REMOTE-CONTROL SYSTEM
FOR BROADCASTING PRODUCTION EQUIPMENT
TELECINE TYPE-SPECIFIC MESSAGES

Tech. 3245 - Supplement 4 December 1989

CONTENTS

Introduction

Document Tech. 3245 describes the specification of a digital remote-control system for broadcasting production equipment. It defines completely the electrical/mechanical level (level 1), and the supervisory level (level 2), of the interface. The two remaining levels - the system service level (level 3), and the virtual machine level (level 4) - are defined only in terms of function and control message syntax.

Supplement 1 to Tech. 3245 completes the definition of the system service level by detailing the system service messages and, in addition, defines the virtual machine messages which are common to all types of virtual machine - the common messages.

The present Supplement defines the type-specific virtual machine messages which are applicable to telecines. Type-specific messages applicable to other categories of equipment are defined in other supplements to Tech. 3245.

In order to implement a complete network, the system designer therefore requires:

Document Tech. 3245 - the general specification,

Supplement 1 - system service and common messages

and one or more other supplements appropriate to the category or categories of equipment to be used.

The specification described in this Supplement has been developed jointly with the SMPTE, and is functionally identical to that to be published as an SMPTE Recommended Practice.

Chapter 1

General concepts

This chapter contains a general explanation of some of the concepts used in the formulation of the TK type-specific message set. It constitutes tutorial information and is intended to assist in the understanding of the specifications in Chapter 2 of this document. A working knowledge of the following ESbus topics is assumed:

ESbus system overview

Control message architecture

Supervisory protocol

Tributary interconnection

Electrical and mechanical characteristics

System service and common messages

The TK type-specific dialect shares many conceptual constructs with the VTR type-specific dialect. As far as possible comparable functions of both machine types are controlled with commands of the same code and format; there are, however, also some differences.

In respect of the control of analogue functions in particular, the message set and the Information Field array of the telecine are much more developed than those of the VTR.

Conventions:

- Acronyms and abbreviations are shown in upper-case characters.

e.g. Telecine TK
Transport Motion State TMS
Information Field I/F

- Message keywords and names of information fields are shown in upper-case characters.

e.g. FIXED PLAY

PREROLL DURATION

These command keywords and information field names are used within the text of this document to imply requested action, information field identity, and in turn the information field contents of the virtual machine. To assist in readability of this document, these terms are used in the context of the presentation material.

e.g. "If the SYNC VELOCITY is standard play speed ....
("SYNC VELOCITY" in this context refers to the content of an Information Field.)

- Terms having special meanings in this or related documents are shown with leading upper-case characters :

e.g. Virtual Machine
Transport Motion Process

I. Transport Motion States

The transport mechanism of a TK is considered as a separate state machine. Therefore the commands which control transport functions form a subset within the TK type-specific message set. These commands are called Transport Motion State commands ("TMS" commands). Each TMS command causes a transition into a transport state and ceases the previous state, i.e. these functions are mutually exclusive.

TMS commands include:

STOP, VARIABLE PLAY, FIXED PLAY, STEP, VISIBLE FAST, SHUTTLE.

All TMS commands are marked as such in the command description.

2. Transport Motion Processes

Transport Motion Process commands (" TMP " commands) are overriding control commands that cause the controlled device automatically to choose it's own Transport Motion States to achieve the desired result.

TMPs include:

TARGET SEARCH, PREROLL SEARCH, SYNC.

All TMP commands are marked as such in the command description.

3. Electrical machine states

Other TK commands affect states of the electrical environment of the TK. The functions controlled by them are not necessarily mutually exclusive.

4. Transport speeds

Some commands require a speed specification which is carried by the command in the form of a three-byte parameter. This parameter is intended to define the direction and absolute value of the desired speed that should be achieved as closely as possible by the real machine.

All commands with a speed parameter use the same format and coding. This is a three-byte signed number with a scale range defined such that:

000000h	represents	stationary*[1],
010000h	represents	FIXED SPEED, forward direction,
7F0000h	represents	approximately 127 times FIXED SPEED, forward direction,
FF0000h	represents	FIXED SPEED, reverse direction,
800000h	represents	128 times FIXED SPEED, reverse direction.

It allows, theoretically, for speeds between - 128 and approximately + 127 times FIXED SPEED and a resolution of 1/65,536th of FIXED SPEED.

5. TK Information Fields

The TK dialect makes extensive use of the Information Field concept. Some specific features of the TK Information Fields are described in the following sections.

[1] the letter "h" appended to a number indicates that it is expressed in hexadecimal notation.

5.1. TMS tallies

These Information Fields indicate the current state of the transport. As these mutually exclusive states are commanded by TMS commands, the code of the corresponding TMS keyword is used to identity them individually. An additional byte tallies the level of success, i.e. whether the commanded state function is still in transition or has been achieved, successfully or not.

5.2. TMP tallies

These Information Fields indicate the current Transport Motion Processes. As these mutually exclusive processes are commanded by TMP commands, the code of the corresponding TMP keyword is used to identify them individually. An additional byte tallies the level of success, i.e. whether the commanded process is still in progress, or has already accomplished its respective goal, successfully or not.

During processes, the Transport Motion State will be reflected in the TMS TALLY I/F, as though that TMS command had been issued.

5.3. Other command tallies

Commands which cause changes in any electrical machine state (non-TMSs) have a corresponding Information Field. When the Information Field is read, the response is tallied in the same format as that of the command.

Example: The command ASPECT SELECT is intended to choose the aspect ratio of the reproduced picture. The Information Field ASPECT TALLY may be read to obtain information about the currently selected aspect ratio, which will be tallied in the same format as that used in the ASPECT SELECT command itself.

5.4. Film Code

There are several ways to identify a film position, by using for example:

- film time-code.

- frame counter 1,

- frame counter 2.

For a search, and for other automatic procedures, only one scale is used. The selected scale is referred to as the FILM CODE, and can be chosen by the FILM CODE SELECT command. The functions mentioned above then refer to the FILM CODE rather than to a frame counter directly.

There is a separate Information Field for each of the codes and timers mentioned above; nonetheless, the film code actually selected can also be read from the Information Field FILM CODE.

6. Synchronization

Synchronization means that the machine is programmed to pass:

- a specified point on the film ("where")
- at a specified point in time ("when"), and
- locked to a specified speed ("how").

"Where" : The point on the film is called SYNC POINT. It is specified in terms of FILM CODE, and is maintained in the Information Field SYNC POINT. The sync point is specified by applying a PRESET command to this Information Field.

"When" : The point in time is defined by the instant of issue of the SYNC command. At a specified time period after the arrival of the SYNC command, the SYNC POINT must be reached. This time period is called PREROLL DURATION; it is maintained in the Information Field PREROLL DURATION, and is specified by applying a PRESET command to this Information Field.

Note: the PREROLL DURATION is reserved mainly for synchronization purposes; a greater PREROLL DURATION than that required by the real machine may, however, be chosen for operational reasons (e.g. extended preview time).

"How" : The speed at the sync point is defirted by a value maintained in the Information Field SYNC VELOCITY; it is specified by applying a PRESET command to this Information Field.

As a prerequisite for the use of the SYNC command the film must be placed at a park position which is calculated from the SYNC POINT and the SYNC VELOCITY as follows:

$$\text{SYNC POINT} - \frac{\text{PREROLL DURATION} \times \text{SYNC VELOCITY}}{\text{FIXEDSPEED}}$$

To achieve this park position the PREROLL SEARCH command is used and the TK virtual machine must make the calculation automatically.

The SYNC Command in the case of an "Ideal" Machine

A better understanding of the function of the SYNC command is possible if it is considered from the viewpoint *of an " ideal " machine.

- On the arrival of a SYNC command an ideal TK would start immediately with no delay, fully locked and with the specified speed. Under these ideal conditions the machine would, at the PREROLL DURATION time later, be precisely at the SYNC POINT.

- A real TK cannot start and synchronize immediately; it is therefore the responsability of the virtual machine, and hence of the virtual machine manufacturer, to control the real machine in such a manner that the result is the same.

Measures taken in order to correct synchronization during the preroll duration period may include:

- on the receipt of a PREROLL SEARCH command, parking a few frames down the film to match the average number of frames lost while coming up to play speed;

- on the SYNC command, overriding the specified velocity using the play speed override facility of the real machine to eliminate the remaining offset from the appropriate lock condition.

7. Immediate and Timeline Modes

All TK commands can be used in the "immediate mode" which causes their instantaneous execution. In this way they could, theoretically, be used to control even time-critical functions. As the transfer of a message over the bus within a given time slot cannot be guaranteed, however, the immediate mode is not recommended for such applications.

Wherever possible, time-critical commands should be queued on the timeline, using the command facilities provided by the common message set. Activities requiring synchronous operations between several machines are best suited to the " timeline mode " of operation which allows for the pre-programming of sequences of time-critical functions (e.g. SYNC command). All time-critical functions refer to the timelines of the individual virtual machines, which themselves are synchronized by a system time transmission from the bus controller in response to a REQUEST TIME TRANSMISSION command.

For certain time-critical applications, (e.g. editing), it is essential that all machine internal clocks are synchronized to the station field phase sequence. In order to achieve this phasing, the machine internal clock will be ADVANCED by as many frames as necessary following receipt of the TIMELINE RUN command.

8. Sample command sequences

The following sections show samples of typical command sequences in immediate mode as well as in timeline mode. These sequences describe only some of the applications of the command set; there is no obligation on the part of system designers to use precisely these sequences.

8.1. Immediate Mode

8.1.1. Search and Play

Some time before initial action:

<PRESET> <PREROLL DURATION> < time value >

<PRESET> < SYNC POINT > < time value >

initial action:

<PREROLL SCHEARCH>

final action (not earlier than when the TMC TALLY has been "SEARCHed, successfully"):

<FIXED PLAY>

On the FIXED PLAY command the TK starts and reaches the sync point approximately after the preroll duration.

If the TK is required to start at the sync point location (using no preroll) the TARGET SEARCH command should be used.

synchronzation is not then guaranteed.

Note that the preroll duration and the sync point, once loaded, need not be reloaded until changed.

8.1.2. Search and Synchronbs

Some time before initial action:

<PRESET> <PREROLL DURATION> < time value >

<PRESET> <SYNC POINT> < time value>

<PRESET> <SYNC VELOCITY> <speed value>

initial action:

<PREROLL SEARCH>

final action (not earlier than when the TMC TALLY has been SEARCHed successfully):

<SYNC>

On the SYNC command the TK starts and reaches the sync point precisely after the preroll duration.

Under control of the virtual machine the play speed override function of the TK may be used internally to find the appropriate lock.

This sequence can be used for the synchronous operation of multiple TKs only when delivery of the SYNC command can be guaranteed within a reasonable time slot (e.g. one field).

Note that the preroll duration, once loaded, need not be reloaded until changed.

8.2. Timeline Mode

8.2.1. Search and Play

Some time before initial action:

<PRESET> <PREROLL DURATION> <time value>

<CLEAR EVENT> <0>

<STOP TIMIELINE> (optional),

<PRESET> <SYNC POINT> <time value>

<PRESET> <SYNC VELOCITY> < speed value>

initial action:

<PREROLL SEARCH>

final action (not earlier than when the TMC TALLY has been SEARCHed, successfully

<REQUEST TIME TRANSMISSION>

<DEFINE EVENT>

<TIMELINE> <"TL sync point" — "preroll duration">

<FIXED PLAY>

Note that the " TL sync point " is the value of the timeline when the sync point has been reached approximately; it must be calculated from the instantaneous timeline value transmitted by the bus controller in response to the preceding REQUEST TIME TRANSMISSION command.

In this case it is in fact easier to use the immediate mode which allows for FIXED PLAY at a specific time from commands given much earlier.

8.2.2. Search and Synchronize

Some time before initial action:

<PRESET> <PREROLL DURATION> < time value >

<CLEAR EVENT> <0>

<STOP TIMELINE> (optional)

<PRESET> <SYNC POINT> <time value>

<PRESET> <SYNC VELOCITY> < speed value>

initial action:

<PREROLL SEARCH>

final action (not earlier than when the TMC TALLY has been SEARCHed, successfully

<REQUEST TIME TRANSMISSION>

<DEFINE EVENT>

< TIMELINE > < "TL sync point" - " preroll duration ">

<SYNC>

Note that the " TL sync point " is the value of the timeline when the sync point has been reached precisely; it must be calculated from the instantaneous timeline value transmitted by the bus controller in response to the preceding REQUEST TIME TRANSMISSION command. For editing it is generally desirable to avoid introducing unnecessary waiting times; therefore it is suggested that (TI, sync point - preroll duration) be substituted in the DEFINE EVENT command by (instantaneous timeline value plus some frames) to compensate for transmission delay.

9. Analogue magnitudes

There are many analogue magnitudes to be controlled in a TK. In order to facilitate remote-control of these magnitudes in a variety of modes, a special structure of Information Fields and some additional commands applicable to these Fields are provided.

9.1. Information Fields related to analogue magnitudes

All analogue magnitudes have two related Information Fields:

- One " ACTUAL Field that represents the instantaneous value of the magnitude, and

- One " TARGET Field that contains a possible future value of the magnitude.

Writing to an ACTUAL Field by a PRESET command changes the magnitude immediately.

Writing to a TARGET Field has no immediate effect on the magnitude.

The TARGET value, however, may become the ACTUAL value when one of the appropriate TRANSITION commands is applied to the TARGET Field.

9.2. TRANSITION commands

The TRANSITION commands cause a transition of the magnitude from the value present before the advent of the command, reflected by the ACTUAL Field, to the value specified by the TARGET Field.

There is a choice of several kinds of transition:

The TRANSITION IMMEDIATE command causes an immediate change from the ACTUAL to the TARGET value.

The TRANSITION CONTINUOUS command switches to a mode where the ACTUAL value follows the TARGET value continuously all the time.

The following TRANSITION commands cause controlled transitions from the ACTUAL value to the TARGET value with a specified duration; each of these commands causes a special kind of transition

- TRANSITION LINEAR command: linear transition

- TRANSITION POS-LOG command: positive-logarithmic transition

- TRANSITION S-CURVE command: S-curve transition

- TRANSITION USER-DEFINED command: user-defined transition.

As long as a transition is still in progress it may be stopped by a CANCEL TRANSITION command. This command is also used to cease the status caused by a TRANSITION CONTINUOUS command.

9.3. The CHANGE I/F command

The CHANGE I/F command for a continuous change of the value of an ACTUAL Field with specified direction and speed (incremental/decremental operation).

This command enables the user to increment or decrement an analogue magnitude without knowing the exact absolute value. This may be useful when an analogue magnitude is adjusted manually according to a visual effect. An example would be the focus adjustment controlled by applying the CHANGE I/F command to the Information Field FOCUS ACTUAL.

9.4. The NORMALIZE I/F command

The NORMALIZE I/F command causes the addressed Information Field to assume its standard value.

This command may also be applied to TARGET Fields. Then a smooth transition to the standard value can be managed by applying one of the TRANSITION commands.

Interrogating the Information Field NORMALIZED FIELDS gives a list of the names of all those Information Fields that are currently in the normalized condition.

9.5. The AUTO CONTROL I/F command

The AUTO CONTROL I1F command the addressed Information Field to a mode in which the value of the Field is controlled automatically.

In many cases this command may also be applied to TARGET Fields. Thus a smooth transition to the auto mode can be arranged by applying one of the TRANSITION commands, and, as soon as the transition has ended, by sending another ALTTO CONTROL I/F command, applied to the ACTUAL Field.

While in the Auto Control mode, changes caused by PRESET and/or CHANGE commands will modify the automatically-generated value by shifting the control target.

Interrogating the Information Field AUTO CONTROLLED FIELDS gives a list of the names of all those Information Fields that are currently in the auto-controlled condition.

9.6. Multiple I/F operation

All commands operating on I/Fs representing analogue magnitudes may address just one Information Field or several of them at the same time (using a BEGIN/END construct), thus reducing the bus load and transmission time required.

Chapter 2

Telecine (TK) type-specific messages
(Virtual Machine type is 04h)

General Notes

1. *Commands which have a related information field for tally purposes ("...SELECT"-"... TALLY" pairs) are identified by a ">>" sign in the list below.*
2. *All Transport Motion State commands (indicated below as " TMS") are mutually exclusive.*
3. *Transport Motion Process commands (indicated below as "TMP") are overriding control commands that cause the controlled device to enter automatically the appropriate Transport Motion States to achieve the desired result. The Transport Motion State will be reflected in the TMS tally, as though that TMS command had been issued. TMPs are mutually exclusive.*
4. *In all cases, the temporal order of EVEN75 must be preserved. Mutually exclusive commands actuated by the EVENT construct, that are placed on the EVENT cue at the same trigger point, will cause both events to cancel.*

1. Index of keywords, mnemonics and information field names

	Hex	Message keyword	(mnemonic)		Hex	Information field name	(mnemonic)
	40	not used			40	not used	
TMS	41	STOP	STOP		41	TIME CODE FROM FILM	TCFF
TMS	42	VARIABLE PLAY	VAPI,		42	not used	
TMS	43	FIXED PLAY	FIPL		43	SELECTED FILM CODE	SEFC
TMS	44	STEP	STEP		44	USERBITS FROM FILM	UBFF
TMS	45	VISIBLE FAST	VFST		45	not used	
TMS	46	SHUTTLE	SHUT		46	FRAMECOUNTER 1	FCON
TMS	47	PLAY SPEED OVERRIDE	PSPO		47	FRAMECOUNTER 2	FCTW
	48	READY SELECT	REDS	>>	48	READY TALLY	REDT
	49	SERVO REF SELECT	SRES	>>	49	SERVO REF TALLY	SRET
	4A	FREEZE SELECT	FRES	>>	4A	FREEZE TALLY	FRET
	4B	WETGATE SELECT	WEGS	>>	4B	WETGATE TALLY	WEGT
	4C	AREA MARKER SWITCH	ARMS		4C	not used	
	4D	FILM CODE SELECT	FICS	>>	4D	FILM CODE TALLY	FICT
TMP	4E	TARGET SEARCH	TASE		4E	SYNC VELOCITY	SVTY
TMP	4F	PREROLL SEARCH	PRSE		4F	PREROLL DURATION	PRDU

TMP	50	SYNC	SYNC		50	SYNC POINT	SPNT
	51	SYNC SHIFT	SYSH		51	not used	
	52	GATE BLAST	GABL		52	not used	
	53	DIRT CONCEAL SELECT	DICS	>>	53	DIRT CONCEAL TALLY	DICT
	54	TCG TIME SOURCE SEL	TrSS	>>	54	TCG TIME SOURCE TLY	TTST
	55	reserved			55	reserved	
	56	TCG UB SOURCE SEL	TUSS	>>	56	TCG UB SOURCE TLY	TUST
	57	reserved			57	reserved	
	58	reserved			58	not used	
	59	FIXED SPEED SELECT	FISS	>>	59	FIXED SPEED TALLY	FIST
TMS	5A	FIXED PLAY RESERVE	FIPR		5A	not used	
	5B	not used			5B	reserved	
TMS	5C	ROCK	ROCK		5C	SYNCHRONISM ACCURAC	SYAC
	5D	EMULSION IN/OUT SEL	EMUS	>>	5D	EMULSION IN/OUT TLY	EMUT
	5E	SEQUENCE SELECT	SEQS	>>	5E	5EQUENCE TALLY	SEQT
	5F	LAMP SELECT	LAMS	>>	5F	LAMP TALLY	LAMT
	60	PRESET	PRST		60	TMP TALLY	TMPT
TMP	61	FREEZE START	FRST		61	TMS TALLY	TMST
	62	not used			62	VELOCITY TALLY	VELT
	63	not used			63	FIELD DOMINANCE	FIDO
	64	TELECINE SOURCE SEL	TESS	>>	64	TELECINE SOURCE TLY	TEST
	65	AUDIO SOURCE SELECT	AUSS	>>	65	AUDIO SOURCE TALLY	AUST
	66	CHANNEL MUTE SELECT	CMUS	>>	66	CHANNEL MUTE TALLY	CMUT
	67	SUBTITLE SELECT	SUBS	>>	67	SUBTITLE TALLY	SUBT
	68	not used			68	TIMECODE TO FILM	TTFI
	69	FRAMING CONTROL	FRAC		69	reserved	
	6A	not used			6A	USERBITS TO FILM	UBFI
	6B	not used			6B	reserved	
	6C	not used			6C	PRESETTABLE TIME SRC	PTSR
	6D	not used			6D	reserved	
	6E	not used			6E	PRESETTABLE UB SRC	PUSR
	6F	not used			6F	reserved	
	70	MONOCHROME SELECT	MONS	>>	70	MONOCHROME TALLY	MONT
	71	NEGATIVE SELECT	NEGS	>>	71	NEGATIVE TALLY	NEGT
	72	B/STRETCH/COMPR SEL	BSCS	>>	72	B/STRETCH/COMPR TLY	BSCT
	73	GRAIN REDUCTION SEL	GRES	>>	73	GRAIN REDUCTION TLY	GRET
	74	GAIN SELECT	GAIS	>>	74	GAIN TALLY	GAIT
	75	SATURATION STEP SEL	SASS	>>	75	SATURATION STEP TLY	SAST
	76	FILM FORMAT SELECT	FIFS	>>	76	FILM FORMAT TALLY	FIFT
	77	AUDIO NR SELECT	ANRS	>>	77	AUDIO NR TALLY	ANRT
	78	FPN ALIGNMENT	FPNA		78	MATRIX	MTRX
	79	SHIFT SOUND FOLLOWER	SHSF		79	MASKING	MSKG
	7A	LOCAL LOCKOUT SEL	LLOS	>>	7A	LOCAL LOCKOUT TALLY	LLOT
	7B	not used			7B	TIMECODE ATTRIBUTES	TCAT
	7C	TEST PATTERN SWITCH	TEPA		7C	LOOP RANGE	LORA
	7D	REF FRAME SELECT	REFS	>>	7D	REF FRAME TALLY	REFT
	7E	VIDEO STANDARD SEL	VISS	>>	7E	VIDEO STANDARD TLY	VIST
	7F	ON AIR SELECT	ONAS	>>	7F	ON AIR TALLY	ONAT

80	NORMALIZE I/F	NORI	80	NORIMLALIZED FIELDS	NORF
81	AUTO CONTROL I/F	AUTI	81	AUTO CONTR'D FIELDS	AUTF
82	CHANGE I/F	CHAI	82	FOCUS ACTUAL	FOCA
83	not used		83	FOCUS TARGET	FOCT
84	not used		84	FRAMING ACTUAL	FRAA
85	not used		85	FRAMING TARGET	FRAT
86	not used		86	AUDIO OUT LEVEL ACT	AOLA
87	not used		87	AUDIO OUT LEVEL TAR	AOLT
88	not used		88	SCANNING WIDTH ACT	RWIA
89	not used		89	SCANNING WIDTH TARG	RWIT
8A	not used		8A	SCANNING HEIGHT ACT	RHEA
811	not used		8B	SCANNING HEIGHT TAR	RHET
8C	not used		8C	SCANNING H POS ACT	RHPA
8D	not used		8D	SCANNING H POS TARG	RHPT
8E	not used		8E	SCANNING V POS ACT	RVPA
8F	not used		8F	SCANNING V POS TARG	RVPT
90	TRANSITION IMM	TIMM	90	REPROD WIDTH ACT	RWIA
91	TRANSITION CONT	TCON	91	REPROD WIDTH TARG	RWIT
92	TRANSITION LINEAR	TLIN	92	REPROD HEIGHT ACT	RHEA
93	TRANSITION POS/LOG	TPOL	93	REPROD HEIGHT TARG	RHET
94	TRANSITION S-CURVE	TSCU	94	REPROD H POS ACT	R11PA
95	TRANSITION USER-DEF	TUSD	95	REPROD H POS TARG	RHPT
96	not used		96	REPROD V POS ACT	RVPA
97	not used		97	REPROD V POS TARG	RVPT
98	CANCEL TRANSITION	TCAN	98	SCANNING ROTAT ACT	RROA
99	not used		99	SCANNING ROTAT TARG	RROT
9A	not used		9A	not used	
9B	not used		9B	not used	
9C	not used		9C	not used	
9D	not used		9D	not used	
9E	not used		9E	not used	
9F	not used		9F	not used	
A0	not used		A0	MASTER LIFT ACTUAL	MLIA
A1	not used		A1	MASTER LIFT TARGET	MLIT
A2	not used		A2	LUM LIFT ACTUAL	LLIA
A3	not used		A3	LUM LIFT TARGET	LLIT
A4	not used		A4	R-Y LIFT ACTUAL	RLIA
A5	not used		A5	R-Y LIFT TARGET	RLIT
A6	not used		A6	B-Y LIFT ACTUAL	BLIA
A7	not used		A7	B-Y LIFT TARGET	BLIT
A8	not used		A8	MASTER GAMMA ACTUAL	MGAA
A9	not used		A9	MASTER GAMMA TARGET	MGAT
AA	not used		AA	LUM GAMMA ACTUAL	LGAA
AB	not used		AB	LUM GAMMA TARGET	LGAT
AC	not used,.		AC	R-Y GAMMA ACTUAL	RGAA
AD	not used		AD	R-Y GAMMA TARGET	RGAT
AE	not used		AE	B-Y GAMMA ACTUAL	BGAA
AF	not used		AF	B-Y GAMMA TARGET	BGAT
B0	not used		B0	MASTER GAIN ACTUAL	MGNA
B1	not used		B1	MASTER GAIN TARGET	MGNT
B2	not used		B2	LUM GAIN ACTUAL	LGNA
B3	not used		B3	LUM GAIN TARGET	LGNT
B4	not used		B4	R-Y GAIN ACTUAL	RGNA
B5	not used		B5	R-Y GAIN TARGET	RGNT
B6	not used		B6	B-Y GAIN ACTUAL	BGNA
B7	not used		B7	B-Y GAIN TARGET	BGNT

B8	not used	
B9	not used	
BA	not used	
BB	not used	
BC	not used	
BD	not used	
BE	not used	
BF	not used	
C0	not used	
C1	not used	
C2	not used	
C3	not used	
C4	not used	
C5	not used	
C6	not used	
C7	not used	
C8	not used	
C9	not used	
CA	not used	
CB	not used	
CC	not used	
CD	not used	
CE	not used	
CF	not used	
D0	not used	
D1	not used	
D2	not used	
D3	not used	
D4	not used	
D5	not used	
D6	not used	
D7	not used	
D8	not used	
D9	not used	
DA	not used	
DB	not used	
DC	not used	
DD	not used	
DE	not used	
DF	not used	
E0	not used	
El	not used	
E2	not used	
E3	not used	
E4	not used	
E5	not used	
E6	not used	
E7	not used	
E8	not used	
E9	not used	
EA	not used	
EB	not used	
EC	not used	
ED	not used	
EE	not used	
EF	not used	

B8	not used	
B9	not used	
BA	not used	
BB	not used	
BC	not used	
BD	not used	
BE	not used	
BF	not used	
C0	not used	
C1	not used	
C2	RED LUM ACTUAL	RLUA
C3	RED LUM TARGET	RLUT
C4	GREEN LUM ACTUAL	GLUA
C5	GREEN LUM TARGET	GLUT
C6	BLUE LUM ACTUAL	BLUA
C7	BLUE LUM TARGET	BLUT
C8	MAGENTA LUM ACTUAL	MLUA
C9	MAGENTA LUM TARGET	MLUT
CA	CYAN LUM ACTUAL	CLUA
CB	CYAN LUM TARGET	CLUT
CC	YELLOW LUM ACTUAL	YLUA
CD	YELLOW LUM TARGET	YLUT
CE	not used	
CF	not used	
D0	SATURATION ACTUAL	SATA
D1	SATURATION TARGET	SATT
D2	RED SAT ACTUAL	RSAA
D3	RED SAT TARGET	RSAT
D4	GREEN SAT ACTUAL	GSAA
D5	GREEN SAT TARGET	GSAT
D6	BLUE SAT ACTUAL	BSAA
D7	BLUE SAT TARGET	BSAT
D8	MAGENTA SAT ACTUAL	MSAA
D9	MAGENTA SAT TARGET	MSAT
DA	CYAN SAT ACTUAL	CSAA
DB	CYAN SAT TARGET	CSAT
DC	YELLOW SAT ACTUAL	YSAA
DD	YELLOW SAT TARGET	YSAT
DE	DARK SAT ACTUAL	DSAA
DF	DARK SAT TARGET	DSAT
E0	not used	
E1	not used	
E2	RED HUE ACTUAL	RHUA
E3	RED HUE TARGET	RHUT
E4	GREEN HUE ACTUAL	GHUA
E5	GREEN HUE TARGET	GHUT
E6	BLUE HUE ACTUAL	BHUA
E7	BLUE HUE TARGET	BHUT
E8	MAGENTA HUE ACTUAL	MHUA
E9	MAGENTA HUE TARGET	MHUT
EA	CYAN HUE ACTUAL	CHUA
EB	CYAN HUE TARGET	CHUT
EC	YELLOW HUE ACTUAL	YHUA
ED	YELLOW HUE TARGET	YHUT
EE	not used	
EF	not used	

F0	not used	F0	H CORR IN/BAND ACT	HINA
F1	not used	Fl	H CORR INIBAND TARG	HINT
F2	not used	F2	H CORR OUT/BAND ACT	HOUA
F3	not used	F3	H CORR OUTIBAND TARG	HOUT,
F4	not used	F4	H CORING ACTUAL	HCOA
F5	not used	F5	H CORING TARGET	HCOT
F6	not used	F6	V CORR INIBAND ACT	VI?4*
F7	not used	F7	V CORR IN/BAND TARG	VINT
F8	not used	F8	V CORR OUT/BAND ACT	VOUA
F9	not used	F9	V CORR OUT/BAND TARG	VOUT
FA	not used	FA	V CORING ACTUAL	VCOA
FB	not used	FB	V CORING TARGET	YCOT
FC	not used	FC	not used	
FD	not used	FD	not used	
FE	not used	FE	not used	
FF	EXTENSION	FF	EXTENSION	

EXTENSION SET

00	not used	00	not used	
01	not used	01	not used	
02	not used	02	NEG RED LIFT ACTUAL	NRLA
03	not used	03	NEG RED LIFT TARGET	NRLT
04	not used	04	NEG GRN LIFT ACTUAL	NGLA
05	not used	05	NEG GRN LIFT TARGET	NGLT
06	not used	06	NEG BLU LIFT ACTUAL	NBLA
07	not used	07	NEG BLU LIFT TARGET	NBLT
08	not used	08	NEG RED GAIN ACTUAL	NRGA
09	not used	09	NEG RED GAIN TARGET	NRGT
OA	not used	OA	NEG GRN GAIN ACTUAL	NGGA
OB	not used	OB	NEG GRN GAIN TARGET	NGGT
OC	not used	OC	NEG BLU GAIN ACTUAL	NBGA
OD	not used	OD	NEG BLU GAIN TARGET	NBGT
OE	not used	OE	not used	
OF	not used	OF	REF FRAME WIPE	REFW

2. Keywords

40 not used

41 STOP (TMS command)
causes the controlled TK to stop as soon as possible; indeterminate picture.

Format: <STOP>

42 VARIABLE PLAY (TMS command)
causes the controlled TK to enter continuously variable playwith specified direction and speed

Format: <VARIABLE PLAY>
<SPEED> 3-byte signed binary number; 2's complement

scale:
000000h = stationary
010000h = FIXED SPEED, forward direction
7F0000h = approximately 127 times FIXED SPEED, forward direction
FF0000h = FIXED SPEED, reverse direction
800000b. = 128 times FIXED SPEED, reverse direction

Note: FIXED SPEED is the value of the ~ defined in the FIXED SPEED I1F

43 FIXED PLAY (TMS command)
causes the controlled TK to enter playback at the speed determined by the value in the FIXEDSPEED TALLY I/F.

Format: <FIXED PLAY>

44 STEP (TMS command)
causes the controlled TK to move the film a specified number of frames forward or backward, with respect to its current position; this command is applicable only in the following Tape Motion States: STOP, STEP, VISIBLE FAST (stationary) or VARIABLE PLAY (stationary). Successive commands are cumulative until the next TMS (other than STEP).
Format: <STEP>
<NUMBER OF FRAMES> 1-byte signed number;
range: - 128 to + 127

45 VISIBLE FAST (TMS command)
causes the controlled TK to enter fast film motion with visible but not necessarily broadcastable picture, with specified direction and speed.
Format: <VISIBLE FAST>
< SPEED > 3-byte signed binary number;
same format as in VARIABLE PLAY

46 SHUTTLE (TMS command)
causes the controlled TK to travel at specified direction and speed without necessarily reproducing picture or sound.
Format: <SHUTTLIl>
<SPEED> 3-byte signed binary number;
same format as in VARIABLE PLAY

47 PLAY SPEED OVERRIDE (TMS command)
causes the controlled TK to override instantaneous play speed for synchronising purposes.
Format: <PLAY SPEED OVERRIDE>
<SPEED> 3-byte signed binary number;
same format as in VARIABLE PLAY

48 READY SELECT
establishes the TK in a state to minimize start-up time.

Format: <READY SELECT>
<SWITCH> boolean value:
00h = OFF
01h - READY

49 SERVO REFERENCE SELECT
selects the input switch for video reference source.

Format: <SERVO REFERENCE SELECT>
<MODIl> 1-byte special binary code:
00h = auto select
01h = external video input
02h = external reference input
FFh = as selected locally

4A FREEZE SELECT
cause the controlled TK to provide a frozen broadcastable picture.

Format: <FREEZE SELECT>
<SWITCH> boolean value:
00h = OFF
01h frozen

48 WETGATE SELECT
selects wetgate mode.

Format: <WETGATE, SELECT>
<MODE 1-byte special binary code:
00h = OFF
01h = dry
02h = wet
FFh = as selected locally

4C AREA MARKER SWITCH
switches markers on/off.

Format: <AREA MARKER SWITCH>
<SWITCH> boolean value:
00h = OFF
01h = ON

4D FILM CODE SELECT
selects the type of code for all succeeding messages that refer to FILM CODE.

Note: As TIMECODE FROM FILM, FRAME COUNTER 1 and 2 are also contained in an item of the TK-specific INFORMATION FLELD, they may be accessed by a READ command at any time, even if not selected as F7LM CODE by the command FILM CODE SELECT

Format: <FILM CODE SELECT>
<CODE TYPE> 1-byte special binary code:
01h = TIMECODE FROM FILM
02h = FRAMECOUNTER 1
03h = FRAMECOUNTER 2
FFh = as selected locally

4E TARGET SEARCH UMP command)
causes the controlled TK to move to a defined filmm position m accordance with the SELECTED FILM CODE.
Format: <TARGET SEARCH>
<FILM CODE> (type TIME; frame referenced)

Note: The type of SELECTED FILM CODE *is selected by the command FILM* CODE *SELECT.*

4F PREROLL SEARCH (TMP command)
causes the controlled TK to move to a film position (reference the SELECTED FILM CODE) in advance of the SYNC POINT determined by PREROLL DURATION and SYNC VELOCITY.

Note: PREROLL DURA TION, SYNC POINT and SYNC VELOCITY are part of the TK-specific INFORMA TION FIELD.
Format: <PREROLL, SEARCH>

50 SYNC (TMP command)
causes the controlled TK to start and synchronize so that PREROLL DURATION later, the film will be at the SYNC POINT and travelling at the SYNC VELOCITY.

Notes: 1. SYNC POINT and SYNC VELOCITY are part of the TK-specific INFORMATION FIELD, and must be predefined by a PRESET command before execution.
2. The film must be positioned and tallied previously by a PREROLL SEARCH command.
3. If the SYNC VELOCITY is FIXED SPEED, the Tape Motion State reverts to FIXED PLAY after the TK has attained sync.
Format: < SYNC >

51 SYNC SHIFT
advances/retards the film phase by the specified number of frames, while in FIXED PLAY or in SYNC.
Format: <SYNC SHIFT>
<NUMBER OF FRAMES> 1-byte signed number;
range 128 to + 127

52 GATE BLAST
operates air blast in film gate.
Format: <GATE BLAST>

53 DIRT CONCEAL SELECT
switches dirt concealment.
Format: <DIRT CONCEAL SELECT>
<MODE> 1-byte binary number:
00h = OFF
FEh = maximum concealment
FFh = as selected locally

54 TCG TIME SOURCE SELECT
selects the time source for the time code generator of the controlled TK.
Format: <TCG TIME SOURCE SELECT>
<TIME SOURCE> 1-byte special binary code:
00h = hold
01h = run independently, starting with the value contained in I/F PRESETTABLE TIME SOURCE
02h = run with external, unspecified source
05h = run with SELECTED FILM CODE as source(contained in I/F SELECTED FILM CODE)

55 reserved

56 TCG USERBIT SOURCE SELECT
selects the userbit source for the time code generator of the controlled device.
Format: <TCG USERBIT SOURCE SELECT>
<USERBIT SOURCE> 1-byte special binary code:
00h = no userbits; i.e. all set to zero
011 = userbits from I/F PRESETTABLE USERBIT SOURCE, which may be presd by a PRESET command
02h = userbits from external, unspecified source

57 reserved

58 reserved

59 FIXED SPEED SELECT
causes the controlled device to select the nominal play speed.
Format: <FIXED SPEED SELECT>
<SPEED> 1-byte special binary code:
10h = 6 frames/sec
20h = 6 1/4 frames/sec
30h = 12 frames/sec
40h = 12 1/2 frames/sec
50h = 16 2/3 frames/sec
60h = 17 1/7 frames/sec
70h = 18 frames/sec
80h = 24 frames/sec
90h = 25 frames/sec
A0h = 30 frames/sec
B0h = 48 frames/sec
C0h = 50 frames/sec
D0h = 60 fraffies/sec

5A FIXED PLAY REVERSE (TMS command)
causes the controlled TK to enter reverse playback at the nominal speed determined by the value in the FIXED SPEED TALLY I/F.
Format: <FIXED PLAY REVERSE>

5B not used

5C ROCK (TMS command)
causes the-controlled TK to enter the "rock mode".
Format : <ROCK>

5D EMULSION IN/OUT SELECT
moves objective lens to predetermined position, according to the emulsion side of the film.
Format: <EMULSION IN/OUT SELECT>
<MODE> 1-byte special binary code:
00h = emulsion in
01h = emulsion out
FFh = as selected locally

5E SEQUENCE SELECT
defines in-phase-locked servo start.
Format: <SEQUENCE SELECT>
<MODE> 1-byte special binary code:
00h = 2 field start
01h = 4 field start
02h = 8 field start (PAL only)

5F LAMP SELECT
controls the lamp power.
Format: <LAMP SELECT>
<MODE> 1-byte special binary code:
00h = off
01h = reduced power
02h = full power
FFh = as selected locally.

The following command is used to preset items whose contents are represented in an Information Field:

60 PRESET
presets the named Information Field to the given value.
Format: <PRESET>
<PERMITTED INFORMATION FIELD NAME>
<VALUE> format and coding defined by the I/F NAME
(see Section 3: Information Fields)
Permitted Information Field names or TKs are:

FRAMECOUNTER 1
FRAMECOUNTER 2
SYNC VELOCITY
PREROLL DURATION
SYNC POINT
SYNCHRONISM ACCURACY
FIELD DOMINANCE
PRESETTABLE TIME SOURCE
PRESETTABLE UB SOURCE
MATRIX
MASKING
TIMECODE ATTRIBUTES
LOOP RANGE

Plus all I/Fs used for analogue magnitudes
(named as ... ACTUAL and ... TARGET respectively)

61 FREEZE START (TMP command)
causes the controlled TK to output a frozen picture of the instantaneous film position and to park PREROLL DURATION in advance of this point, pending a FIXED PLAY or VARIABLE PLAY command in order to start the film motion and to take over from the frozen to the moving picture without disturbances.
Format: <FREEZE START>

62 not used

63 not used

64 TELECINE SOURCE SELECT
selects the telecine change-over in case of integrated multiplexing.
Format: <TELECINE SOURCE SELECT>
<MODE> 1-byte special binary code:
meaning of left nibble:
lxh = video of telecine 1
2xh = video of telecine 2
meaning of right nibble:
xlh = audio of telecine 1
x2h = audio of telecine 2

65 AUDIO SOURCE SELECT
selects the available audio channels

Format: <AUDIO SOURCE SELECT>
<CHANNEL 1 > 1-byte special binary code:
01h = magnetic sound head(s)
02h = optical sound head(s)
03h = mag & opt sound heads mixed
04h = separate sound 1 from sound follower
05h = separate sound 2 from sound follower
06h = test tone
FFh = as selected locally

<CHANNEL 2> 1-byte special binary code:
01h = magnetic sound head(s)
02h = optical sound head(s)
03h = mag & opt sound heads mixed
04h = separate sound 1 from sound follower
05h = separate sound 2 from sound follower
06h = test tone
FFh = as selected locally

66 CHANNEL MUTE SELECT
selects auto mute function.
Format: <CHANNEL MUTE SELECT>
<SWITCH> 1-byte boolean value:
00h = OFF
01h = ON

67 SUBTITLE SELECT
switches the caption blanking on/off.

Format: <SUBTITLE SELECT>
<SWITCH> 1-byte boolean value:
00h = OFF
01h = ON

68 not used

69 FRAMING CONTROL
controls shifts in the framing in perforation steps.

Format: <FRAMING CONTROL>
<MODE> 1-byte signed binary number specifying direction and number of the steps.

Note: Fine adjustment of framing is controlled by the 1/F FRAMING ACTUAL.

6A not used

6B not used

6C not used

6D not used

6E not used

6F not used

70 MONOCHROME SELECT
switches to monochrome.
Format: <MONOCHROME SELECT>
<SWITC1l> 1-byte special binary code:
00h = colour
01h = standard black and white monochrome
02h = adjustable monochrome
FFh = as selected locally

Note: When "adjustable monochrome - is selected, the output picture colour may be adjusted.

71 NEGATIVE SELECT
switches to negative scanning.
Format: <NEGATIVE SELECT>
<SWITCH> 1-byte special binary code:
00h = positive
01h = intermediate positive
02h = black and white negative
03h = colour negative
FFh = as selected locally

72 BLACK STRETCH/COMPRESSION SELECT
selects and controls the black stretch and compression functions.
Format: <BLACK STRETCH/COMPRESSION SELECT>
<MODE> 1-byte special binary code:
00h = linear
01h = stretch function 1
02h = stretch function 2
03h = compression function 1
04h = compression function 2
05h = user defined function 1
06h = user defined function 2
FFh = as selected locally

73 GRAIN REDUCTION SELECT
selects and controls the film grain reducer.
Format: <GRAIN REDUCTION SELECT>
<MODE> 1-byte special binary code:
00h = switched off
11h = automatic
meaning of right nibble:
x2h = grain size 1 (fine)
x4h = grain size 2
x6h = grain size 3
x8h = grain size 4 (coarse)

meaning of left nibble:
3xh = reduction by 3 dB
5xh = reduction by 5 dB
7xh = reduction by 7 dB
Axh = reduction by 10 dB
FFh = as selected locally

74 GAIN SELECT
switches the gain control.
Format: <GAIN SELECT>
<GAIN> 1-byte binary number:
00h = 0 dB
06h = 6 dB
0Ah = 10 dB etc.
<MODE> 1-byte special binary code:
00h = AGC off
01h = AGC fast
02h = AGC delayed
FFh = as locally selected

75 SATURATION STEP SELECT
selects the colour saturation.

Format: <SATURATION STEP SELECT>
<MODE> 1-byte special binary code:
00h = OFF
01h = 0.75 75 % colour saturation
02h = 1.00 100 % colour saturation
03h = 1.25 125 % colour saturation
04h = 1,50 150 % colour saturation
FFh = as locally selected

Note: The saturation magnitude selected by this command is the base to which the adjustment controlled by the I/1F SATURATION ACTUAL is added.

76 FILM FORMAT SELECT
selects the film format.
Format: <FILM FORMAT SELECT>
< MODE > 1-byte special binary code:

01h = Super 8
02h = Super 16
03h = 16 mm
04h = Super 35
05h = 35 mm, 2 perforations
06h = 35 mm, 3 perforations
07h = 35 ram, 4 perforations
08h = 2-position slide gate
09h = 16-position slide gate
FFh = as selected locally

Note: Remote-controlled transitions between some of the choices are obviously not possible.

77 AUDIO NR SELECT
controls the none reduction System.

Format: <AUDIO NR SELECT>
<MODE> 1-byte s~ binary code:
00h = NR off
01h = NR stereo
02h = NR mono
FFh = as selected locally

78 FPN ALIGNMENT
activates the fixed pattern noise alignment.

Format: <FPN ALIGNMENT>

79 SHIFT SOUND FOLLOWER
advances/retards the phase of a sound follower attached to the telecine by the specified number of frames relative to the film, while the telecine is in FIXED PLAY or in SYNC.
Format: <SHIFT SOUND FOLLOWER>
<NUMBER OF FRAMES> 1-byte signed number

7A LOCAL LOCKOUT SELECT
causes the controlled device to disable all local control.

Format: <LOCAL LOCKOUT SELECT>
<SWITCH> boolean value:
00h = local control not disabled
01h = local control disabled

7B not used

7C TEST PATTERN SWITCH
controls the built-in test pattern generator on/off.

Format: <TEST PATTERN SWITCH>
<MODE> 1-byte special binary code:
00h OFF
01h staircase
02h sawtooth
03h - colour bar
XXh - pattern no. XX (user defined)
FFh = as selected locally

7D REFERENCE FRAME SELECT
selects source and mode of reference frames.

Format: <REFERENCE FRAME SELECT>
<SOURCE> 1-byte special binary code:
meaning of right nibble:
x0h = normal
x1h = internal source
x2h = external source
meaning of left nibble:
0xh = normal
lxh = instantaneous grab
2xh = continuous grab
FFh = as selected locally

<DISPLAY> 1-byte special binary code:
00h = off
01h = on
FFh = as seleced locally

7E VIDEO STANDARD SELECT
determines the video standard used.
Format: <VIDEO STANDARD SELw r>
< SWITCH > 1-byte special binary code:
00h = 525 lines/60Hz
01h = 625 lines/50Hz
xxh = user defined
FFh = as selected locally

7F ON AIR SELECT
determines the on-air condition, if required.
Format: <ON AIR SELECT>
<SWITCH> 1-byte special binary code:
00h = on air off
01h = on air on
FFh = as selected locally

The following commands may be applied to Information Fields that represent analogue magnitudes only. These are the Information Fields with codes from 80h to FEh. It is indicated below whether the command can address ACTUAL or TARGET type of fields or both.

80 NORMALIZE I/F
causes the addressed Information Field to assume its standard value.

Addressed to a TARGET I/F, only the TARGET I/F assumes the standard value, while the corresponding ACTUAL I/F and the analogue magnitude remain unchanged.

Addressed to an ACTUAL I/F, the analogue magnitude that is associated with this Information Field assumes the standard value immediately, and the ACTUAL I/F will reflect this value from now, while the content of the corresponding TARGET I/F will remain unchanged.
Format: <NORMALIZE I/F>
<PERMITTED I/F NAME>

Notes: 1. Permitted Information Fields are all ACTUAL and TARGET
2. Several I1F names may be wrapped in a BEGINIEND construct.

81 AUTO CONTROL I/F
switches the automatic control of the addressed 1/17, where applicable.

Addressed to a TARGET I/F, only the TARGET I/F assumes the automatically generated values, while the corresponding ACTUAL I/F and the analogue magnitude remain unchanged.

Addressed to an ACTUAL I/F, the analogue magnitude is controlled directly from now, and the ACTUAL I/F will reflect the instantaneous value, while the content of the corresponding TARGET I/F will remain unchanged.
Format: <AUTO CONTROL I/F>
<SWITCH I/F> 1-byte boolean value:
00h = auto control off
01h = auto control on
<PERMITTED I/F NAME>

Notes: 1 permitted Information fields are all ACTUAL and TARGET Fields.
2. Several I/F names may be wrapped in a BEGIN/END construct.
3. Default condition for all permitted I/Fs is "auto control off".
4. When switched off the last I/F content will be maintained until another command affects the field.
5. This command applied to a TARGET I/F and combined with an appropriate TRANSITION command allows a smooth transition from normal mode to auto mode (if applicable)o

82 CHANGE I/F

controls a continuous change of the contents of an Information Field.

Format: <CHANGE I/F>
<SPEED> 2-byte signed binary number:
scale: 0000h = off (no change) Ah
0001h = 1 bit/sec increasing
FFFFh= 1 bit/sec decreasing
<PERMITTED I/F NAME>

Notes: 1. Permitted Information Belds are all ACTUAL F7elds.
2. Several JIF names may be wrapped in a BEGINIEND construct.

not used

84 not used

86 not used

87 not used

88 not used

89 not used

8A not used

8B not used

8C not used

8D not used

8E not used

8F not used

90 TRANSITION IMMEDIATE

causes the contents of the addressed TARGET I/F to be transferred immediately to the corresponding ACTUAL I/F, thus causing the analogue magnitude as~ed with this I/F also to assume this value.

Format: <TRANSITION IMMEDIATE>
<PERMITTED I/F NAME>

Notes: 1. Permitted Information F7elds are all TARGET fyelds.
2. Several Ilf nam5 ma be d in a BEGINIEND construct.

91 TRANSITION CONTINUOUS

causes the contents of the addressed TARGET I/F to be transferred continuously to the corresponding ACTUAL I/F, thus causing the analogue magnitude associated with this I/F also to assume this value.

Format: <TRANSITION CONTINUOUS>
<PERMITTED I/F NAME>

Notes: 1. Permitted Information Fields are all TARGET fields.
2. Several I/F names may be wrapped in a BEGIN/END construct.
3. The continuous status entered by this command will be ceased upon the arrival of any other TRANS177ON 11F command or the CANCEL TRANSITION command.

92 TRANSITION LINEAR

causes the analogue magnitude associated with the addressed Information Field to execute a linear transition from its instantaneous value, which is also reflected in the associated ACTUAL I/F, to the value contained in the corresponding TARGET I/F, using the specified duration.

Format: <TRANSITION LINEAR>
<DURATION> 2-byte binary number; specifies the transition duration in units of frames
<PERMITTED I/F NAME>

Notes: 1. Permitted Information Fields are all TARGET Fields.
2 Several I/F names may be wrapped in a BEGIN/END construct.

93 TRANSITION POS-LOG

causes the analogue magnitude associated with the addressed Information Field to execute a positive-logarithmic transition from its instantaneous value, which is also reflected in the associated ACTUAL I/F, to the value contained in the corresponding TARGET I/F, using the specified duration.

Format: <TRANSITION POS-LOG>

<DURATION> 2-byte binary number;
specifies the transition duration in units of frames

<PERMITTED I/F NAME>

Notes: 1. Permitted Information Fields are all TARGET Fields.
2. Several I1F names may be wrapped in a BEGINIEND construct.

94 TRANSITION S-CURVE

causes. the analogue magnitude associated with the addressed Information Field to execute an S-curve transition from its instantaneous value, which is also reflected in the associated ACTUAL I/F, to the value contained in the corresponding TARGET I/F, using the specified duration.

Format: <TRANSITION S-URVE>

<DURATION> 2-byte binary number;
specifies the transition duration in units of frames

<PERMITTED I/F NAME>

Notes.. 1. Permitted Information Fields are all TARGET Fields.
2. Several I/F names may be wrapped in a BEGINIEND construct.

95 TRANSITION USER-DEFINED
causes the analogue magnitude associated with the addressed Information Field to execute a user-defined transition from its instantaneous value, which is also reflected in the associated ACTUAL I/F, to the value contained in the corresponding TARGET II/, using the specified duration.

Format: <TRANSITION USER-DEFINED>
<DURATION> 2-byte binary number;
specifies the transition duration in units of frames
<PERMITTED I/F NAME>

Notes: 1. Permitted Information Fields are all TARGET Fields.
2. Several I/F names may be wrapped in a BEGIN/END construct.

96 not used

97 not used

98 CANCEL TRANSITION
ceases transitions still in progress with the specified I/F(s).
Format: <CANCEL TRANSITION>
<PERMITTED I/F NAME>
Notes: 1. Permitted Information Fields are all TARGET Fields.
2. Several I1F names may be wrapped in a BEGINIEND construct.

3. Information fields

Notes

1. The item of the INFORMATION FIELD are accessed *by the Common* messages:
READ, UPDATE, CYCLE or SIMULTANEOUS READ

and are tallied by the Common messages:

I/F ITEM RESPONCE or SIMULTANEOUS READ RESPONSE.

These commands use the format::

<KEYWORD> <PARAMETER NAME>

and

<KEYWORD> <PARAMETER NAME> <PARAMETER VALUE>

where

- the *PARAMETER NAME* uses the Information Field Name specified *below,*
- *the PARAMETER VALUE* carries the Information *Field* contents specified below.

Several names/values may be grouped together *by* means *of* a *BEGIN/END* construct.

2. At power-up *the content of* Information Fields is not specified, but it is recommended that Information F1elds which are associated with analogue magnitudes assume 'standard' values.

40 not used

41 TIMECODE FROM FILM
contain any kind of longitudinal timecode coded on the film.
Format: <TIMECODE FROM FILM>
<CODE VALIDITY> 1-byte special binary code:

00h = valid LTc
01h = derived LTC
FFh = not valid LTC

<TIME VALUE> standard "time" format

42 not used

43 SELECTED FILM CODE
contains the time value of the code (TIMECODE FROM FILM, FRAMECOUNTER 1, FRAMECOUNTER 2), which has been most recently selected by the FILM CODE SELECT command.

Format: <SELECTED FILM CODE>
<IDENTIFIER> 1-byte special binary code:
00h = TIMECODE FROM FILM
02h = FRAMECOUNTER 1
03h = FRAMECOUNTER 2
FFh = invalid
<TIME VALUE> standard "time" format

44 USERBITS FROM FILM
contains the userbit contents most recently read from flim.
Format: <USERBITS FROM FILM>
<UB SPECIFICATION> 1-byte special code:
bits 0, 1
0,0 = content of userbits unspecified
1,0 = content of userbits is eight-bit character set conforming to ISO 646 and ISO 2022
0,1 = unassigned
1,1 = unassigned
bit 2
0 = = unassigned
1 = = content of userbits is secondary time data in standard time format
bits 3-7
0 = set to 0 until assigned
<UB GROUP 8/UB GROUP 7> 4 bytes, each consisting
<UB GROUP 6/UB GROUP 5> of two 4-bit nibbles,
<UB GROUP 4/UB GROUP 3> each containing
<UB GROUP 2/UB GROUP 1> one UB group
(MSNibble)
Note: UB 1 is the UB group which comes first on the film.

45 not used

46 FRAMECOUNTER 1
contains the instantaneous counting status of the framecounter 1.
Format: <FRAMECOUNTER 1 >
<TIME VALUE> standard "time" format

47 FRAMECOUNTER 2
contains the instantaneous counting status of the framecounter 2.

Format: <FRAMECOUNTER 2>
<TIME VALUE> standard "time" format

48 READY TALLY
tallies the status set by the READY SELECT command.

Format: <READY TALLY>
<SWITC1l> boolean value:
00h = OFF
01h = ON

49 SERVO REFERENCE TALLY
tallies the status set by the SERVO REFERENCE SELECT command.

Format: <SERVO REFERENCE TALLY>
<MODE> 1-byte special binary code:
00h = auto select
01h = external video input
02h = external reference input

4A FREEZE TALLY
tallies the status set by the FREEZE SELECT command.

Format: <FREEZE TALLY>
<SWITCH> boolean value:
00h = OFF (= default)
01h = frozen

4B WETGATE TALLY
tallies the status set by the WETGATE SELECT command.

Format: <WETGATE TALLY>
<MODE> 1-byte special binary code:
00h = OFF default)
01h = dry
02h = wet

4C not used

4D FILM CODE TALLY
tallies the code currently selected by the most recent FILM CODE SELECT command.

Format: <FILM CODE TALLY>
<CODE TYPE> 1-byte special binary code:
00h = TIMECODE FROM FILM
02h = FRAMECOUNTER 1
03h = FRAMECOUNTER 2

4E SYNC VELOCITY
contains a velocity used as the synchronization velocity for the SYNC command.

Format: <SYNC VELOCITY>
<SPEED> 3-byte signed binary number; 2's complement

000000h = stationary
010000h = FIXED SPEED, forward direction
7F0000h = approximately 127 times FIXED SPEED, forward direction
FF0000h = FIXED SPEED, reverse direction
800000h = 128 times FIXED SPEED, reverse direction

Notes: 1 FIXED SPEED is the value of the speed defined in the FIXED SPEED I/F.
2. This is the same coding as in the argument of the VARLABLE PLAY command.

4F PREROLL DURATION
contains the preroll time used in advance of sychronizing processes.

Format: <PREROLL DURATION>
<TIME VALUE> standard "time" format

50 SYNC POINT
contains a FILM CODE value used as the synchronization point for the SYNC command.

Format: <SYNC POINT>
< TIME VALUE > standard time format

not used

52 not used

53 DIRT CONCEAL TALLY
tallies the status set by the DIRT CONCEAL SELECT command.
Format: <DIRT CONCEAL TALLY>
<MODE> 1-byte binary number:
00h = OFF (= default)
FEh = maximum concealment

54 TCG TIME SOURCE TALLY
tallies the status set by the TCG TIME SOURCE SELECT command.

Format: <TCG TIME SOURCE TALLY>
<TIME SOURCE> 1-byte special binary code:
00h = hold
01h = run independently, starting with the value contained in I/F PRESETTABLE TIME SOURCE LTC
02h = run with external, unspecified source
05h = run with FILM CODE as source (contained in I/F TIMECODE FROM FILM)

55 reserved

56 TCG USERBIT SOURCE TALLY
tallies the status set by the TCG USERBIT SOURCE SELECT command.

Format: <TCG USERBIT SOURCE TALLY>
<USERBIT SOURCE> 1-byte special binary code:
00h = no userbits; i.e. all set to zerodefault)
01h = userbits from I/F PRESETTABLE USERBIT SOURCE, which may be pre-set by a PRESET command
02h = userbits from external, unspecified source

57 reserved

58 not used

59 FIXED SPEED TALLY
tallies the status set by the FIXED SPEED SELECT command.
Format: <FIXED SPEED TALLY>
<SPEED> 1-byte special binary co&:
10h = 6 frames/sec
20h = 6 1/4 frames/sec
30h = 12 frames/sec
40h = 12 1/2 frames/sec
50h = 16 2/3 frames/sec
60h = 17 1/7 frames/sec
70h = 18 frames/sec
80h = 24 frames/sec
90h = 25 frames/sec
A0h = 30 frames/sec
B0h = 48 frames/sec
C0h = 50 frames/sec
D0h = 60 frames/sec

5A not used

5B reserved

5C SYNCHRONISM ACCURACY
contains a time value that determines the accuracy of synchronizing processes, i.e. it specifies the maximum allowed offset error at the SYNC POINT.
Format: <SYNCHRONISM ACCURACY>
<FIELDS> 1-byte unsigned number

5D EMULSION IN/OUT TALLY
tallies the status set by the EMULSION IN/OUT SELECT command.
Format: <EMULSION IN/OUT TALLY>
<MODE> 1-byte special binary code:
00h = emulsion in
01h. = emulsion out

5E SEQUENCE TALLY
tallies the status set by the SEQUENCE SELECT command.
Format: <SEQUENCE TALLY>
<MODE> f-byte special binary code:
00h = 2 field start (= defauk)
01h = 4 field start
02h = 8 field start (PAL only)

5F LAMP TALLY
tallies the status of the lamp.
Format: <LAMP TALLY>
<MODE> 1-byte special binary code:
00h = off
01h = reduced power
02h = full power
F0h = lamp failure

60 TMP TALLY

tallies the current Transport Motion Process of the controlled TK, and spedM its success in accomplishing that process.

Format: <TMP TALLY>
<KEYWORD> 1 -byte value, that contains the keyword of the last commanded TMP.
<SUCCESS LEVEL> 1-byte special binary code:
00h = trying; transition in process
01h = successful
02h = failure; this tally should be supplemented by an ERROR message as appropriate

61 TMS TALLY

tallies the current Transport Motion State of the controlled TK, and specifies its success in accomplishing that process.

Format: <TMS TALLY>
<KEYWORD> 1-byte value, that contains the keyword of the last active commanded TMS command.
<SUCCESS LEVEL> 1-byte special binary code:
00h = trying; transition in process
01h = successful
02h = failure; this tally should be supplemented by an ERROR message as appropriate

62 VELOCITY TALLY

tallies the current transport velocity. Note that this is the true velocity in all TMS modes.

Format: <VELOCITY TALLY>
< SPEED > 3-byte signed binary number; 2's complement
same coding as in the argument of the VARIABLE PLAY command

63 FIELD DOMINANCE

contains the value specifying the field-coincidence with film frame.

Format: <FIELD DOMINANCE>
<MODE> 1 -byte special binary code:
00h = field 1 (= default)
01h = field 2
02h = field 3
03h = field 4
04h = field 5 (PAL only)
05h = field 6 (PAL only)
06h = field 7 (PAL only)
07h = field 8 (PAL only)

64 TELECINE SOURCE TALLY

tallies the status set by the TELECINE SOURCE SELECT command.

Format: <TELECINE SOURCE TALLY>
<MODE> 1-byte special binary code:
meaning of left nibble:
lxh = video of telecine 1
2xh = video of telecine 2
meaning of right nibble:
xlh = audio of telecine 1
x2h = audio of telecine 2

65 AUDIO SOURCE TALLY
tallies the status set by the AUDIO SOURCKS8Wr coo~

Format: <AUDIO SOURCE TALLY>
<CHANNEL 1 > 1-byte special binary code:
01h = magnetic sound head(s)
02h = optical sound head(s) (= default)
03h = mag & opt sound heads mixed
04h = separate sound 1 from sound follower
05h = separate sound 2 from sound follower
06h = test tone

<CHANNEL 2 > 1-byte special binary code:
01h = magnetic sound head(s)
02h = optical sound head(s) (default)
03h = mag & opt sound heads mixed
04h = separate sound 1 from sound follower
05h = separate sound 2 from sound follower
06h = test tone

66 CHANNEL MUTE TALLY
tallies the status set by the CHANNEL MUTE SELECT command.
Format: <CHANNEL MUTE TALLY>
<SWITCH> boolean value:
00h = OFF (= default)
01h. = ON

67 SUBTITLE TALLY
tallies the status set by the SUBTITLE SELECT command.

Format: <SUBTITLE TALLY>
<SWITCH> 1-byte boolean value:
00h = OFF (= default)
01h = caption blanking ON

68 TIMECODE TO FILM
contains the current timecode value being generated by a timecode generator.
Format: <TIMECODE TO FILM>
<TIME VALUE> standard "t ime" format

69 reserved

6A USERBITS TO FILM
contains the current userbit contents being generated by a timecode generator to go with the longitudinal timecode.
Format: <USERBITS TO FILM>
<UB SPECIFICATION> for format description
<UB GROUP S/UB GROUP 7> see USERBIT FROM FILM"
<UB GROUP 6/UB GROUP 5 >
<UB GROUP 4/UB GROUP 3 >
<UB GROUP 2/UB GROUP 1 >

6B reserved

6C PRESETTABLE TIME. SOURCE
contains a time value that can be PRESET and be used to start a timecode generator by selecting it in a TCG TIME SOURCE SELECT command.

Format: <PRESETTABLE TIME SOURCE>
<TIME VALUE> standard "time" format

6D reserved

6E PRESETTABLE UB SOURCE
contains a userbit pattern that can be PRESET and be used by a timecode generator by selecting it in a TCG UB SOURCE SELECT command.
Format: <PRESETTABLE UB SOURCE>
<UB SPECIFICATION> for format description
<UB GROUP 8/UB GROUP 7> see "USERBIT FROM FILM"
<UB GROUP 6/UB GROUP 5>
<UB.GROUP 4/UB GROUP 3>
<UB GROUP 2/UB GROUP 1>

6F reserved

70 MONOCHROME TALLY
tallies the status set by the MONOCHROME SELECT command.
Format: <MONOCHROME TALLY>
<SWITCH> 1-byte special binary code:
00h = colour (= default)
01h = standard black and white monochrome
02h = adjustable monochrome

71 NEGATIVE TALLY
tallies the status act by the NEGATIVE SELECT command.
Format: <NEGATIVE TALLY>
< SWITCH > 1-byte special binary code:
00h. = positive (= default)
01h = intermediate positive
02h = black and white negative
03h = colour negative

72 BLACK STRETCH/COMPRESSION TALLY
tallies the status set by the BLACK STRETCH/COMPRESSION SELECT command.
Format: <BLACK STRETCH/COMPRESSION TALLY>
<MODE> 1-byte special binary code:
00h = linear (= default)
01h = stretch function 1
02h = stretch function 2
03h = compression function 1
04h = compression function 2
05h = user defined function 1
06h = user defined function 2

73 GRAIN REDUCTION TALLY
tallies the status act by the GRAIN REDUCTION SELECT command.
Format: <GRAIN REDUCTION TALLY>
<MODE> 1-byte special. binary code:
00h = switched off (= default)
11h = automatic
meaning of right nibble:
x2h = grain size 1 (fine)
x4h = grain size 2
x6h = grain size 3
x8h = grain size 4 (coarse)
meaning of left nibble:
3xh = reduction by 3 dB
5xh = reduction by 5 dB
7xh = reduction by 7 dB
Axh = reduction by 10 dB

74 GAIN TALLY
tallies the status set by the GAIN SELECT command.
Format: <GAIN TALLY>
<GAIN> 1-byte binary number:
00h = 0 dB (= default) 06h = 6 dB 0Ah = 10 dB etc.

<MODE> 1-byte special binary code:
00h = AGC off (= default)
01h = AGC fast
02h = AGC delayed

75 SATURATION STEP TALLY
tallies the status set by the SATURATION STEP SELECT command.
Format: <SATURATION STEP TALLY>
<MODE> 1-byte special binary code
00h = OFF (= default)
01h = 0.75 75% colour saturation
02h = 1.00 10001o colour saturation
03h = 1.25 125% colour saturation
04h = 1.50 150% colour saturation

76 FILM FORMAT TALLY
tallies the film format in use; this status may be set partly by the FILM FORMAT SELECT command.
Format: <FILM FORMAT TALLY>
<MODE> 1-byte special binary code:
01h = Super 8
02h = Super 16
03h = 16 mm
04h = Super 35
05h = 35 mm, 2 perforations
06h = 35 mm, 3 perforations
07h = 35 mm , 4 perforations
08h = 2-position slide gate
09h = 16-position slide gate

77 AUDIO NR TALLY

tallies the status set by the AUDIO NR SELECr com~.

Format: <AUDIO NR TALLY>

<MODE> 1-byte special binary code:

00h = NR off (= default)

01h = NR stereo

02h = NR mono

78 MATRIX

contains the value specifying one of several linear matrix coefficients.

Format: <MATRIX>

<SELECTION> 1-byte special binary code:

00h = matrix OFF default)

01h = matrix 1

02h = matrix 2

03h = matrix 3

etc.

79 MASKING

contains the value specifying one of several logarithmic masking coefficients.

Format: <MASKING>

<SELECTION> 1-byte special binary code:

00h = masking OFF default)

01h = masking 1

02h = masking 2

03h = masking 3

etc.

7A LOCAL LOCKOUT TALLY

tallies the status set by the LOCAL LOCKOUT SELECT command.

Format: <LOCAL LOCKOUT TALLY>

<SWITCH> 1-byte Boolean value:

00h = local control not disabled

01h = local control disabled

7B TIMECODE ATTRIBUTES

contains the attributes of the film timecode and the frame counters.

Format: <TIMECODE ATTRIBUTES>

<ATTRIBUTE> 1-byte special binary code:

00h = 24 frame count code

01h = 25 frame count code

02h = 30 frame count code

12h = 30 frame count code compensated

7C LOOP RANGE

defines the boundaries of the loop executed in "rock" operations, where applicable.

Format: <LOOP RANGE>

<UPPER LIMIT> 1 -byte unsigned binary number:
specifies the number of frames in forward direction, counted from the starting position

<LOWER LIMIT> 1-byte unsigned binary number:
specifies the number of frames in reverse direction, counted from the starting position

7D REFERENCE FRAME TALLY
tallies the status set by the REFERENCE FRAME SELECT command.
Format: <REFERENCE FRAME TALLY>
<SOURCE> 1-byte special binary code:
meaning of right nibble:
x0h = normal (= default)
x1h = internal source
x2h = external source
meaning of left nibble:
x0h = normal (= default)
x1h = instantaneous grab
x2h = continuous grab
<DISPLAY> 1-byte special binary code:
00h = off (= default)
01h = on

7E VIDEO STANDARD TALLY
tallies the status set by the VIDEO STANDARD SELECT command.
Format: <VIDEO STANDARD TALLY>
<SWITCH> 1-byte special binary code:
00h = 525 lines/60 Hz
01h = 625 lines/50 Hz
xxh = user defined

7F ON AIR TALLY
indicates the on-air condition, if required.
Format: <ON AIR TALLY>
<SWITCH> 1-byte special binary code:
00h = 'on air' off (= default)
01h = 'on air' on

80 NORMALIZED FIELDS
indicates the names of all I/Fs that are currently in their normalized condition.
Format: <NORMALIZED FIELDS>
<BEGIN>
<I/F NAME>
<I/F NAME>
<END>

Note: If no I/F is in this condition. BEGIN is immediately followed by END.

81 AUTO CONTROLLED FIELDS
indicates the names of all I/Fs that are currently automatically controlled.

Format: <AUTO CONTROLLED FIELDS>
<BEGIN>
<I/F NAME>
<I/F NAME>
<END>

Note: If no 1/F is in this condition, BEGIN is immediately followed by END.

The following Information Fields represent Analogue Magnitudes; all these have the following characteristics in common.

1. Every magnitude has two associated Information Fields, one for the ACTUAL value, the other for a TARGET value.

2. All these Information Fields can be loaded by a PRESET command.

3. In order to cause a variety of transitions of the magnitudes, "activate" commands (e.g. CHANGE, TRANSITION) may be applied.

4. All these Information Fields use the same format:

Format:	<I/F NAME>	
	<MAGNITUDE>	2-byte unsigned binary number scale marks: 0000h = minimum value FFFFh= maximum value

The hexadecimal codes and Information Field Names are:

82 FOCUS ACTUAL
83 FOCUS TARGET
84 FRAMING ACTUAL
85 FRAMING TARGET
86 AUDIO OUT LEVEL ACTUAL
87 AUDIO OUT LEVEL TARGET

88 SCANNING WIDTH ACTUAL
89 SCANNING WIDTH TARGET
8A SCANNING HEIGHT ACTUAL
8B SCANNING HEIGHT TARGET
8C SCANNING H POSITION ACTUAL
8D SCANNING H POSITION TARGET
8E SCANNING V POSITION ACTUAL
8F SCANNING V POSITION TARGET

90 REPRODUCTION WIDTH ACTUAL
91 REPRODUCTION WIDTH TARGET
92 REPRODUCTION HEIGHT ACTUAL
93 REPRODUCTION HEIGHT TARGET
94 REPRODUCTION H POSITION ACTUAL
95 REPRODUCTION H POSITION TARGET
96 REPRODUCTION V POSITION ACTUAL
97 REPRODUCTION V POSITION TARGET
98 SCANNING ROTATION ACTUAL
99 SCANNING ROTATION TARGET

A0 MASTER LIFT ACTUAL
A1 MASTER LIFT TARGET
A2 LUMINANCE LIFT ACTUAL
A3 LUMINANCE LIFT TARGET
A4 R-Y LIFT ACTUAL
A5 R-Y LIFT TARGET
A6 B-Y LIFT ACTUAL
A7 B-Y LIFT TARGET

A8 MASTER GAMMA ACTUAL
A9 MASTER GAMMA TARGET
AA LUMINANCE GAMMA ACTUAL
AB LUMINANCE GAMMA TARGET
AC R-Y GAMMA ACTUAL
AD R-Y GAMMA TARGET
AE B-Y GAMMA ACTUAL
AF B-Y GAMMA TARGET

B0 MASTER GAIN ACTUAL
B1 MASTER GAIN TARGET
B2 LUMINANCE GAIN ACTUAL
B3 LUMINANCE GAIN TARGET
B4 R-Y GAIN ACTUAL
B5 R-Y GAIN TARGET
B6 B-Y GAIN ACTUAL
B7 B-Y GAIN TARGET

C2 RED LUMINANCE ACTUAL
C3 RED LUMINANCE TARGET
C4 GREEN LUMINANCE ACTUAL
C5 GREEN LUMINANCE TARGET
C6 BLUE LUMINANCE ACTUAL
C7 BLUE LUMINANCE TARGET
C8 MAGENTA LUMINANCE ACTUAL
C9 MAGENTA LUMINANCE TARGET
CA CYAN LUMINANCE ACTUAL
CB CYAN LUMINANCE TARGET
CC YELLOW LUMINANCE ACTUAL
CD YELLOW LUMINANCE TARGET

D0 SATURATION ACTUAL
D1 SATURATION TARGET
D2 RED SATURATION ACTUAL
D3 RED SATURATION TARGET
D4 GREEN SATURATION ACTUAL
D5 GREEN SATURATION TARGET
D6 BLUE SATURATION ACTUAL
D7 BLUE SATURATION TARGET
D8 MAGENTA SATURATION ACTUAL
D9 MAGENTA SATURATION TARGET
DA CYAN SATURATION ACTUAL
DB CYAN SATURATION TARGET
DC YELLOW SATURATION ACTUAL
DD YELLOW SATURATION TARGET
DE DARK SATURATION ACTUAL
DF DARK SATURATION TARGET

E2 RED HUE ACTUAL
E3 RED HUE TARGET
E4 GREEN HUE ACTUAL
E5 GREEN HUE TARGET
E6 BLUE HUE ACTUAL
E7 BLUE HUE TARGET
E8 MAGENTA HUE ACTUAL
E9 MAGENTA HUE TARGET
EA CYAN HUE ACTUAL
EB CYAN HUE TARGET

EC YELLOW HUE ACTUAL
ED YELLOW HUE TARGET

F0 H CORRECTION IN-BAND ACTUAL
F1 H CORRECTION IN-BAND TARGET
F2 H CORRECTION OUT-OF-BAND ACTUAL
F3 H CORRECTION OUT-OF-BAND TARGET
F4 H CORING ACTUAL
F5 H CORING TARGET
F6 V CORRECTION IN-BAND ACTUAL
F7 V CORRECTION IN-BAND TARGET
F8 V CORRECTION OUT-OF-BAND ACTUAL
F9 V CORRECTION OUT-OF-BAND TARGET
FA V CORING ACTUAL
FB V CORING TARGET

FF02 NEGATIVE RED LIFT ACTUAL
FF03 NEGATIVE RED LIFT TARGET
FF04 NEGATIVE GREEN LIFT ACTUAL
FF05 NEGATIVE GREEN LIFT TARGET
FF06 NEGATIVE BLUE LIFT ACTUAL
FF07 NEGATIVE BLUE LIFT TARGET
FF08 NEGATIVE RED GAIN ACTUAL
FF09 NEGATIVE RED GAIN TARGET
FF0A NEGATIVE GREEN GAIN ACTUAL
FF0B NEGATIVE GREEN GAIN TARGET
FF0C NEGATIVE BLUE GAIN ACTUAL
FF0D NEGATIVE BLUE GAIN TARGET
FF0E not used
FF0F REFERENCE FRAME WIPE

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