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Master Control Switcher

Automation Control Protocol SW-P-32

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Contents

Change Record

Issue	Date	DCR No
4	30/05/95	SW-DCR-0141
5	27/06/96	-
6	21/08/96	
7	26/09/96	-
8	12/09/97	-
9	18/03/98	-
10	06/05/98	-
11	06/07/98	-
12	29/09/98	-
13	05/10/98	
14	13/11/98	-
15	15/01/99	-
16	01/10/99	Added messages Set Source Gain, New Source Gain, Current Source Gain, New Audio Mode and Current Audio Mode. Corrected specification of Source Table Setup. Corrected specification of Current Version String. Replaced New Version String with Manual Insert Source 0.
17	15/08/00	Corrected the operation of response 0x7B. For TX Series Mixers this is still New Version String. Only for GVG440 does this change to Manual Insert Source Zero.
18	02/10/00	Added new messages for DSKs 3 and 4 (0x15, 0x16, 0x17, 0x18, 0x55, 0x56, 0x95, 0x96)
19	23/10/00	Added new message Take with late lead (0x3E)
20	30/11/00	Added new messages for DVE control (0x12, 0x52, 0x92)
21	12/03/01	Change DVE and DSK messages for implementation
22	30/09/02	Changed the New DSK Status message to include all the parameters of the Set DSK message.
23	15/04/03	Removed the following messages: Set Dsk Clip Level (0x27), Set Dsk Gain Level (0x28), Lead On (0x2C), Lead Go (0x2D), Lead Off (0x2E), Set Audio Over Rate (0x38), Take with Late Lead (0x3E) and their equivalent new and current responses. Added the following messages: Extended Transition Type (0x04), Extended Transition Rate (0x05), + their equivalent new and current responses, Audio PGM (0x20), Audio PST (0x21),
24	11/08/03	Put back Set Audio Over Rate (0x38), New Audio Over Rate (0x78) and Current Audio Over Rate (0xB8)
25	14/05/04	New Commands added in the TX520 & TX510. These include the ability to send time stamped commands on some messages. Also the ability for the controller to remotely specify whether it is being controlled from a panel and the ability for an automation system to remotely configure the channel assignments. <0X00> - Timestamp commands <0X18> - Remote channel assignment <0x19> - Remote panel connection configuration
26	28/06/04	<0x19> - Added extra comments for clarity

		<0X40> - Added time message received
27	24/11/2004	<0x37> - Modified command to add a separate config flag for each Audio Over. This enables each over to be configured either live or not. Added two new timed commands two <0x00>
28	13/12/2004	<0x77> - Modified command to add a separate config flag for each Audio Over Status. This enables each over to be configured either live or not.
29	24/11/2006	New Status Poll message added to report any system timeouts to the automation. <0x1D> Status Poll <0x5D> Status Poll reply
30	29/03/2007	<0x34> - Modified protocol to allow 0 to indicate no change to the L or R routing

1 INTRODUCTION

The document describes the protocol used to control the TX 520 Master Control Switcher unless states the 2645 controller version. This protocol is designed for use with the Pro-Bel automation controller.

2 ELECTRICAL SPECIFICATION

An RS485 4 wire link provides the medium for control communications. The normal electrical parameters used are:

RS485, 8 bit data, 1 stop bit, even parity, 38.4k baud.

3 SOFTWARE PROTOCOL

3.1 Message format

The message format used is very simple, and contains no byte counts, checksum or parity bits. The protocol uses a unique data byte FF hex as a start of message, followed by a message identifier and according to the message appropriate data bytes. This is shown below.

FF, <Message ID>, [Message data]

3.2 Automation Control Messages

The table on the following page defines the messages sent from the automation controller to the switcher.

All data is shown as hexadecimal data unless otherwise stated.

The release column is used to show those messages that have been implemented for which release of the protocol software. Other messages will be implemented at a later date as required.

Use	Header and Data	Parameters	Code Version
3.2.1 Time Stamped Cmd's	00,c,tttt,data	This message' wraps' existing commands with a timestamp. The system will execute these commands at the set time. E.g. for the message format SOM,<MessageID>,c,tttt,data where Data = <MessageID>,[message data] Control (c) (1 byte) = 0 – Clear = 1 - Set where tttt (4 byte) is H,M,S,F (hex) Hours = 0-23 Minute = 0-59 Seconds = 0-59 Frames= 0-29 The current commands that can be wrapped are:- 3.2.16 Take 3.2.17 Take Audio 3.2.18 Take Video 3.2.19 Run DVE Preset 3.2.21 Set Audio over source 3.2.22 Set DSK 3.2.28 Set Audio PGM 3.2.29 Set Audio PST 3.2.35 Set Multiple audio over active 3.2.44 Set Audio Over Levels Note – The Automation powered up command (02) will clear any time stamped events, events are also cleared when the mixer powers up.	TX520 & Tx510 (All)

Use	Header and Data	Parameters	Code Version
3.2.2 Set TransitionType	01,xx	xx = Transition type as follows: 01 V Fade 02 Fade and Take 03 Mix 04 Take and Fade 05 Cut 06 WIPE left to right horizontal wipe 07 WIPE top to bottom vertical wipe 08 WIPE outwards horizontal split 09 WIPE outwards vertical split 0A WIPE left to right diagonal wipe 0B WIPE top right corner wipe 0C WIPE top left corner wipe 0D WIPE outwards box wipe 0E WIPE outwards circle wipe 0F WIPE outwards diamond wipe 10 WIPE REVERSE left to right horizontal wipe 11 WIPE REVERSE top to bottom vertical wipe 12 WIPE REVERSE outwards horizontal split 13 WIPE REVERSE outwards vertical split 14 WIPE REVERSE left to right diagonal wipe 15 WIPE REVERSE top right corner wipe 16 WIPE REVERSE top left corner wipe 17 WIPE REVERSE outwards box wipe 18 WIPE REVERSE outwards circle wipe 19 WIPE REVERSE outwards diamond wipe 1A U Fade	Tx320 & Tx420 (V0.01) V1.09 U Fade Tx5xx (All)
3.2.3 Automation Powered Up	02	No parameters used. Mixer will respond with is current configuration Data (See Section 3.4).	Tx320 Tx420 0.01
3.2.4 Set Transition Rate	03,xx	xx = 0-99 (decimal) frames.	0.01
3.2.5 Extended Transition Type	04,xx,bb	xx = Transition type (see Set Transition Type command) bb = 01 – Video Only 02 – Audio Only	3.10
3.2.6 Extended Transition Rate	05,xx,bb	xx = 0-99 (decimal) frames bb = 01 – Video Only 02 – Audio Only	3.10
3.2.7 Set DSK 1 State	06,xx	xx = 00 Cut Off 01 Cut On 02 Mix Off 03 Mix On	0.01
3.2.8 Set DSK 2 State	07,xx	xx = 00 Cut Off 01 Cut On 02 Mix Off 03 Mix On	0.04

Use	Header and Data	Parameters	Code Version
3.2.9 Set Aux 2 bus Video + Audio	08,xx or 08,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) Or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.2.10 Set Tx bus Video	09,xx or 09,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) Or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.2.11 Set Tx bus Audio	0A,xx or 0A,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.2.12 Set Preset bus Video	0B,xx or 0B,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.2.13 Set Preset bus Audio	0C,xx or 0C,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.2.14 Set Aux 1 bus Video	0D,xx or 0D,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.2.15 Set Aux 1 bus Audio	0E,xx or 0E,7F,aa,bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.2.16 Take	0F	No Parameters	0.01
3.2.17 Take Audio	10	No Parameters Also performs a lead, depending on configuration.	0.04
3.2.18 Take Video	11	No Parameters	3.10

Use	Header and Data	Parameters	Code Version
3.2.19 Run DVE Preset	12,bb,pp,cc, rr, mm	bb = bitmap indicating which of following bytes have information in them. Byte 2**7 set means Initiate **DVE ON** transition Byte 2**6 set means Initiate **DVE OFF** transition Byte 2**0 set means set Effect number (pp) Byte 2**1 set means set Configuration mode (cc) Byte 2**2 set means set Rate (rr) Byte 2**3 set means set Move Profile (mm) pp = Preset number (0 - 255) where 0 = disable DVE cc = ConfigurationMode (DVE hardware specific) rr = Rate (0-99, decimal) frames, 0 = cut in DVE mm = MoveProfile (if Rate != 0): 0 = Linear 1 = Smoothed	3.01
3.2.20 Audio over Mixer	13,xx	xx = 00 Cut off 01 Cut on 02 Mix off 03 Mix on	0.01
3.2.21 Set Audio over source	14,xx	xx = Audio over number 1 - 4 (Single over mode only)	1.03
3.2.22 Set DSK	15,nn,vv,XX ,DD, RR,CH, CL,GH, GL	nn = DSK number (1..4) vv = 01: XX byte valid 02: DD byte valid 04: RR byte valid 08: CH and CL bytes valid 10: GH and GL bytes valid XX =00 Cut off 01 Cut on 02 Mix off 03 Mix on DD = DSK Source number 1..16 RR = DSK rate in frames.0..99 (decimal) frames. CH = High 6 bytes of clip level CL = Low 6 bytes of clip level GH = High 6 bytes of gain GL = Low 6 bytes of gain	V3.09
3.2.23 Remote Channel Assignment	18,xx,aa,bb	This command allows an external controller to assign source association to channel numbers. xx= Channel number 1-20 aa= Source association hi 7 bits bb= Source association lo 7 bits	TX520 & Tx510

Use	Header and Data	Parameters	Code Version
3.2.24 Remote Panel Assignment	19, Byte Count, MixerName, Separator, ?DeviceNam e, Separator	A TX controller can be connected to n different TX Desks and fader panels simultaneously. If more than one panel is assigned to a mixer controller the desks and panels mirror each other. Message format Header –- 0x019. Byte count hi byte – 14 bit number, bits 7-13. (message length – excluding SOM,CND and byte count) Byte count low byte – bits 0-6. Ttotal Message) Note Mixer and Device names <=8 characters, no spaces in the name. MixerName – Mixer name (n ASCII characters). Seperator – 0x00. ?DeviceName – Device name (n ASCII characters), where ? precedes the mixer name and specifies the required action ?= + Add device, - Remove device, * Make device exclusive. Device can be either a Mixer panel or fader panel. Separator – 0x00 For reassigning more than one device repeat the DeviceName and Separator. **NOTE –ONLY EXCLUSIVE MODE IMPLEMENTED**	TX520 & Tx510
3.2.25 Source Table Setup	1A,xx, aa,bb,cc, dd,ee,ff, gg	xx = Channel (source) number aa = First character of source name bb = Second character of source name cc = Third character of source name dd = Fourth character of source name ee = Machine type (not currently used) ff = Channel number (not currently used) gg = Pre-roll time in seconds(not currently used)	0.05
3.2.26 Status Poll	1D	No Parameters. Mixer will respond with Mixer Status byte (See Section 3.3.25)	Tx510 (V1.23)
3.2.27 Mixer Poll	1E	No parameters. Mixer will respond with Mixer Response message (See Section 3.3.26)	
3.2.28 Audio PGM	20,xx,dd	xx = fade rate, 0-99 (decimal) frames dd = 0 down, 1 up	3.10
3.2.29 Audio PST	21,xx,dd	xx= fade rate, 0-99 (decimal) frames dd = 0 down, 1 up	3.10

Use	Header and Data	Parameters	Code Version
3.2.30 Set Audio Over level	24,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01
3.2.31 Set Program audio level	25,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01
3.2.32 Set Source Gain	29,SH,SL,LV, LH,LL,RH,RL	SH = High 7 bits, SL = Low 7 bits of source (1-999) LV = Level number (1-4) LH = High 6 bits, LL = Low 6 bits of Left gain RH = High 6 bits, RL = Low 6 bits of Right gain (0x000-0xFFF, 0x800 = unity)	TX520 & Tx510
3.2.33 Set State	2B,xx,yy	Set state, where xx is state ID as follows: 01 = Automation control enabled and yy is the state as follows: 00 = FALSE 01 = TRUE	0.01
3.2.34 Set Over Rate	2C, BB R,R,R,R,R	BB Data filter b0-b3=Over1-4 , b4=PGM R= Fade rate 0-99 for Overs 1-4, PGM (Multiple over mode only)	TX520 & Tx510
3.2.35 Set Multiple Audio overs active	2D,X1,X2,X3,X4,X5	Activate multiple Overs X1-X4 = Over 1 to Over 4 X5 = PGM XN =00 Cut off 01 Cut on 02 Mix off 03 Mix on 04 No change (Multiple over mode only) – Over Sources will only set if they have already been selected (ref CMD 36)	TX520 & Tx510
3.2.36 Lag On	2F,rate	xx = fade rate, 0-99 (decimal) frames	Lagbox/
3.2.37 Lag Go	30		Lagbox
3.2.38 Lag Off	31		Lagbox / TX520 & Tx510
3.2.39 DSK 1 Setting	32,DD,RR	DD = DSK Source number 1..16 RR = DSK rate in frames. 0..99 (decimal frames)	3.10
3.2.40 DSK 2 Setting	33,DD,RR	DD = DSK Source number 1..16 RR = DSK rate in frames. 0..99 (decimal frames)	3.10

Use	Header and Data	Parameters	Code Version
3.2.41 Set Audio Mode	34, L1,R1,M1 L2,R2,M2 L3,R3,M3 L4,R4,M4	4 Stereo (8 mono) output channels have their input channel and audio mode selected. L1 = Input channel 1-8 for the 1st Left output R1 = Input channel 1-8 for the 1st Right output 0 in the L1 or R1 value will indicate “no change” for that output M1 = Mode for stereo pair 1 (1 bit per function) 01 = Mono if set (Stereo otherwise) 02 = Phase reverse 04 = 'Synth' Mode Other bits not used Similarly for the other 3 output channels	TX Cont (2.01) TX520 & TX510 V1.25 onwards
3.2.42 Set Guard Source	35,xx,vv,vv, aa,aa	xx = 00 – PGM, 01 – PST, vv,vv = video guard source aa,aa = audio guard source	M21 Saturn
3.2.43 Pre-select Audio over sources	36,xx	xx = Over bit map bits 0 -3 = Overs 1 - 4 (Multiple over mode only)	TX320 (1.00)
3.2.44 Set Audio Over levels	37,BB, HH,LL, HH,LL HH,LL HH,LL HH,LL, F,F,F,F,F	BB Data filter b0-b3=Over1-4 , b4=PGM (where 1=change,0=ignore) HH = High 6 bits of level, LL = Low 6 bits of level Overs 1 – 4, PGM F (for each level in the order of the data filter) = 1=Pre-Config, 0=Live, note if over pre-selected then live will on-air level, pre-config will wait for the next Audio over mix command (Multiple over mode only)	TX520 & Tx510 (All)
3.2.45 Set Audio Over Rate	38,xx,rr	xx = Audio over number rr = Audio over rate in frames 0..99 (decimal) frames	M2100
3.2.46 Set Preset Aspect Ratio	39,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	ARC
3.2.47 Set Programme Aspect Ratio	3A,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	ARC
3.2.48 Get Version String	3B	No Parameters	1.09
3.2.49 Set U Fade section times.	3C,xx,yy	xx, yy = 0-99 (decimal) frames. Where - xx = Fade down time yy = Zero level time Note - These times are used when a U fade is selected. The Fade up time is calculated by subtracting these times from the transition rate. Although times can be specified as 0, in practice the minimum time is 1 or 2 frames.	1.09

Use	Header and Data	Parameters	Code Version
3.2.50 Take Guard	3D,XS	XS Where X is the high nibble and S is the low nibble. X = 0 – PGM, 1 – PST S = 0 Video & Audio, 1 Video, 2 Audio	M21 Saturn

3.3 Switcher Response Messages

The following table defines the messages sent from the switcher to the automation controller when a change is detected on the current mixer status. This will normally be when the information is manually changed by the operator.

The release column is used to show those messages that have been implemented for which release of the protocol software. Other messages will be implemented at a later date as required.

Use	Header and Data	Parameters	Code Version
3.3.1	40,c,tttt,data,rrrr	This message' wraps' existing commands with a timestamp. The system will execute these commands at the set time. E.g. for the message format SOM,<MessageID>,c,tttt,data where Data = <MessageID>,[message data] Control (c)(1 byte) 00=Clear Success 01=Set Success 02=Clear Failed 03=Set Failed where tttt (4 byte) is H,M,S,F (hex) Hours = 0-23 Minute = 0-59 Seconds = 0-59 Frames= 0-29 The current commands that can be wrapped are:- 3.2.16 Take 3.2.17 Take Audio 3.2.18 Take Video 3.2.19 Run DVE Preset 3.2.21 Set Audio over source 3.2.22 Set DSK 3.2.28 Set Audio PGM 3.2.29 Set Audio PST 3.2.35 Set Multiple audio over sources **Note** On execution of the time command the TX520 will respond with appropriate response. E.g. 0F <TAKE> response 4F <Take Complete>. Time message was received. where rrrr (4 byte) is H,M,S,F (hex) Hours = 0-23 Minute = 0-59 Seconds = 0-59 Frames= 0-29	TX520 & Tx510
3.3.2 New Transition Type	41,xx	xx = Transition type as follows as defined for setting transition type in Section 3.2.	0.01

Use	Header and Data	Parameters	Code Version
3.3.3 Mixer Powered Up	42	No parameters used. Mixer will follow this message with messages Defined in Section 3.4.	0.01
3.3.4 New Transition Rate	43,xx	xx = 0-99 (decimal) frames.	0.01
3.3.5 New Extended Transition Type	44,xx,bb	xx = Transition type (see Set Transition Type command) bb = 1 Video Only, 2 Audio Only	3.10
3.3.6 New Extended Transition Rate	45,xx,bb	xx = 0-99 (decimal) frames bb = 1 Video Only, 2 Audio Only	3.10
3.3.7 New DSK 1 State	46,xx	xx = 00 Dsk 1 Off 01 Dsk 1 On	0.01
3.3.8 New DSK 2 State	47,xx	xx = 00 Dsk 2 Off 01 Dsk 2 On	0.04
3.3.9 New Aux 2 bus Video + Audio	48,xx or 48,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.3.10 New Tx bus Video	49,xx or 49,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.3.11 New Tx bus Audio	4A,xx or 4A,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.3.12 New Preset bus Video	4B,xx or 4B,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.3.13 New Preset bus Audio	4C,xx or 4C,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.3.14 New Aux 1 bus Video	4D,xx or 4D,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.3.15 New Aux 1 bus Audio	4E,xx or 4E,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.3.16 Take Complete	4F	No Parameters	0.01
3.3.17 Take Audio Complete	50	No Parameters	3.10

Use	Header and Data	Parameters	Code Version
3.3.18 Take Video Complete	51	No Parameters	3.10
3.3.19 New DVE Preset	52,bb,pp, cc,rr,mm	Byte meanings as for command code 12	3.01
3.3.20 New Audio over Mixer state	53,xx	xx = 00 Mix off 01 Mix on	0.01
3.3.21 New Audio over source	54,xx	xx = Source number 1 – 4 (Single over mode only)	1.03
3.3.22 New DSK Status	55,nn,vv, XX,DD, RR,CH, CL,GH, GL	nn = DSK number (1..4) vv = 01: XX byte valid 02: DD byte valid 04: RR byte valid 08: CH and CL bytes valid 10: GH and GL bytes valid XX =00 Off 01 On DD = DSK Source number 1..16 RR = DSK rate in frames.0..99 (decimal) frames. CH = High 6 bytes of clip level CL = Low 6 bytes of clip level GH = High 6 bytes of gain GL = Low 6 bytes of gain	V3.09 (XX Only)
3.3.23 Remote Channel Assignment Response	58,xx,aa,bb	xx= Channel number 1-20 aa= Source association hi 7 bits bb= Source association lo 7 bits	TX520 & Tx510

Use	Header and Data	Parameters	Code Version
3.3.24 Remote Panel Assignment Response	59, Byte Count, MixerName, Separator, DeviceName , Separator	A TX controller can be connected to n different TX Desks and fader panels simultaneously. If more than one panel is assigned to a mixer controller the desks and panels mirror each other. This command indicates the current configuration between a mixer controller and its devices. Only devices that are assigned to this mixer are returned. Message format Header –- 0x059. Byte count hi byte – 14 bit number, bits 7-13. Byte count low byte – bits 0-6. MixerName – Mixer name (n ASCII characters). Seperator – 0x00. DeviceName – Device name (n ASCII characters). Only devices that are currently in control will be issued. If none then only the mixer name will be sent Separator – 0x00 When for more than one device is assigned, repeat the DeviceName and Separator.	TX520 & Tx510
3.3.25 Mixer Status Responce	5D, XX	Resonce to a Status Poll message, where XX = Status of the system Bit 0 – Audio Mixer Bit 1 – Video Mixer Bit 2 – Combined DSKs Bit 3 – Audio Router Bit 4 – Video Router Bit 5 – DVE Bit 6 – Panels Bit 7 – Reserved (0 = OK, 1 = Error/Timeout) (See Section 3.2.26)	TX5xx (V1.23 onwards)
3.3.26 Mixer Poll Response	5E	No parameters. Sent in response to Mixer Poll Message (See Section 3.2.27)	0.01
3.3.27 New Audio Over level	64,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01

Use	Header and Data	Parameters	Code Version
3.3.28 New Program audio level	65,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01
3.3.29 New Source Gain	69,SH,SL, LV,LH,LL, RH,RL	SH = High 7 bits, SL = Low 7 bits of source (1-999) LV = Level number (1-4) LH = High 6 bits, LL = Low 6 bits of Left gain RH = High 6 bits, RL = Low 6 bits of Right gain (0x000-0xFFF, 0x800 = unity)	TX Cont 2.01
3.3.30 New State	6B,xx,yy	Set state, where xx is state ID as follows: 01 = Automation on/off 02 = Pre-roll button (* Note 1) 03 = Pre-roll and Take button (* Note 1) and yy is the state as follows: 00 = Released 01 = Asserted * Note 1: These messages are only sent when the corresponding button on the mixer is pushed or released and the mixer is under automation control.	0.01
3.3.31 New Over Rate	6C, BB, R,R,R,R,R	BB Data filter b0-b3=Over1-4 , b4=PGM R= Fade rate 0-99 for Overs 1-4, PGM (Multiple over mode only)	TX520 & Tx510
3.3.32 New Multiple Audio over sources	6D,X1,X2,X 3,X4,X5	Set multiple over levels X1-X4 = Over level1 to Over level 4 X5 = PGM level XN =00 Cut off 01 Cut on 02 Mix off 03 Mix on 04 No change (Multiple over mode only)	TX520 & Tx510
3.3.33 New Audio Mode	6E, L1,R1,M1 L2,R2,M2 L3,R3,M3 L4,R4,M4	4 Stereo (8 mono) output channels have their input channel and audio mode selected. L1 = Input channel 1-8 for the 1st Left output R1 = Input channel 1-8 for the 1st Right output M1 = Mode for stereo pair 1 (1 bit per function) 01 = Mono if set (Stereo otherwise) 02 = Phase reverse 04 = 'Synth' Mode Other bits not used Similarly for the other 3 output channels	TX Cont 2.01
3.3.34 Lag On - Notify	6F	None	TX520 & Tx510
3.3.35 Lag Of f -Notify	71	None	TX520 & Tx510

Use	Header and Data	Parameters	Code Version
3.3.36 New Audio over sources	76,xx	xx = Over bit map bits 0 -3 = Overs 1 - 4 (Multiple over mode only)	TX320 1.00
3.3.37 Change Audio Over levels	77,BB, HH,LL, HH,LL HH,LL HH,LL HH,LL, F,F,F,F,F	BB Data filter b0-b3=Over1-4 , b4=PGM (where 1=change,0=ignore) HH = High 6 bits of level, LL = Low 6 bits of level Overs 1 – 4, PGM F = ignore (1=Pre-Config, 0=Live) (Multiple over mode only)	TX520 & Tx510
3.3.38 New Audio Over Rate	78,xx,rr	xx = Audio over number rr = Audio over rate in frames 0..99 (decimal) frames	M2100
3.3.39 New Preset Aspect Ratio	79,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	ARC
3.3.40 New Programme Aspect Ratio	7A,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	ARC
3.3.41 New Version String OR Manual Insert Source 0	7B,vv,ss,bb, nn,v1..vn 7B	vv = Version number 0 - 99 ss = Subversion number 0 - 99 bb = Beta char (space = Not a beta release) nn = version string length v1..vn = version description e.g. “TX220 Master control switcher” Sent by GVG440 I/F. Special for RAI. Indicates PST matrix destination same as TX matrix destination.	1.09
3.3.42 New U Fade section times.	7C,xx,yy	xx, yy = 0-99 (decimal) frames. Where - xx = Fade down time yy - Zero level time The fade up time = Transition time - xx - yy	1.09

3.4 Switcher Status Messages

The following messages are all sent when the switcher powers up or in response to a automation powered up message (Section 3.2).

When the switcher powers up, the messages will be sent after the switcher power up message (Section 3.3)

The release column is used to show those messages that have been implemented for which release of the protocol software. Other messages will be implemented at a later date as required.

Use		Header and Data	Parameters	Code Version
3.4.1	Current Transition Type	81,xx	xx = Transition type as follows as defined for setting transition type in Section 3.2.	0.01
3.4.2	Current Transition Rate	83,xx	xx = 0-99 (decimal) frames.	0.01
3.4.3	Current Extended Transition Type	84,xx,bb	xx = Transition type (see Set Transition Type command) bb = 1 Video Only, 2 Audio Only	3.10
3.4.4	Current Extended Transition Rate	85,xx,bb	xx = Transition type (see Set Transition Type command) bb = 1 Video Only, 2 Audio Only	3.10
3.4.5	Current DSK 1 State	86,xx	xx = 00 Dsk 1 Off 01 Dsk 1 On	0.01
3.4.6	Current DSK 2 State	87,xx	xx = 00 Dsk 2 Off 01 Dsk 2 On	0.04
3.4.7	Current Aux 2 bus Video + Audio	88,xx or 88,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.4.8	Current Tx bus Video	89,xx or 89,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.4.9	Current Tx bus Audio	8A,xx or 8A,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.4.10	Current Preset bus Video	8B,xx or 8B,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.4.11	Current Preset bus Audio	8C,xx or 8C,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.01 1.06
3.4.12	Current Aux 1 bus Video	8D,xx or 8D,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.4.13	Current Aux 1 bus Audio	8E,xx or 8E,7F,aa, bb	xx = Channel (source) number 1 - 20 (decimal) or aa = High 7 bits, bb = low 7 bits of source (>20)	0.04 1.06
3.4.14	Current DVE Preset	92,bb,pp, cc,rr,mm	Byte meanings as for command code 12	3.10
3.4.15	Current Audio over Mixer state	93,xx	xx = 00 Mix off 01 Mix on	0.01

3.4.16 Current Audio over source	94,xx	xx = Source number 1 - 4 (Single over mode only)	1.03
3.4.17 Current DSK Status	95,nn,vv, XX,DD, RR,CH, CL,GH, GL	nn = DSK number (1..4) vv = 01: XX byte valid 02: DD byte valid 04: RR byte valid 08: CH and CL bytes valid 10: GH and GL bytes valid XX =00 Cut off 01 Cut on 02 Mix off 03 Mix on DD = DSK Source number 1..16 RR = DSK rate in frames.0..99 (decimal) frames. CH = High 6 bytes of clip level CL = Low 6 bytes of clip level GH = High 6 bytes of gain GL = Low 6 bytes of gain	3.10
3.4.18 Remote Channel Assignment	98,xx,aa,bb	xx= Channel number 1-20 aa= Source association hi 7 bits bb= Source association lo 7 bits	TX520 & Tx510
3.4.19 Remote Panel Assignment	99, Byte Count, MixerName , Separator, DeviceNam e, Separator	A TX controller can be connected to n different TX Desks and fader panels simultaneously. If more than one panel is assigned to a mixer controller the desks and panels mirror each other. This command indicates the current configuration between a mixer controller and its devices. Only devices that are assigned to this mixer are returned. Message format Header –- 0x099. Byte count hi byte – 14 bit number, bits 7-13. Byte count low byte – bits 0-6. MixerName – Mixer name (n ASCII characters). Seperator – 0x00. DeviceName – Device name (n ASCII characters). Separator – 0x00 When for more than one device is assigned, repeat the DeviceName and Separator.	TX520 & Tx510
3.4.20 Current Audio Over level	A4,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01

3.4.21 Current Program audio level	A5,HH,LL	HH = High 6 bits of level, LL = Low 6 bits of level (Single over mode only)	0.01
3.4.22 Current Source Gain	A9, SH,SL, LV,LH,LL, RH,RL	SH = High 7 bits, SL = Low 7 bits of source (1-999) LV = Level number (1-4) LH = High 6 bits, LL = Low 6 bits of Left gain RH = High 6 bits, RL = Low 6 bits of Right gain (0x000-0xFFF, 0x800 = unity)	TX Cont 2.01
3.4.23 Current State	AB,xx,yy	Set state, where xx is state ID as follows: 02 = Pre-roll button 03 = Pre-roll and Take button and yy is the state as follows: 00 = Released 01 = Asserted	0.01
3.4.24 Current Over Rate	AC, BB, R,R,R,R,R	BB Data filter b0-b3=Over1-4 , b4=PGM R= Fade rate 0-99 for Overs 1-4, PGM (Multiple over mode only)	TX520 & Tx510
3.4.25 Current Multiple Audio over sources	AD,X1,X2, X3,X4,X5	Set multiple over levels X1-X4 = Over level1 to Over level 4 X5 = PGM level XN =00 Cut off 01 Cut on 02 Mix off 03 Mix on 04 No change (Multiple over mode only)	TX520 & Tx510
3.4.26 Current Audio Mode	AE, L1,R1,M1 L2,R2,M2 L3,R3,M3 L4,R4,M4	4 Stereo (8 mono) output channels have their input channel and audio mode selected. L1 = Input channel 1-8 for the 1st Left output R1 = Input channel 1-8 for the 1st Right output M1 = Mode for stereo pair 1 (1 bit per function) 01 = Mono if set (Stereo otherwise) 02 = Phase reverse 04 = 'Synth' Mode Other bits not used Similarly for the other 3 output channels	TX Cont 2.01
3.4.27 Current Audio over sources	B6,xx	xx = Over bit map bits 0 -3 = Overs 1 - 4 (Multiple over mode only)	TX320 1.00
3.4.28 Current Audio Over levels	B7,BB, HH,LL, HH,LL HH,LL HH,LL HH,LL, F	BB Data filter b0-b3=Over1-4 , b4=PGM (where 1=change,0=ignore) HH = High 6 bits of level, LL = Low 6 bits of level Overs 1 – 4, PGM F = ignore (1=Pre-Config, 0=Live) (Multiple over mode only)	TX520 & Tx510
3.4.29 Set Audio Over Rate	B8,xx,rr	xx = Audio over number rr = Audio over rate in frames 0..99 (decimal) frames	M2100

3.4.30 Current Preset Aspect Ratio	B9,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	N/A
3.4.31 Current Programme Aspect Ratio	BA,ii,jj,kk	ii = i/p aspect ratio jj = o/p 1 aspect ratio kk = o/p 2 aspect ratio	N/A
3.4.32 Current Version String	BB,vv,ss, bb,nn v0..vn	vv = Version number 0 - 99 ss = Subversion number 0 - 99 bb = Beta char (space = Not a beta release) nn = Length of version descriptor v0..vn = version description: n characters	1.09
3.4.33 Current U Fade section times. **NOTE** - This is the last message issued as a result of a 3.2.3 Automation power up.	BC,xx,yy	xx, yy = 0-99 (decimal) frames. Where - xx = Fade down time yy - Zero level time The fade up time = Transition time - xx - yy	1.09