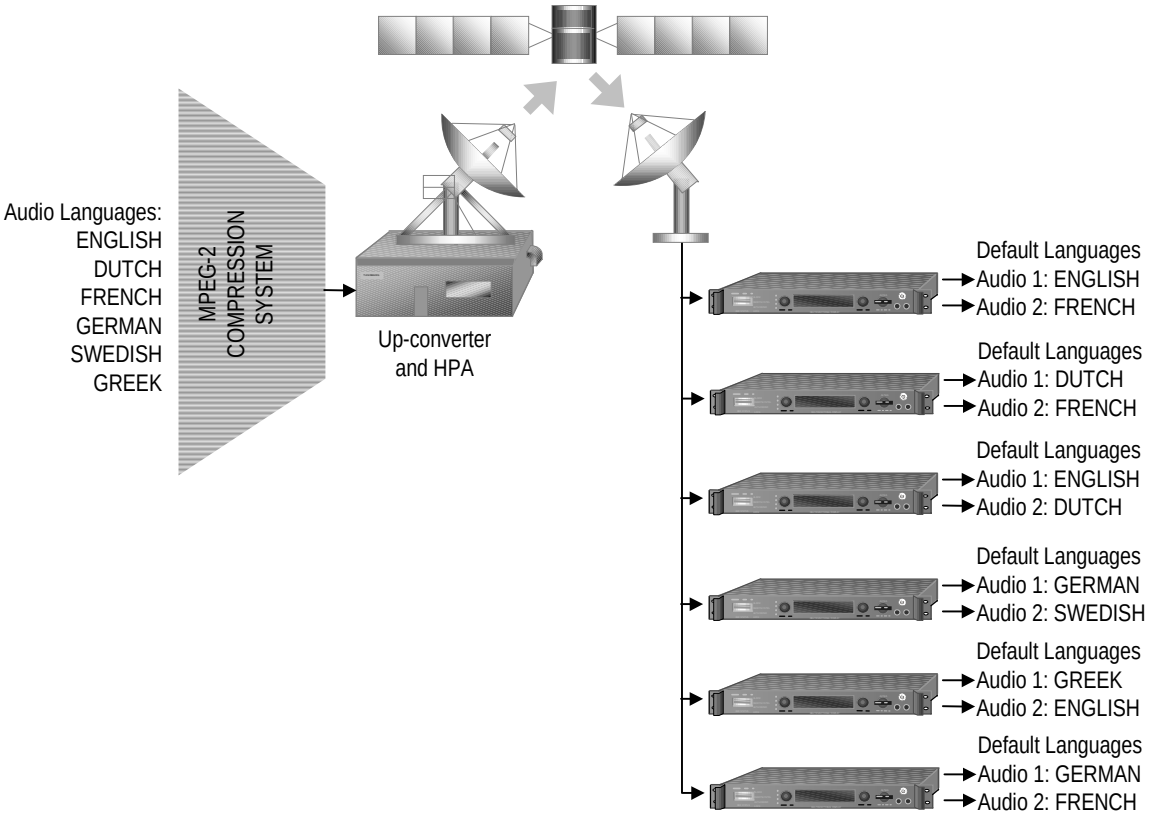


Figure 3.2: Automatic Selection of Languages

Audio Selection - Manual

It is possible to select any audio component from the active service by using the front panel controls or via the remote control interface. *Table 3.11* describes the procedure for selecting a component using a Satellite Receiver. Other units act in a similar manner.

Table 3.11: Manually Selecting the Audio Component

Step	Action	Result
1.	Tune the Receiver to an incoming transport stream and select a service using page 1 of menu #3.	This selects the service from which to select the audio component.
2.	Go to the Service menu (#3). Pages 2 and 3 allow the audio components for Audio 1 and 2 to be selected. Press the EDIT button and rotate the SELECT control to scroll through the available streams.	This results in an audio stream being selected for each of Audio 1 and Audio 2.
3.	Press SAVE to store the choice. It can also be stored as a preset using Menu # 2.	The selected audio is now part of the active service.

Audio Selection - Automatic

To automatically select an audio language, the Alteia must have the default languages (for Audio1 and Audio2) defined. These are set in Menus #8 and #9 page 3. Whenever a new service is selected, the Alteia automatically searches for that language. This feature enables a number of Alteias to select different languages from the same transport stream. This feature is illustrated in *Figure 3.2.* See *Annex G, Quick Reference Guide* for setting the Audio defaults.

3.4.4 Selecting Data Component

Page 5 of Menu #3 allows the data streams to be decoded if there is more than one stream. If no choice has been made, the first data stream to appear in the Program Map Table (PMT) is decoded by default. Any other data streams are ignored unless selected through Menu #3.

Table 3.12: Selecting Data

Step	Action	Result
1.	Go to Menu #3 page 5.	This displays the current status of the Data streams.
2.	If there are no streams, then NONE is displayed. If a number of streams are available, they are numbered and one can be selected. The Teletext module can be disabled.	Use EDIT and SELECT to select the required stream.
3.	Press SAVE to store the choice.	The Async and Sync data outputs are now set.

3.4.5 Setting up the Conditional Access/Scrambling

Introduction

Menu #10 allows the status and configuration of the Conditional Access (CA) module to be checked.
The structure and content of this group depends on the CA system. The available CA options are as follows:

- No conditional access
- VideoGuard
- Remote Authorisation System (RAS)
- VideoGuard, RAS and BISS

The Transport Stream command may require altering to accommodate the installed CA software.

Remote Authorisation System (RAS)

RAS has two levels of operation. These are designated as RAS1 and RAS2.

RAS1 has a fixed control word to encrypt the data in the transport stream. Some control words are reserved for use in the TANDBERG Television DSNG Encoder.

RAS2 is used for fixed head-end systems. Its main functionality is:

- Over-air addressing of receivers for authorisation/de-authorisation to decrypt the transmission
- Group operation for authorisation/de-authorisation
- Periodic control word changes during transmission

Basic Interoperable Scrambling System (BISS)

This product is compliant to transitional BISS as specified by the EBU Technical specification; Tech 3290 March 2000. Please refer to TANDBERG Television Customer Services regarding the use of BISS equipment.

VideoGuard

Insert a valid Director system card to enable the decryption.

VideoGuard, RAS and BISS

The process for setting this up is as for the RAS CA.

Changing the VideoGuard Customer ID (Menu #10, Page 4)

The unit must be re-powered with the appropriate smart card installed after the Customer ID has been changed.

3.4.6 Setting up the Transport Stream Output (TSO)

Set-up Procedure

Page 3 of Menu #11 is used to allow the transport stream for the current service to bypass the CA module on its way to the TSO module.

Table 3.13: Setting up the Transport Stream Output (TSO)

Step	Action	Result
1.	In Menu # 11 (Data), go to page 3.	This displays the current status of the incoming Transport Stream.
2.	If the Alteia is appropriately authorised, and the TSO selection is DECRYPTED, then the transport stream passes through the CA module as follows: • VideoGuard: Semi-decrypted • BISS: Part/ Semi-decrypted • RAS2: Fully decrypted • RAS1: Fully decrypted If the transport stream output is to remain encrypted, choose the ENCRYPTED option. For VideoGuard, only components of the currently selected service, which is being successfully decoded and decrypted by the IRD, will be presented to the TSO in their decrypted form. A maximum of 6 components, all from the same locally selected service will be passed to the TSO in their decrypted form. If a service contains more than 6 components, the remainder will stay encrypted. (see *table C.22*, [Menu 10, pages 11 and 12] for instructions on selecting which components remain encrypted). The Semi-decrypted output contains the original, unmodified SI, PSI and CA information. This includes CA descriptors of the currently selected service. This should be considered when feeding downstream re-mux type products. This restriction does not applied to RAS decryption where the entire transport stream can be decrypted.	The Transport Stream Output will be formatted according to the choice made.
3.	Press SAVE to store the choice.	The Transport Stream Output (TSO) is now set.

Packet Lengths

The output is an MPEG-2 bit-stream from the received services.

The output packet length depends on the input.

- For Receivers, if the incoming stream is 204-bytes (because of Reed-Solomon coding), the output bit-stream also consists of 204-byte packets (containing 16 bytes of redundant Reed-Solomon error correction).
- For Decoders, the output packet length is the same as that at the input.

ASI Output Mode

The ASI transmission of data within Alteia conforms to the DVB specification, "*INTERFACES FOR CATV / SMATV HEADENDS AND SIMILAR PROFESSIONAL EQUIPMENT" DVB DOCUMENT A010 rev. 1 May 1997 Annex B*.

- All models except M2/PDU/P42C Decoder
  The ASI output is byte-mode only.
- M2/PDU/P42C Decoder
  If the ASI output option card is used (see *Chapter 5, Options*) the output mode is dependent on the input mode. If the input mode is SPI, the ASI output is byte-mode. If the input is ASI, the ASI output is single packet burst mode.

Table 3.14: ASI Output Modes

Input Mode	ASI Output Mode	DVB Document A010 rev. 1 Description
ASI	Single packet burst mode	Transmission Format with Data Packets
SPI	Byte-mode	Transmission Format with Data Bursts

3.5 Personalising the Alteia

3.5.1 Assigning Status Items (Menu #1)

Using the Status Menu Pages

This group of pages is the primary Menu for the Alteia. The factory default for page 1 is for it to display the current service name. There are four other pages (initially blank) which allow items associated with the service to be displayed in an order determined by the operator.

Assigning a Status Item

Menu #1 allows selected pages from any other menu to be displayed (in a non-editable form) in an order determined by the operator. *Table 3.15* shows the process, using page 2 as an example. The process is identical for the other pages.

Table 3.15: Setting up the Status Pages

Step	Action	Result
1.	Go to Menu #1, page 2.	This displays a blank page.
2.	Rotate the SELECT control until the required parameter is displayed on the LCD display.	This action selects the required non-editable item for storing.
3.	Press SAVE to store the choice.	The selected item is now displayed on Menu #1, page 2 for the current service.

3.5.2 Setting up Preset Services (Menu #2)

Using Preset Services

This group allows up to 20 (00 to 19) services to be stored as presets. Selecting a Service from the preset list in Menu #2 page 1 automatically reconfigures the Alteia to receive that Service with its associated parameters set as stored.

> NOTE...
> A preset can only be stored if the service is currently being decoded.

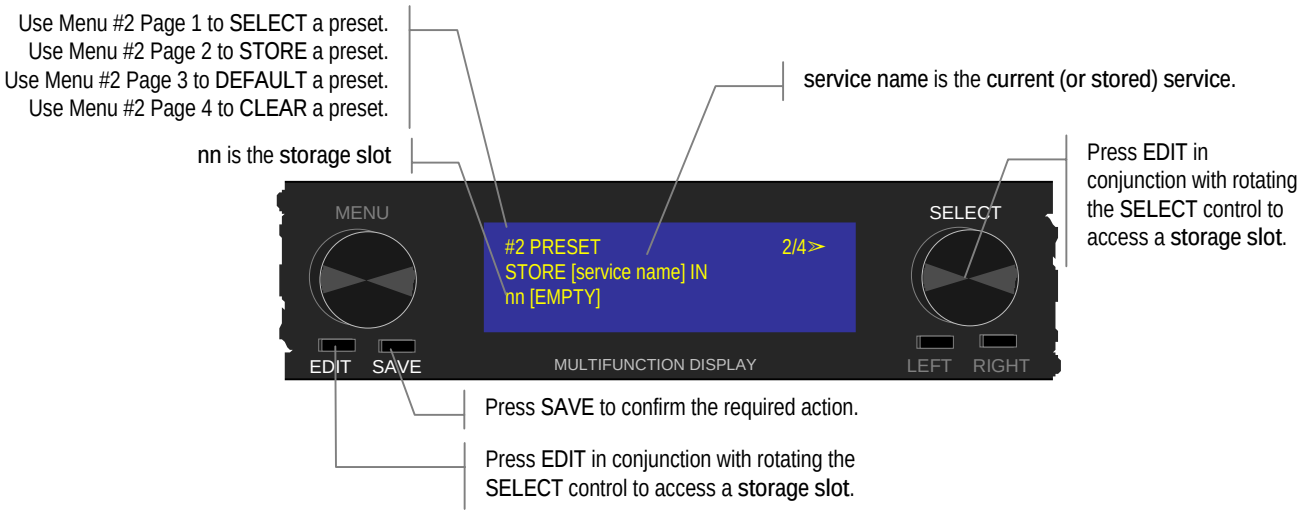


Figure 3.3: Using the Preset Menu

Setting up a Pre-set Service

Follow the steps in *Table 3.16* to store the current Service as a preset.

Table 3.16: Setting up a Preset Service

Step	Action	Result
1.	Use the menus to set-up the unit so that the required Service is current. (See *Sections 3.3 and 3.4*)	This selects the Service and associated parameters for the preset process.
2.	Display page 2 of the preset menu (#2). (The Service Name in this display is truncated to 11 characters)	This displays the menu which allows the Current Service to be stored at a chosen location (00 - 19). If there is no Current Service, the menu display reads NOTHING TO STORE.
3.	Select a location to store the preset. The EDIT mode cannot be entered unless a valid Service being decoded.	Use EDIT and SELECT to step through the stored items. This allows a specific location to be chosen. Any vacant locations are marked by the legend [EMPTY].
4.	Press SAVE.	Confirmation is required before the selection is stored.
5.	CONFIRM the selection.	This stores the current Service and its associated parameters as a preset in the selected location. This adds the Service to the list displayed on page 1.

Setting up the Power-up Default Preset Service

Follow the steps in *Table 3.17* to select the preset Service that will be presented on power-up.

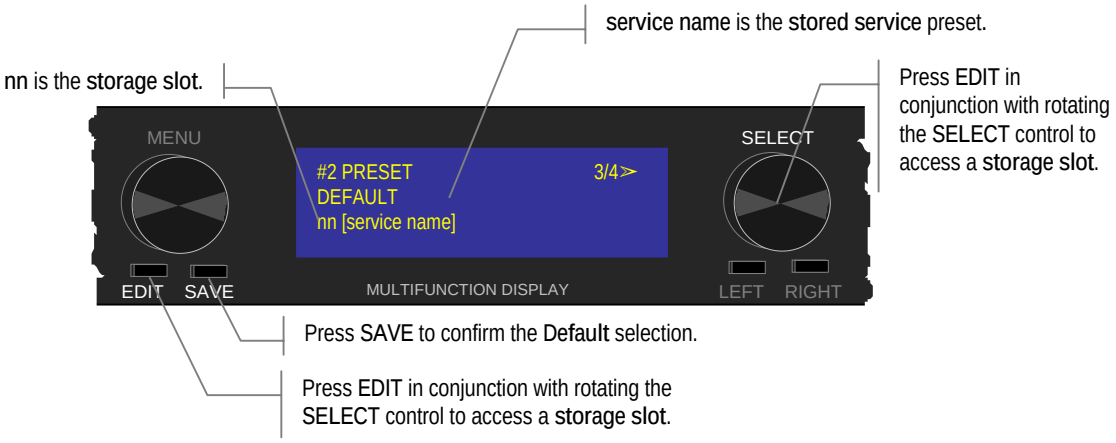


Figure 3.4: Setting Up the Power-up Default

The LAST VALID SERVICE can be chosen instead to allow the Alteia to power up to the Service that was in use at power-down.

Table 3.17: Setting up the Default Preset Service

Step	Action	Result
1.	Display page 3 of the Preset menu (#2).	This is the menu that allows the default preset Service to be selected.
2.	Select the required preset Service as the default on power-up.	Use EDIT and SELECT to step through the stored presets. Alternatively, choose LAST VALID SERVICE to automatically reselect the Service in use at power-down.
3.	Press SAVE.	This stores the selected preset Service and its associated parameters as the default Service to be presented on power-up.

Clearing a Preset Service

To clear a preset Service from the list, follow the steps in *Table 3.18*.

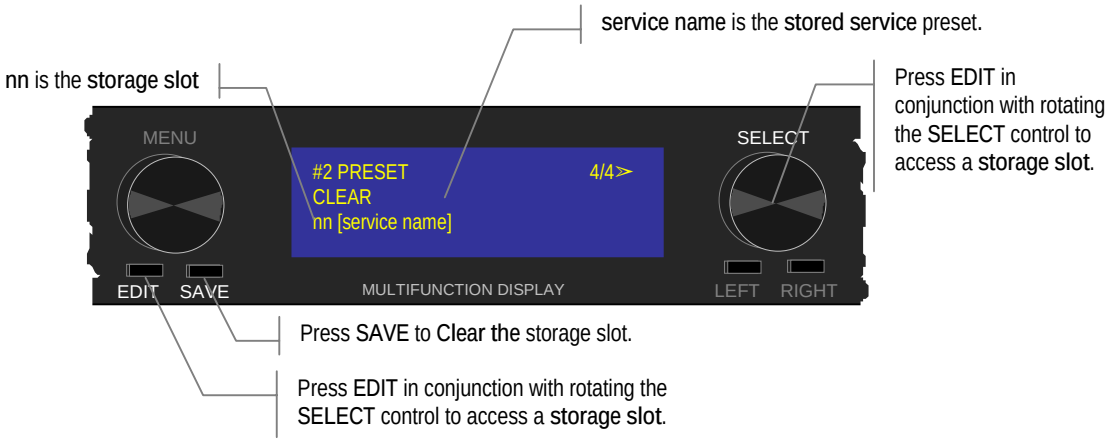


Figure 3.5: Clear a Preset Service

Table 3.18: Clearing a Preset Service

Step	Action	Result
1.	Display page 4 of the preset menu (#2).	This menu allows the currently selected preset to be cleared from the store.
2.	Select the required preset Service.	Use EDIT and SELECT to step through the stored presets.
3.	Press SAVE.	Confirmation is required before the selection is cleared.
4.	CONFIRM the selection.	This clears the Service from the store and inserts the legend [EMPTY] against the store number.

3.5.3 Frame Synchronisation

Frame Sync Option

For Frame Synchronisation to work, the Frame Sync option (M2/PRO/SYNC) must have been purchased and installed in the unit. This being the case, the Alteia *plus* software will detect it during initialisation and show the corresponding menu screen (menu #6 (Video) page 13).

Reference Signal

The line standard of the Frame Sync reference signal must match the line standard of the video signal being decoded. For a video signal line standard of 625/50, the reference signal line standard must be 625/50 and likewise, for a video signal line standard of 525/60, the reference signal line standard must be 525/60.

Enabling Frame Sync

To enable Frame Synchronisation, go to menu #6 (Video), page13 (Frame Sync). Press EDIT, rotate the SELECT knob until ENABLED is seen on the bottom line of the display and then press SAVE.

With Frame Sync enabled, the display will show the lock status. If the locking signal applied to the Frame Sync input is good, the display will show LOCKED otherwise the display will show NOT LOCKED.

Chapter 4

Alarms

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4.1 Front Panel Alarms and Indications

4.1.1 Introduction

There are a number of Front Panel LEDs, which indicate the status of the Alteia. These can be used indicate abnormal running of the unit.

4.1.2 Location of the Alarm and Indication LEDs

(TUNER) LOCK Indication

LED Status	Description
Not lit	The Alteia is not locked either because the incoming transport stream is not present or it is not valid.
Green	A valid transport stream has been detected and the unit has locked to it.

AUTHORIZED Indication

LED Status	Description
Not lit	Conditional Access is not being applied to the received service.
Blinking (Green)	RAS1 or BISS Conditional Access system in operation.
Green	All the conditions required to decode an incoming encrypted service have been met.
Red	All or some of the conditions required to decode an incoming encrypted service have not been met.

REMOTE CTRL Indication

LED Status	Description
Not lit	The unit is in LOCAL CONTROL mode.
Red	The unit is in REMOTE CONTROL / OVER-AIR mode.

Summary ALARM Indication

LED Status	Description
Green	No unmasked alarms reported. (Alarms are masked using the Alarm Menu pages, see *Annex C, Menus.*)
Red	An unmasked alarm is active. Use the Alarm Menu #5 pages to investigate the cause.

Figure 4.1: Front Panel Alarm Indications

4.1.3 Authorised LED Indications and Alarms (CA)

Table 4.1: Authorised LED

Model	Legend Displayed on Menu #10, Page 1	AUTHORIZED LED Status	Description
All models	NO SERVICE SELECTED	OFF	
All models	CLEAR	OFF	A stream transmitted clear has been detected.
Models with RAS enabled	RAS2 AUTHORISED	Green	A stream scrambled with RAS2 has been detected and the unit is authorised to decrypt it.
	RAS1	Green (Blinking)	A stream scrambled with RAS1 has been detected.
	RAS2 UNAUTHORISED	Red	A stream scrambled with RAS has been detected and the unit is not authorised to decrypt it.
Models with BISS enabled	BISS AUTHORISED	Green (Blinking)	A stream scrambled with BISS Mode 1, 2 or 3 has been detected and the unit is authorised to decrypt it.
	BISS UNAUTHORISED	Red	A stream scrambled with BISS Mode 1 has been detected but the unit is in BISS Disabled mode.
Models with VideoGuard enabled	VGUARD AUTHORIZED	Green	A stream scrambled with Videoguard conditional access has been detected and the unit is authorised to decrypt it.
	VGUARD UNAUTHORIZED	Red	A stream scrambled with Videoguard conditional access has been detected and the unit is not authorised to decrypt it.

4.1.4 Summary Alarm

The front panel summary ALARM LED provides a high-level indication of an alarm within the unit. The alarm list depends on the Alteia model. The alarm lights under the following conditions (if not masked – see *Annex C, Menus, Menu #5*):

- No valid input signal
- Signal level too low
- The input frequency is out of range
- The received Service is not authorised
- The Smart-Card is not readable
- The LNB supply trips
- The tuner/demodulator is not locked

4.2 Operational Alarm Conditions

4.2.1 Asynchronous Data Alarm

If asynchronous data is not present in the selected service, an Async alarm will be raised. If asynchronous data is not used, mask the alarm (see *Section 4.3, Summary Alarm Masking and Relay Setting*).

4.2.2 Closed Captions (Software Version 2.2 and Earlier)

WARNING...

IF CLOSED CAPTION IS DISABLED, IT CAN CAUSE A SINGLE GREEN LINE IN THE FIRST LINE OF THE VBI.

TANDBERG Television Ltd recommend that Closed Captions should be left at the Factory Default (ENABLED). See Menu #7.

If the Closed Captions option is ENABLED and the incoming service does not contain them, a VBI alarm will be raised in Menu #5. Mask the alarm on the same page.

4.3 Summary Alarm Masking and Relay Setting

Figure 4.2 shows the alarm sources for a Satellite Receiver, however the principle is the same for Decoders and Terrestrial Receivers. Illustrated are the effects of the Relay and Mask options. Also shown are the sources that cannot be masked. Relays can be assigned in any chosen order and more than one Alarm can be assigned to a relay contact, creating an alarm group. The choices made in *Figure 4.2* are for illustration purposes only.

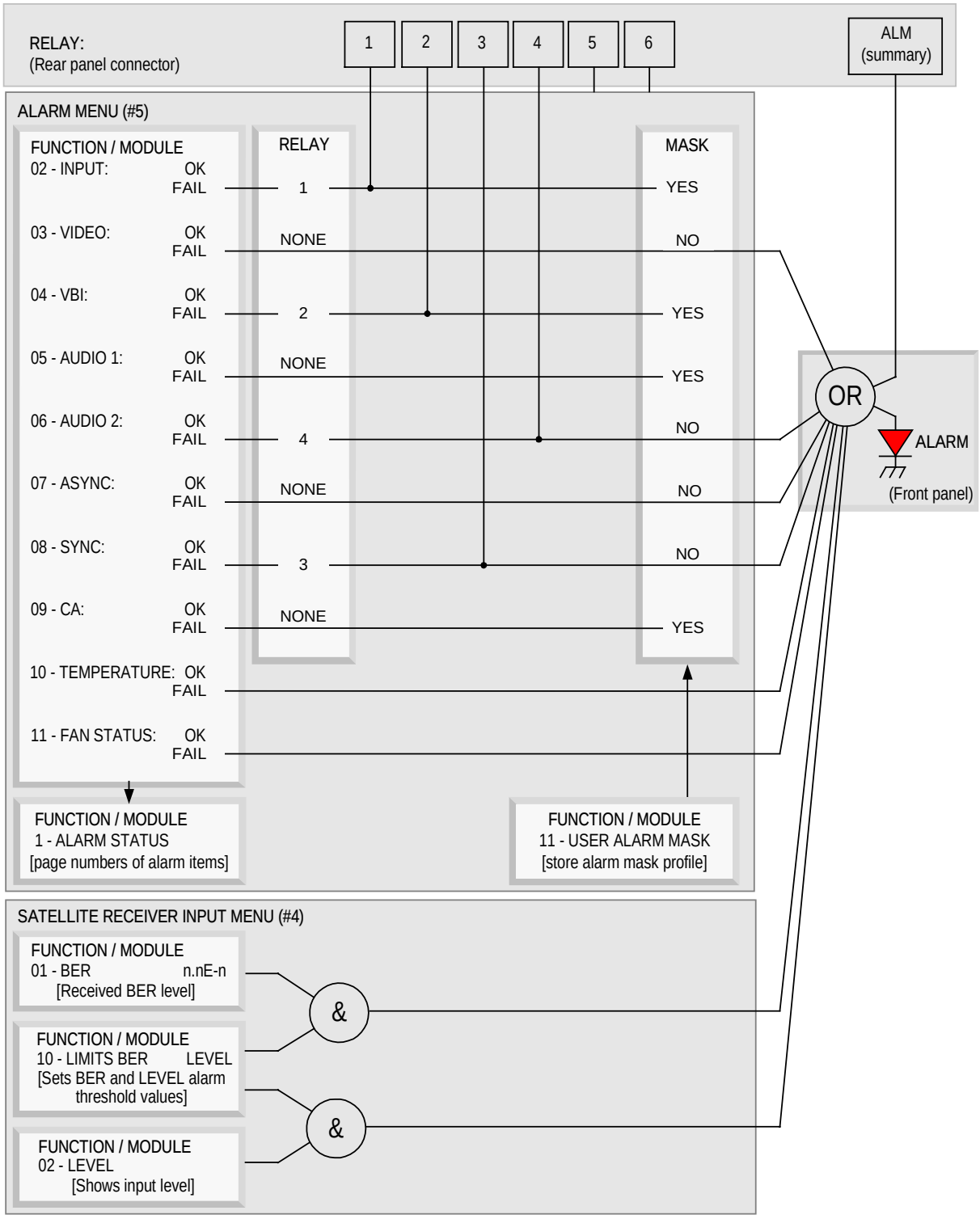

Figure 4.2: Satellite Receiver Alarm Sources

Chapter 5

Options

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5.1 ASI Output Module (M2/PRO/ASI)

5.1.1 General Description

Output formats are DVB asynchronous serial (copper), and asynchronous serial (optical). The synchronous parallel interface (TSO-SPI) is available on the rear panel as standard. The full multiplex of compressed services can be used for satellite signal re-distribution (via a Modulator) or for redistribution via telecom links (using a suitable interface).

5.1.2 Connector Details

DVB ASI Copper Connector

This provides a copper connector for the DVB Asynchronous Serial Interface (ASI) with the following consideration:

- All models except M2/PDU/942C Decoder.
  The ASI output is byte-mode only.
- M2/PDU/942C Decoder.
  If the ASI output option card is used, the output mode depends on the input mode. If the input mode is SPI, the ASI output is byte-mode. If the input is ASI, the ASI output is single packet burst mode.

> NOTE...
> Terminate this connector in 75 Ω when not in use.

Table 5.1: DVB ASI Copper Output

Item	Specification	
Safety status	SELV	
Connector type	BNC, Female 75 Ω	
Connector designation	TSO ASI	
Cable specification	Capable of transmitting a maximum frequency of 850 MHz	
Connection	Pin: Signal	Shield: Ground/Chassis

DVB ASI Optical Connector

WARNING...
LASER: CLASS I LASER PRODUCT
DO NOT LOOK INTO THE APERTURE.
LOOKING INTO THE APERTURE COULD CAUSE DISCOMFORT TO YOUR EYE.

NOTE...
The Class 1 LASER warning is as defined in paragraph 5.2 of EN 60825-1 1994.

Provides an optical fibre connector for the DVB Asynchronous Serial Interface (ASI). This output is continuously active when fitted.

Table 5.2: DVB ASI Optical Output

Item	Specification
Safety status	CLASS 1 LED PRODUCT as defined in EN 60825-1
Connector type	SC type
Connector designation	TSO ASI (FIBER)
Fibre optic cable type	Multimode 62.5/125 μm
Maximum cable attenuation	1.5 dB/km @ 1300 nm
Maximum output cable length	≤2.66 km
Maximum data rate	270 Mbit/s
Transmission format	See para 5.1.1

5.2 Options (Purchasable)

There are a number of options that can be purchased separately. Some of these are model dependent. *Table 5.3* lists the options.

Table 5.3: Options (Purchasable)

Description	Option Type	Marketing Code	Availability (S/W version)
ASI Output Module	Internal card	M2/PRO/ASI	all versions
BISS	Software	M2/PRO/BISS	2.8 and later
Dolby Digital (AC-3) Audio	Software	M2/PRO/DAC3	2.2 and later
Frame Synchroniser option	Software	M2/PRO/SYNC	2.4 and later
RAS I and II	Software	M2/PRO/RAS	2.1.1 and later
Linear Audio (SMPTE 302M-1998)	Software	M2/PRO/LINA	2.4 to 2.5.5
Linear Audio (SMPTE 302M-2000)	Software	M2/PRO/LINA	2.8 and later
VBI reinsertion	Software	M2/PRO/AVBI	2.4 and later

NOTES...
1. A software upgrade to v2.8 would require the installation of Linear Audio (SMPTE 302M-2000).
2. M2/PTRE/948CVL comprises M2/PTRE/948C plus M2/PRO/LINA.

Chapter 6

Preventive Maintenance and Fault-finding

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6.1 Routine Checks

6.1.1 Cooling Fan

There are no routine checks associated with this equipment other than to ensure that the unit is adequately cooled. This equipment must never be operated unless the cooling fan is working; this should be checked periodically.

CAUTION...

The fan contained within this unit is not fitted with an insect/dust filter. Pay particular attention to the environment in which it is going to be used.

6.1.2 Cleaning

Unplug the equipment from the supply before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning the exterior of the Receiver.

6.2 Servicing

6.2.1 Conditions Requiring Servicing

WARNING...

DO NOT ATTEMPT TO SERVICE THIS PRODUCT AS OPENING OR REMOVING COVERS MAY EXPOSE DANGEROUS VOLTAGES OR OTHER HAZARDS. REFER ALL SERVICING TO SERVICE PERSONNEL WHO HAVE BEEN AUTHORISED BY TANDBERG TELEVISION.

The following is a list of conditions that may indicate the need for servicing:

1. When the power supply cord or plug is damaged.
2. If liquid has been spilled, or objects have fallen into the product.
3. If the product has been exposed to rain or water.
4. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
5. If the product has been dropped or the case has been damaged.
6. When the product exhibits a distinct change in performance.
7. If the equipment has been subject to a lightning strike or power surge.

6.2.2 Replacement Parts

When replacement parts are required, be sure only parts specified by TANDBERG Television Ltd (or having the same characteristics as the original part) have been used. Unauthorised substitutions may result in fire, electric shock or other hazards.

6.2.3 Checks on Completion of Servicing

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in a safe operating condition. Also, performance and EMC checks may be required.

6.3 Maintenance and Support Services

6.3.1 Introduction

TANDBERG Television is a leader in the design, integration and implementation of digital broadcasting products and systems. It has a large team dedicated to keeping our customers on air 24 hours a day, 365 days a year.

With regional offices worldwide, and ultra-modern specialist service facilities in the US, UK, Hong Kong and Australia, TANDBERG Television covers the world. There is a customer service centre open round the clock, every day of the year, in your time zone.

TANDBERG's years of design and support experience enable it to offer a range of service options that will meet your needs at a price that makes sense.

It's called the **TANDBERG Advantage**.

6.3.2 Warranty

All TANDBERG Products and Systems are designed and built to the highest standards and are covered under a comprehensive 12 month warranty.

6.3.3 Levels of Continuing TANDBERG Television Service Support

For standalone equipment, then TANDBERG Television **BASIC Advantage** is the value for money choice for you.
BASIC provides you with year-by-year Service long after the warranty has expired.

VOYAGER Advantage is the truly mobile service solution. This provides a service specifically designed to keep you mobile and operational.

More information can be obtained from TANDBERG Television Customer Services; contact information is given in the preliminary pages of this manual.

6.4 Fault-finding

6.4.1 General

The information contained in this chapter is intended to isolate the unit as the faulty equipment if a system failure occurs. If the following information fails to clear the abnormal condition, please contact Customer Services using the information given in the *Preliminary Pages* of this manual.

6.4.2 Factory Default Settings

Alteias are dispatched with the factory defaults shown in *Annex F*. These can be restored at any time using System Menu (#13).

6.4.3 Preliminary Investigations

1. Ensure all leads and connectors are in place and serviceable.
2. Ensure the unit is powered. If not investigate the power source. Check the fuse.
3. Ensure any red alarm LEDs on the front of the unit are not lit. If any are, investigate the Alarm status (see *Chapter 4, Alarms*).
4. Use the BER display to ensure that the Receiver is within its carrier capture range. If it is not, check the input to the Receiver.

6.4.4 Testing The Front Panel

Setting up the Test Mode

Press and hold the EDIT button, then power up the Alteia. When the name ALTEIA is displayed, the unit is in Test Mode: release the EDIT button. The LCD display will not proceed to the usual start-up routine.

Testing the Front Panel LEDs

Repeatedly press the EDIT button to continuously step through the LEDs in the following sequence:

ALARM	Red
ALARM	Green
REMOTE CTRL	Red
REMOTE CTRL	Green
AUTHORIZED	Red
AUTHORIZED	Green
LOCK	Red
LOCK	Green
RIGHT button	Green
LEFT button	Green
SAVE button	Red
EDIT button	Green

Testing the BER Meter (Receivers Only)

Rotate the SELECT control anti-clockwise one step. The BER meter needle should indicate 10^{-4}.

Testing the LCD Display

Pressing the LEFT or RIGHT button once displays all segments. Press SAVE to clear the display.

6.4.5 Asynchronous Data Alarm

If asynchronous data is not present in the selected service, an Async alarm will be raised. If asynchronous data is not used, mask the alarm (see *Chapter 4, Alarms*).

6.4.6 Closed Captions (Software Version 2.2 and Earlier)

If Closed Caption is DISABLED, it can cause a single green line in the first line of the VBI. It is advisable that Closed Captions should be left at the Factory Default (ENABLED). See Menu #7, page 5 (s/w ver 2.1) or page 6 (s/w ver 2.2 and 2.3).

If the Closed Caption option is ENABLED and the incoming service does not contain them, a VBI alarm will be raised in Menu #5. Mask the alarm on the same page.

6.4.7 Remote Control

The Alteia remote control input operates with both RS-232 and RS-485 serial data formats (Menu #13, page 4). In addition, a device address can be set (in Menu #13, page 3) for use in multi-drop RS-485 systems.

> CAUTION...
>
> Be sure to set the correct format and address via the front panel before attempting to use this input. The Alteia will ignore any remote control commands if the input is not correctly set.

6.4.8 Frame Sync Not Working

Following the questions and steps below will help you solve the problem. If the problem is cured at any point, there is no need to complete the list:

1. Has the Frame Sync option (M2/PRO/SYNC) been purchased and installed in the unit? If you are unsure, look in menu #6 page13.
   a) If the option is not installed, the display will show NOT PURCHASED (Alteia *plus*, software v2.4 and later). Contact TANDBERG Television Sales department for further information.
   b) If the option is installed, the display will show either ENABLED or DISABLED.
2. Is the Frame Sync option enabled? Look in menu #6 page13.
   a) If it is DISABLED, refer to *Chapter 3, Operating the Equipment Locally*. The section *Frame Synchronisation, Enabling Frame Sync,* takes you through the steps required to enable Frame Sync.
   b) If it is ENABLED, the display shows LOCKED when the Alteia has locked to the reference signal applied to the Frame Sync input. If the display shows UNLOCKED the external locking signal is then suspect. Go through the following questions in order, if the problem is cured at any point, there is no need to complete the list:
      i. Is the Frame Sync cable connected?
      ii. The input is high impedance; an external resister is required. Is the Frame Sync signal terminated?
      iii. Is there a good connection on the wire?
      iv. Is the signal in good condition (good sync pulse etc.)?
      v. If the locking signal is applied to other equipment, will that equipment lock satisfactorily to the signal?
      vi. If other equipment will lock to the reference signal but the Alteia will not, contact Customer Services.

6.4.9 Terrestrial Receiver M2/PTR/9xx

High BER Reading

This may be due to Signal Degradation being enabled in Menu #4 (Input), Page 8. Disable it and note the difference.

Signal Degradation Mode

The Signal Degradation Mode is a test function designed to enable the extension of the Post-Viterbi Bit Error Rate (BER) measurement capability of the OFDM Receiver. Normally the measurement of BER is limited to a figure of 10^7 errors. Measurement of lower error rates is dependent upon increasing the measuring time. Thus it would require an unacceptably long measurement time to measure lower BERs using the current range of Transport Stream bit-rates.

In practice the range of BER measurement capability means that the Quasi Error Free (QEF) threshold (the level just above the OFDM failure level), equating to a BER of approximately 2×10^{-4}, corresponds to a carrier-to-noise ratio (C/N) of approximately 20 dBs. Above this C/N, BER measurements can usefully be made for about 4 dBs to a C/N of approximately 24 dBs. To measure BER at higher levels of C/N would take too long for normal system parameter monitoring purposes.

An apparent reduction in the transmitter output C/N is caused by non-linear operation of the transmitter, whereby inter-modulation products are generated which appear like an increase in the noise floor. This effect is known as Equivalent Noise Degradation (END). It is this type of performance degradation that the Signal Degradation mode is primarily aimed at measuring.

The Signal Degradation mode extends the range of measurement by approximately a further 5 dBs, such that BER can be measured up to a C/N of approximately 28 dBs. Normally it is anticipated that this would be used as a demodulator test function where it would not be in the broadcast signal path. In this mode it would be used to monitor the performance of the transmitter and left switched on. It would not normally be used in an off-air reception mode of operation because the performance of the system would be significantly degraded. It could be switched on occasionally to give some indication of field strength if the Receiver is not indicating any Post-Viterbi BER.

It should be noted that the effect of the signal degradation mode varies with input signal level. As measured at different signal levels and comparing the degradation of the BER caused by (1) the signal degradation mode and (2) varying the C/N to achieve the same change in BER as signal degradation mode, the equivalent effect of the signal degradation mode to changes in C/N, varies with level of the received signal. Therefore it may be necessary to adjust the input level to achieve the optimum measurement criteria.

In the Alteia, seven signal degradation modes are provided, whilst in the '0' position the signal degradation mode is switched off. Mode 1 provides a setting about mid-range. Modes 2 to 7 bracket mode 1 and range from the minimum degradation of 2 to the maximum of 7. If mode 7 is selected near the MPEG failure threshold, the Alteia may experience difficulty re-locking after the loss of input signal. In this case mode 0 should be reselected to acquire the signal and once locked mode 7 can be reselected.

6.5 Changing the Equipment Fuse

CAUTION...

This product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home or business, consult your appliance dealer or local power company. For products intended to operate from battery power, or other sources, refer to the operating instructions.

The power supply used in this equipment is a wide-ranging, ac power supply unit designed for use in ambient air temperature conditions of 0°C to +50°C for 100-120 Vac and 220-240 Vac, 50-60 Hz (see *Annex B, Technical Specification* for details). There are no links or switches to be altered for operation from different ac supplies.

The Alteia is designed for user accessible fuse replacement.

In addition to the fuse in the supply cable plug (if appropriate) a fuse is held in the fuse carrier of the ac power inlet at the rear of the Alteia.

Table 6.1: Fuse Information

Item	Specification
Fuse	Single pole, fitted in live conductor in power input filter at rear of unit.
Fuse type	5 mm x 20 mm anti-surge (T) HBC, IEC127 (sheet v)
Fuse rating	1.6 A, 250 Vac

To replace the ac power fuse perform the following:

WARNING...

BEFORE REPLACING THE REAR PANEL FUSE, DISCONNECT THE EQUIPMENT FROM THE SUPPLY. FAILURE TO DO THIS MAY EXPOSE HAZARDOUS VOLTAGES. UNPLUG THE EQUIPMENT FROM THE LOCAL SUPPLY SOCKET.

1. Ensure that power is turned off and the power cable is disconnected from the ac power inlet.
2. Ease out the fuse carrier by placing a small, flat-bladed screwdriver in the notches at the sides of the carrier.

CAUTION...

When replacing the power input fuse, always ensure that a fuse of the correct type and rating is fitted. Failure to do so results in inadequate protection. If the replacement fuse also blows, do not continue. Disconnect the equipment and contact Customer Services (see *Preliminary Pages*) for advice.

3. Replace the fuse in the carrier.
4. Insert the fuse carrier back in the ac power inlet.

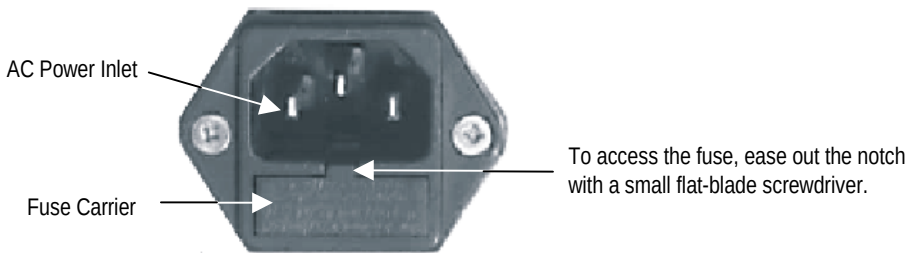

Figure 6.1: Fuse Carrier

6.6 Disposal

6.6.1 Moulded Plugs

If the moulded plug fitted to the mains cable supplied with this equipment is not required, use another cable. If the supplied plug is to be changed cut it off and dispose of it safely.

WARNING...

IF THE MOULDED PLUG FITTED TO THE MAINS CABLE SUPPLIED WITH THIS EQUIPMENT IS NOT REQUIRED, PLEASE CUT IT OFF AND DISPOSE OF IT SAFELY. FAILURE TO DO THIS MAY ENDANGER LIFE AS LIVE ENDS MAY BE EXPOSED IF THE REMOVED PLUG IS INSERTED INTO A MAINS OUTLET.

6.6.2 Equipment

Dispose of this equipment safely at the end of its life. Local codes and/or environmental restrictions may affect its disposal. Check with your local authority.

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Annex A

Glossary

The following list covers most of the abbreviations, acronyms and terms as used in TANDBERG Television Limited Manuals. All terms may not be included in this manual.

µm	Micrometre (former name - micron): a unit of length equal to one millionth (10^{-6}) of a metre.
3:2 pulldown	A technique used when converting film material (which operates at 24 pictures per second) to 525-line video (operating at 30 pictures per second).
4:2:0	Digital video coding method in which the colour difference signals are sampled on alternate lines at half the luminance rate.
4:2:2	Digital video coding method in which the colour difference signals are sampled on all lines at half the luminance rate.
422P@ML	422 Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 50 Mbit/s over various mediums. Used for Contribution and Distribution applications.
5B6B	5 Binary Bits Encoded to 6 Binary Bits: Block code.
AC-3	Audio Coding algorithm number 3 (See Dolby Digital).
ACC	Authorisation Control Computer.
ADPCM	Adaptive Differential Pulse Code Modulation: An advanced PCM technique that reduces the bit-rate by coding the difference values between successive samples rather than the absolute value of each sample.
ADT	Audio, Data And Teletext.
AFC	Automatic Frequency Control.
AFS	Automation File Server.
AGC	Automatic Gain Control.
AMOL I and II	Automatic Measure of Line-ups I and II: Used by automated equipment to measure programme-viewing ratings.
ASI	Asynchronous Serial Interface.
ASIC	Application-Specific Integrated Circuit: A customised chip designed to perform a specific function.
Async	Asynchronous.
ATM	Asynchronous Transfer Mode: A connection orientated, cell based, data transport technology designed for Broadband ISDN (B-ISDN). It provides a circuit-switched bandwidth-on-demand carrier system, with the flexibility of packet switching. It offers low end-to-end delays and (negotiable on call set-up) Quality of Service guarantees. Asynchronous refers to the sporadic nature of the data being transmitted. Cells are transmitted only when data is to be sent; therefore the time interval between cells varies according to the availability of data.
ATSC	Advanced Television Standards Committee: An organisation founded in 1983 to research and develop a digital TV standard for the U.S.A. In late 1996, the FCC adopted the ATSC standard, the digital counterpart of the NTSC standard.

B3ZS	Bipolar with Three Zero Substitution: A method of eliminating long zero strings in a transmission. It is used to ensure a sufficient number of transitions to maintain system synchronisation when the user data stream contains an insufficient number of 1s to do so. B3ZS is the North American equivalent of the European HDB3.
Backward Compatibility	Refers to hardware or software that is compatible with earlier versions.
BAT	Bouquet Association Table: Part of the service information data. The BAT provides information about bouquets. It gives the name of the bouquet and a list of associated services.
baud rate	The rate of transfer of digital data when the data comprises information symbols that may consist of a number of possible states. Equivalent to bit-rate when the symbols only have two states (1 and 0). Measured in Baud.
BER	Bit Error Rate: A measure of transmission quality. The rate at which errors occur in the transmission of data bits over a link. It is generally shown as a negative exponent, (e.g. 10^{-7} means that 1 in 10,000,000 bits are in error).
BISS	Basic Interoperable Scrambling System: Non-proprietary encryption from EBU (Tech3290).
Bit-rate	The rate of transfer of digital data when the data comprises two logic states, 1 and 0. Measured in bit/s.
Block; Pixel Block	An 8-row by 8-column matrix of luminance sample values, or 64 DCT coefficients (source, quantised, or dequantised).
Bouquet	A collection of services (TV, radio, and data, or any combination of the three) grouped and sold together, and identified in the SI as a group. A single service may be in several bouquets.
B-Picture; B-Frame	Bi-directionally Predictive Coded Picture/Frame: A picture that is coded using motion-compensated prediction from previous I or P frames (forward prediction) and/or future I or P frames (backward prediction). B frames are not used in any prediction.
BPSK	Binary Phase Shift Keying: A data modulation technique.
Buffer	A memory store used to provide a consistent rate of data flow.
BW	Bandwidth: The transmission capacity of an electronic line such as (among others) a communications network, computer bus, or broadcast link. It is expressed in bits per second, bytes per second or in Hertz (cycles per second). When expressed in Hertz, the frequency may be a greater number than the actual bits per second, because the bandwidth is the difference between the lowest and highest frequencies transmitted. High bandwidth allows fast transmission or high-volume transmission.
Byte-mode	Each byte is delivered separately in the ASI Transport Stream, with stuffing data added between the Bytes to increase the data rate to 270 Mbit/s. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
CA	Conditional Access: The technology used to control the access to viewing services to authorised subscribers through the transmission of encrypted signals and the programmable regulation of their decryption by a system such as viewing cards.
CAT	Conditional Access Table: Part of the MPEG-2 Program Specific Information (PSI) data. Mandatory for MPEG-2 compliance if CA is in use.
C-Band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 4 GHz to 6 GHz. Used by communications satellites. Preferred in tropical climates because it is not susceptible to fading.
CCIR	*See:* ITU-R.
CCITT	*See:* ITU-T.
Channel	A narrow range of frequencies, part of a frequency band, for the transmission of radio and television signals without interference from other channels. In the case of OFDM, a large number of carriers spaced apart at precise frequencies are allocated to a channel.
Channel Coding	A way of encoding data in a communications channel that adds patterns of redundancy into the transmission path in order to improve the error rate. Such methods are widely used in wireless communications.
Chrominance	The colour part of a TV picture signal, relating to the hue and saturation but not to the luminance (brightness) of the signal. In a composite-coded colour system, the colour information (chrominance, often referred to as chroma) is modulated onto a high frequency carrier and added to the monochrome-format video signal carrying the luminance (Y). In a component-coded colour system, the two colour-difference signals (R-Y)(B-Y) usually referred to as C_RC_B (digital) or P_RP_B (analogue), are used to convey colour information. When C_RC_B (P_RP_B) is added to the luminance (Y), the complete picture information is conveyed as YC_RC_B (YP_RP_B).
Closed Captioning	A TV picture subtitling system used with 525-line analogue transmissions.
CODE	Create Once Distribute Everywhere.
Codec	The combination of an Encoder and a complementary Decoder located respectively at the input and output of a transmission path.
COFDM	Coded OFDM: COFDM adds forward error correction to the OFDM transmission consisting of Reed-Solomon (RS) coding followed by convolutional coding to add extra bits to the transmitted signal. This allows a large number of errors at the receive end to be corrected by convolutional (Viterbi) decoding followed by RS decoding.

Compression	Reduction in the number of bits used to represent the same information. For the purposes of a broadcast system, it is the process of reducing digital picture information by discarding redundant portions of information that are not required when reconstituting the picture to produce viewing clarity. Compression allows a higher bite-rate to be transmitted through a given bandwidth.
Compression System	Responsible for compressing and multiplexing the video / audio / data bit-streams, together with the authorisation stream. The multiplexed data stream is then ready for transmission.
C_RC_B	Digital Colour difference signals. These signals, in combination with the luminance signal (Y), define the colour and brightness of each picture element (pixel) on a TV line. *See:* Chrominance
CRC	Cyclic Redundancy Check: A mathematical algorithm that computes a numerical value based on the bits in a block of data. This number is transmitted with the data and the receiver uses this information and the same algorithm to ensure the accurate delivery of data by comparing the results of algorithm and the number received. If a mismatch occurs, an error in transmission is presumed.
CVCT	Cable Virtual Channel Table (ATSC).
dB	Decibels: A ratio of one quantity to another using logarithmic scales to give results related to human aural or visual perception. dB is a ratio whereas dBm, for example, is an absolute value, quoted as a ratio to a fixed point of 0 dBm. 0 dBm is 1 mW at 1 kHz terminated in 600Ω. 0 dBmV is 1 mV terminated in 75Ω.
DCE	Data Communications Equipment: Typically a modem. It establishes, maintains and terminates a session on a network but in itself is not the source (originator) or destination (end receiving unit) of signals (e.g. a computer, see DTE). A DCE device may also convert signals to comply with the transmission path (network) format.
DCT	Discrete Cosine Transform: A technique for expressing a waveform as a weighted sum of cosines. Raw video data is not readily compressible. DCT is not in itself a compression technique but is used to process the video data so that it is compressible by an encoder. DCT processes the picture on an 8x8-pixel block basis, converting the data from an uncompressible X Y form (as displayed by an oscilloscope) to a compressible frequency domain form (as displayed by a spectrum analyser). Can be forward DCT or inverse DCT.
DDS	Direct Digital Synthesiser.
Decoder	The unit containing the electronic circuitry necessary to decode encrypted signals. Some Decoders are separate from the receiver but in satellite TV broadcasting, the term is often used interchangeably as a name for an Integrated Receiver Decoder (IRD). The term IRD, or IRD / Decoder, is usually associated with satellite TV broadcasting while Cable systems are based on Converters or on Set-Top Boxes / Converters.
Decoding Time-stamp	A field that may be present in a PES packet header that indicates the time that an access unit is to be decoded in the system target Decoder.
DID	Data Identifier.
Differential Coding	Method of coding using the difference between the value of a sample and a predicted value.
DIL	Dual In Line: The most common type of package for small and medium scale integrated circuits. The pins hang vertically from the two long sides of the rectangular package, spaced at intervals of 0.1 inch.
DIN	Deutsches Institut für Normung: German Standards Institute.
Dolby Digital	Formerly AC-3. An audio coding system based on transform coding techniques and psychoacoustic principles.
Downlink	The part of the satellite communications circuit that extends from the satellite to an Earth station.
Downconvert	The process by which the frequency of a broadcast transport stream is shifted to a lower frequency range.
DPCM	Differential Pulse Code Modulation: An audio digitisation technique that codes the difference between samples rather than coding an absolute measurement at each sample point.
DSNG	Digital Satellite News-Gathering.
DSP	Digital Signal Processor.
DTE	Data circuit Terminating Equipment: A communications device that originates (is the source) or is the end receiving unit (destination) of signals on a network. It is typically a terminal or computer.
DTH	Direct To Home. The term used to describe uninterrupted transmission from the satellite directly to the subscriber, that is, no intermediary cable or terrestrial network utilised.
DTS	Digital Theater Systems: A motion picture digital sound system.
DVB	Digital Video Broadcasting: A European project which has defined transmission standards for digital broadcasting systems using satellite (DVB-S), cable (DVB-C) and terrestrial (DVB-T) medium, created by the EP-DVB group and approved by the ITU. Specifies modulation, error correction, etc. (see EN 300 421 for satellite, EN 300 429 for cable and EN 300 744 for terrestrial).
DVB SI	Digital Video Broadcasting Service Information.
DVB-PI	DVB-Professional Interfaces: TTV Lan search shows – DVB Physical Interfaces

Earth	Technical Earth: Ensures that all equipment chassis within a rack are at the same potential, usually by connecting a wire between the Technical earth terminal and a suitable point on the rack. This is sometimes known as a Functional earth. Protective Earth: Used for electric shock protection. This is sometimes known as a safety earth.
EBU	European Broadcast Union.
ECM	Entitlement Control Message.
EDI	Ethernet Data Input
EIA	Electronics Industries Association (USA).
EIT	Event Information Table: Equipment: A component of the DVB-Service Information (SI) stream generated within an Encoder, containing information about events or programmes such as event name, start time, duration, etc. System: EIT (Present/Following) contains the name of the current and next event. It may include an optional descriptor (synopsis) giving brief details of content. EIT (Schedule) is used to produce a full EPG. The EIT is the only DVB-SI table, which can be encrypted.
Elementary Stream	A generic term for a coded bit-stream, be it video, audio or other.
EMC	Electromagnetic Compatibility.
EMM	Entitlement Management Message.
Encryption	Encoding of a transmission to prevent access without the appropriate decryption equipment and authorisation.
EPG	Electronic Programme Guide: On-screen programme listing using thumbnail pictures and/or text.
Ethernet	The most widely used local area network (LAN) defined by the IEEE as the 802.3 standard. Transmission speeds vary according to the configuration. Ethernet uses copper or fibre-optic cables.
ETS	European Telecommunications Standard.
ETSI	European Telecommunications Standards Institute.
FCC	Federal Communications Commission.
FDM	Frequency Division Multiplex: A common communication channel for a number of signals, each with its own allotted frequency.
FEC	Forward Error Correction: A method of catching errors in a transmission. The data is processed through an algorithm that adds extra bits and sends these with the transmitted data. The extra bits are then used at the receiving end to check the accuracy of the transmission and correct any errors.
FFT	Fast Fourier Transformation: A fast algorithm for performing a discrete Fourier transform.
FIFO	First In, First Out: A data structure or hardware buffer from which items are taken out in the same order they were put in. Also known as a shelf from the analogy with pushing items onto one end of a shelf so that they fall off the other. A FIFO is useful for buffering a stream of data between a sender and receiver that are not synchronised - i.e. they not sending and receiving at exactly the same rate.
Footprint	The area of the Earth's surface covered by a satellite's downlink transmission. Also (generally) the area from which the satellite can receive uplink transmissions.
FTP	File Transfer Protocol: A protocol used to transfer files over a TCP/IP network (Internet, UNIX, etc.). For example, after developing the HTML pages for a Web site on a local machine, they are typically uploaded to the Web server, using FTP. Unlike e-mail programs in which graphics and program files have to be attached, FTP is designed to handle binary files directly and does not add the overhead of encoding and decoding the data.
G.703	The ITU-T standard which defines the physical and electrical characteristics of hierarchical digital interfaces.
GOP	Group of Pictures: MPEG video compression works more effectively by processing a number of video frames as a block. The TANDBERG Television Encoder normally uses a 12 frame GOP; every twelfth frame is an I frame.
GUI	Graphical User Interface: The use of pictures rather than just words to represent the input and output of a program. A program with a GUI runs under a windowing system and has a screen interface capable of displaying graphics in the form of icons, drop-down menus and a movable pointer. The on-screen information is usually controlled / manipulated by a mouse or keyboard.
HDTV	High Definition Television.
HPA	High Power Amplifier: Used in the signal path to amplify the modulated and up-converted broadcast signal for feeding to the uplink antenna.
HSYNC	Horizontal (line) SYNCs.
Hub	A device in a multipoint network at which branch nodes interconnect.
ICAM	Integrated Conditional Access Module: Embedded in the IRD and responsible for descrambling, plus packet filtering and reception. It also contains the physical interface to the subscriber's viewing card.
IEC	International Electrotechnical Committee.

IF	Intermediate Frequency: Usually refers to the 70 MHz or 140 MHz output of the Modulator in cable, satellite and terrestrial transmission applications.
Interframe Coding	Compression coding involving consecutive frames. When consecutive frames are compared, temporal redundancy is used to remove common elements (information) and arrive at difference information. MPEG-2 uses B and P frames, but since they are individually incomplete and relate to other adjacent frames, they cannot be edited independently.
Intraframe Coding	Compression coding involving a single frame. Redundant information is removed on a per frame basis. All other frames are ignored. Coding of a macroblock or picture that uses information only from that macroblock or picture. Exploits spatial redundancy by using DCT to produce I frames; these are independent frames and can be edited.
IP	Internet Protocol: The IP part of TCP/IP. IP implements the network layer (layer 3) of the protocol, which contains a network address and is used to route a message to a different network or sub-network. IP accepts packets from the layer 4 transport protocol (TCP or UDP), adds its own header to it and delivers a datagram to the layer 2 data link protocol. It may also break the packet into fragments to support the Maximum Transmission / Transfer Unit (MTU) of the network.
I-picture; I-frame	Intracoded Picture/Frame: A picture / frame, which is coded using purely intracoding with reference to no other field or frame information. The I frame is used as a reference for other compression methods.
IPPV	Impulse Pay Per View: One-time events, purchased at home (on impulse) using a prearranged SMS credit line.
IRD	Integrated Receiver Decoder: The Receiver with an internal MPEG Decoder, which is connected to the subscriber's TV. The IRD is responsible for receiving and de-multiplexing all signals. The unit receives the incoming signal and if CA is active, decodes the signal when provided with a control word by the viewing card. Domestic IRDs are also known as Set-Top Units or Set-Top Boxes.
IRE	Institute of Radio Engineers: No longer in existence but the name lives on as a unit of video amplitude measurement. This unit is 1% of the range between blanking a peak white for a standard amplitude signal.
ISDN	Integrated Services Digital Network: The basic ISDN service is BRI (Basic Rate Interface), which is made up of two 64 kbit/s B channels and one 16 kbit/s D channel (2B+D). If both channels are combined into one, called bonding, the total data rate becomes 128 kbit/s and is four and a half times the bandwidth of a V.34 modem (28.8 kbit/s). The ISDN high-speed service is PRI (Primary Rate Interface). It provides 23 B channels and one 64 kbit/s D channel (23B+D), which is equivalent to the 24 channels of a T1 line. When several channels are bonded together, high data rates can be achieved. For example, it is common to bond six channels for quality videoconferencing at 384 kbit/s. In Europe, PRI includes 30 B channels and one D channel, equivalent to an E1 line.
ISO	International Standards Organisation.
ISOG	Inter-union Satellite Operations Group.
ITS	Insertion Test Signal: A suite of analogue test signals placed on lines in the VBI. Also known as VITS.
ITT	Invitation To Tender.
ITU-R	International Telecommunications Union - Radiocommunications Study Groups (was CCIR).
ITU-T	International Telecommunications Union - Telecommunications Standardisation Sector (was CCITT).
JPEG	Joint Photographic Experts Group: ISO/ITU standard for compressing still images. It has a high compression capability. Using discrete cosine transform, it provides user specified compression ratios up to around 100:1 (there is a trade-off between image quality and file size).
kbit/s	1000 bits per second.
Kbit	1024 bits, usually refers to memory capacity or allocation.
Ku-band	The portion of the electromagnetic spectrum, which spans the frequency range of approximately 12 GHz to 14 GHz. Used by communications satellites. Preferred for DTH applications because this range of frequency is less susceptible to interference.
LAN	Local Area Network: A network, which provides facilities for communications within a defined building or group of buildings in close proximity.
L-band	The frequency band from 950 MHz to 2150 MHz, which is the normal input-frequency-range of a domestic IRD. The incoming signal from the satellite is down-converted to L-band by the LNB.
LED	Light Emitting Diode.
LNB	Low Noise Block Down-Converter: The component of a subscriber satellite transmission receiving dish which amplifies the incoming signal and down-converts it to a suitable frequency to input to the IRD (typically 950 MHz - 1600 MHz).
LO	Local Oscillator.
LSB	Least significant bit.
Luminance	The television signal representing brightness, or the amount of light at any point in a picture. The Y in YC_RC_B.

LVDS	Low Voltage Differential Signal: LVDS is a generic multi-purpose Interface standard for high speed / low power data transmission. It was standardised in ANSI/TIA/EIA-644-1995 Standard (aka RS-644).
Macroblock	A 16x16-pixel area of the TV picture. Most processing within the MPEG domain takes place with macro blocks. These are converted to four 8x8 blocks using either frame DCT or field DCT. Four 8 x 8 blocks of luminance data and two (4:2:0 chrominance format), four (4:2:2) or eight (4:4:4) corresponding 8 x 8 blocks of chrominance data coming from a 16 x 16 section of the luminance component of the picture. Macroblock can be used to refer to the sample data and to the coded representation of the sample values and other data elements.
Mbit/s	Million bits per second.
MCC	Multiplex Control Computer: A component of a System 3000 compression system. The MCC sets up the configuration for the System 3000 Multiplexers under its control. The MCC controls both the main and backup Multiplexer for each transport stream.
MCPC	Multiple Channels Per Carrier.
MEM	Multiplex Element Manager: A GUI based control system, part of the range of TANDBERG Television compression system control element products. The evolution 5000 MEM holds a model of the system hardware. Using this model, it controls the individual system elements to configure the output multiplexes from the incoming elementary streams. The MEM monitors the equipment status and controls any redundancy switching.
MMDS	Multichannel Microwave Distribution System: A terrestrial microwave direct-to-home broadcast transmission system.
Motion Compensation	The use of motion vectors to improve the efficiency of the prediction of sample values. The prediction uses motion vectors to provide offsets into the past and/or future reference frames or fields containing previously decoded sample values that are used to form the prediction error signal.
Motion Estimation	The process of estimating motion vectors in the encoding process.
Motion Vector	A two-dimensional vector used for motion compensation that provides an offset from the co-ordinate position in the current picture or field to the co-ordinates in a reference frame or field.
MP@ML	Main Profile at Main Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 15 Mbit/s over various mediums.
MP@HL	Main Profile at High Level: A subset of the MPEG-2 standard, which supports digital video storage (DVD etc.) and transmissions up to 80 Mbit/s over various mediums.
MPEG	Moving Pictures Experts Group: The name of the ISO/IEC working group, which sets up the international standards for digital television source coding.
MPEG-2	Industry standard for video and audio source coding using compression and multiplexing techniques to minimise video signal bit-rate in preparation for broadcasting. Specified in ISO/IEC 13818. The standard is split into layers and profiles defining bit-rates and picture resolutions.
MSB	Most significant bit.
Msymbol/s	(Msym/s) Mega (million) Symbols per second (10^6 Symbols per second).
Multiplex	A number of discrete data streams (typically 8 to 12), from encoders, that are compressed together in a single DVB compliant transport stream for delivery to a Modulator.
MUSICAM	Masking pattern adapted Universal Sub-band Integrated Coding And Multiplexing: An audio bit-rate reduction system relying on sub-band coding and psychoacoustic masking.
Mux	Multiplexer: Transmission Multiplexer: receives EMMs from the ACC, ECMs from the BCC, video/audio data from the encoders, and the SI stream from the SIC. It then multiplexes them all into a single DVB-compliant transport stream, and delivers the signal to the uplink after modulation. The Multiplexer also contains the cypher card, which scrambles the services according to the control words supplied by the BCC.
Network	In the context of broadcasting: a collection of MPEG-2 transport stream multiplexes transmitted on a single delivery system, for example, all digital channels on a specific cable system.
NICAM	Near Instantaneously Companded Audio Multiplex: Official name is NICAM 728. Used for digital stereo sound broadcasting in the UK employing compression techniques to deliver very near CD quality audio. 728 refers to the bit-rate in kbit/s.
NIT	Network Information Table: Part of the service information data. The NIT provides information about the physical organisation of each transport stream multiplex, and the characteristics of the network itself (such as the actual frequencies and modulation being used).
nm	Nanometre: a unit of length equal to one thousand millionth (10^{-9}) of a metre.
NTSC	National Television Systems Committee: The group, which developed analogue standards used in television broadcast systems in the United States. Also adopted in other countries (e.g. Mexico, Canada, Japan). This system uses 525 picture lines and a 59.97 Hz field frequency.

NVOD	Near Video On Demand: Method of offering multiple showings of movies or events. The showings are timed to start at set intervals, determined by the broadcaster. Each showing of a movie or event can be sold to subscribers separately.
NVRAM	Non-volatile Random Access Memory: Memory devices (permitting random read / write access) that do not lose their information when power is removed. Stores the default configuration parameters set by the user.
OFDM	Orthogonal FDM: A modulation technique used for digital TV transmission in Europe, Japan and Australia; more spectrally efficient than FDM. In OFDM, data is distributed over a large number of carriers spaced apart at precise frequencies. The carriers are arranged with overlapping sidebands in such a way that the signals can be received without adjacent channel interference.
OPPV	Order ahead Pay Per View: An advance purchase of encrypted one-time events with an expiry date.
OSD	On-screen display: Messages and graphics, typically originating from the SMS, and displayed on the subscriber's TV screen by the IRD, to inform the subscriber of problems or instruct the subscriber to contact the SMS.
Packet	A unit of data transmitted over a packet-switching network. A packet consists of a header followed by a number of contiguous bytes from an elementary data stream.
PAL	Phase Alternating Line: A colour TV broadcasting system where the phase of the R-Y colour-difference signal is inverted on every alternate line to average out errors providing consistent colour reproduction.
PAT	Program Association Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. The PAT points (maps) to the PMT.
PCM	Pulse Code Modulation: A process in which a signal is sampled, each sample is quantised independently of other samples, and the resulting succession of quantised values is encoded into a digital signal.
PCR	Program Clock Reference: A time-stamp in the transport stream from which the Decoder timing is derived.
PDC	Programme Delivery Control (VBI): A Teletext service allowing simple programming (i.e. VideoPlus) of VCR recording times. If the desired program is rescheduled, PDC updates the programming information in the VCR.
Pel	Picture Element: Also known as a pixel. The smallest resolvable rectangular area of an image either on a screen or stored in memory. On screen, pixels are made up of one or more dots of colour. Monochrome and grey-scale systems use one dot per pixel. For grey-scale, the pixel is energised with different intensities, creating a range from dark to light (a scale of 0-255 for an eight-bit pixel). Colour systems use a red, green and blue dot per pixel, each of which is energised to different intensities, creating a range of colours perceived as the mixture of these dots. If all three dots are dark, the result is black. If all three dots are bright, the result is white.
PES	Packetised Elementary Stream: A sequential stream of data bytes that has been converted from original elementary streams of audio and video access units and transported as packets. Each PES packet consists of a header and a payload of variable length and subject to a maximum of 64 kbytes. A time-stamp is provided by the MPEG-2 systems layer to ensure correct synchronisation between related elementary streams at the Decoder.
PID	Packet Identifier: The header on a packet in an elementary data stream, which identifies that data stream. An MPEG-2 / DVB standard.
PIN	Personal Identification Number: A password used to control access to programming and to set purchase limits. Each subscriber household can activate several PINs and may use them to set individual parental rating or spending limits for each family member.
Pixel	PIX (picture) Element: The digital representation of the smallest area of a television picture capable of being delineated by the bit-stream. See Pel for more information.
pk-pk	peak to peak: Measurement of a signal or waveform from its most negative point to its most positive point.
PLL	Phase-Locked Loop. A phase-locked loop is a control system which controls the rotation of an object by comparing its rotational position (phase) with another rotating object as in the case of a sine wave or other repeating signal. This type of control system can synchronise not only the speed, but also the angular position of two waveforms that are not derived from the same source.
PMT	Program Map Table: Part of the MPEG-2 Program Specific Information (PSI) data and is mandatory for MPEG-2 compliance. Each service has a PMT, which lists the component parts (elementary streams of video, audio, etc.) for the various services being transmitted.
P-picture/P-frame	A picture / frame produced using forward prediction. It contains predictions from either previous I frames or previous P frames. The P frame is used as a reference for future P or B frames.
ppm	Parts per million.
PPV	Pay Per View: A system of payment for viewing services based on a usage / event basis rather than on on-going subscription. Subscribers must purchase viewing rights for each PPV event that they wish to view. PPV events may be purchased as IPPV or OPPV.
Program	PC - A sequence of instructions for a computer. TV - A concept having a precise definition within ISO 13818-1 (MPEG-2). For a transport stream, the timebase is defined by the PCR. The use of the PCR for timing information creates a virtual channel within the stream.

Programme	A linking of one or more events under the control of a broadcaster. For example, football match, news, film show. In the MPEG-2 concept, the collection of elementary streams comprising the programme, have a common start and end time. A series of programmes are referred to as events.
P_RP_B	Analogue Colour difference signals. Refer to C_RC_B for an explanation.
PROM	Programmable Read-Only Memory: A device, which may be written once with data for permanent storage, and then read whenever required. Special types of PROM permit the erasure of all data by Ultraviolet light (EPROM) or by application of an electronic signal (EEPROM).
PS	Program Stream: A combination of one or more PESs with a common timebase.
PSI	Program Specific Information: Consists of normative data, which is necessary for the demultiplexing of transport streams and the successful regeneration of programs. (*See also:* SI).
PSIP	Program System Information Protocol: The ATSC equivalent of SI for DVB.
PSK	Phase Shift Keying: A method of modulating digital signals particularly suited to satellite transmission.
PSR	Professional Satellite Receiver: *See also:* IRD.
PSU	Power Supply Unit.
PTS	Presentation Time Stamp (ATSC).
QAM	Quadrature Amplitude Modulation: A method of modulating digital signals, which uses combined techniques of phase modulation and amplitude modulation. It is particularly suited to cable networks.
QPSK	Quadrature Phase Shift Keying: A form of phase shift keying modulation using four states.
QSIF	Quarter Screen Image Format.
Quantise	A process of converting analogue waveforms to digital information. 8-bit quantisation as set out in ITU-R Rec. 601. uses 256 levels in the range 0 – 255 to determine the analogue waveform value at any given point. The value is then converted to a digital number for processing in the digital domain.
RAM	Random Access Memory: A volatile storage device for digital data. Data may be written to, or read from, the device as often as required. When power is removed, the data it contains is lost.
RAS	Remote Authorization System: A TANDBERG TV proprietary public-key encryption system used to prevent unauthorized viewing of a TV programme or programmes.
RF	Radio Frequency.
ROM	Read Only Memory: A non-volatile storage device for digital data. Data has been stored permanently in this device. No further information may be stored (written) there and the data it holds cannot be erased. Data may be read as often as required.
RS	Reed-Solomon coding: An error detection and correction, coding system. 16 bytes of Reed-Solomon Forward Error Correction code are appended to the packet before transmission, bringing the packet length to 204 bytes. The 16 bytes are used at the receiving end to correct any errors. Up to eight corrupted bytes can be corrected.
RLC	Run Length Coding: Minimisation of the length of a bit-stream by replacing repeated characters with an instruction of the form 'repeat character *x y* times'.
SCPC	Single Channel Per Carrier.
Spectral Scrambling	A process (in digital transmission) used to combine a digital signal with a pseudo-random sequence, producing a randomised digital signal that conveys the original information in a form optimised for a broadcast channel.
Scrambling	Alteration of the characteristics of a television signal in order to prevent unauthorised reception of the information in clear form.
SDI	Serial Digital Interface.
SDT	Service Description Table: Provides information in the SI stream about the services in the system; for example, the name of the service, the service provider, etc.
SELV	Safety Extra Low Voltage (EN 60950).
STB	Set-Top Box: A box that sits on top of a television set and is the interface between the home television and the cable TV company. New technologies evolving for set-top boxes are video-on-demand, video games, educational services, database searches, and home shopping. The cable equivalent of the IRD.
STT	System Time Table (ATSC).
SFN	Single Frequency Network: The SFN technique allows large geographic areas to be served with a common transmission multiplex. All transmitters in the network are synchronously modulated with the same signal and they all radiate on the same frequency. Due to the multi-path capability of the multi-carrier transmission system (COFDM), signals from several transmitters arriving at a receiving antenna may contribute constructively to the total wanted signal. The SFN technique is not only frequency efficient but also power efficient because fades in the field strength of one transmitter may be filled by another transmitter.

SI	Service Information: Digital information describing the delivery system, content and scheduling (timing) of broadcast data streams. DVB-SI data provides information to enable the IRD to automatically demultiplex and decode the various streams of programmes within the multiplex. Specified in ISO/IEC 13818[1]. (DVB)
Single Packet Burst Mode	A burst of ASI bytes (either 188 or 204, depending on packet length) is contiguously grouped into an MPEG-2 Transport Stream packet. Stuffing data is added between the packets to increase the data rate to 270 Mbit/s. See DVB Document A010 rev. 1, Section B3.3, (ASI) Layer-2 Transport Protocol.
Smart Card	A plastic card with a built-in microprocessor and memory used for identification, financial transactions or other authorising data transfer. When inserted into a reader, data is transferred to and from the host machine or a central computer. It is more secure than a magnetic stripe card and it can be disabled if the wrong password is entered too many times. As a financial transaction card, it can be loaded with digital money and used in the same way as cash until the balance reaches zero. The file protocol is specific to its intended application.
SMATV	Satellite Mast Antenna Television: A distribution system, which provides sound and television signals to the households of a building or group of buildings, typically used to refer to an apartment block.
SMPTE	Society of Motion Picture and Television Engineers.
SMS	Subscriber Management System: A system which handles the maintenance, billing, control and general supervision of subscribers to conditional access technology viewing services provided through cable and satellite broadcasting. An SMS can be an automatic (e.g. Syntellect) system where subscribers order entitlements by entering information via a telephone. Alternatively, an SMS can be a manual system, which requires subscribers to speak with an operator who then manually enters their entitlement requests. Some systems support multiple SMSs.
SNG	Satellite News-Gathering.
SNMP	Simple Network Management Protocol.
Spatial Redundancy	Information repetition due to areas of similar luminance and/or chrominance characteristics within a single frame. Removed using DCT and Quantisation (Intra-Frame Coding).
SPI	Synchronous Parallel Interface.
Statistical Redundancy	Data tables are used to assign fewer bits to the most commonly occurring events, thereby reducing the overall bit-rate. Removed using Run Length Coding and Variable Length Coding.
TAXI	Transparent Asynchronous Tx / Rx Interface: A proprietary high-speed data interface.
TCP / IP	Transmission Control Protocol/Internet Protocol: A set of communications protocols that may be used to connect different types of computers over networks.
TDM	Time Division Multiplex: One common, communications channel carrying a number of signals, each with its own allotted time slot.
TDT	Time and Date Table: Part of the DVB Service Information. The TDT gives information relating to the present time and date.
Temporal Redundancy	Information repetition due to areas of little or no movement between successive frames. Removed using motion estimation and compensation (Inter-Frame Coding).
Time-stamp	A term that indicates the time of a specific action such as the arrival of a byte or the presentation of a presentation unit.
TOT	Time Offset Table: This optional SI table supports the use of local offsets as well as the UTC time/date combination. The purpose of the table is to list by country the current offset from UTC and the next expected change to that offset (to track when daylight saving occurs). The offset resolution is to within 1 minute over a range of ±12 hours from UTC.
Transport Stream	A set of packetised elementary data streams and SI streams, which may comprise more than one programme, but with common synchronisation and error protection. The data structure is defined in ISO/IEC 13818-1 [1] and is the basis of the ETSI Digital Video Broadcasting standards.
Transport Stream Packet Header	A data structure used to convey information about the transport stream payload.
TS	Transport Stream.
TSDT	Transport Stream Descriptor Table: A component of the MPEG-2 PSI data. This table describes which type of Transport stream it is in (i.e. DVB, ATSC etc.). It may also contain other descriptors.
TSP	Transport Stream Processor.
TVCT	Terrestrial Virtual Channel Table (ATSC).
U	44.45 mm (rack height standard).

UART	Universal Asynchronous Receiver Transmitter: A device providing a serial interface for transmitting and receiving data.
UHF	Ultra High Frequency: A portion of the electromagnetic spectrum covering 300 MHz to 3000 MHz (3 GHz).
Upconvert	The process by which the frequency of a broadcast transport stream is shifted to a higher frequency range.
Uplink	The part of the communications satellite circuit that extends from the Earth to the satellite.
UPS	Uninterruptable Power Supply: A method of supplying backup power when the electrical power fails or drops to an unacceptable voltage level. Small UPS systems provide battery power for a few minutes; enough to power down the computer in an orderly manner. This is particularly important where write back cache is used. Write back cache is where modified data intended for the disk, is temporarily stored in RAM and can be lost in the event of a power failure. Sophisticated systems are tied to electrical generators that can provide power for days. UPS systems typically provide surge suppression and may provide voltage regulation.
UTC	Universal Time Co-ordinate: An internationally agreed basis for timekeeping introduced in 1972 and based on international atomic time (corresponds to Greenwich Mean Time or GMT).
VCT	Virtual Channel Table (ATSC).
VHF	Very High Frequency: A portion of the electromagnetic spectrum covering 30 MHz to 300 MHz.
VITC	Vertical Interval Time Code.
VITS	Vertical Interval Test Signal: *See:* ITS.
VPS	Video Programming System: A German precursor to PDC
WSS	Wide Screen Switching: Data used in wide-screen analogue services, which enables a receiver to select the appropriate picture display mode.
WST	World System Teletext: System B Teletext. Used in 625 line / 50 Hz television systems (ITU-R 653).
XILINX	A type of programmable Integrated Circuit.
Y (Luminance)	Defines the brightness of a particular point on a TV line. The only signal required for black and white pictures.

Annex B

Technical Specification

Contents

List of Tables

B.1 General Information

B.1.1 Model Availability

Due to continuing development and improvement, models become obsolete and are replaced. *Table B.1* lists the availability of models by Marketing Code. (See *Table 1.1* in *Chapter 1* for an explanation of the Marketing Code components.)

Table B.1: Model Availability

Product	Range		Marketing Code	Availability	Comments
Decoders		Alteia	M2/PDU/942	Current	
		Alteia *plus*	M2/PDU/942B	Superseded	Replaced by M2/PDU/942C (S/W version 2.5→)
			M2/PDU/942C	Superseded	Replaced by M2/P8R/942D (S/W version 2.8→)
			M2/PDU/942D	Current	
Satellite Receivers	8PSK Capable	Alteia	M2/P8R/942	Obsolete	
			M2/P8R/942A	Superseded	Replaced by M2/P8R/942C (S/W version 2.4→)
		Alteia *plus*	M2/P8R/942B	Superseded	Replaced by M2/P8R/942C (S/W version 2.4→)
			M2/P8R/942C	Superseded	Replaced by M2/P8R/942D (S/W version 2.8→)
			M2/P8R/942D	Current	
	QPSK Capable	Alteia	M2/PSR/932	Obsolete	
			M2/PSR/932C	Obsolete	
			M2/PSR/942	Obsolete	
			M2/PSR/942A	Superseded	Replaced by M2/PSR/942C (S/W version 2.4→)
		Alteia *plus*	M2/PSR/942B	Superseded	Replaced by M2/PSR/942C (S/W version 2.4→)
			M2/PSR/942C	Superseded	Replaced by M2/PSR/942D (S/W version 2.8→)
			M2/PSR/942D	Current	
Terrestrial Receivers	UHF/VHF	Alteia	M2/PTR/942	Obsolete	
			M2/PTR/948	Obsolete	Obsolete from July 1999.
			M2/PTR/948A	Current	Also accepts 70 MHz input
	Digital ENG	Alteia	M2/PTRE/942	Current	
			M2/PTRE/942B	Obsolete	Replaced by M2/PTRE/948C
		Alteia *plus*	M2/PTRE/948C	Current	
			M2/PTRE/948CVL	Current	For use with Voyager Lite

B.1.2 Video

Supported Video Resolutions

Table B.2: Supported Video Resolutions

625-line, 25 frame/s	525-line, 30 (29.97) frame/s	
720 pixels x 608 active lines	720 pixels x 512 active lines	4:2:2 mode only
720 pixels x 576 active lines	720 pixels x 480 active lines	4:2:0 and 4:2:2 modes
704 pixels x 576 active lines	704 pixels x 480 active lines	
544 pixels x 576 active lines	544 pixels x 480 active lines	
480 pixels x 576 active lines	480 pixels x 480 active lines	
352 pixels x 576 active lines	352 pixels x 480 active lines	
352 pixels x 288 active lines	352 pixels x 240 active lines	

Supported Video Bit-rates

Table B.3: Supported Video Bit-rates

4:2:2 Format		4:2:0 Format
Alteia ***plus*** Models	Non-B suffix Models	All Models
50 Mbit/s	40 Mbit/s	15 Mbit/s

Alteia supports 4:2:0 Chroma Format at 422P@ML providing a video rate higher than 15 Mbit/s.

B.1.3 International Television Standards

Supported Standards

Up to two composite video outputs are provided at the rear panel. These carry identical video. The standard is selectable to PAL-B, -G, -I, -N Combination, -N Normal, -M (PAL-M on D variants only) or NTSC-M (with or without pedestal).

> NOTE...
>
> Be aware that although PAL-M may be selectable on earlier versions of Alteia, its performance is fully supported and guaranteed on D variants only.

Table B.4: International Television Standards

As indicated in Menus:	M	M	N	-------- B/G -------		I
Standard	NTSC	---------- PAL ----------				
Region	USA/Japan	South America, Brazil	Argentina (combination) Jamaica/Uruguay (normal)	Europe / Asia		UK
Lines / frame	525	525	625	625	625	625
Fields / second	60	60	50	50	50	50
Interlace	2/1	2/1	2/1	2/1	2/1	2/1
Frames / second	30 (29.97)	30 (29.97)	—	25	25	25
Lines / second	15 750	15 750	15 625	15 625	15 625	15 625
Aspect ratio	4 / 3	4 / 3	4 / 3	4 / 3	4 / 3	4 / 3
Video band (MHz)	4.2	4.2	4.2	5.0	5.0	5.5
RF band (MHz)	6.0	6.0	6.0	7.0	8.0	8.0

Performance Figures[1]

Table B.5: Alteia Video Performance

Parameter	Performance			
Luminance bar amplitude	PAL:	700 ±14 mV	NTSC:	100 ±2 IRE
White		1000 ±14 mV		140 ±3 IRE
Sync amplitude		300 ±10 mV		40 ±1 IRE
Burst amplitude		300 ±10 mV		40 ±1 IRE
Pedestal		N/A		7.5 ±1 IRE
Luminance bar tilt	±2%			
2T K Response	1.5%K			
Differential gain	±2%			
Differential phase	±1.5°			
Luminance non-linearity	±4%			
Signal-to-noise luminance weighted [2]	≥60 dBw			
Chrominance - luminance gain	±5%			
Chrominance - luminance delay	±20 ns			
Chrominance to AM noise ratio	≥50 dBrms			
Chrominance to PM noise ratio	≥50 dBrms			
Luminance freq. response	0-4 MHz: ±0.2 dB; 4.8 MHz: ±1.5 dB			

Vertical Blanking Signals

The Alteia range of M2/Pxx/9x2 Receivers and Decoders support the following VBI reinsertion and signalling:

- Closed Captioning (525-line sub-titling system)
- Vertical Interval Test Signal (VITS) and Insertion Test Signal (ITS)

[1] Measured with 1 metre RG-22 co-axial cable, 75 Ω terminated.
[2] Signal-to-noise luminance weighted: measured on an active video line with unmodulated ramp video signal.

B.1.4 Audio Performance

Supported Audio Specifications

Table B.6: Supported Audio Specifications

Specification	Description	Availability
ISO/IEC 13818-3	Generic Coding of Moving Pictures and Associated Information: (MPEG-2) Audio	All models
ATSC A-52	Digital Audio Compression Standard (Dolby Digital AC-3)	All models
SMPTE 302M-1998	Linear Audio	S/W v2.1 – v2.5
SMPTE 302M-2000	Linear Audio	S/W v2.8 and later

Supported Audio Bit-rates

Table B.7: Supported Audio Data Bit-rates (MPEG-2)

Mono kbit/s	Stereo kbit/s	Mono kbit/s	Stereo kbit/s
32	64	96	192
48	96	112	224
56	112	128	256
64	128	160	320
80	160	192	384

Analogue Audio Performance

Table B.8: Analogue Audio Performance

Parameter	Performance
Voltage gain adjustment	± 3 dBm
Maximum undistorted output (terminated with 600 Ω)	21 dBm
Crosstalk	50 to 100 Hz: >80 dB 100 to 15 000 Hz: >60 dB
Frequency response	50 to 16 000 Hz: ±0.5 dB
Total harmonic distortion (THD), terminated in 600 Ω	<0.5%
Signal-to-noise ratio (referenced to 1 kHz tone at +9 dBm out)	≥ 70 dB
Audio Reference Level	-9 dBm

Digital Audio Outputs

Digital audio outputs as fitted to M2/Pxx/94x models only, comply with E1A-422[3] and have a maximum data rate of 3.072 Mbit/s.

[3] EIA-422-A-1978: Electrical characteristics of balanced voltage digital interface circuits.

B.2 Internal Decoder

B.2.1 Introduction

The Alteia range of Receivers and Decoders contains an internal decoder. This circuit incorporates a packet demultiplexer that selects audio, video and ancillary services from the stream received from the digital demodulator. These services are locked to the transmission rate using clock phase information from the incoming multiplex.

B.2.2 Alteia and A Variant

The maximum transport stream bit-rate that can be de-multiplexed is affected by the incoming video bit-rate. *Table B.9* shows the effect of the transport stream output as a result of the incoming video bit-rate.

Table B.9: Output Transport Bit-rate against Incoming Video Bit-rate

Software Version 2.1 and 2.2		Software Version 2.3 and later	
Incoming Video Bit-rate	Transport Stream Maximum Bit-rate	Incoming Video Bit-rate	Transport Stream Maximum Bit-rate
<30 Mbit/s	54 Mbit/s	<30 Mbit/s and PDU models	54 Mbit/s
>30 Mbit/s	50 Mbit/s	>30 Mbit/s	50 Mbit/s

The decoder operates with user data rates (excluding Reed-Solomon overhead) as shown in *Table B.10*.

Table B.10: Maximum User Bit-rates (Software version 2.3 and later)

	User Input Bit-rate (Mbit/s)				
	QPSK symbol rate		8PSK symbol rate		
Code Rate	1.0 MSym/s	44.5 MSym/s	3.0 MSym/s	30 MSym/s	28.125 MSym/s
½ Rate FEC	0.92	41.01	—	—	—
2/3 Rate FEC	1.23	54.68	—	—	—
¾ Rate FEC	1.38	61.51	—	—	—
5/6 Rate FEC	1.54	68.34	6.91	69.11	—
7/8 Rate FEC	1.61	71.76	—	—	—
8/9 Rate FEC	—	—	7.37	—	69.11

B.2.3 Alteia *plus*

The Transport Stream bit-rate in the Alteia *plus* versions is not dependent on the incoming video bit-rate.

B.3 Input Specifications

B.3.1 Decoders

Models

This section applies to models M2/PDU/942[B][C][D].

DVB SPI

Table B.11: DVB-SPI: M2/PDU/942

Input	Specification
Connector type	25-way D-type, Female
Data rate range	1.544 - 54 Mbit/s
Signal levels	LVDS
Clock and Data jitter	Within G.823/G.824 limits.
Error decoding	None

DVB ASI Optical

Table B.12: DVB ASI Optical: M2/PDU/942[B]

Input	Specification
Connector type	SC type
Data rate range	0.53872 - 54 Mbit/s
Error decoding	None

DVB ASI Copper

Table B.13: DVB-ASI Copper: M2/PDU/942[B][C][D]

Input	Specification
Connector type	BNC, Female
Input impedance	75 Ω
Data rate range	0.53872 - 54 Mbit/s
Error decoding	None

The DVB ASI Copper input is byte-mode only for M2/PDU/942B.
It is byte-mode and single packet burst mode for M2/PDU/942C.

B.3.2 Satellite Receivers QPSK/8PSK

This table applies to M2/P8R/942[A] models

Table B.14: P8R Satellite Receiver Input Specification: QPSK/8PSK

Parameter	Value
Safety status	SELV
Number of inputs	2
Isolation between inputs	25 dB typical[4]
Connector type	F-type, female 75 Ω
Input impedance	75 Ω
Return loss	> 7 dB, 950 < f < 2,150 MHz[5]
Signal type	EN 301 210 (8PSK)[6], EN 300 421 (QPSK)
Tuning range	950 to 2,150 MHz
Frequency capture range	Programmable up to: ± 5 MHz, QPSK ± 2.5 MHz, 8PSK
Tuning step	100 kHz
Receive spectrum sense	Normal and inverted, automatic selection
Input level per carrier (8PSK)	-80 to –37 dBm (1.0 ≤ Rs < 3.75 MSymbol/s) -72 to –31 dBm (3.75 ≤ Rs < 7.5 MSymbol/s) -65 to –25 dBm (7.5 ≤ Rs ≤ 44.5 MSymbol/s)
Input level per carrier (8PSK)	-65 to –25 dBm (3.0 ≤ Rs < 20.0 MSymbol/s) -55 to –25 dBm (20 ≤ Rs < 30.0 MSymbol/s)
3rd order intercept point	+5 dBm typical at wanted carrier input power levels –25 dBm (Wideband – for signals outside ± 200 MHz of wanted carrier)
FEC rates	QPSK: 1/2, 2/3, 3/4, 5/6, 7/8 8PSK: 5/6, 8/9
Symbol rate range	QPSK: 1.0 to 44.5 MSymbol/s 8PSK: FEC rate 5/6: 3.0 to 30.0 MSymbol/s FEC rate 8/9: 3.0 to 24.0 MSymbol/s (operates up to 28.125 MSymbol/s)
Symbol-rate step	100 Symbol/s
Symbol-rate lock range	± 100 ppm
Oscillator power at the L-band input	< -55 dBm, 40 < f < 2050 MHz (active input)
Image rejection ratio	27 dB min for a carrier power level of -25 dBm 30 dB min for a carrier power level of -65 dBm (f_c + 959 MHz (nominal))
Surge protection	4.5 kV typical

[4] This specification relates to, **a -** the isolation across inputs (loop-through isolation) and, **b** – isolation from the non-selected to the selected input measured at the demodulator input.
[5] Applies to the selected input. The non-selected input is reflective.
[6] EN 301 210: Digital Video Broadcasting (DVB); Framing Structure, channel coding and modulation for Digital Satellite News Gathering (DSNG) and other contribution applications by satellite.

B.3.3 Satellite Receivers QPSK/BPSK

This table applies to all M2/PSR/9xx models

Table B.15: PSR Satellite Receiver Input Specification: QPSK/BPSK

Parameter	Value
Safety status	SELV
Number of inputs [7]	2 or 4 (See *Chapter 2, Section 2.6*)
Isolation between inputs [8]	#1 - #2, #3 - #4: 25 dB typical[9] #1 - #3, #2 - #3, #1 - #4, #2 - #4: 80 dB min (where inputs fitted)
Connector type	F-type, female 75 Ω
Input impedance	75 Ω
Return loss	> 7 dB, 950 < f < 2,150 MHz (active input)[10]
Signal type[11]	QPSK per EN 300 421
Tuning range[12]	950 to 2,150 MHz
Frequency capture range	Programmable up to ± 5 MHz
Tuning step	100 kHz
Receive spectrum sense	Normal and inverted (automatic selection)
Input carrier power level	-25 to –72 dBm (1.0 ≤ Rs < 5.0 MSymbol/s) –25 to –65 dBm (5.0 ≤ Rs < 30.0 MSymbol/s) –25 to –65 + 0.34 (Rs – 30.0) dBm (30.0 ≤ Rs < 44.5 MSymbol/s)
Total L-band input power	< -10 dBm
3rd order intercept point	+5 dBm typical at wanted carrier input power levels –25 dBm (Wideband – for signals outside ± 200 MHz of wanted carrier)
Convolutional FEC rates	1/2, 2/3, 3/4, 5/6, 7/8
Symbol rate range	1.0 to 44.5 MSymbol/s
Symbol rate step	100 Symbol/s
Symbol rate lock range	± 120 ppm min
Oscillator power at the L-band input	< -55 dBm, 40 < f < 2,150 MHz (active input)
Image rejection ratio	27 dB min for a carrier power level of -25 dBm 30 dB min for a carrier power level of -65 dBm (f_c + 959 MHz (nominal))
Surge protection	4.5 kV typical

[7] Only the active input is powered.
[8] Where high isolation between L-band inputs to the receiver is required, inputs 1-3, 2-3, 1-4 and 2-4 should be used.
[9] This specification relates to, **a -** the isolation across inputs (loop-through isolation) and, **b** – isolation from the non-selected to the selected input measured at the demodulator input.
[10] Applies to the selected input. Non-selected inputs may be reflective.
[11] EN 300 421: Framing structure, channel coding and modulation for 11/12 GHz satellite services.
[12] The displayed frequency is either L-band or SHF dependent on the LNB frequency and the SHF carrier frequency set in the satellite receiver input menu.

Table B.16: L-band Satellite Input — Eb/N_0 Ratio: QPSK, all M2/PSR models

Convolutional FEC Rate	Receive Eb/N_0 Ratio (dB min) in IF Loop for Correct MPEG-2 System Operation
1/2	4.5
2/3	5.0
3/4	5.5
5/6	6.0
7/8	6.4

Eb/N_0 ratio is referred to user bit-rate Ru188. See EN 300 421 specification. For more detailed specification information and advice on performance in specific applications, please contact TANDBERG Television Customer Services.

Table B.17: L-band Satellite Input — Eb/N_0 Ratio: 8PSK/QPSK, all M2/PSR models

Modulation/FEC Rate	Receive Eb/N_0 Ratio (dB min) in IF Loop for Correct MPEG-2 System Operation
QPSK 1/2	4.5
QPSK 2/3	5.0
QPSK 3/4	5.5
QPSK 5/6	6.0
QPSK 7/8	6.4
8PSK 5/6	8.9
8PSK 8/9	9.4

Eb/N_0 ratio is referred to user bit-rate Ru188. See EN 300 421 and EN 301 210 specification. For more detailed specification information and advice on performance in specific applications, please contact TANDBERG Television Customer Services.

B.3.4 LNB Power and Control

This section applies to M2/P8R/942[A] and all M2/PSR/9xx models.

The Alteia range of QPSK Satellite Receivers provides LNB power and control signals through the active RF input connector. The 22 kHz tone is turned ON and remains on when high-band is selected. LNB power and controls are enabled through the Satellite Input Menu (#4) Pages, see *Annex C, Menus*.

Table B.18: LNB Power and Control

Parameter	Specification		
	Voltage (V nominal)	Boost Voltage (V typical)	Receiver Polarisation[13]
M2/PSR/9XX [A][B][C]	13	0.5	linear vertical/circular right
	17	1.0	linear horizontal/circular left
M2/P8R/942[A]	13	0.8	linear vertical/circular right
	17	0.8	linear horizontal/circular left
Current	≤ 350 mA		
Software control TONE ON/OFF		This is automatic and is triggered by the frequency range required.	
Tone frequency	22 ± 2 kHz		
Tone amplitude	ON: 0.6 ± 0.2 Vp-p OFF: ≤ 0.05 Vp-p		

B.3.5 Terrestrial Receivers

Models

This section applies to the M2/PTR/94x[A] models.

UHF Input Specification

Table B.19: Terrestrial Receiver UHF Input Specifications: M2/PTR/942 and M2/PTR/948[A]

Item	Specification	
Modulation types	QPSK, 16QAM, 64QAM	
Guard intervals	1/32 ≡ 7µs, 1/16 ≡ 14µs, 1/8 ≡ 28µs, 1/4 ≡ 56µs	
Inner code rates	1/2, 2/3, 3/4, 5/6, 7/8	
FFT size	2k	8k (M2/PTR/948[A] only)
Number of transmitted carriers	1705	6817
Active data carriers in each OFDM symbol	1512	6048
Signal format	EN 300 744	
Input frequency	Channel 21 to Channel 68 (470 MHz - 862 MHz)	
Bit-rate	4.98 - 31.67 Mbit/s	
Input carrier power (P_{in})	Depends on mode and channel. E.g. channel 21, 64QAM, rate 2/3: minimum: -79 dBm (typical) maximum: -25 dBm	
Noise figure	7.5 dB (typical)	
Oscillator power at input connector	<-62 dBm, 510 <f <895 MHz	
Image rejection ratio	>50 dB for front end gain reduction < = 10 dB	

[13] Receive Polarisation: As specified in EN 300 784: Satellite Earth Station and Systems (SES); Television Receive-only (TVRO) earth stations operating in the 11/12 GHz frequency bands.

Net Input Data Rates

The Terrestrial Receiver operates with useful bit-rates (Mbit/s) for all combinations of guard interval, constellation and code rate for non-hierarchical systems, as shown in *Table B.20.*

Table B.20: Terrestrial Receiver Useful Data Rates: M2/PTR/94x[A]

Modulation	Code Rate	Guard Interval			
		1/4	**1/8**	**1/16**	**1/32**
QPSK	1/2	4,98	5,53	5,85	6,03
	2/3	6,64	7,37	7,81	8,04
	3/4	7,46	8,29	8,78	9,05
	5/6	8,29	9,22	9,76	10,05
	7/8	8,71	9,68	10,25	10,56
16QAM	1/2	9,95	11,06	11,71	12,06
	2/3	13,27	14,75	15,61	16,09
	3/4	14,93	16,59	17,56	18,10
	5/6	16,59	18,43	19,52	20,11
	7/8	17,42	19,35	20,49	21,11
64QAM	1/2	14,93	16,59	17,56	18,10
	2/3	19,91	22,12	23,42	24,13
	3/4	22,39	24,88	26,35	27,14
	5/6	24,88	27,65	29,27	30,16
	7/8	26,13	29,03	30,74	31,67

Baseband Connector

Table B.21: Terrestrial Receiver Baseband Connector: M2/PTR/94x[A]

Input	Specification
Connector type	BNC, 50 Ω, Female
Centre frequency	4.5714286 MHz
Signal bandwidth	7.612 MHz
Direction of spectrum	Normal

B.3.6 Digital ENG Receivers

Models

This section applies to the M2/PTRE/94x[C][CVL] models.

IF Input Specification

Table B.22: Digital ENG Receiver IF Input Specifications: M2/PTRE/94x[C][CVL]

Item	Specification
Modulation types	QPSK, 16QAM, 64QAM
Guard intervals	$^1/_{32} \equiv 7\mu s$, $^1/_{16} \equiv 14\mu s$, $^1/_8 \equiv 28\mu s$, $^1/_4 \equiv 56\mu s$
Inner code rates	$^1/_2$, $^2/_3$, $^3/_4$, $^5/_6$, $^7/_8$
FFT size	2k
Number of transmitted carriers	1705
Active data carriers in each OFDM symbol	1512
Signal format	EN 300 744
Input frequency	70 MHz
Input impedance	75 Ω
Return loss	< 15 dB
Bit-rate	4.98 - 31.67 Mbit/s
Input carrier power (P_{in}):	Depends on mode and channel. E.g. 64QAM, rate $^2/_3$: minimum: -20 dBm (typical), maximum: 20 dBm
Noise figure	2.4 dB (typical)
Oscillator power at input connector	<-65 dBm, 1 to 200 MHz
Adjacent Channel Interference	> 10 dB relative to wanted for sine wave at frequencies at least 4 MHz away from 70 MHz.

Net Input Data Rates

The Digital ENG Receiver operates with useful bit-rates (Mbit/s) for all combinations of guard interval, constellation and code rate for non-hierarchical systems, as shown in *Table B.20.*

B.3.7 Frame Sync Connector (Alteia *plus* Only)

Frame Sync is a purchasable option (M2/PRO/SYNC).

Table B.23: Frame Sync Connector (Alteia plus Only)

Item		Specification
Connector type		BNC, Female
Connector designation		FRAME SYNC
Connection	Pin	Analogue Black and Burst Input
	Body	Ground/Chassis
Impedance		High

NOTES...

1. Software versions 2.1 and 2.2: This connector is not used.
2. Alteia models – Connector used to provide an additional analogue video output.
   Alteia *plus* models: Software version 2.3 and later – Connector used for Frame Sync input.

B.4 Output Specifications

B.4.1 Transport Stream Output

A high-speed synchronous parallel data output is provided for the partially decrypted MPEG-2 data stream.

Table B.24: DVB-SPI Parallel Transport Stream Output Connector

Input	Specification	
Safety status	SELV	
Connector designation	MPEG-2 SPI-TSO	
Interface signals	CLOCK:	Byte data transfer clock to accompany data.
	DATA(7:0):	Data bus.
	PACKET SYNC:	Packet start signal, high for one cycle of CLOCK on the first byte of the packet.
	DATA_VALID	High during valid Transport Stream content. Compliant with DVB-SPI specification.
	GND:	Ground.
Data rate	Up to 10 MByte/s.	
Data levels	LVDS signal levels.	
Timing	Compliant with DVB-PI specification of SPI timing.	

NOTES...

Alteia *plus* Models Only

1. Decoder Models (M2/PDU/942B): If the transport stream bit-rate from the SPI output is less than 54 Mbit/s, the unit provides a DVB compliant output. Any ASI output is unaffected.
   If the transport stream bit-rate is between 54 Mbit/s and 100 Mbit/s, the output is not DVB compliant. Any ASI output is unaffected.
2. All models except M2/PDU/942C Decoder: The ASI output is byte-mode only.
3. M2/PDU/942C Decoder: If the ASI output option card is used (see *Chapter 5, Options*) the output mode depends on the input mode. If the input mode is SPI, the ASI output is byte-mode. If the input is ASI, the ASI output is single packet burst mode.
4. Satellite Receiver Models: The transport stream output is as shown in *Table B.9*.
5. All models: if the transport stream bit-rate is greater than 80 Mbit/s the Director CA system is disabled.

B.4.2 Video Outputs

Analogue Composite Video

Table B.25: Analogue Video Output Connector

Item	Specification
Safety status	SELV
Connector type	2 x BNC, female, 75Ω. (1 if a B suffix model)
Video standards	PAL-B, -G, -I, -M (PAL-M is fully supported on D variants only; It can be selected on B and C variants but performance is not guaranteed), -N Combination, -N Normal or NTSC-M, with or without pedestal (set in Video Menu, #6)
Composite video level	1 Vpk-pk in 75Ω nominal
Composite video level adjustment	0.7 to 1.3 Vpk-pk

Digital Video

Table B.26 applies to all M2/Pxx/94x Models.

Table B.26: Digital Video Output Connector

Item	Specification
Safety status	SELV
Connector type	BNC, female, 75 Ω.
Video standards	ITU-R BT.656 digital output at 270 MHz
Video level	800 mV ± 10mV pk-pk in 75 Ω nominal
Jitter Performance, Nominal (Tested according to SMPTE RP184 100% Colour Bars)	PXX / 942 0.7 UI PXX / 942/A 0.3 UI PXX / 942/B 0.2 – 0.26 UI locked to PCR 0.7 UI Frame Synchronised PXX / 942/C 0.2 – 0.26 UI

Video Test (Monitor) Connector

Table B.27: Video Test (Monitor) Connector

Item	Specification (See notes on *Page B-15*)
Safety status	SELV
Connector type	BNC, female, 75 Ω
Composite video level	1V pk-pk into 75 Ω nominal

> NOTE...
> Video performance characteristics are different to those measured at the rear panel connectors.

B.4.3 Audio Outputs

Analogue Audio

Four XLR audio connectors are provided for two stereo or dual-channel audio outputs.

Table B.28: Analogue Audio Output Connector

Item	Specification
Safety status	SELV
Output level	0 dBm nominal
Nominal output impedance	50 Ω
Load impedance	≥600 Ω balanced
Clipping level dBm	0 to +18 (set via on-screen menus)
Output level	±3 dBm from the clipping level
Compression layers	MPEG-2 layers 1 and 2, Dolby Digital (AC-3)
Sampling rates	32, 44·1, 48 kHz
Data rates	All MPEG-2 rates

Digital Audio

Table B.29 applies to M2/Pxx/94x Models.

Two audio connectors are provided for two digital stereo or dual-channel audio outputs conveying Dolby Digital 5.1, Dolby Digital AC-3 or Linear PCM.

Table B.29: Digital Audio Output Connector

Item	Specification
Safety status	SELV
Output format	AES/EBU in IEC958 Analogue, Compressed, Professional or Consumer (selectable). See *Table C-19 on Page C-25* for further information.
Output level	5 Volts nominal, coded signal level –12 dB FS nominal.
Nominal output impedance	50 Ω
Load impedance	110 Ω

Audio Monitor

Table B.30: Audio Monitor Connector

Item	Specification
Safety status	SELV
Output level	0 dBm nominal

> NOTE...
> Audio Monitor performance characteristics are different to those measured at the rear panel connectors.

Supported Audio Modes

Table B.31 shows the supported audio output modes.

Table B.31: Supported Audio Output Modes

Audio Mode	Description
Single channel	A single channel is output to both XLR connectors.
Dual channel mono	Two mono signals are carried in the transport stream as a single PES - both are decoded and output on the appropriate connector. One mono source can be output to both connectors.
Joint stereo (Intensity stereo)	Stereo pair is coded taking advantage of the stereo nature of the channels.
Stereo	Stereo pair is coded as two mono signals - the signals are output to the two XLR connectors.

B.4.4 Data Outputs

RS-232 Asynchronous (Low-speed) Data

Table B.32: RS-232 Asynchronous (Low-speed) Data Connector

Item	Specification
Safety status	SELV
Data-rates (bit/s)	1200; 2400; 4800; 9600; 19 200
Standards	EIA RS-232C / ITU-T BT. V.24/V.28
Line length	< 15 metres

RS-422 Synchronous (High-speed) Data

Table B.33: RS-422 Synchronous (High-speed) Data Connector

Item	Specification
Safety status	SELV
Data-rates (bit/s)	In integer multiples of 56 kbit/s and 64 kbit/s up to 2.048 Mbit/s (Subject to the number and type of services in the multiplex)

NOTE...

High-speed RS-422 Synchronous data is available on suffix A Alteias (e.g. M2/PSR/942A) and Alteia *plus*.

B.4.5 Auxiliary Relay Interface

Automatic Gain Control (AGC) Output

Table B.34: Automatic Gain Control (AGC) Output

Item	Specification
Safety status	SELV
Connector type	Female
Output impedance	10 kΩ ±1%
Output voltage range	0 - 10 Volts into 10 kΩ ±1% termination when RF varies as in *Table B.7*

NOTE...

The AGC output is available on Receivers only.

Discrete Control and Summary Alarm Relays

Table B.35: Discrete Control and Summary Alarm Relays

Item	Specification
Safety status	SELV
Connector type	Female
Current rating	1 amp at 24 Vdc

B.4.6 Remote Control Connector (R CTRL RS-232/485)

Table B.36: Remote Control Connector

Item	Specification
Safety status	SELV
Connector type	9-way D-type, male
Connector designation	R CTRL RS-232/485
Standard	EIA RS-232C / RS-485

B.5 Environmental

B.5.1 Conditions

Table B.37: Environmental Conditions

Operational	
Temperature	0°C to +40°C (+32°F to +104°F) ambient with free airflow
Humidity	0% to 95% (non-condensing)
Cooling requirements	Convection cooling/free airflow
Handling/movement	Fixed (non-mobile) use only
Storage/Transportation	
Temperature	0°C to +70°C (+32°F to +158°F)
Humidity	0% to 95% (non-condensing)

B.5.2 Physical

Table B.38: Physical Parameters

Parameter	Performance
Height	44 mm
Width	432 mm (without rack fixing brackets) 486.8 mm (with rack fixing brackets)
Depth	433.5 mm (over connectors)
Rack mounting standard	1U x 19 inches (1U ≡ 44.45 mm)
Weight	4 kg (8.8 lbs) approximate

B.6 Power Supply

This equipment is fitted with an auto-ranging power supply. It is suitable for supply voltages of 100-120 Vac -10% +6% or 220-240 Vac -10% +6% at 50/60 Hz nominal.

Table B.39: Power Supply Specifications

Item	Specification
Power distribution system	Type TN ONLY (EN 60950 para 1.2.12.1): Power distribution system having one point directly earthed, the exposed conductive parts of the installation being connected to that point by protective earth conductors. This equipment must NOT be used with single-phase three-wire and PE, TT or IT Type Power distribution systems.
Connection to supply	Pluggable Equipment Type A (EN 60950 para 1.2.5): Equipment that is intended for connection to the building power supply wiring via a non-industrial plug and socket-outlet or a non-industrial appliance coupler or both. Correct mains polarity must always be observed. Do not use reversible plugs with this equipment.
Class of equipment	Class I Equipment (EN 60950 para 1.2.4): electric shock protection by basic insulation and protective earth.
Rated voltage	100 – 120 / 220 – 240 Vac
Rated frequency	50 - 60 Hz
Voltage selection	Auto-ranging
Rated current (max)	1.0 A
Input connector	CEE 22/IEC 320 3-pin male receptacle
Fuse rated voltage	250 Vac
Fuse type	T1.6A, H250 V, 5x20mm, IEC 127-1 and UL recognised.
Consumption	75 W nominal
Power cable connector fuse	5 A

B.7 Compliance[14]

B.7.1 Safety

This equipment has been designed and tested to meet the requirements of the following:

EN 60950 European	Safety of information technology equipment including business equipment.
IEC 950 International	Safety of information technology equipment including business equipment.

In addition, the product has been designed to meet the following:

UL 1950 USA	Safety of information technology equipment including business equipment.

B.7.2 EMC[15]

This equipment has been designed and tested to meet the following:

EN 50082-1[16] European	Generic Immunity Standard Part 1: Residential, commercial and light industry environment.
EN55013 EN55013/A12 European[17]	Test: Limits of disturbance voltage at the antenna terminals. Table 2 applied only. Limits and methods of measurement of radio disturbance characteristics of broadcast receivers and associated equipment.
EN 55022 European AS/NZS 3548 Australia/NZ	Emission Standard Limits and methods of measurement of radio frequency interference characteristics of information technology equipment - Class A.
EN 61000-3-2 European	Electromagnetic Compatibility (EMC), Part 3 Limits; Section 2. Limits for harmonic current emissions (equipment input current >16 A per phase).
EN 61000-3-3 European	Electromagnetic Compatibility (EMC), Part 3. Limits; Section 3. Limitation of voltage fluctuations and flicker in low voltage supply systems for equipment with rated current ≤ 16 A.
FCC USA	Conducted and radiated emission limits for a Class A digital device, pursuant to the Code of Federal Regulations (CFR) Title 47-Telecommunications, Part 15: Radio frequency devices, subpart B - Unintentional Radiators.

[14] The version of the standards shown is that applicable at the time of manufacture.
[15] The EMC tests were performed with the Technical earth attached, and configured using recommended cables.
[16] Both 1992 and 1997 versions.
[17] Applies to PTR model only.

B.7.3 CE Marking

The CE mark is affixed to indicate compliance with the following directives:

89/336/EEC of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility.

73/23/EEC of 19 February 1973 on the harmonisation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits.

> NOTE...
> The CE mark was first affixed to this product in 1998.

B.7.4 C-Tick Mark

The C-Tick mark is affixed to denote compliance with the Australian Radiocommunications (Compliance and Labelling – Incidental Emissions) Notice made under s.182 of Radiocommunications Act 1992.

> NOTE...
> The C-Tick mark was first affixed to this product in 1999.

Annex C

Menus

Contents

List of Figures

List of Tables

C.1 LCD Menu Groups

C.1.1 Using the Menus

Detailed descriptions of the use of menus are given in *Chapter 3, Operating the Equipment Locally* or *Chapter 6, Preventive Maintenance and Fault-finding*.

C.1.2 Menu Descriptions

This annex describes the front panel LCD Menus.

When the unit is first powered up, it progresses through a series of start-up pages on the LCD display.

> NOTES...
>
> 1. If the EDIT button is kept pressed as the unit powers up, it will enter a mode that allows the front panel LEDs and LCD display to be tested. This is explained in *Chapter 6, Preventive Maintenance and Fault-finding*.
> 2. Director system (over-air) only: If the RIGHT button is kept pressed as the unit powers up, the unit will run the inactive code. Note that, from this point, this becomes the active code.

There are 14 Menu groups and associated sub-menu pages. Menus are selected using the MENU control and sub-menu pages by the SELECT control.

If the front panel controls or pushbuttons are not used for about three minutes, the display reverts to *Menu #1, Page 1 (Status: Service*) and any edits that have not been saved are lost.

C.2 LCD Front Panel Display Menu Tree

Figure C.2 and *Figure C.3* illustrate the menu tree accessed from the front panel for the Alteia range of products. The following conventions are used to aid understanding:

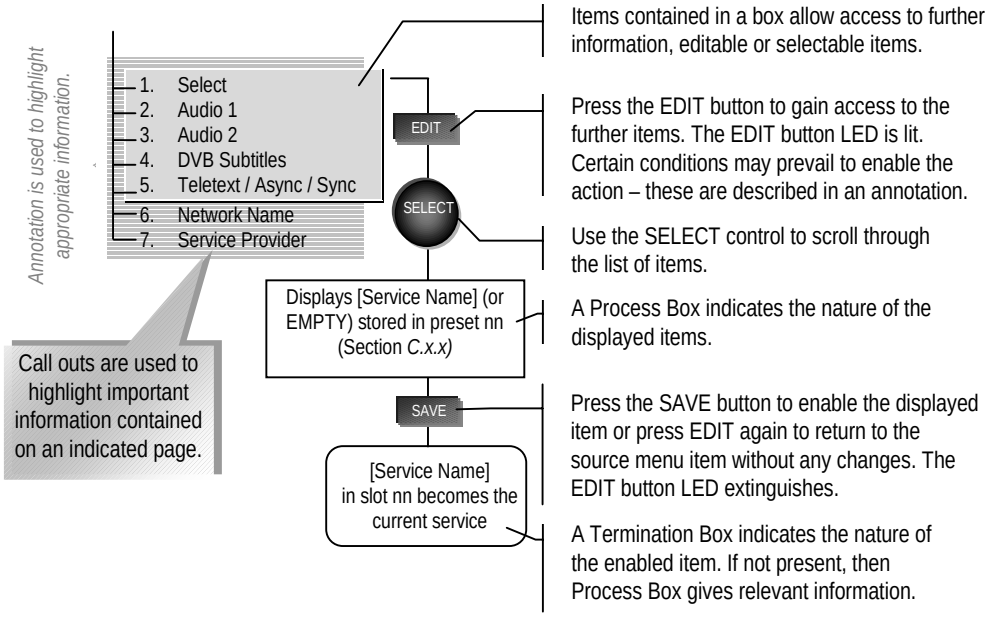

Figure C.1: Conventions Used in the Menu Tree Diagrams

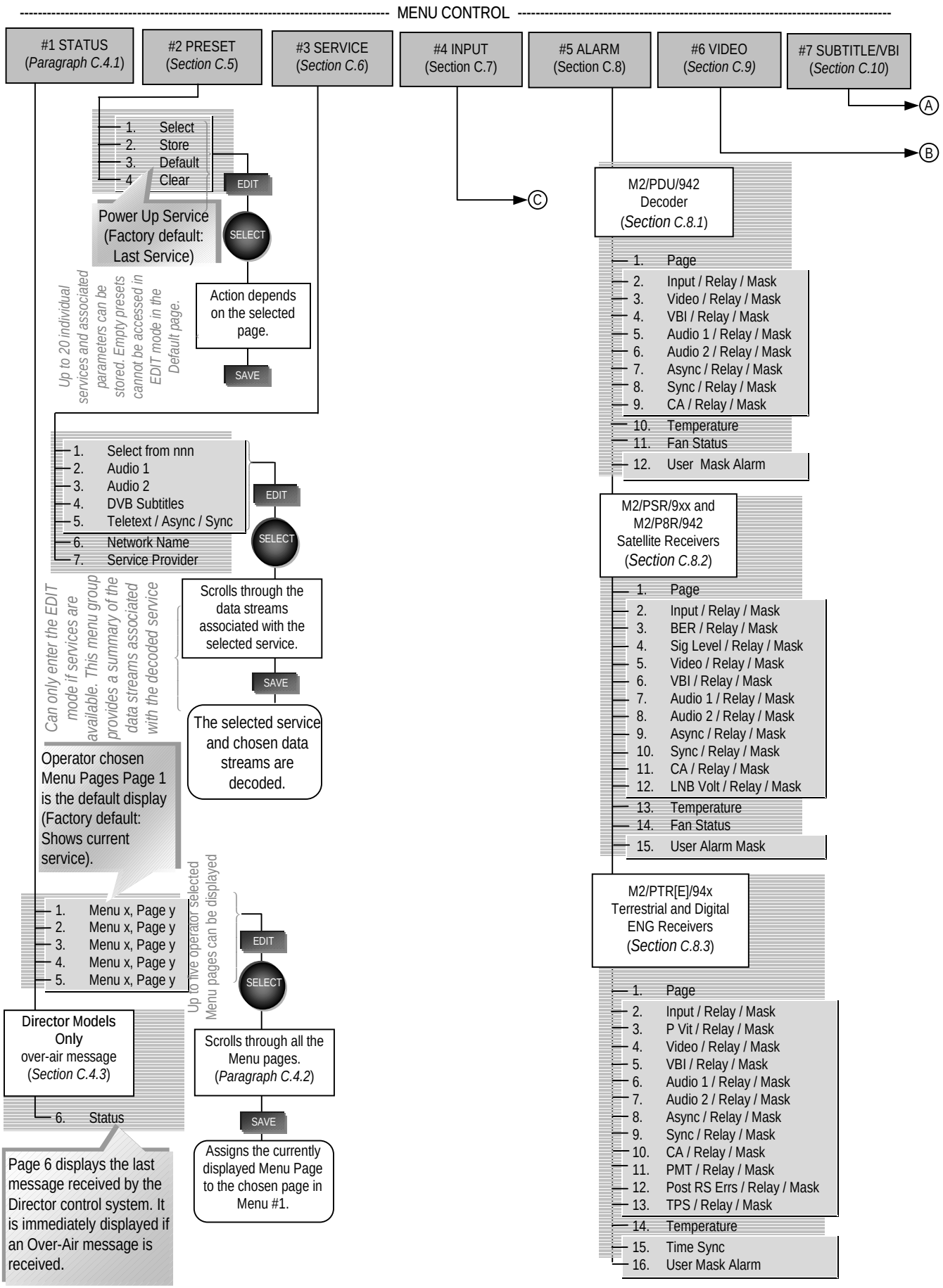

Figure C.2: Pages under Menus #1 to #7 (excluding #4)

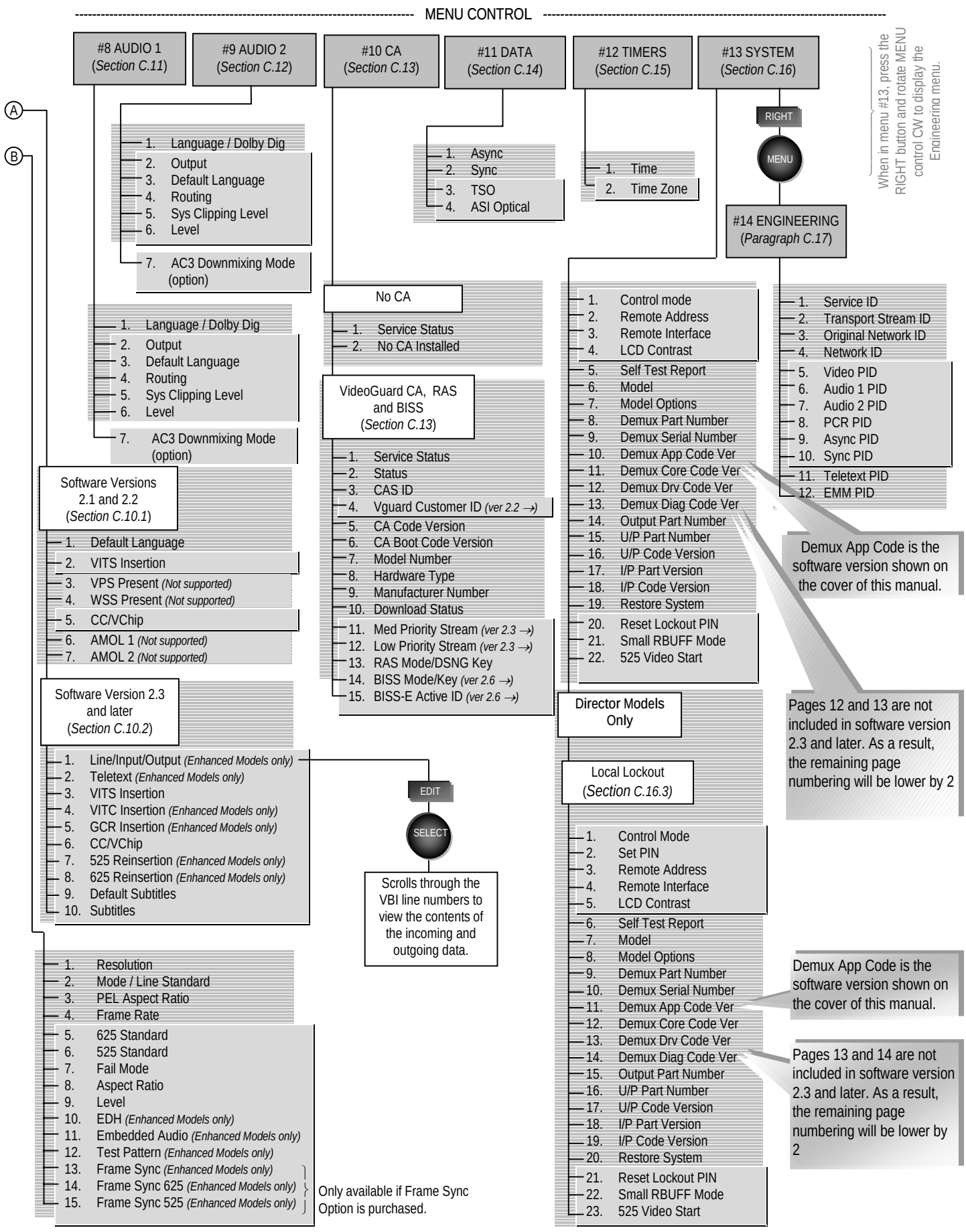

Figure C.3: Pages under Menus #8 to #14

MENU CONTROL

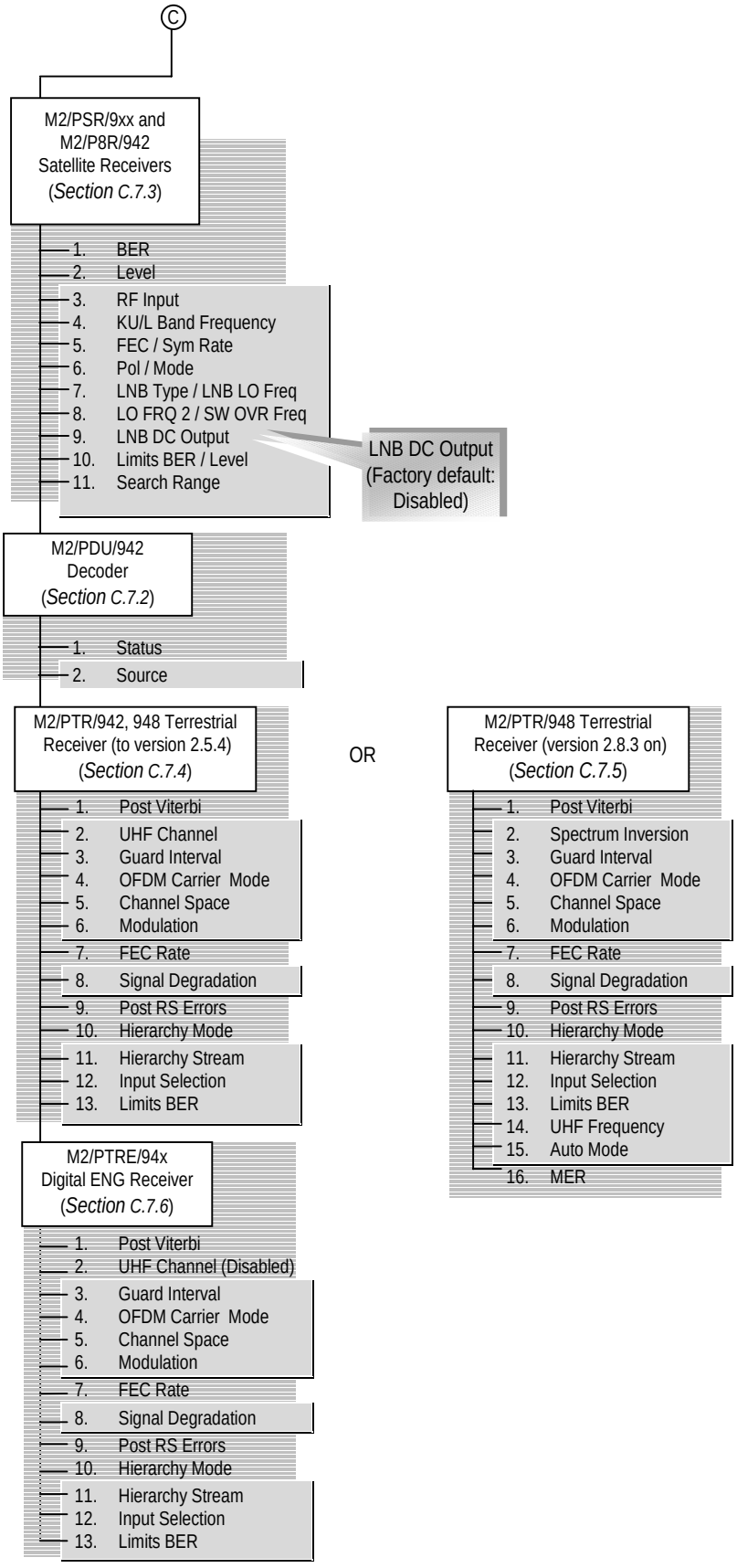

Figure C.4: Pages under Menu #4

C.3 Menu/Page Lines

C.3.1 Fields and Lines

Figure C.5 has a number of fields on three lines that are used to display which parameters are set. The Sections in this Annex describes the set of menus and their associated pages.

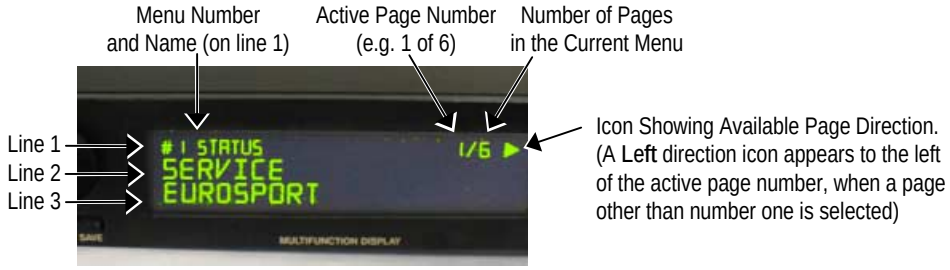

Figure C.5: Page Lines and Fields

C.3.2 Line 1

This is a non-editable line that, on the left-hand side, displays the menu group number and name. The right-hand side displays the number of the displayed sub-menu and the total number of submenus in the group in the form xx/nn.

The left (◂) and right (▸) icons indicate the presence of pages beyond the current display.

Line 1 may contain a status message such as LOCK, FAIL or OK.

C.3.3 Line 2

Line 2 contains non-editable item headings or text.

C.3.4 Line 3

Line 3 contains editable items or the non-editable balance of any message string that has wrapped over from line 2 in the case of a Director message.

C.3.5 Terminology

The tables in the remainder of this Annex are annotated (at the Menu Page number) with the following terms:

- **Selectable**. This indicates that there are items on that page, having items that can be chosen from a presented list.
- **Editable**. This indicates that there are items on that page, which have values that are entered directly by the operator.

C.4 Status Menu (#1)

C.4.1 Status Menu Pages

This is the primary menu group for the Alteia. Any five of the Alteia's menu pages can be displayed in any order as required. Alteia reverts to Menu #1 page 1 when the front panel controls have not been used for approximately three minutes.

The factory defaults are that page 1 displays the current service and the other pages are blank.

Table C.1: Status Menu (#1) Pages

Page	Display	Description
1 selectable	#1 STATUS 1/5 ▸ SERVICE MOVIES ONE	Factory default: this page displays the current service. However, it can be reconfigured to display any menu page.
n selectable	#1 STATUS ◂ n/5 ▸ [BLANK]	Factory default: pages 2 to 5 are blank. They can be configured to display any menu page.
5 selectable	#1 STATUS ◂ 5/5 [BLANK]	

Each of the five pages can be can be configured to display any Menu page.

C.4.2 Status Menu Configuration

Pressing the EDIT button and using the SELECT control allows access to all the displayable Menu items.

Table C.2: Menu (#1) Configuration Pages

Page	Display	Description
selectable	#1 STATUS – TIMERS 1/6 ▸ TIME ZONE 081 GMT+0000	This is an example of a page displayed (when in page 1 of Menu #1) after pressing the EDIT button and rotating the SELECT control to scroll through the complete set of menu pages. The viewed menu is shown between STATUS and 1/6 (e.g. TIMERS). The number in the lower left hand corner is the page reference while in this mode

C.4.3 Director Status Message Page

If the unit is under Over-air control, a further page is added to the Status Menu (shown overleaf in *Table C.3*). This page gives a maximum of 6 pages to Menu #1 and displays the last received Director message.

In over-air mode, the page is automatically displayed when a new information message is received. It remains until either the message is cancelled, or a new menu or page is displayed locally.

When cancelled, the Menu display reverts to Page 1.

Table C.3: Director Status Menu (#1) Pages

Page	Display	Description	Restrictions
6	#1 STATUS MESSAGE ◂ 6/6 THIS IS A 40 CHARACTER DIRECTOR MESSAGE	The last page contains the last received non-editable message from the current service provider. If the unit is in Remote control, there is an indication that a new message is available.	Over-air control (Director) models only

C.5 Preset (Services) Menu (#2)

This group allows up to 20 (00 to 19) services to be stored as presets. Selecting a Service via the Preset menu automatically reconfigures the Alteia. It also allows the power-up default (Menu #2, page 3) to be set.

Where a choice exists, each preset can have a selected language, network name and service provider associated with it.

> NOTES...
> 1. A preset can only be stored if the service is currently being decoded.
> 2. Preset "– " is below entry "00" in the list.

Table C.4: Preset Menu (#2) Pages

Page	Display	Description
1 selectable	#2 PRESET 1/4 ▸ SELECT 18 [service name]	Provides a list of stored presets. Press EDIT and use SELECT to scroll through the list, and SAVE to select a service. • If a service is stored, the preset number and the Service Name are displayed. • If the current Service is not a preset, the preset number is set to - - and the current Service Name is displayed. • If a preset does not contain a stored service, the service name displays EMPTY. • If no service is being decoded, the preset number is not shown and the service name displays NO SERVICE RUNNING. • If there is no input lock, the preset number is not shown and the service name displays INPUT NOT LOCKED. • If the input is locked but there is no SI, the preset number is not shown and the service name displays NO SERVICE INFO. • If the incoming transport stream is MPEG-2-only, the service number is shown in the format SERVICE ID nnnn
2 selectable	#2 PRESET ◂ 2/4 ▸ STORE [service name] IN 17 [EMPTY]	This page allows the currently active Service [service name] and associated parameters to be stored as a preset (the service name is truncated to 15 characters). Press EDIT and use LEFT/RIGHT/SELECT to select the preset number, and SAVE to store the service. • If no service is stored, the service name displays EMPTY. • If no service is being decoded, the service name displays NOTHING TO STORE.
3 selectable	#2 PRESET ◂ 3/4 ▸ DEFAULT 21 [service name]	Specifies the default power-up service. Empty presets are not selectable in EDIT mode. • If no service is stored, the service name displays EMPTY. • If LAST VALID SVC (factory default) is selected, the unit powers up to the Service being decoded at power-down.
4 selectable	#2 PRESET ◂ 4/4 CLEAR 17 [service name]	Used to clear filled presets. Scroll through the list, stopping at the Service to be terminated as a preset. Press SAVE while the cursor is still within the Service name or associated number. Press SAVE button to CONFIRM. Rotate the MENU or SELECT control to abort the process. • If no presets, the service name displays SLOTS ALL CLEARED.

C.6 Service Menu (#3)

This menu group allows access to the currently available services. This group provides a summary of the data streams associated with the decoded service. In the case of multiple streams of the same component type, each stream can be selected independently.

After making a selection (in EDIT mode using page 1), and selecting the required component data streams (using the other pages), pressing SAVE makes it the current service. The audio, DVB Subtitles, Teletext[1] and data[2] modules will decode according to the default parameters set in other pages.

> CAUTION...
>
> The Edit mode can only be entered if there are services available.

Table C.5: Service Menu (#3) Pages

Page	Display	Description
1 selectable	#3 SERVICE 1/7 ▸ SELECT FROM nnn [service name]	This is the main page and is used to list the currently available Services. • If no service is selected, the service name displays NO SERVICE RUNNING. • If there is no input lock, the service name displays INPUT NOT LOCKED. • If no services are available, the service name displays NO SERVICE INFO. • If the incoming transport stream is MPEG-2-only, the service number is shown in the format SERVICE ID nnnn
2 selectable	#3 SERVICE ◂ 2/7 ▸ AUDIO 1 DOLBY DIG ENGLISH 1FF0	When entering this page, the languages displayed are those currently being decoded by channel 1. *Annex E* lists the available languages. This page sets the Audio channel 1 language and output format. In the example, the left and right channels are in English and coded to Dolby Digital AC-3. The Audio stream PID is displayed. • If no audio streams are available, the language displays NOT RUNNING. • If the stream is Dolby digital and is enabled, the language displays DOLBY DIG. • If the stream is Dolby digital and is not enabled, the language does not form part of the list. • If the Alteia model has a B suffix (e.g. M2/PSR/942B) and the audio is encoded as Linear audio, the language displays LINEAR. • If the input is not locked, the language displays INPUT NOT LOCKED. • If the input is locked but no service is selected, the language displays NO SERVICE RUNNING.
3 selectable	#3 SERVICE ◂ 3/7 ▸ AUDIO 2 GERMAN FINNISH	When entering this page, the languages displayed are those currently being decoded by channel 2. *Annex E* lists the available languages. This page sets the Audio channel 2 language and output format. In the example, the left channel is in German and the right is in Finnish. • If no audio streams are available, the language displays NOT RUNNING. • If the stream is Dolby digital and is enabled, the language displays DOLBY DIG. • If the stream is Dolby digital and is not enabled, the language does not form part of the list. • If the Alteia model has a B suffix (e.g. M2/PSR/942B) and the audio is encoded as Linear audio, the language displays LINEAR. • If the input is not locked, the language displays INPUT NOT LOCKED. • If the input is locked but no service is selected, the language displays NO SERVICE RUNNING.

[1] Teletext is only available on models with suffix B, e.g. M2/PSR/942B.
[2] Synchronous, high-speed, data is only available on models with suffixes A or B, e.g. M2/PSR/942A.

Page	Display	Description
4 selectable (Software version 2.3 and later)	#3 SERVICE ◂ 4/7 ▸ DVB SUBTITLES ENGLISH NORMAL	DVB Subtitling can be enabled and the language specified using this page. On entering the page, the language is that which is currently being displayed on the video. *Annex E* lists all the available languages. The subtitle language and type are treated as a single parameter. • If available, displays the language for the currently received subtitle stream. It can take any value listed in *Annex E*. • The subtitles can be turned ON or OFF as required. • If no subtitle streams are available, the subtitle language displays NONE AVAILABLE. • The subtitle type can be any of the following: NORMAL – normal subtitles suitable for any aspect ratio. NORMAL 4/3 – normal subtitles for 4/3 aspect ratio displays. NORMAL 16/9 – normal subtitles for 16/9 aspect ratio displays. NORMAL 2.21/1 – normal subtitles for 2.21 aspect ratio displays. H OF H – hard of hearing subtitles suitable for any aspect ratio displays. H OF H 4/3 – hard of hearing subtitles for 4/3 aspect ratio displays. H OF H 16/9 – hard of hearing subtitles for 16/9 aspect ratio displays H OF H 2.21/1 – hard of hearing subtitles for 2.21/1 aspect ratio displays
5 selectable	#3 SERVICE ◂ 5/7 ▸ TELETEXT ASYNC SYNC 3 NONE NONE	The list of Teletext[3] services can be scrolled through and a choice made. The choices are: NONE (available) or n (stream choice). The asynchronous and/or synchronous[4] data associated with a Service can be enabled. If any streams fail, - - - is displayed. • If multiple streams are available (indicated by numbers under a stream heading), choose the required stream using this page. • If no streams are available, NONE is displayed.
6	#3 SERVICE ◂ 6/7 ▸ NETWORK NAME [network name]	Actual network name truncated to 15 characters. • If no input lock, [network name] displays INPUT NOT LOCKED. • If input locked but no SI received, [network name] displays NO SERVICE INFO.
7	#3 SERVICE ◂ 7/7 SERVICE PROVIDER [service provider name]	Actual service provider name truncated to 15 characters. • If no input lock, [service provider name] displays INPUT NOT LOCKED. • If input locked but no SI received, [service provider name] displays NO SERVICE INFO. • If the input is locked but no service is selected, [service provider name] displays NO SERVICE RUNNING

When **SAVE** is pressed, the currently selected Service becomes the current Service.

Audio channel 1 is set to decode the language which best matches the preferences set up in menu #8. If no match can be found, the audio language is set to the first audio stream found in the service descriptor.

Audio channel 2 is set to the language which best matches the preferences defined in Menu #9. Decoding is as for Audio 1.

If a DVB Subtitle stream (page 4) is found, the Alteia is set decode the language which best matches the one selected in the SUBTITLES/VBI Menu (#7). If no match is found, the subtitle language is set to the first language found in the service descriptor.

If Teletext streams are found then the first one to appear in the PMT is decoded and reinserted into the video output.

If asynchronous data streams are found then the first one to appear in the PMT is decoded.

If synchronous data streams are found then the first one to appear in the PMT is decoded.

[3] Teletext is only available on models with suffix B, e.g. M2/PSR/942B.
[4] Synchronous, high-speed, data is only available on models with suffixes A or B, e.g. M2/PSR/942A.

C.7 Input Menu (#4) for Various Models

C.7.1 Locking to the Incoming Transport Stream

When the unit locks to the incoming transport stream, the LOCK LED on the front panel is lit (GREEN). When the unit is not locked to the incoming stream, the LED is RED.

If the incoming transport stream only has one service, the unit will automatically select it. If the stream carries more than one service, the operator must choose the required service using the Service menu.

C.7.2 Decoder Input Menu Pages

Table C.6 applies to models M2/PDU/942[B][C][D]

This menu has pages that allow the lock status to be displayed and the input source to be chosen.

Table C.6: Decoder Input Menu (#4) Pages

Page	Display	Description	Options
1	#4 INPUT 1/2 ▸ STATUS LOCKED TO 188 PACKET	This page displays the Lock status.	LOCKED TO 188 PACKET LOCKED TO 204 PACKET INPUT NOT LOCKED
2 selectable	#4 INPUT ◂ 2/2 SOURCE AUTO	This page allows the Decoder source to be chosen	M2/PDU/942[B]: SPI (Synchronous Par. Interface) ASI-C (Async Ser. Interface – copper) ASI-F (Async Ser. Interface - fibre) AUTO (ASI-F → ASI-C → SPI) M2/PDU/942C: SPI (Synchronous Par. Interface) ASI-C (Async Ser. Interface – copper) AUTO (ASI-C(1) → ASI-C(2) → SPI)

The inputs to the Decoder could be fully wired and each input active. The required SOURCE can be chosen using page 2.

C.7.3 Satellite Receiver Input Menu Pages

This section applies to M2/PSR/932[C] and all M2/P8R/942 and M2/PSR/942 models. Any differences between models are highlighted in the Options column. *Table 1.4* in *Chapter 1,* details the number of inputs for the various models.

Table C.7: Satellite Receiver Input Menu (#4) Pages

Page	Display	Description	Options
1	#4 INPUT 1/11 ▸ BER n.n E - nn	This page dynamically displays the Bit Error Ratio (BER) at the receiver input.	INPUT NOT LOCKED Display BER value
2	#4 INPUT 1 ◂ 2/11 ▸ LEVEL L- - - - OK- - - - H 155 ✳	This page dynamically displays the input signal level. The three-digit number under LEVEL is the AGC level from the demodulator. The display immediately to the right of LEVEL is a scale representation of the AGC value.	Keep the signal within the displayed band by adjusting the input.
3 selectable	#4 INPUT 1 ◂ 3/11 ▸ RF INPUT NO 1	The RF input is chosen using this menu. The heading (INPUT n) in all menus in the group changes to reflect the input number.	M2/PSR/942[A][B], M2/PSR/932C: 1, 2, 3, 4. M2/PSR/932: M2/P8R/942: 1, 2.
4 selectable	#4 INPUT 1 ◂ 4/11 ▸ KU BAND FREQUENCY 11410.0 MHz	The parameter on this page is determined by the frequency range entered in page 7. The frequency bands appear in the options column. OUT OF RANGE is displayed for an invalid entry.	C BAND (LNB LO: 5000 - 6000 MHz) KU BAND (LNB LO: 9000 - 11 500 MHz) L BAND (LNB LO ≡ NONE) FREQUENCY (LO frequency none of above) OUT OF RANGE (User enters frequency in the range 950 MHz to 2150 MHz)
5 selectable	#4 INPUT 1 ◂ 5/11 ▸ FEC SYM RATE 2/3 20.000000 MSYM/S	Set the Forward Error Correction (FEC) and Symbol rate using this page. Minimum increment is 100 Sym/s.	FEC rates — M2/PSR/9xx: ½, $^2/_3$, ¾, $^5/_6$, $^6/_7$, $^7/_8$. M2/P8R/9xx: $^5/_6$, $^8/_9$.
6 selectable	#4 INPUT 1 ◂ 6/11 ▸ POL MOD HORIZONTAL QPSK	Use this page to set the antenna polarisation and modulation mode. When first displayed, the page displays the current settings of the modulation mode being used.	MODE — M2/PSR/9xx: BPSK, QPSK. M2/P8R/9xx: BPSK, QPSK, 8PSK POL — HORIZONTAL, VERTICAL.
7 selectable	#4 INPUT 1 ◂ 7/11 ▸ LNB TYPE LNB LO FREQ NORMAL 10000 MHz	Set the LNB type in this page. Minimum LNB LO FREQ increment is 1 MHz.	LNB TYPE — NORMAL, DUAL, NONE. LNB LO FREQ — (LNB freq) MHz (LNB ≡ NORMAL) (LNB lower freq) MHz (LNB ≡ DUAL) - - - - - - (LNB type ≡ NONE).
8 selectable	#4 INPUT 1 ◂ 8/11 ▸ LO FRQ 2 SW OVR FREQ 10000 MHz 10000.0 MHz	If the LNB type set in page 7 is not DUAL, the LO frequency and switchover point are set to dashes. Minimum LO FRQ2 increment is 100 kHz. Minimum SW OVR FREQ increment is 100 kHz.	LO FREQ 2 — (LNB upper freq) MHz (LNB ≡ DUAL) - - - - - - (LNB type ≡ NORMAL/NONE). SW OVR FREQ — xxxxx MHz (switchover frequency) - - - - - - (LNB type ≡ NORMAL/NONE).
9 selectable	#4 INPUT 1 ◂ 9/11 ▸ LNB DC OUTPUT ENABLED	Allows the dc voltage to be applied to the LNB via the currently selected output.	DISABLED (factory default) ENABLED BOOST
10 editable	#4 INPUT 1 ◂ 10/11 ▸ LIMITS BER LEVEL 1.8E-3 050	Set the BER and input signal input alarm thresholds. An alarm is generated if the BER is above its alarm threshold or the signal level below its alarm threshold.	
11 editable	#4 INPUT 1 ◂ 11/11 SEARCH RANGE +/- 5000 kHz	Sets the upper and lower limits of the satellite signal acquisition process. Minimum increment is 1 kHz.	

C.7.4 Terrestrial Receiver Input Menu Pages (to version 2.5.4)

This section applies to models M2/PTR/942 and M2/PTR/948B[C] (to version 2.5.4).

The input is the UHF connector.

Table C.8: Terrestrial Receiver Input Menu (#4) Pages (to version 2.5.4)

Pages	Display	Description	Options
1	#4 INPUT DEG ON ◂ 1/13 ▸ POST VITERBI BER n.n E - nn	This page dynamically displays the current Post-Viterbi BER value. This is the value shown on the front panel BER meter. Also shows the status of the Signal Degradation mode (DEG ON | OFF)	
2 selectable	#4 INPUT ◂ 2/13 ▸ UHF CHANNEL 8MHZ CH: 21 OFF: +3	This sets up the channel number and tuner frequency offset for the required service. The channel number and offset are limited to the applicable range of the tuner.	
3 selectable	#4 INPUT ◂ 3/13 ▸ GUARD INTERVAL 1/32	This page sets the guard interval between consecutive symbols on each carrier to prevent inter-symbol interference.	$^1/_{32}$, $^1/_{16}$, $^1/_8$, $^1/_4$.
4 selectable	#4 INPUT ◂ 4/13 ▸ OFDM CARRIER MODE 2K	This page sets up the carrier mode of the receiver front end. The type of receiver front end may limit the option choice.	2K 8K (M2/PTR/948[A] only)
5 selectable	#4 INPUT ◂ 5/13 ▸ CHANNEL SPACE 8MHz	This page displays the band plan channel spacing. Valid values are determined by the system hardware.	6 MHz (s/w ver 2.4), 7 MHz (s/w ver 2.4), 8 MHz
6 selectable	#4 INPUT ◂ 6/13 ▸ MODULATION 16QAM	This page displays the channel coding (constellation).	QPSK, 16QAM, 64QAM
7	#4 INPUT ◂ 7/13 ▸ FEC RATE HIGH ½ LOW 2/3	ALPHA ≠ 0: This non-editable page displays the HIGH and LOW FEC code rates when the transmission is hierarchical. ALPHA = 0: This non-editable page displays a single FEC RATE when the transmission is non-hierarchical.	$^1/_2$, $^2/_3$, $^3/_4$, $^5/_6$, $^7/_8$.
8 selectable	#4 INPUT ◂ 8/13 ▸ SIGNAL DEGRADATION OFF	A test mode which degrades the incoming signal. The status on the signal degradation is shown on page 1 (DEG ON | DEG OFF) See CAUTION following this table.	OFF, 1 - 7
9	#4 INPUT ◂ 9/13 ▸ POST RS ERRORS nnn	This page displays the number of errors in a single packet after Viterbi correction. • If the error is 15 or more, GREATER THAN 255 ERRORS is displayed. • If the input is not locked, INPUT NOT LOCKED displayed.	000 - 254
10	#4 INPUT ◂ 11/13 ▸ HIERARCHY MODE ALPHA = 1	ALPHA = 0 means that it is a non-hierarchical transmission.	OFF (hierarchy = 0) 1, 2, 4
11 selectable	#4 INPUT ◂ 11/13 ▸ HIERARCHY STREAM HP	In hierarchy mode, this page allows a selection between high and low priority streams.	HP (high priority) LP (low priority)
12 selectable	#4 INPUT ◂ 12/13 ▸ INPUT SELECTION UHF NORMAL	Allows the input connector to be chosen. Choices available depend on the Tuner type. See CAUTION following this table.	UHF NORMAL UHF INVERTED BASEBAND –NORMAL BASEBAND –INVERTED
13 editable	#4 INPUT ◂ 13/13 LIMITS BER n.n E - nn	This page allows the limit Post-Viterbi BER threshold. An alarm is generated if the BER is above the threshold.	

CAUTIONS...

1. **Software version 2.2 and earlier.** If the input selection is edited between UHF and Baseband operation, whilst a signal degradation mode other than 0 is selected, it will be necessary to reselect the required signal degradation mode using the following method:

   Step 1. Select signal Degradation mode 0 on menu 4/8.

   Step 2. Reselect the signal Degradation mode required on menu 4/8.

2. When using the combination 64QAM, 3/4 FEC, 1/32 Guard Interval and 204 packet length (29.454545 Mbit/s), the demodulator may not always lock up correctly following switch-on or after a brief loss of signal. This will be apparent from a higher than expected BER or lack of video. Normal lock up is achieved by disconnecting and reconnecting the input again.

C.7.5 Terrestrial Receiver Input Menu Pages (version 2.8.3 on)

This section applies to models M2/PTR/948C and M2/PTR/948CVL (from version 2.8.3). The input is the UHF connector.

Table C.9: Terrestrial Receiver Input Menu (#4) Pages (version 2.83 on)

Pages	Display	Description	Options
1	#4 INPUT DEG ON ◂ 1/16 ▸ POST VITERBI BER n.n E – nn	This page dynamically displays the current Post-Viterbi BER value. This is the value shown on the front panel BER meter. Also shows the status of the Signal Degradation mode (DEG ON | OFF)	
2 selectable	#4 INPUT ◂ 2/16 ▸ SPECTRUM INVERSION ON	This page selects normal or inverted spectrum. Will exit AUTO-MODE if a manual selection is made.	ON OFF
3 selectable	#4 INPUT ◂ 3/16 ▸ GUARD INTERVAL 1/32	This page sets the guard interval between consecutive symbols on each carrier to prevent inter-symbol interference Will exit AUTO-MODE if a manual selection is made.	$^1/_{32}$, $^1/_{16}$, $^1/_8$, ¼.
4 selectable	#4 INPUT ◂ 4/16 ▸ OFDM CARRIER MODE 2K	This page sets up the carrier mode of the receiver front end. The type of receiver front end may limit the option choice. Will exit AUTO-MODE if a manual selection is made.	2K 8K (M2/PTR/948[A] only)
5 selectable	#4 INPUT ◂ 5/16 ▸ CHANNEL SPACE 8MHz	This page displays the band plan channel spacing. Valid values are determined by the system hardware.	6 MHz (s/w ver 2.4), 7 MHz (s/w ver 2.4), 8 MHz
6 selectable	#4 INPUT ◂ 6/16 ▸ MODULATION 16QAM	This page displays the channel coding (constellation).	QPSK, 16QAM, 64QAM
7	#4 INPUT ◂ 7/16 ▸ FEC RATE HIGH ½ LOW 2/3	ALPHA ≠ 0: This non-editable page displays the HIGH and LOW FEC code rates when the transmission is hierarchical. ALPHA = 0: This non-editable page displays a single FEC RATE when the transmission is non-hierarchical.	$^1/_2$, $^2/_3$, $^3/_4$, $^5/_6$, $^7/_8$.
8 selectable	#4 INPUT ◂ 8/16 ▸ SIGNAL DEGRADATION OFF	A test mode which degrades the incoming signal. The status on the signal degradation is shown on page 1 (DEG ON | DEG OFF) See CAUTION following this table.	OFF, 1 - 7
9	#4 INPUT ◂ 9/16 ▸ POST RS ERRORS nnn	This page displays the number of errors in a single packet after Viterbi correction. • If the error is 15 or more, GREATER THAN 255 ERRORS is displayed. • If the input is not locked, INPUT NOT LOCKED displayed.	Values 000 - 254
10	#4 INPUT ◂ 10/16 ▸ HIERARCHY MODE ALPHA = 1	ALPHA = 0 means that it is a non-hierarchical transmission.	OFF (hierarchy = 0) 1, 2, 4
11 selectable	#4 INPUT ◂ 11/16 ▸ HIERARCHY STREAM HP	In hierarchy mode, this page allows a selection between high and low priority streams.	HP (high priority) LP (low priority)
12 selectable	#4 INPUT ◂ 12/16 ▸ INPUT SELECTION UHF	This page allows the input selection type to be set.	UHF 70 MHz – IF BASEBAND
13 editable	#4 INPUT ◂ 13/16 ▸ LIMITS BER n.n E – nn	This page allows the limit Post-Viterbi BER threshold. An alarm is generated if the BER is above the threshold.	
14 editable	#4 INPUT ◂ 14/16 ▸ UHF FREQUENCY 165.250 MHz	This page sets the UHF Frequency of the tuner. UHF Input must be selected on page 12/16.	Editable range 0 – 920 MHz
15 selectable	#4 INPUT ◂ 15/16 ▸ AUTO MODE ON	This page allows the automatic selection of SPECTRUM INVERSION, GUARD INTERVAL and CARRIER MODE; Causing the unit to hunt for the correct setting.	ON, OFF

Pages	Display	Description	Options
16	#4 INPUT ◂ 16/16 MER 14:00	Display of the instantaneous Modulation Error Ratio (MER)	Values 0 - 32

C.7.6 Digital ENG Input Menu Pages

This section applies to the M2/PTRE/xxx models.
The input is the IF connector.

Table C.10: Digital ENG Receiver Input Menu (#4) Pages,

Pages	Display	Description	Options
1	#4 INPUT DEG OFF ◂ 1/12 ▸ POST VITERBI n.n E – nn	This page dynamically displays the current Post-Viterbi BER value. This is the value shown on the front panel BER meter.	
2 Disabled	#4 INPUT ◂ 2/13 ▸ UHF CHANNEL 8MHZ	Although this page is displayed by the PTRE it is disabled.	None
3 selectable	#4 INPUT ◂ 2/12 ▸ GUARD INTERVAL 1/32	This page sets the guard interval between consecutive symbols on each carrier to prevent inter-symbol interference.	$^1/_{32}$, $^1/_{16}$, $^1/_8$, $^1/_4$.
4 selectable	#4 INPUT ◂ 3/12 ▸ OFDM CARRIER MODE 2K	This page sets up the carrier mode of the receiver front end.	2K 8K (M2/PTR/948[A] only)
5	#4 INPUT ◂ 4/12 ▸ CHANNEL SPACE 8MHz	This page displays the band plan channel spacing using this page. Valid values are determined by the system hardware.	6 MHz (s/w ver 2.4), 7 MHz (s/w ver 2.4), 8 MHz
6	#4 INPUT ◂ 5/12 ▸ MODULATION 16QAM	This page displays the channel coding (constellation).	QPSK, 16QAM, 64QAM
7	#4 INPUT ◂ 6/12 ▸ FEC RATE HIGH ½ LOW 2/3	ALPHA ≠ 0: This non-editable page displays the HIGH and LOW FEC code rates when the transmission is hierarchical. ALPHA = 0: This non-editable page displays a single FEC RATE when the transmission is non-hierarchical.	$^1/_2$, $^2/_3$, $^3/_4$, $^5/_6$, $^7/_8$.
8 selectable	#4 INPUT ◂ 7/12 ▸ SIGNAL DEGRADATION OFF	A test mode which degrades the incoming signal. In the M2/PTRE/942 model it should be set to OFF. The status on the signal degradation is shown on page 1 (DEG OFF).	OFF, 1 - 7
9	#4 INPUT ◂ 8/12 ▸ POST RS ERRORS nnn	This page displays the number of errors in a single packet after Viterbi correction. • If the error is 15 or more, GREATER THAN 255 ERRORS is displayed. • If the input is not locked, INPUT NOT LOCKED displayed.	000 - 254
10	#4 INPUT ◂ 9/12 ▸ HIERARCHY MODE ALPHA = 1	ALPHA = 0 means that it is a non-hierarchical transmission.	OFF (hierarchy = 0) 1, 2, 4
11 selectable	#4 INPUT ◂ 10/12 ▸ HIERARCHY STREAM HP	In hierarchy mode, this page allows a selection between high and low priority streams.	HP (high priority) LP (low priority)
12 selectable	#4 INPUT ◂ 11/12 ▸ INPUT SELECTION BASEBAND NORMAL	Allows the input connector to be chosen. See next line for PTRE/948C.	BASEBAND –NORMAL BASEBAND –INVERTED
12 selectable	#4 INPUT ◂ 11/12 ▸ INPUT SELECTION IF 70MHZ NORMAL	Allows the lower or upper side-band to be chosen. This applies to PTRE/948C only. UHF and Base-band options may be displayed but IF 70 MHz is the only active input.	IF 70MHZ NORMAL (LSB) IF 70MHZ INVERTED (USB)
13 editable	#4 INPUT ◂ 12/12 LIMITS BER n.n E - nn	This page allows the limit Post-Viterbi BER threshold. An alarm is generated if the BER is above the threshold.	

When using the combination 64QAM, 3/4 FEC, 1/32 Guard Interval and 204 packet length, please refer to the CAUTION on the following page.

CAUTION...

When using the combination 64QAM, 3/4 FEC, 1/32 Guard Interval and 204 packet length (29.454545 Mbit/s), the demodulator may not always lock up correctly following switch-on or after a brief loss of signal. This will be apparent from a higher than expected BER or lack of video. Normal lock up is achieved by disconnecting and reconnecting the input again. Not applicable to version 2.3 and later.

C.8 Alarm Menu (#5) for Various Models

C.8.1 Decoder Alarm Menu Pages

This section applies to the M2/PDU/xxx models

Table C.11: Decoder Alarm Menu (#5) Pages

Pages	Display	Description	Options
1	#5 ALARM [FAIL] 1/12 ▸ PAGE 2 - - - - - 9 - - - - - 11 STAT ✳	This page provides a summary of the alarm status. Each number corresponds to an Alarm Menu page. An asterisk shows which page is contributing to the summary Alarm.	PAGE number (2 to 11)
2 selectable	#5 ALARM ◂ 2/12 ▸ INPUT RELAY MASK FAIL 1 YES	These pages display the status of the module or function indicated by the title on line 2. The RELAY parameter allows an Alarm to be associated with a particular relay contact at the rear of the unit. If a relay is selected and a failure occurs, that relay activates. More than one Alarm can be assigned to a relay contact. For example, INPUT, BER and SIG LEVEL could be assigned to Relay 1, VIDEO to Relay 2 and Audio 1 and 2 to Relay 3. Any Alarm condition would then operate its assigned Relay. The MASK parameter allows an Alarm to be masked so that it does not contribute to the Summary Alarm.	ALARM STATUS — OK, FAIL RELAY — NONE (default) 1, 2, 3, 4, 5 or 6 MASK — YES (default), NO
3 selectable	#5 ALARM ◂ 3/12 ▸ VIDEO RELAY MASK OK 3 YES		
4 selectable	#5 ALARM ◂ 4/12 ▸ VBI RELAY MASK OK 2 YES		
5 selectable	#5 ALARM ◂ 5/12 ▸ AUDIO 1 RELAY MASK OK NONE YES		
6 selectable	#5 ALARM ◂ 6/12 ▸ AUDIO 2 RELAY MASK OK NONE YES		
7 selectable	#5 ALARM ◂ 7/12 ▸ ASYNC RELAY MASK OK NONE NO		
8 selectable	#5 ALARM ◂ 8/12 ▸ SYNC RELAY MASK OK NONE NO		
9 selectable	#5 ALARM ◂ 9/12 ▸ CA RELAY MASK FAIL NONE YES		
10	#5 ALARM ◂ 10/12 ▸ TEMPERATURE OK 27C 75F	This is a non-editable page. The temperature is shown in both Celsius and Fahrenheit and shows if the internal temperature exceeds 60°C.	OK, FAIL
11	#5 ALARM ◂ 11/12 ▸ FAN STATUS FAIL	This non-editable page monitors pulses from the fan to ensure it is rotating.	OK, FAIL
12 selectable	#5 ALARM ◂ 12/12 USER ALARM MASK STORE	This page allows the current mask configuration to be stored (default is all alarms masked). Restore allows the user to recall the previously stored mask (which could be the default).	STORE, RESTORE

C.8.2 Satellite Receiver Alarm Menu Pages

This section applies to M2/PSR/932[C] and all M2/P8R/942 and M2/PSR/942 models.

Table C.12: Satellite Receiver Alarm Menu (#5) Pages

Page	Display	Description	Options
1	#5 ALARM 1/15 ▸ PAGE 2 - - - - - 9 - - - - - 14 STAT ✳ ✳	This page provides a summary of the alarm status. Each number corresponds to an Alarm Menu page. An asterisk will appear for each page contributing to the summary Alarm.	PAGE number (2 to 15)
2 selectable	#5 ALARM ◂ 2/15 ▸ INPUT RELAY MASK FAIL 1 YES	These pages display the status of the module or function indicated by the title on line 2.	ALARM STATUS — OK, FAIL
3 selectable	#5 ALARM ◂ 3/15 ▸ BER RELAY MASK OK 1 YES		
4 selectable	#5 ALARM ◂ 4/15 ▸ SIG LEVEL RELAY MASK OK 1 YES		
5 selectable	#5 ALARM ◂ 5/15 ▸ VIDEO RELAY MASK OK 1 YES		
6 selectable	#5 ALARM ◂ 6/15 ▸ VBI RELAY MASK OK 2 YES		
7 selectable	#5 ALARM ◂ 7/15 ▸ AUDIO 1 RELAY MASK OK NONE YES	The RELAY parameter allows an Alarm to be associated with a particular relay contact at the rear of the unit. If a relay is selected and a failure occurs, that relay activates. More than one Alarm can be assigned to a relay contact. For example, INPUT, BER and SIG LEVEL could be assigned to Relay 1, VIDEO to Relay 2 and Audio 1 and 2 to Relay 3. Any Alarm condition would then operate its assigned Relay.	RELAY — NONE (default) 1, 2, 3, 4, 5 or 6
8 selectable	#5 ALARM ◂ 8/15 ▸ AUDIO 2 RELAY MASK OK NONE YES		
9 selectable	#5 ALARM ◂ 9/15 ▸ ASYNC RELAY MASK OK NONE NO		
10 selectable	#5 ALARM ◂ 10/15 ▸ SYNC RELAY MASK OK NONE NO	The MASK parameter allows an Alarm to be masked (YES) so that it does not contribute to the Summary Alarm.	MASK — YES (default), NO
11 selectable	#5 ALARM ◂ 11/15 ▸ CA RELAY MASK FAIL NONE YES		
12 selectable	#5 ALARM ◂ 12/15 ▸ LNB VOLT RELAY MASK FAIL NONE YES	This alarm will be raised if a short circuit occurs in the cable or LNB. If the alarm persists after the rear panel connection is removed, then a fault exists within the Alteia.	
13	#5 ALARM ◂ 13/15 ▸ TEMPERATURE OK 27C 75F	This page is non-editable. The temperature is shown in both Celsius and Fahrenheit. FAIL indicates that the internal temperature exceeds 60°C.	OK FAIL
14	#5 ALARM ◂ 14/15 ▸ FAN STATUS OK	This non-editable page monitors pulses from the fan to ensure it is rotating.	OK FAIL
15 selectable	#5 ALARM ◂ 15/15 USER ALARM MASK STORE	This page allows the current mask configuration to be stored (default is all alarms masked). Restore allows the user to recall the previously stored mask (which could be the default).	STORE, RESTORE

C.8.3 Terrestrial and Digital ENG Receiver Alarm Menu Pages

This section applies to the M2/PTR[E]/942[B][C][D] and M2/PTR/948[A] models.

Table C.13: Terrestrial Alarm Menu (#5) Pages

Page	Display	Description	Options
1	#5 ALARM [FAIL] 1/16 ▸ PAGE 2 - - - - 9 - - - - 14 STAT ✳	This page provides a summary of the alarm status. Each number corresponds to an Alarm Menu page. An asterisk shows which page is contributing to the summary Alarm.	PAGE number (2 to 18)
2 selectable	#5 ALARM ◂ 2/16 ▸ INPUT RELAY MASK FAIL NO 1 YES	These pages display the status of the module or function indicated by the title on line 2. The RELAY parameter allows an Alarm to be associated with a particular relay contact at the rear of the unit. If a relay is selected and a failure occurs, that relay activates. See additional comments in section *C.8.2* The MASK parameter allows an Alarm to be masked so that it does not contribute to the Summary Alarm.	ALARM STATUS — OK, FAIL RELAY — NONE (default) 1, 2, 3, 4, 5 or 6 MASK — YES (default), NO
3 selectable	#5 ALARM ◂ 3/16 ▸ POS V BER RELAY MASK OK 1 YES		
4 selectable	#5 ALARM ◂ 4/16 ▸ VIDEO RELAY MASK OK 1 YES		
5 selectable	#5 ALARM ◂ 5/16 ▸ VBI RELAY MASK OK 2 YES		
6 selectable	#5 ALARM ◂ 6/16 ▸ AUDIO 1 RELAY MASK OK NONE YES		
7 selectable	#5 ALARM ◂ 7/16 ▸ AUDIO 2 RELAY MASK OK NONE YES		
8 selectable	#5 ALARM ◂ 8/16 ▸ ASYNC RELAY MASK OK NONE NO		
9 selectable	#5 ALARM ◂ 9/16 ▸ SYNC RELAY MASK OK NONE NO		
10 selectable	#5 ALARM ◂ 10/16 ▸ CA RELAY MASK FAIL NONE YES		
11 selectable	#5 ALARM ◂ 11/16 ▸ PMT RELAY MASK FAIL NONE YES	Program Map Table (PMT) not available.	
12 selectable	#5 ALARM ◂ 12/16 ▸ POST RS RELAY MASK FAIL NONE YES	Post Reed-Solomon errors (POST RS) indicates RS Decoder failure.	
13 selectable	#5 ALARM ◂ 13/16 ▸ TPS RELAY MASK FAIL NONE YES	Transmitter Parameter Signalling (TPS) failed.	
14	#5 ALARM ◂ 14/16 ▸ TEMPERATURE OK 27C 75F	This is a non-editable page. The temperature is shown in both Celsius and Fahrenheit and shows if the internal temperature exceeds 60°C.	OK, FAIL
15	#5 ALARM ◂ 15/16 ▸ TIME SYNC RELAY MASK OK NONE NO	Provides an alarm if the timing recovery is not in lock.	OK, FAIL
16 Selectable	#5 ALARM ◂ 16/16 USER ALARM MASK STORE NONE NO	This page allows the current mask configuration to be stored (default is all alarms masked). Restore allows the user to recall the previously stored mask (which could be the default).	STORE, RESTORE

C.9 Video Menu (#6)

C.9.1 General Menus

This menu group applies to all Alteia models and allows the video to be configured and its status checked. The word OK or FAIL appears in line 1 on all pages dependent on whether the video module is running.

Table C.14: Video Menu (#6) Pages

Pages	Display	Description	Options
1	#6 VIDEO [OK] 1/9 ▸ RESOLUTION 720x576	This page displays the current video resolution and bit-rate.	RES(olution) — See *Annex B*.
2	#6 VIDEO [OK] ◂ 2/9 ▸ MODE LINE STANDARD 4.2.2 625	This page displays the current video mode and line standard.	MODE — 4:2:0, 4:2:2 LINE STANDARD — 525, 625
3	#6 VIDEO [OK] ◂ 3/9 ▸ PEL ASPECT RATIO 16/9	This page displays the current picture element (PEL) aspect ratio.	4/3, 16/9
4	#6 VIDEO [OK] ◂ 4/9 ▸ FRAME RATE 25 Hz	This page displays the current frame rate.	25 Hz, 30 Hz
5 selectable	#6 VIDEO [OK] ◂ 5/9 ▸ 625 STANDARD PAL-I	This page sets the composite output when decoding 625-line video.	See *Annex B* for list of supported 625 standards.
6 selectable	#6 VIDEO [OK] ◂ 6/9 ▸ 525 STANDARD NTSC M	This page sets the composite output when decoding 525-line video.	See *Annex B* for list of supported 525 standards.
7 selectable	#6 VIDEO [OK] ◂ 7/9 ▸ FAIL MODE BLANK	This page allows the action to be taken on video failure to be set. It also determines the line standard during the boot period.	FAIL MODE — FREEZE, NO SYNCS *(ver 2.6 →)*, BLANK
8 selectable	#6 VIDEO [OK] ◂ 8/9 ▸ ASPECT RATIO 16/9	Identifies the aspect ratio of the monitor connected to the Alteia.	4/3, 16/9
9 selectable	#6 VIDEO [OK] ◂ 9/9 LEVEL - - | + 00 PCT ✳	This page sets the output video level. The choice made is enabled when the SAVE button is pressed.	±30% (Factory default is unity video.)

C.9.2 Additional Menus for Alteia *plus* Models

There are a number of menus that are applicable to Alteia *plus* models.

Table C.15: Video Menu (#6) Pages for Alteia plus Models

Pages	Display	Description	Options	
10 selectable	#6 VIDEO ◀ 10/16 ▶ EDH DISABLED	This page allows the user to enable or disable the pass-through of Error Detection Hierarchy (EDH) data.	DISABLED ENABLED	
11 editable	#6 VIDEO ◀ 11/16 ▶ EMBEDDED AUDIO DID CHANNEL 1 2FF	This page allows the user to enable and set up the decoding of audio signals embedded in the video signal. Data ID can be edited by using the LEFT and RIGHT buttons to select a hexadecimal digit and the SELECT control to change its value.	NONE BOTH CHANNEL 1 CHANNEL 2	DID (Data ID) 0x000 to 0x7FF
12 selectable	#6 VIDEO ◀ 12/16 ▶ TEST PATTERN STD 8 625	This menu allows the user to select a test pattern and have it available at the analogue video output. Pressing the RIGHT button allows the line standard to be selected; pressing the LEFT button allows the test patterns to be selected. The choice made is enabled when the SAVE button is pressed.	Test Pattern: DISABLED, 1 – 8 see *Table C.16*	(Line) STD: 625 525
13 selectable	#6 VIDEO ◀ 13/16 ▶ FRAME SYNC ENABLED NOT LOCKED	This page allows the user to enable the use of the Frame Sync input (using the F SYNC connector at the rear of the unit). Only available if Frame Sync Option is purchased.	DISABLED ENABLED	
14 editable	#6 VIDEO ◀ 14/16 ▶ FRAME SYNC 625 OFFSET +13824	This page allows the user to set the offset delay of the frame sync signal (in units of 37ns, $^1/_{27}$ MHz). Only available if Frame Sync Option is purchased.	+13824 to -13824	
15 editable	#6 VIDEO ◀ 15/16 FRAME SYNC 525 + OFFSET +13728	This page allows the user to set the offset delay of the frame sync signal (in units of 37ns, $^1/_{27}$ MHz). Only available if Frame Sync Option is purchased.	+13728 to - 13728	
16 editable	#6 VIDEO ◀ 16/16 VIDEO OUTPUT SHAPING CVBS – 704 PIXELS	This page allows shaping of the output video, depending on the encoding source.	CVBS – 704 PIXELS SDI – 720 PIXELS	

Table C.16: Video Test Patterns (Menu #6 Page 12)

Test	Description
Disabled	Normal video
1	Pulse and Bar, 20T Magenta Pulse and Luminance Staircase
2	Multiburst
3	Pulse and Bar and Chrominance Staircase
4	Chrominance Step and Burst
5	Flat Field Red
6	Luminance Ramp
7	Component Ramps (YC_RC_B ramps)
8	Colour Bars

C.10 Subtitle/VBI Menu (#7)

C.10.1 Menu #7 (Software Versions 2.1 and 2.2)

This group of menus sets the Subtitle default language, enables/disables Vertical Interval Test Signals (VITS) and enables/disables various types of Vertical Blanking Interval (VBI) data.

Table C.17: Subtitle/VBI Menu (#7) Pages (Software Versions 2.1 and 2.2)

Page	Display	Description	Line		Options
			Standard	Number	
1	#7 SUBTITLE/VBI 1/7 ▸ DEFAULT LANGUAGE NOT SUPPORTED	Sets the default language for the Subtitle decoder.			
2 selectable	#7 SUBTITLE/VBI ◂ 2/7 ▸ VITS INSERTION ENABLED	Enable/disable the insertion of Vertical Interval Test Signals (VITS) into the outgoing video VBI.	525 625 (UK) 625 (ITU-R)	17/280 19/20/332/333 17/18/329/330	ENABLED, DISABLED
3	#7 SUBTITLE/VBI ◂ 3/7 ▸ VPS PRESENT NOT SUPPORTED				NOT SUPPORTED
4	#7 SUBTITLE/VBI ◂ 4/7 ▸ WSS PRESENT NOT SUPPORTED				NOT SUPPORTED
5 selectable	#7 SUBTITLE/VBI ◂ 5/7 ▸ CC/VCHIP NOT PRESENT DISABLED	Enable/disable the Closed Caption (CC) and Parental Control (VCHIP) control into the outgoing video VBI. Line 2 indicates the presence or absence of the signal incoming. Refer to *Chapter 6, Preventive Maintenance and Fault-finding* for setting information.	525	21	ENABLED, DISABLED
6	#7 SUBTITLE/VBI ◂ 6/7 ▸ AMOL 1 NOT PRESENT NOT SUPPORTED				NOT SUPPORTED
7	#7 SUBTITLE/VBI ◂ 7/7 AMOL 2 NOT PRESENT NOT SUPPORTED				NOT SUPPORTED

Table C.17 shows the correct operation for 4:2:0 mode. However, for 4:2:2 mode, the VBI can be encoded as video at the Encoder.
The Receiver auto-detects this and switches into pass-through mode. In this mode, any VBI can be transferred.

NOTES...

1. If the incoming video is 608 or 512 lines (4:2:2 mode) the unit will automatically be in pass-through mode. The line resolution can be checked on Menu #6, Page 1.
2. When in video pass-through mode, the pages displayed under Menu #7 may not be correct.

C.10.2 Menu #7 (Software Version 2.4 and Later)

This group of menus sets the Subtitle default language, enables/disables Vertical Interval Test Signals (VITS) and enables/disables various types of Vertical Blanking Interval (VBI) data.

Menu pages 3, 6, 9 and 10 are displayed in Alteia as pages 1 to 4, of 4. Pages 1 through 10 are all displayed by Alteia *plus* as shown in *Table C.18.*

Table C.18: Subtitle/VBI Menu (#7) Pages (Software Version 2.4 and later)

Page	Display	Description	Options	
1 selectable Purchasable option.	#7 SUBTITLE/VBI 1/10 ▸ LINE INPUT OUTPUT 21 WSS TTXT	This menu displays the current reinsertion data available for the selected line and the data type being inserted by the unit. The INPUT field only includes reinsertion data received over-air, not Teletext or VBI test signals. The OUTPUT field shows data inserted by the unit based on the user's selections – Teletext data and test signals take priority over reinsertion signals.	The selected LINE can be 11 to 23. INPUT: VPS (Video Programming System) CCVC (Closed Caption /VCHIP) WSS (Wide Screen Signalling) AMOL (Automatic Measure of Lineups) VIDX (Video Index) NONE (not available or line disabled) OUTPUT: TTXT (EBU Teletext data) ITS (Insertion test signals) GCR (Ghost cancelling reference) VITC (Vertical interval time code) NONE	
2 selectable Purchasable option.	#7 SUBTITLE/VBI ◂ 2/10 ▸ TELETEXT ENABLED	This menu controls the insertion of all Teletext lines. Should any conflicts occur, these signals take priority over reinsertion signals.	625 standard: Teletext lines may be placed on any or all of lines 7 – 22 and 320 – 335.	Line 1: TELETEXT Line 2: ENABLED DISABLED
3 selectable	#7 SUBTITLE/VBI ◂ 3/10 ▸ VITS INSERTION ENABLED CCIR	Enable/disable the insertion of VITS test signals.	525 (FCC) standard: Lines 17/280 625 (UK) standard: Lines 19/20/332/333 625 (ITU-R): Lines 17/18/329/330	DISABLED ENABLED CCIR [ITU-R] ENABLED FCC/UK NOT SUPPORTED
4 selectable Purchasable option.	#7 SUBTITLE/VBI ◂ 4/10 ▸ VITC INSERTION ENABLED	Enable/disable the insertion of the VITC signal. The signal appears on two non-adjacent lines per field.	525 (SMPTE) standard: Lines 14 and 16 625 (UK) standard: Lines 19 and 21	DISABLED ENABLED NOT SUPPORTED
5 selectable Purchasable option.	#7 SUBTITLE/VBI ◂ 5/10 ▸ GCR INSERTION ENABLED	Enable/disable the Ghost Cancellation Reference. This only appears on the SDI output NOT the analogue output.	525 standard: Line 19 625 standard: Line 318	DISABLED ENABLED NOT SUPPORTED
6 selectable	#7 SUBTITLE/VBI ◂ 6/10 ▸ CC / VCHIP ENABLED	Enable/disable the presence of Closed Caption / VCHIP data to be monitored and to enable or disable its reinsertion into the VBI. Refer to *Chapter 6, Preventive Maintenance and Fault-finding* for setting information.	525 standard: Line 21	Line 1: CC / VCHIP Line 2: ENABLED DISABLED NOT SUPPORTED

Page	Display	Description	Options	
7 selectable Purchasable option.	#7 SUBTITLE/VBI ◀ 7/10 ▶ 525 REINSERTION LINE 21 ENABLED	This menu controls the insertion of individual lines of VBI data received over-air, e.g. WSS, Video Index. There is no effect on the reinsertion of Closed Captions / VCHIP data, EBU Teletext or Test Signals as they have their own control menus. However, if VBI is on a separate PID, then 525 Reinsertion will have an effect on the VBI services listed. Where VBI is on a separate PID, the PID detail will not appear on any of the Front Panel displays.	525 standard: Lines 14 to 22 (Line mirroring is used)	DISABLED ENABLED
8 selectable Purchasable option.	#7 SUBTITLE/VBI ◀ 8/10 ▶ 625 REINSERTION LINE 21 ENABLED	This menu controls the insertion of individual lines of VBI data received over-air, e.g. WSS, Video Index. There is no effect on the reinsertion of Closed Captions / VCHIP data, EBU Teletext or Test Signals as they have their own control menus.	625 standard: Lines 11 to 23 (Line mirroring is used)	DISABLED ENABLED
9 selectable	#7 SUBTITLE/VBI ◀ 9/10 ▶ DEFAULT SUBTITLES ENGLISH NORMAL	This menu allows the default subtitle language and type to be specified for the DVB subtitle decoder.		Language: See *Annex E*. Type: See *Menu #3, page 4* for type definitions.
10 selectable	#7 SUBTITLE/VBI ◀ 10/10 SUBTITLES ENABLED	This menu allows the user to enable or disable the reinsertion of subtitles into the VBI.		DISABLED ENABLED

Table C.18 shows the correct operation for 4:2:0 mode. However, for 4:2:2 mode, the VBI can be encoded as video at the Encoder. The Receiver auto-detects this and switches into pass-through mode. In this mode, any VBI can be transferred.

> NOTE...
> When in video pass-through mode, the pages displayed under menu #7 may not be correct.

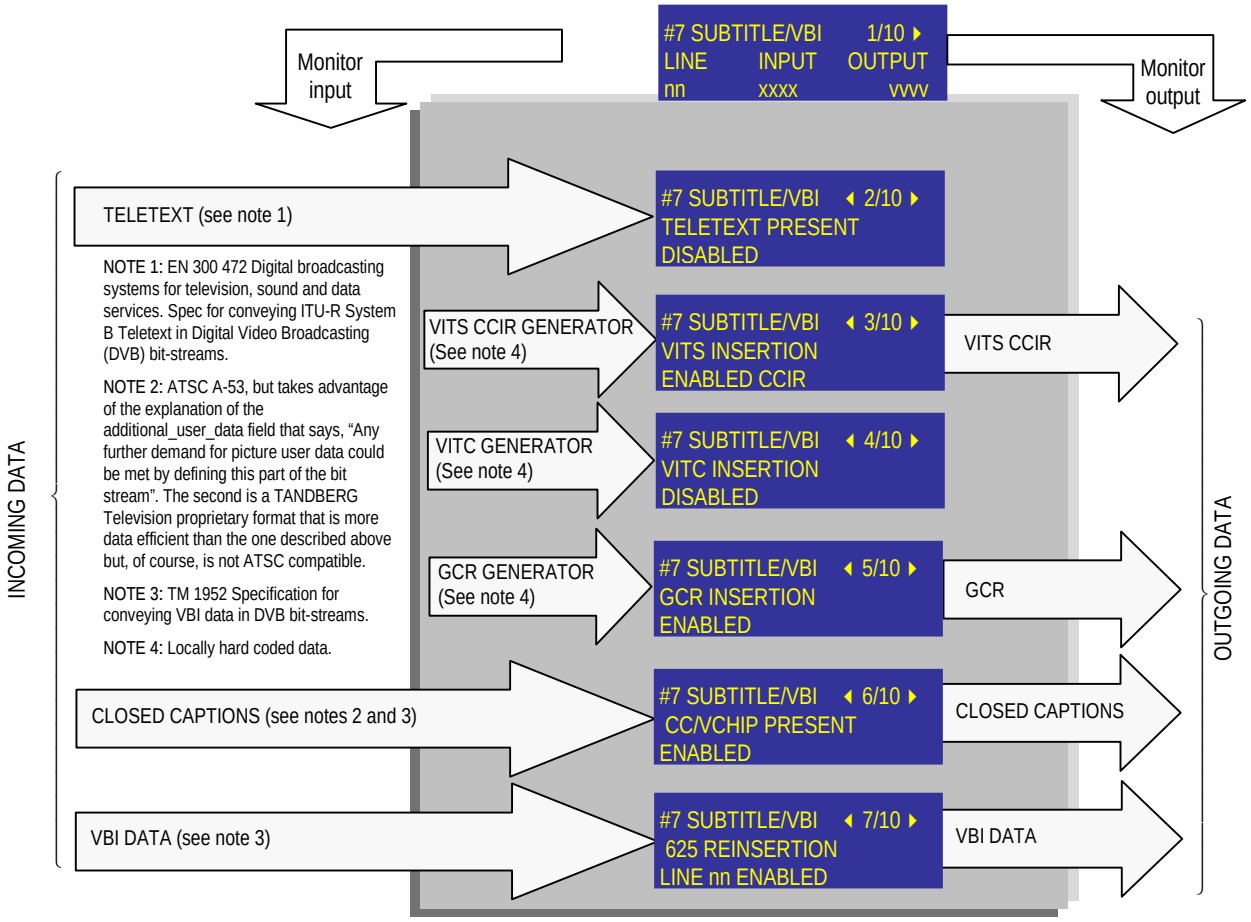

Figure C.6: Building Up the VBI Output Data

C.11 Audio 1 Menu (#8)

This menu group allows Audio 1 to be configured and its status to be checked; it has 7 pages if the AC-3 Downmixing option is installed. The word OK or FAIL appears in line 1 on all pages dependent on whether the primary audio module is running.

Table C.19: Audio 1 Menu (#8) Pages

Page	Display	Description	Options
1	#8 AUDIO 1 [OK] 1/6 ▸ LANGUAGE DOLBY DIG ENG (L) GER (R) 1FF0	This page displays the language that the audio module is currently decoding. A stereo channel can contain two mono languages (as shown). • If the Audio decoder status is FAIL, ------- is displayed. • If the audio stream is Dolby Digital encoded, DOLBY DIG appears on line 2.	See *Annex E* for a list of languages.
2 selectable	#8 AUDIO 1 [OK] ◂ 2/6 ▸ OUTPUT ANALOGUE	The audio output can be configured using this page. If required, M2/Pxx/932 models (analogue outputs only) can feed received Dolby Digital to the output for processing by an external Decoder.	Refer to *Table C.20*.
3 selectable	#8 AUDIO 1 [OK] ◂ 3/6 ▸ DEFAULT LANGUAGE ENGLISH	Set the default language for Audio 1.	See *Annex E* for a list of languages.
4 selectable	#8 AUDIO 1 [OK] ◂ 4/6 ▸ ROUTING NORMAL	Set the audio output routing.	NORMAL LEFT TO BOTH RIGHT TO BOTH
5 selectable	#8 AUDIO 1 [OK] ◂ 5/6 ▸ SYS CLIPPING LEVEL 12 DB	Sets the audio gain to compensate for the attenuation in the encoding process. Specified by DVB to be +18 dB.	6 dB – 18 dB.
6 selectable	#8 AUDIO 1 [OK] ◂ 6/6 LEVEL - | + n.n DB ✳	This page sets the analogue audio output level referenced to the clipping level. In EDIT mode, the SELECT control changes the level setting in steps of 0.1 dB. (The change is not effective until the SAVE button is pressed).	±3.0 dB. Factory default is 0 dB referenced to the clipping level set in page 5.

Table C.20: Audio Output Options

Model	Legend	Description
All models	ANALOGUE	Analogue audio is carried on both left and right outputs.
	IEC958 COMPRESSED	Compressed up to 5 + 1 on right output (only if input stream is Dolby Digital encoded).
M2/Pxx/94x only	IEC958 PROFESSIONAL	Uncompressed stereo on Right output that conforms to AES/EBU formatting.
	IEC958 CONSUMER	Uncompressed stereo on Right output that conforms to SPDIF formatting.

If the AC-3 down-mixing option is installed (available as an option) then the page shown in *Table C.21* is displayed. If the AC-3 decoder is presented with an elementary stream with more than two channels, the decoder down-mixes them to produce a stereo pair. The AC-3 Standard allows for downmixing to a Dolby Pro Logic compatible stereo signal (designated LT RT) or a conventional stereo signal (designated LO RO).

Table C.21: AC-3 Down-mixing

Page	Display	Options
7 selectable	#8 AUDIO 1 [OK] ◂ 7/7 AC3 DOWNMIXING MODE LT RT	LO RO (CONVENTIONAL STEREO: Stereo without Dolby Pro Logic Surround Sound). LT RT (PRO LOGIC STEREO: Stereo compatible with Dolby Pro Logic Surround Sound).

C.12 Audio 2 Menu (#9)

The selections for Audio 2 are identical to those for Audio 1.

C.13 Conditional Access Menu (#10)

C.13.1 Introduction

This menu group allows the status and configuration of the Conditional Access (CA) module to be checked.
The structure and content of this group depends on the CA system. The available CA options are:

- No conditional access
- VideoGuard
- Remote Authorisation System (RAS)
- VideoGuard and RAS

C.13.2 Menu #10 (With No Conditional Access)

Table C.22: Menu #10 Pages with no Conditional Access Installed

Pages	Display	Description	Options
1	#10 CA 1/2 ▸ SERVICE STATUS VGUARD UNAUTHORIZED	This page displays the current status of the conditional access module.	
2	#10 CA ◂ 2/2 NO CA INSTALLED	If neither VideoGuard nor RAS is installed, this non-editable page is displayed.	

C.13.3 Menu #10 (VideoGuard)

Table C.23: VideoGuard Conditional Access menu (#10) Pages

Page	Display	Description	Options
1	#10 CA 1/13 ▸ SERVICE STATUS VGUARD AUTHORIZED	This page displays the current status of the conditional access module.	See *Table C.24*.
2	#10 CA ◂ 2/13 ▸ STATUS CARD REMOVED	This is the menu displayed if the VideoGuard CA system is installed. It provides CA status information.	See *Table C.25.*
3	#10 CA ◂ 3/13 ▸ CAS ID 2305	This page displays the current CA system ID.	
4 selectable	#10 CA ◂ 4/13 ▸ VGUARD CUSTOMER ID DIRECTOR	This menu displays the current VideoGuard customer ID. (Software version 2.2 and later.) If this is changed, the unit MUST be repowered with the appropriate smart card in place Factory default is DIRECTOR.	
5	#10 CA ◂ 5/13 ▸ CA CODE VERSION VERSION n n n n	This page displays the CA code version.	
6	#10 CA ◂ 6/13 ▸ CA BOOT VERSION VERSION n nn	This page displays the CA boot code version.	
7	#10 CA ◂ 7/13 ▸ MODEL NUMBER XXX nnn	This page displays the Alteia model number.	See *Chapter 1* for a list of model numbers and short description.
8	#10 CA ◂ 8/13 ▸ HARDWARE TYPE nn	This page displays the hardware type.	
9	#10 CA ◂ 9/13 ▸ MANUFACTURER NUMBER nn	This is a unique identifier that allows a unit to be identified by the CA system.	Set by the manufacturer.
10	#10 CA ◂ 10/13 ▸ DOWNLOAD STATUS XXX YY TT-NN CCC	This page displays codes relating to the download status.	See *Table C.26* to *Table C.31* for option details.
11 selectable	#10 CA ◂ 11/13 ▸ MED PRIORITY STREAM SYNC DATA	The VideoGuard CA system can only decrypt six different elementary streams. There are eight specified, so these two pages select which streams remain encrypted. The medium priority stream is de-scrambled in preference to the low priority stream. Medium priority has SYNC as its default and Low priority has ASYNC as its default. Software version 2.3 and later	Models with suffix B only (e.g. M2/PSR/942B): VIDEO, AUDIO 1, AUDIO 2, TELETEXT[5], VBI, DVB SUBTITLES, ASYNC DATA, SYNC DATA[6]. Other Models: NONE
12 selectable	#10 CA ◂ 12/13 ▸ LOW PRIORITY STREAM ASYNC DATA		

[5] Teletext is only available on models with suffix B, e.g. M2/PSR/942B.
[6] Synchronous, high-speed, data is only available on models with suffixes A or B, e.g. M2/PSR/942A.

Table C.24: Conditional Access Status Messages (Menu #10, Page 1)

Associated Text	Description	Authorised LED
NO SERVICE SELECTED		LED is OFF
CLEAR OR UNKNOWN CA		LED is OFF
RAS 1	A stream scrambled with RAS 1 has been detected.	LED blinks GREEN
RAS 2 AUTHORIZED	A stream scrambled with RAS 2 has been detected and the unit is authorised to de-crypt it. This only appears if RAS CA software is installed.	LED is GREEN
RAS 2 UNAUTHORIZED	A stream scrambled with RAS 2 has been detected and the unit is not authorised to de-crypt it. This would happen if RAS CA software were not installed.	LED is RED
VGUARD AUTHORIZED	A stream scrambled with VideoGuard has been detected and the unit is authorised to de-crypt it. This only appears if the appropriate version of VideoGuard CA software is installed.	LED is GREEN
VGUARD UNAUTHORIZED	A stream scrambled with VideoGuard has been detected and the unit is not authorised to de-crypt it. This would happen if the appropriate version of VideoGuard CA software were not installed. The reason for not being authorised is given in the VideoGuard menu (page 2), see *Table C.25*.	

Table C.25: Conditional Access System Messages (Menu #10, Page 2)

Associated Text	Description
CARD INSERTED	Card present and inserted in the Alteia
CARD REMOVED	Card not present
CARD INVALID	The card inserted is not valid for descrambling the selected service
SERVICE BLOCKED	The selected service has been blocked by the broadcaster
INVALID PACKET	The CA software has received an invalid packet
CARD UNAUTORIZED	The card is unauthorised to descramble the selected service
HARDWARE FAILURE	The CA system has suffered a hardware failure
CLR BUT RESTRICTED	The selected service is in the clear but viewing is not permitted
SRV BLACKED OUT	The viewing of this service is not permitted by the broadcaster
SERVICE EXPIRED	The selected service has expired
SECURITY PROBLEM	There is a security problem with the CA system
NO EMPTY PPV SLOTS	There are no empty PPV slots
INSUFFICIENT CREDITS	There are insufficient credits on the smart card in use
PAIRING ERROR	This is the wrong card for this Alteia
PPV NOT AVAILABLE	Purchase not permitted without call-back ability
USE NEW CARD	Use new card – old card already chained
PURCHASED FAILED	PPV purchased failed
BAD PPV PACKET	Purchase failed
SPECIAL BIT SET	Special bit set
PURCHASE OK	Purchase successful
PURCHASE NOT OK	Purchase failed

Table C.26: Download Status - Percentage (XXX)

Percentage (XXX)	Description
000 - 100	0% complete to 100% complete

Table C.27: Download Status - Status (YY)

Status (YY)	Description
00	Idle
01	Running
02	Aborted
03	Wait User
04	Wait Service
05	Wait Section
06	Finished

Table C.28: Download Status – Error Count (CCC)

Error Count (CCC)	Description
000 - 255	Wrap around count of errors

Table C.29: Download Status – Common Download Errors (TT-NN)

Error Type and Number (TT-NN)	Description
04-00	No error (initial state)
02-14	Section unavailable (PMT)
03-14	Section unavailable (CDS)
00-09	Software already in flash (general)
02-16	Download not in service (PMT)
03-18	Incorrect software received (CDS)
03-22	Invalid signature (CDS)
00-08	Incorrect switch version (general)
00-07	Timed out (general)

Table C.30: Download Status – Error Type (TT)

Error Type (TT)	Description
00	General Error
01	Section Error
02	PMT Error
03	CDS Error
04	No Error

Table C.31: Download Status – Error Number (NN)

Error Type (TT)	Description
00	No error
01	Code verification error
02	Program flash failure
03	Unexpected OS message
04	Unexpected return
05	Unexpected event
06	Timer not available
07	Timed out
08	Switch no version
09	Already in flash
10	No inactive code
11	Cannot lock section
12	Desc not found
13	Invalid header
14	Section unavailable
15	Code stream not found
16	Not in service
17	CDS invalid CDS
18	Incorrect received
19	Software size invalid
20	SW desc inconsistent
21	CDB section not found
22	Invalid signature

C.13.4 Menu #10 (RAS)

If RAS is enabled, then a further page is displayed under menu #10.

Table C.32: Additional RAS Menu associated with Menu #10

Page	Display	Description	Options
13 selectable	#10 CA ◀ 13/13 CA MODE DSNG KEY RAS FIXED XXXXXXX	The DSNG Encoder has its own variant of RAS1 encryption. In order to de-scramble the signal, the Alteia should be put into the RAS MODE - DSNG and the DSNG KEY must be entered.	RAS MODE — FIXED (default) DSNG, Secondary, Disabled. DSNG KEY — 7 digits to match DSNG (default ≡ 0000000).

C.13.5 Menu #10 (BISS)

If BISS is enabled, the following pages are displayed in menu #10.

Table C.33: Additional BISS Menu Pages Associated with Menu #10

Page	Display	Description
14 selectable	#10 CA ◄ 14/15 BISS MODE SW MODE 1 XXXXXXXXXXX	Please refer to TANDBERG Television Customer Services regarding the use of BISS equipment.
15 selectable	#10 CA ◄ 15/15 BISS - - E ACTIVE ID USER 1 XXXXXXXXXXXXX	Please refer to TANDBERG Television Customer Services regarding the use of BISS equipment.

C.14 Data Menu (#11)

Table C.34: Data Menu (#11) Pages

Page	Display	Description
1	#11 DATA 1/4 ► ASYNC BITRATE OK 9600 BAUD	This page displays the status and baud-rate of the asynchronous data module (supported after v2.1). • If the module is running, the page displays the legend OK and shows the current baud-rate. • If the module is not running, the page displays the legend FAIL and the BITRATE is shown as - - - - -.
2	#11 DATA ◄ 2/4 ► SYNC BITRATE OK 64 KBITS/S	This page displays the status and baud-rate of the synchronous data module. Only available on models with suffix B only (e.g. M2/PSR/942B). • If the module is running, the page displays the legend OK and shows the current bit-rate. • If the module is not running, the page displays the legend FAIL and the BITRATE is shown as - - - - -.
3 selectable	#11 DATA ◄ 3/4 ► TSO ENCRYPTED	This CA dependent page allows selection of the route the transport stream takes within the unit. • ENCRYPTED: Select encrypted if the transport stream is to pass to the TSO without going through the CA module. Depending on the CA system used, the data will be either partially or fully decrypted. See CAUTION following this table.

CAUTION...

Software version 2.1.1 or earlier.

In the M2/PTR/942 receiver, the Encrypt mode (Menu #11, page 3) should always be used.

C.15 Timers Menu (#12)

This set of pages allow the current time and date to be set. It also allows a time to be allocated to the operation of an auxiliary relay or to reconfigure the unit to a specified preset.

> NOTE...
> The time is also set from a valid incoming transport stream.

Table C.35: Timers Menu (#12) Pages

Page	Display	Description
1	#12 TIMERS 1/2 ▸ TIME DATE 13:30 11 Jun 2000	This page displays the current time and date being used by the Alteia. • If the unit is locked to a stream, this is locked to time information contained in the stream. • If the lock is lost, the unit attempts to keep the time locally until lock is reacquired. • If the unit has not locked to a valid stream since power up, the time and date fields are set to ----------
2 selectable	#12 TIMERS ◂ 2/2 TIME ZONE GMT+00:00	This page allows the entry of local time information. 00.00 (default) local offset. The time can be altered in increments of 30 minutes.

C.16 System Menu (#13)

C.16.1 Introduction

The set of pages shown in *Table C.36* is modified if the Director system is installed and the unit is in LOCAL LOCKOUT.

Versions 2.2 and later have 21 pages (pages 12 and 13 removed)

Table C.36: System Menu (#13) Pages

Page	Display	Description	Options
1 selectable	#13 SYSTEM 1/23 ▸ CONTROL MODE LOCAL ONLY	This page allows the operating mode of the Alteia to be selected. • The unit can be in either LOCAL ONLY (front panel) or REMOTE ONLY. • If the receiver is part of an Director Systems, the receiver can also be in OVER-AIR or LOCAL LOCKOUT mode.	
2 editable	#13 SYSTEM ◂ 2/23 ▸ SET PIN ✳✳✳✳	Director only: Changing the PIN is accomplished by entering the current PIN number then pressing the SAVE button. This displays the page shown. Page 2 allows the new PIN to be set and the setting confirmed. This is used to set a new PIN to override the LOCAL LOCKOUT state. This page is displayed as a confirmation for the setting.	
3 editable	#13 SYSTEM ◂ 3/23 ▸ REMOTE ADDRESS 341	Sets the Remote Control address of the unit.	3 LSDs of serial number (default)
4 selectable	#13 SYSTEM ◂ 4/23 ▸ REMOTE INTERFACE RS232	Switches the Remote Interface between RS-232 (default) and RS-485.	
5 selectable	#13 SYSTEM ◂ 5/23 ▸ LCD CONTRAST - ✳ +	Allows the LCD display contrast to be set.	

Page	Display	Description	Options
6	#13 SYSTEM ◀ 6/23 ▶ SELF TEST REPORT NO FAULTS REPORTED	The displays the result of the power-up self-test.	
7	#13 SYSTEM ◀ 7/23 ▶ MODEL PSR / 940	Displays the Model number of the unit.	
8	#13 SYSTEM ◀ 8/23 ▶ MODEL OPTIONS ASI / DAC3/ VG05 / RAS	Displays any installed options.	
9	#13 SYSTEM ◀ 9/23 ▶ DEMUX PART NUMBER Xnnnn	This set of menus allows the make up of the Demultiplexer card to be identified.	
10	#13 SYSTEM ◀ 10/23 ▶ DEMUX SERIAL NUMBER XXXXXXXX		
11	#13 SYSTEM ◀ 11/23 ▶ DEMUX APP CODE VER XXXXXXXXXX		
12	#13 SYSTEM ◀ 12/23 ▶ DEMUX CORE CODE VER XX.XX	This is the version on the manual cover.	
13	#13 SYSTEM ◀ 13/23 ▶ DEMUX DRV CODE VER XX.XX	Removed on version 2.2 and later.	
14	#13 SYSTEM ◀ 14/23 ▶ DEMUX DIAG CODE VER XX.XX	Removed on version 2.2 and later.	
15	#13 SYSTEM ◀ 15/23 ▶ OUTPUT PART NUMBER S8715-1	This allows the output card to be identified.	
16	#13 SYSTEM ◀ 16/23 ▶ U / P PART NUMBER XXXXXXXX	This allows the microprocessor card to be identified.	
17	#13 SYSTEM ◀ 17/23 ▶ U / P CODE VERSION XXXXXXX	This allows the code version of the microprocessor card to be identified.	
18	#13 SYSTEM ◀ 18/23 ▶ I / P PART NUMBER S8675-1	This allows the input card to be identified.	
19	#13 SYSTEM ◀ 19/23 ▶ I / P CODE VERSION NOT APPLICABLE	This allows the code version of the input card to be identified.	
20	#13 SYSTEM ◀ 20/23 ▶ RESTORE SYSTEM DEFAULTS	This menu allows the factory defaults to be restored. It does not reset the Local Override PIN or Service Presets. See *Annex F* for Factory Defaults.	
21 editable	#13 SYSTEM ◀ 21/23 ▶ RESET LOCKOUT PIN * * * * * * * * * * * *	Allows the 4-digit PIN used to override the LOCAL LOCKOUT mode to be reset to a known value (0000). This is used in emergencies only.	13-digit PIN
22 selectable	#13 SYSTEM ◀ 22/23 ▶ SMALL RBUFF MODE DISABLE	This menu allows the receiver's small rate buffer mode to be enabled or disabled. When decoding a signal generated by one of the M2/ENC/E5xxx Encoders or any other manufacturers Encoder, the small rate buffer should be disabled. For any earlier Encoder, the small rate buffer should be enabled.	ENABLE, DISABLE (Default)
23 selectable	#13 SYSTEM ◀ 23/23 525 VIDEO START LINE 23	This allows the start line for 525-line standard to be specified.	22, 23

C.16.2 Using the SMALL RBUFF MODE (Menu #13, Page 22)

When to Disable the SMALL RBUFF MODE

Disable the SMALL RBUFF MODE when the transport stream has been encoded by any of the following families of TANDBERG Television Encoders:

- System 3000 M2/ENC/E5xx0
- evolution *5000* M2/ENC/E5xx1

Disabling the buffer is the factory default.

When to Enable the SMALL RBUFF MODE

Enable the SMALL RBUFF MODE when the transport stream has been encoded by any of the following families of TANDBERG Television Encoders

- System 3000 Mobile Contribution Encoders M2/ENC/E54xx and M2/ENC/E5500
- System 3000 12U and 6U Encoders M2/EDS[3]/…

If trouble is encountered when decoding a non-TANDBERG 4:2:2 transmission, enabling the Small Rate Buffer may resolve the problem.

C.16.3 Director System

Using the PIN Number

The PIN number is required so that the LOCAL LOCKOUT command (sent over-air) can be temporarily overridden.

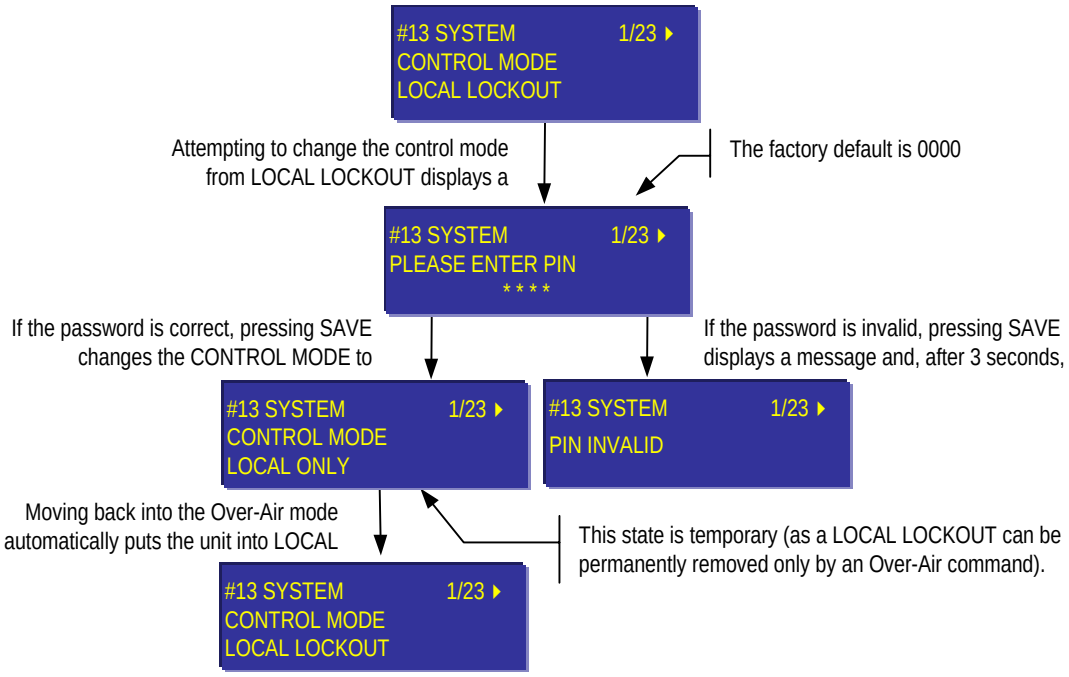

Figure C.7: Using the PIN Number (Director Systems)

Setting the PIN Number

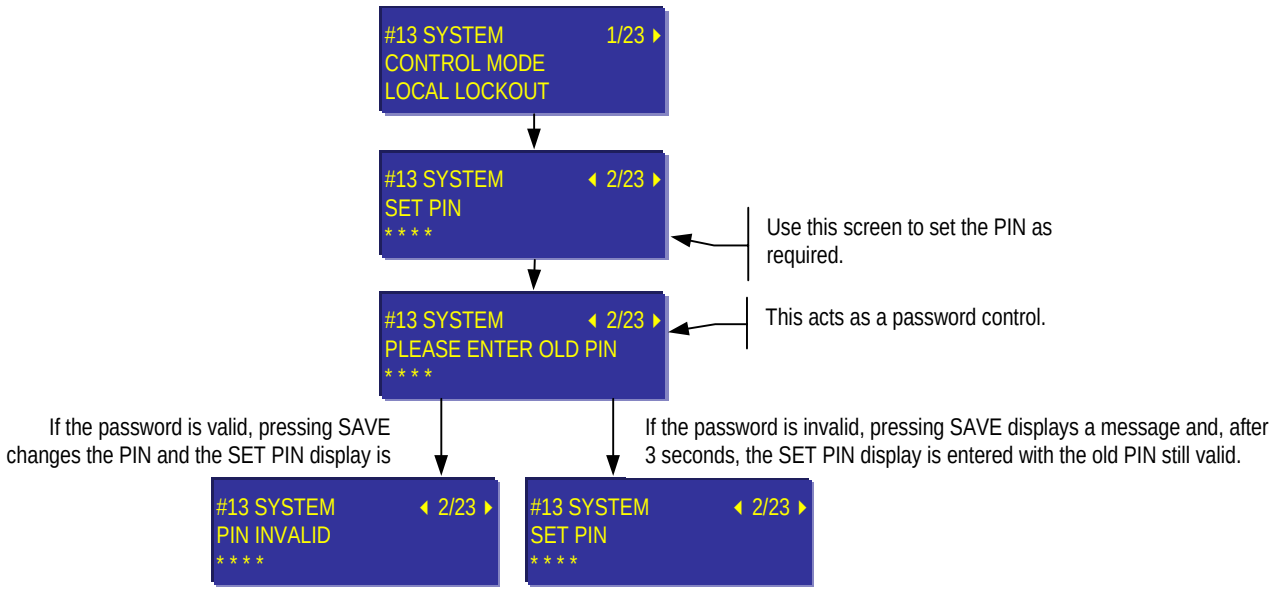

Figure C.8: Setting the PIN Number (Director Systems)

C.17 Engineering Menu (#14)

The pages in this menu display low-level system status information. It is accessed by pressing the **RIGHT** button whilst rotating the **MENU** control.

Table C.37: Engineering Menu (#14) Pages

Page	Display	Description
1	#14 ENGINEERING 1/12 ▸ SERVICE ID	Current Service setting.
2	#14 ENGINEERING ◂ 2/12 ▸ TRANSPORT STREAM ID	Current Service setting.
3	#14 ENGINEERING ◂ 3/12 ▸ ORIGINAL NETWORK ID	Current Service setting.
4	#14 ENGINEERING ◂ 4/12 ▸ NETWORK ID	Current Service setting.
5 editable	#14 ENGINEERING ◂ 5/12 ▸ VIDEO PID	The PID is reset by reselecting the Service from the Service Menu (#3).
6 editable	#14 ENGINEERING ◂ 6/12 ▸ AUDIO1 PID	The PID is reset by reselecting the Service from the Service Menu (#3).
7 editable	#14 ENGINEERING ◂ 7/12 ▸ AUDIO2 PID	The PID is reset by reselecting the Service from the Service Menu (#3).
8 editable	#14 ENGINEERING ◂ 8/12 ▸ PCR PID	Current Service setting.
9 editable	#14 ENGINEERING ◂ 9/12 ▸ ASYNC DATA PID	The PID is reset by reselecting the Service from the Service Menu (#3).
10 editable	#14 ENGINEERING ◂ 10/12 ▸ SYNC DATA PID	The PID is reset by reselecting the Service from the Service Menu (#3). Supported by models having the suffixes A or B (e.g. M2/PSR/942B).
11	#14 ENGINEERING ◂ 11/12➢ TELETEXT DATA NOT SUPPORTED	Current Service setting. (Not supported at ver 2.3; Version 2.32 supports Teletext).
12	#14 ENGINEERING ◂ 12/12 EMM PID NOT SUPPORTED	Current Service setting. (Not supported at ver 2.3.)

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Annex D

Using the Alteia [*plus*] with the Director System

Contents

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D.1 Configuring Alteia for use with Director

D.1.1 Getting Started

You must have VideoGuard CA, a Director smart card and be tuned to a Director stream.

Insert the Director smart card before tuning to the service.

Check that the unit has VideoGuard installed (Menu #13, page 8).

Set the Receiver to OVER-AIR mode (Menu #13, page 1). The REMOTE CONTROL LED should be lit.

Check that the unit is authorised for de-scrambling the selected service (Menu #10, page 1 SERVICE STATUS should read VGUARD AUTHORIZED.)

> NOTES...
>
> 1. The CA system is unrecognised if the service is shown as CLEAR (that is, unscrambled).
> 2. In OVER-AIR mode, menu items can not be edited. The Receiver should be moved to LOCAL control for editing.

D.1.2 DO NOT...

Repeatedly insert and remove the Director smart card.

D.1.3 Using the Alteia in the Over-air Mode

This section describes the behaviour of the Alteia when it is controlled over-air using the **Receiver Control** part of the Director PC GUI.

It is assumed that the Receiver is entitled to receive Director commands. Consult the Director Control PC GUI manual for more information.

The following commands are supported:

- Display On-screen Display (OSD) Messages
- Store Carrier Data
- Set Power-up Channel
- Force Carrier Retune
- Force Service Selection
- Set Emergency Channel
- Set Relays
- Set Default Language
- Local Lockout
- Abort NCP Command
- Fingerprinting Overt/Covert

D.2 Response to Over-air Commands

D.2.1 General

This section describes the response of the Receiver to Over-air commands.

D.2.2 Display On-screen Display (OSD) Messages

Displays a text string on the LCD front panel. The display is forced to MENU # 1 page 6, STATUS MESSAGE. The message is displayed for a set time or until cleared from the Head-End.

> NOTE...
> Unlike the previous System 3000 Receivers, the viewing Monitor does NOT display messages (except fingerprinting), all user interaction is via the front panel.

D.2.3 Store Carrier Data

Stores a particular service as a preset channel. Subsequently, the head-end can force a service selection from this preset – see **Force Service Retune** following. Director presets are different to those set up in **LOCAL ONLY** mode (see *MENU #2 PRESET*). They are not visible to the user on the front panel LCD.

D.2.4 Set Power-up Channel

Sets the Receiver power-up service. If the **Emergency Channel** has not been set, it is set to this service.
If neither the **Emergency** nor **Power-up Channel** have been set, the Alteia will be in an indeterminate state at power-up.

> NOTE...
> This is different to the situation in LOCAL ONLY mode, which chooses the service it last received.

D.2.5 Force Carrier Retune

Forces the Receiver to retune to a different frequency and/or service. This could be a service on a different feed (e.g. LNB input 2) or a service previously set up using the **Store Carrier Data** command.

Timeouts allow the Receiver to revert to the original service after the time has expired. If the command fails, the **Emergency** channel is used. Enter a timeout of not less than 15 secs (except 0 to permanently switch to the new service) to give the Receiver time to retune.

This command fails if the LNBs are not set up realistically (which may happen if the source is changed).

Take care when retuning to services on different LNB inputs. Force Service Selection is more efficient if the required service is on the same frequency and LNB input.

D.2.6 Force Service Selection

Forces the Receiver to decode a different service or stored channel (which may require a retune). The command is generally used to hop between services. The Director system has to be informed of the frequency, FEC-rate and symbol-rate for each stream. This is set up using the MCC or MEM. (The Director User Interface and the Director core require restarting to register changes that have been set in the MCC or MEM.)

D.2.7 Set Emergency Channel

Sets the service to use in the event of a selection failure. Is activated after a specified time has elapsed. If not set, the Power-up Channel is assumed. Setting the Emergency Channel allows a failure situation to be recovered.

D.2.8 Set Relays

Switches the general-purpose relays. This command does not affect the summary alarm relay.

D.2.9 Set Default Language

Sets an audio decoding preference for Audio 1 and Audio 2 when selecting a service. The Alteia supports a number of default languages, please refer to the manual. If the command does not contain a language on the supported list, it is ignored.

D.2.10 Local Lockout

Locks out the LOCAL CONTROL mode but status information can still be viewed. All Director commands are functional. The Receiver can be unlocked locally using a PIN number or over-air using Allow Local Access.

D.2.11 Abort NCP Command

Aborts commands that have been sent but not executed. Fingerprinting and Enable/Disable Product cannot be aborted. If a command is received which has an expired execute time, it is acted on immediately.

D.2.12 Fingerprinting Overt/Covert and Enable/Disable Product

The Receiver fully supports this function.

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Annex E

Language Abbreviations

The Alteia supports the following languages. These are shown in alphabetical order.

NO	LANGUAGE	ABBREVIATION
5	ARABIC	ARA
	BASA	BAS
14	BENGALI	BEN
135	CHINESE	CHI
19	CZECH	CZE
21	DANISH	DAN
82	DUTCH	DUT
25	ENGLISH	ENG
31	FINNISH	FIN
34	FRENCH	FRE
22	GERMAN	GER
24	GREEK	GRK
40	GUJARATI	GUJ
52	HEBREW	HEB
42	HINDI	HIN
44	HUNGARIAN	HUN
50	ICELANDIC	ICE
49	INDONESIAN	IND

NO	LANGUAGE	ABBREVIATION
36	IRISH	IRI
51	ITALIAN	ITA
53	JAPANESE	JAP
55	JAVANESE	JAV
61	KOREAN	KOR
	MALAY	MAY
83	NORWEGIAN	NOR
90	PORTUGESE	POR
94	ROMANIAN	ROM
95	RUSSIAN	RUS
27	SPANISH	SPA
112	SWEDISH	SWE
117	THAI	THA
123	TURKISH	TUR
128	URDU	URD
130	VIETNAMESE	VIE

The following non-ISO languages are supported

LANGUAGE	ABBREVIATION
MAIN	ONE
AUX	TWO
INTERNATIONAL SOUND	INT
AUDIO 1	AAA
AUDIO 2	AAB
AUDIO 3	AAC
AUDIO 4	AAD
AUDIO 5	AAE
AUDIO 6	AAF
AUDIO 7	AAG
AUDIO 8	AAH
AUDIO 9	AAI
AUDIO 10	AAJ
AUDIO 11	AAK
AUDIO 12	AAL
AUDIO 13	AAM
AUDIO 14	AAN
AUDIO 15	AAO
AUDIO 16	AAP

The non-ISO languages allow tagging of audio without reference to specific languages. The system can then transmit two languages (Main and Auxiliary) which could be any type of audio.

NOTE...

The non-ISO languages need to be user defined in the MCC, MEM or Mobile Contribution Encoder for them to be available.

Annex F

Factory Defaults

Alteias are dispatched with the following factory defaults. These can be restored at any time using System Menu (#13). All other parameters are unaffected by restoring the factory defaults.

Menu	Page	Description	Default
#4 Input	2 (M2/PDU/...)	SOURCE	AUTO
	3 (M2/PSR/...)	RF INPUT	1
	9	LNB DC Output.	DISABLED
#5 Alarm	Various	RELAY - allocation of an alarm to an auxiliary relay contact.	NONE
		MASK - all alarms are unmasked so that they do contribute to the Summary Alarm.	NO
#6 Video	5	625 STANDARD	PAL I
	6	525 STANDARD	NTSC M
	7	FAIL MODE	BLANK
	8	ASPECT RATIO	16:9
	9	LEVEL.	0% (calibration unaffected)
Alteia *plus* only	10	EDH	DISABLED
	11	EMBEDDED AUDIO	DISABLED
		DID	2FF
	12	TEST PATTERN	DISABLED
	13	FRAME SYNC	DISABLED
	14	FRAME SYNC 625 OFFSET	0
	15	FRAME SYNC 525 OFFSET	Unaffected
#7 Subttle/VBI	2	TELETEXT PRESENT	Unaffected
	3	VITS INSERTION	DISABLED
	4	VITC INSERTION	DISABLED
	5	GCR INSERTION	DISABLED
	6	CC / VCHIP INSERTION	ENABLED
	7	525 REINSERTION	ALL DISABLED
	8	625 REINSERTION	ALL DISABLED
	9	DEFAULT SUBTITLES	ENGLISH NORMAL
	10	SUBTITLES	DISABLED

Menu	Page	Description	Default
#8 Audio	2	OUTPUT	ANALOGUE
	3	DEFAULT LANGUAGE	ENGLISH
	4	ROUTING	NORMAL
	5	SYS CLIPPING LEVEL	12 dB
	6	LEVEL - referenced to the System Clipping Level.	0 dB
	7	AC3 DOWNMIXING MODE	Lt Rt (Conventional Stereo)
#10 CA	4	VGUARD CUSTOMER ID (s/w ver 2.2 and later).	Unaffected
	11	MED PRIORITY STREAM - required by the VideoGuard CA system.	Unaffected
	12	LOW PRIORITY STREAM - required by the VideoGuard CA system.	Unaffected
	13	RAS MODE - type of control word.	FIXED
		DSNG TYPE - key.	000000
	14	BISS MODE	DISABLED
		KEY	000000000000
#11 Data	3	TSO	DECRYPTED
#12 Timers	2	TIMEZONE - allows a local offset to be entered.	Unaffected
#13 System	1	If Director installed – CONTROL MODE.	Unaffected
		LOCKOUT PIN	Unaffected
	2	If Director installed – PIN.	0000
	3	REMOTE ADDRESS - sets the remote control address of the unit.	Unaffected
	4	REMOTE INTERFACE - sets the remote control connector format.	RS-232
	5	LCD CONTRAST	Unaffected
	22	SMALL RBUFF MODE	DISABLED
	23	525 VIDEO START	23

Annex G

Quick Reference Guide

This annex brings together information that allows the Alteia to be put into service quickly.

G.1 Setting up the Input (Menu #4)

G.1.1 M2/PSR/9xx, M2/P8R/9xx Satellite Receiver

Table G.1 steps through the setting up the Satellite Receiver using menu #4. The transmission parameters must be known before starting.

Table G.1: Tuning the Satellite Receiver

Step	Action (Menu #4)
1.	Go to Menu #4, page 3 and select the RF Input. The receiver takes its signal from the input specified.
2.	Go to Menu #4, page 6, select the Polarisation and the Modulation Mode. Press SAVE.
3.	Go to Menu #4, page 7, select the LNB Type and enter the LNB Local Oscillator Frequency. Press SAVE. If the LNB is set to NONE, the LO frequency appears as a set of dashes. If NORMAL, the LO frequency is the current value. If set to DUAL, the LO frequency displayed is the lowest.
4.	If the LNB type is DUAL, go to page 8 and enter the LO FREQ 2 TYPE and switchover frequency (SW OVR FREQ). Press SAVE. A DUAL LNB has two LO frequencies, switching between them is by 22 kHz tone.
5.	Go to Menu #4, page 4 and enter the Satellite Channel Frequency. Press SAVE. This sets up the RF stage in the receiver.
6.	Go to Menu #4, page 5, select the FEC Rate and enter the Symbol Rate Press SAVE. This sets up the overhead rates.
7.	The Tuner should now be locked to the incoming transport stream. At this stage, the TUNER LOCK LED should light and the BER meter operate to show that the Receiver has picked up the signal.

G.1.2 M2/PTR/9xx Terrestrial Receiver

Table G.2: Tuning the DTTV Receiver

Step	Action (Menu #4)
1.	Go to Menu #4, page 8 and ensure the SIGNAL DEGRADATION mode is switched OFF. This is a test mode that degrades the picture by a known amount. The status of the SIGNAL DEGRADATION mode is shown in line 1 of pages 1 and 2 (alongside the label SD).
2.	Go to Menu #4, page 12 and choose the appropriate INPUT.
3.	Choose the UHF CHANNEL and required OFFSET. This starts the tuning process.
4.	Set the GUARD INTERVAL and OFDM CARRIER MODE to suit the system hardware. This automatically sets the channel spacing (can be checked on page 6). For version 2.8.3 on Go to Menu #4, page 15 and select AUTO MODE. This page allows the automatic selection of SPECTRUM INVERSION, GUARD INTERVAL and CARRIER MODE.
	If hierarchy is present (check on page 11), select the priority multiplex required. The final SAVE action will LOCK the receiver to the chosen incoming stream.

G.1.3 M2/PDU/9xx Decoder

Table G.3: Setting-up the Decoder

Step	Action (Menu #4)
1.	Go to Menu #4, page 2 and select the required input. This sets the input for the Alteia input. If Auto is chosen, ensure that the signal is only routed to one connector at a time.
2.	Press the SAVE button to store the option.

G.2 Service Configuration (Menu #3)

G.2.1 Setting Up a Service

Each transport stream may contain many Services. Menu #3 allows a Service to be chosen as current and the profile of its components to be specified.

Table G.4: Selecting a Service

Step	Action (Menu #3)
1.	Go to Menu #3, page 1 and select the required Service. The EDIT mode cannot be entered unless there are available Services. This page shows the total number of Services available in the incoming transport stream. Use EDIT and SELECT to select the required Service.
2.	Press SAVE. This stores the Service as the Current Service.

G.2.2 Setting Up the Power-up Service

Menu #2 allows a Service to be chosen as the Power-up default. Follow the steps in *Table G.5.*

Table G.5: Selecting a Power-up Service

Step	Action (Menu #2)
1.	Go to Menu #2, page 3 and select the required Service (or last valid service). This sets the service to which the Alteia will configure on power-up.
2.	Press SAVE. This stores the service as the power-up service.

G.2.3 Setting up a Pre-set Service

Follow the steps in *Table G.6* to store the current Service as a pre-set.

Table G.6: Setting up a Pre-set Service

Step	Action (Menu #2)
1.	Use the menus to set up the unit so that the required Service is current. This selects the Service and associated parameters for the pre-set process
2.	Display page 2 of the pre-set menu (#2). (The Service Name in this display is truncated to 11 characters) This displays the menu which allows the Current Service to be stored at a chosen location (00 - 19). If there is no Current Service, the menu display reads NOTHING TO STORE.
3.	Select a location to store the pre-set. The EDIT mode cannot be entered unless a valid Service being decoded. Use EDIT and SELECT to step through the stored items. This allows a specific location to be chosen. Any vacant locations are marked by the legend [EMPTY].
4.	Press SAVE. Confirmation is required before the selection is stored.
5.	CONFIRM the selection. This stores the current Service and its associated parameters as a pre-set in the selected location. This adds the Service to the list displayed on page 1.

G.2.4 Selecting the Default Audio Language

Page 3 of Menus #8 and #9 allows the audio channels default language to be specified. The Alteia uses the default languages, if it can't find these, then them first language specified in the PMT is used on Audio 1 and the second on Audio 2. Menu #3, Pages 2 and 3 can be used to override the default.

Table G.7: Selecting the Default Audio Language

Step	Action (Menu #8, #9)
1.	Go to Menu #8 or #9, page 3 as required. This displays the current default language.
2.	Select the required audio language(s). Use EDIT, SELECT and SAVE to select the required language.
3.	Press SAVE to store the choice. The language profile is now set.

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The following conventions are used in this manual: a page number entry in **bold** indicates a reference to a heading; a page number entry in *italic* is a reference to a table or figure; otherwise the page number indicates a reference to an entry on that page.

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