
SMPTE STABLE DOCUMENT



The attached SMPTE Engineering Document has been declared “Stable” by the controlling Technology Committee.

The SMPTE Operations Manual for Standards states:

A document should be stabilized if it is believed to be substantially correct, does not contain harmful or misleading recommendations, may still be relevant to equipment or practices in use, is stable, but does not represent current technology, and need not be subject to future reviews.

A Stable document shall still be made available and offered for sale by the Society, but it shall be prefaced by a cover page explaining its current status.

At any time, a Technology Committee may revise, amend, or otherwise initiate a new Project on a Stable document.

A Stable document is “In Force”, and not deprecated or withdrawn.

*** * * * ***

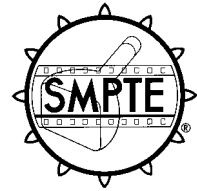
Note:

SMPTE “Stable” documents were previously described as “Archived” and the attached document may be marked as “Archived”. The status of a SMPTE document described as “Archived” is exactly as described above for a “Stable” document.

Stable documents may not adhere to the latest style and format of SMPTE documents, or to current usage of normative language. Suitable care should be taken in interpretation.

SMPTE RECOMMENDED PRACTICE

Type-Specific Messages for Digital Control Interface of Analog Audio Tape Recorders



Page 1 of 34 pages

1 Scope

This practice details and defines the type-specific messages used for the control of analog audio tape recorder devices. These type-specific messages provide the means for the control and monitoring of a specific type of virtual machine and are implemented within an architecture of a greater control message language.

2 General

2.1 Virtual machine type

Analog audio tape recorders shall be identified as a virtual machine of a type which is uniquely coded as "03," expressed as an 8-bit word, in hexadecimal form.

2.2 Notation

This practice describes the keyword coding, naming conventions and its argument constructs in a form as shown below. The coding "NN" represents the assigned keyword code, expressed as an 8-bit word, in hexadecimal form.

NN	KEYWORD or I/F NAME	Keyword or I/F descriptive text
	Format:	<COMMAND>
		<PARAMETER NAME 0> [Parameter description;
		... Parameter value coding, scale or range;
		<PARAMETER NAME n> Parameter definitions and explanations.]

In the practices listed in annex B, keywords are listed numerically, in hexadecimal notation. Keywords numbering 40_h – FF_h are reserved for the type-specific, virtual machine subsets. The type-specific messages for the ATR are contained within this subset.

2.2.1 Command classifications

All tape motion state commands are indicated by the command classification "TMS." Each TMS command causes a transition into a transport state. These states are mutually exclusive.

Tape motion process commands are indicated by the command classification "TMP." Tape motion processes are overriding control commands that cause the controlled device to automatically choose its own tape motion states to achieve the desired result. The tape motion state will be reflected in the TMS tally, as though that TMS command had been issued. TMPs are mutually exclusive.

All audio record commands are indicated by the command classification "ARC." ARC commands affect the manner in which tracks are selected and subsequently sequenced through record entries and exits.

All audio monitor commands are indicated by the command classification "AMC." AMC commands affect the manner in which audio line output source selections are made.

2.2.2 Reserved keywords

All keyword codes listed as "reserved" are specifically retained for the expansion of the range of compatible message usage between ATR and VTR type-specific devices.

3 Index of keywords

3.1 Numerical index of keywords, mnemonics, and information field names

Commands which have a related information field for tally purposes are identified by a ">>" sign within the body of the index listing.

	Message keywords	Mnemonic	I/F field names	Mnemonic
	40 not used		40 not used	
TMS	41 STOP	STOP	41 INTERNAL LTC	INTC
TMS	42 VARIABLE PLAY	VAPL	42 not used	
TMS	43 PLAY	STPL	43 SELECTED TAPE CODE	SETC
TMS	44 STEP	STEP	44 INTERNAL LTC USERBIT	INUB
TMS	45 AUDIBLE FAST	AFST	45 not used	
TMS	46 SHUTTLE	SHUT	46 TAPE TIMER	TATI
	47 not used		47 not used	
	48 reserved		48 reserved	
	49 CAPSTAN REFERENCE SELECT	CAPS >>	49 CAPSTAN REFERENCE TALLY	CRET
ARC	4A REHEARSE SELECT	REMS >>	4A REHEARSE TALLY	REHT
ARC	4B RECORD STROBE	RSTB	4B CHANNEL RECORD STATUS	CRES
ARC	4C RECORD EXIT	REEX	4C not used	
	4D TAPE CODE SELECT	TACS >>	4D TAPE CODE SELECTION TALLY	TACT
TMP	4E TARGET SEARCH	TASE	4E SYNC VELOCITY	SVTY
TMP	4F SYNC PREROLL SEARCH	SPRS	4F PREROLL DURATION	PRDU
TMS	50 SYNC	SYNC	50 SYNC POINT	SPNT
TMS	51 LOCK	LOCK	51 LOCK TIME	LKTT
TMP	52 LOCK PREROLL SEARCH	LPRS	52 not used	
TMP	53 CHASE	CHAS	53 not used	
	54 reserved		54 reserved	
	55 reserved		55 reserved	
	56 reserved		56 reserved	
	57 reserved		57 reserved	
TMS	58 TAPE RELEASE	TARL	58 not used	
	59 FIXED SPEED SELECT	FISS	59 FIXED SPEED TALLY	FIST
	5A not used		5A TAPELENGTH	TLTH
	5B not used		5B not used	
	5C not used		5C SYNC LOCK ACCURACY	SLAC
	5D not used		5D LOCK DEVIATION	LKDE
	5E not used		5E not used	
	5F not used		5F not used	

	60	PRESET	PRST	60	TMP TALLY	TMPT
TMS	61	FAST FORWARD	FFOR	61	TMS TALLY	TMST
TMS	62	FAST REVERSE	FREV	62	VELOCITY TALLY	VELT
	63	not used		63	not used	
ARC	64	RECORD READY SELECT	RECS >>	64	RECORD READY TALLY	RECT
	65	not used		65	not used	
	66	AUTO ATTENUATE SELECT	AUAS >>	66	AUTO ATTENUATE TALLY	AUAT
	67	LIFTER DEFEAT SELECT	TLDS >>	67	LIFTER DEFEAT TALLY	TLDT
	68	not used		68	reserved	
	69	not used		69	reserved	
	6A	not used		6A	reserved	
	6B	not used		6B	reserved	
	6C	not used		6C	reserved	
	6D	not used		6D	reserved	
	6E	not used		6E	reserved	
	6F	not used		6F	reserved	
	70	LOCK MODE SELECT	LKMS >>	70	LOCK MODE TALLY	LKMT
AMC	71	GLOBAL MONITOR SELECT	MONS >>	71	GLOBAL MONITOR TALLY	MONT
AMC	72	EXCLUSIVE SYNC SELECT	ESYS >>	72	EXCLUSIVE SYNC TALLY	ESYT
AMC	73	SYNC INPUT SELECT	SYIS >>	73	SYNC INPUT TALLY	SYIT
	74	not used		74	EXTERNAL TIME CODE	EXTC
	75	not used		75	EXTERNAL USERBITS	EXUB
	76	not used		76	SLEW RATE	SLRT
	77	not used		77	REQUESTED OFFSET	ROFT
	78	not used		78	ACTUAL OFFSET	AOFT
	79	not used		79	STRIDE LENGTH	STLT
	7A	LOCAL LOCKOUT SELECT	LLOS	7A	LOCAL LOCKOUT TALLY	LLOT
	7B	not used		7B	TIME CODE ATTRIBUTES	TCAT
	7C	PLAY MODE SELECT	PLMS	7C	PLAY MODE TALLY	PLMT

3.2 Functional index of keywords, mnemonics, and information field names

Commands which have a related information field for tally purposes are identified by brackets within the body of the index listing.

Message keywords	Mnemonic	I/F field names	Mnemonic
System utility			
7A LOCAL LOCKOUT SELECT	LLOS	7A LOCAL LOCKOUT TALLY	LLOT
Tape motion procedures (TMP)			
4E TARGET SEARCH	TASE \	60 TMP TALLY	TMPT
4F SYNC PREROLL SEARCH	SPRS >		
52 LOCK PREROLL SEARCH	LPRS		
53 CHASE	CHAS /		

Tape motion states (TMS)

41	STOP	STOP >	61	TMP TALLY	TMST
58	TAPE RELEASE	TARL \			
43	PLAY	STPL			
61	FAST FORWARD	FFOR			
62	FAST REVERSE	FREV >	62	VELOCITY TALLY	VELT
44	STEP	STEP			
42	VARIABLE PLAY	VAPL			
45	AUDIBLE FAST	AFST			
46	SHUTTLE	SHUT			
51	SYNC	SYNC			
51	LOCK	LOCK /			

Tape motion references

59	FIXED SPEED SELECT	FISS >>	59	FIXED SPEED TALLY	FIST
49	CAPSTAN REFERENCE SELECT	CAPS >>	49	CAPSTAN REFERENCE TALLY	CRET
60	PRESET	PRST	79	STRIDE LENGTH	STLT

Synchronization parameters

70	LOCK MODE SELECT	LKMS >>	70	LOCK MODE TALLY	LKMT
7C	PLAY MODE SELECT	PLMS >>	7C	PLAY MODE TALLY	PLMT
		/	51	SYNC POINT	SPNT
			51	LOCK TIME	LKTT
			4E	SYNC VELOCITY	SVTY
60	PRESET	PRST <	4F	PREROLL DURATION	PRDU
			77	REQUESTED OFFSET	ROFT
			5C	SYNC/LOCK ACCURACY	SLAC
		\	76	SLEW RATE	SLRT
			78	ACTUAL OFFSET	AOFT
			5D	LOCK DEVIATION	LKDE

Position and synchronization references

4D	TAPE CODE SELECT	TACS >>	4D	TAPE CODE SELECT TALLY	TACT
60	PRESET	PRST >	46 *	TAPE TIMER	TATI
			41 *	INTERNAL LTC	INTC
			43 *	SELECTED TAPE CODE	SETC
			74 *	EXTERNAL TIME CODE	EXTC

* = Time I/Fs which may be used as event triggers.

Position and time code utilities

60	PRESET	PRST	5A	TAPE LENGTH	TLTH
			7B	TIME CODE ATTRIBUTES	TCAT
			44	INTERNAL LTC USERBITS	INUB
			75	EXTERNAL USERBITS	EXUB

Audio record control (ARC)

64	RECORD READY SELECT	RECS >>	64	RECORD READY TALLY	RECT
4A	REHEARSE SELECT	REMS >>	4A	REHEARSE TALLY	REHT
4B	RECORD STROBE	RSTB >	4B	CHANNEL RECORD STATUS	CRES
4C	RECORD EXIT	REEX /			

Audio monitor control (AMC)

71	GLOBAL MONITOR SELECT	MONS >>	71	GLOBAL MONITOR TALLY	MONT
72	EXCLUSIVE SYNC SELECT	ESYS >>	72	EXCLUSIVE SYNC TALLY	ESYT
73	SYNC INPUT SELECT	SYIS >>	73	SYNC INPUT TALLY	SYIT
66	AUTO ATTENUATE SELECT	AUAS >>	66	AUTO ATTENUATE TALLY	AUAT
67	LIFTER DEFEAT SELECT	TLDS >>	67	LIFTER DEFEAT TALLY	TLDT

4 Keywords, definitions, and syntax

40 not used

41 STOP

(TMS) Causes the controlled ATR to stop as soon as possible; all recording tracks are automatically exited from record operation prior to execution.

Format: <STOP>

42 VARIABLE PLAY

(TMS) Causes the controlled ATR to enter capstan-controlled variable forward playback mode with specified velocity relative to the FIXED SPEED. If the controlled ATR is recording, all recording tracks will exit record mode.

Format: <VARIABLE PLAY>
<SPEED>

3-byte signed binary number: twos complement scale:

000000_h = stationary010000_h = fixed speed forward7F0000_h = approximately 127 times
standard fixed speed
forwardFF0000_h = fixed speed reverse800000_h = 128 times fixed speed
reverse

NOTE – Argument does not imply resolution of a controlled device.

43 STD PLAY

(TMS) Causes the controlled ATR to enter playback at the speed determined by the value in the FIXED SPEED I/F. If the controlled ATR is recording, all recording tracks will exit record mode.

Format: <PLAY>

- 44 STEP (TMC) Causes the controlled ATR to move the tape a specified number of STRIDE LENGTHS forward or backward, with respect to its current position, only while in STOP or STEP. Successive commands are cumulative until next TMS or TMP (other than STEP). The number argument refers to the quantity and direction of STRIDE PERIODS of tape movement requested. The longitudinal STRIDE LENGTH is defined in the STRIDE LENGTH I/F.
- Format: <STEP>
<NUMBER>
- 1-byte signed number:
range: -127 ... +127
- 45 AUDIBLE FAST (TMS) Causes the controlled ATR to enter fast tape motion with audible but not necessarily broadcastable audio at specified direction and velocity relative to the FIXED SPEED. All recording tracks are automatically exited from record operation prior to execution.
- Format: <AUDIBLE FAST>
<SPEED>
- 3-byte signed binary number;
same format as in VARIABLE PLAY.
- 46 SHUTTLE (TMS) Causes the controlled ATR to travel at specified direction and velocity relative to FIXED SPEED without necessarily reproducing audio. All recording tracks are automatically exited from record operation prior to execution.
- Format: <SHUTTLE>
<SPEED>
- 3-byte signed binary number;
same format as in VARIABLE PLAY.
- 47 not used .
- 48 reserved
- 49 CAPSTAN REFERENCE SELECT Causes the controlled ATR to select a capstan reference. This command is meaningful only when not in CHASE TMP, SYNC, or LOCK TMS. These operations will cause a return to the default selection.
- Format: <CAPSTAN REFERENCE SELECT>
<MODE>
- 1-byte special binary code:
00_h = internal crystal (= default)
01_h = external capstan reference input
FF_h = as selected locally

- 4A REHEARSE SELECT
- (ARC) During all subsequent record entries and exits, related line-out switching functions will mimic record operation as defined by the SYNC-INPUT SELECT I/F without actually erasing or applying bias and audio signal to tape.
- Format: <REHEARSE SELECT>
<MODE>
- 1-byte special binary code:
 00_h = rehearse true (default)
 04_h = rehearse true
 FF_h = as selected locally
 else = record enabled
- 4B RECORD STROBE
- (ARC) Causes record entry on the presently RECORD READY enabled track(s); causes record exit on any currently recording track(s) that are RECORD READY disabled.
- Format: <RECORD STROBE>
- 4C RECORD EXIT
- (ARC) Causes a record exit on all currently recording track(s).
- Format: <RECORD EXIT>
- 4D TAPE CODE SELECT
- Selects the source of code for all succeeding messages that refer to the SELECTED TAPE CODE.
- Format: <TAPE CODE SELECT>
<CODE TYPE>
- 1-byte special binary code:
 00_h = internal time code (= default)
 01_h = reserved
 02_h = tape timer
 03_h = reserved
 04_h = reserved
 FF_h = as selected locally
- 4E TARGET SEARCH
- (TMP) Causes the controlled ATR to move to a defined tape position in accordance with the TAPE CODE SELECT.
- Format: <TARGET SEARCH>
<TAPE CODE>
- (type TIME)

NOTE – The SELECTED TAPE CODE reference is selected by the command TAPE CODE SELECT.

- 4F SYNC PREROLL SEARCH (TMP) Causes the controlled ATR to move to the SELECTED TAPE CODE tape position determined by the PREROLL DURATION I/F minus any device-specific acceleration allowance in advance of the SYNC POINT I/F. All recording tracks are automatically exited from record operation prior to execution.

Format: <SYNC PREROLL SEARCH>

- 50 SYNC (TMS) This command is styled to follow the functional intent of the VTR dialect SYNC command. When issued, causes the controlled device to immediately establish synchronism with the selected TIMELINE SOURCE.

NOTES

1 The controlled device will synchronize with the above-selected reference at the prescribed SYNC POINT with the prescribed SYNC VELOCITY precisely at the prescribed PREROLL DURATION after either the "immediate" reception or "EVENT" reception of this keycode.

2 It is essential that the selected TIMELINE SOURCE is incrementing in a real time manner at the delivery time of the command during the PREROLL DURATION and throughout the remainder of the SYNC operation.

3 PREROLL DURATION and SYNC POINT I/Fs must be predefined before both SYNC PREROLL SEARCH and SYNC command execution. The controlled device must be cued to the correct preroll position before execution.

4 This command establishes synchronism independently of any previous preset REQUESTED OFFSET, as the offset at the instant of SYNC POINT is dependent upon the time of the command's delivery and the prescribed SYNC VELOCITY. As a function of SYNC operation, REQUESTED OFFSET may continuously be changed in order to maintain SYNC VELOCITY conformance relative to the selected TIMELINE SOURCE.

Format: <SYNC>

- 51 LOCK (TMS) When issued, causes the controlled ATR to establish synchronism in a manner as defined by the LOCK MODE I/F. Causes a LOCK PREROLL SEARCH operation should the controlled device not be cued to the correct prerolled position.

Format: <LOCK>

NOTE – PREROLL DURATION, REQUIRED OFFSET, and LOCK TIME I/Fs must be predefined before LOCK execution.

- 52 LOCK PREROLL SEARCH (TMP) Causes the controlled ATR to move to the SELECTED TAPE CODE tape position determined by the PREROLL DURATION I/F minus any device-specific acceleration allowance in advance of the REQUESTED OFFSET adjusted LOCK TIME I/F. All recording tracks are automatically exited from record operation prior to execution.

Format: <PREROLL SEARCH>

53	CHASE	(TMP) Causes the controlled device to attempt to follow, establish, and maintain synchronism with the EXTERNAL TIME CODE. Synchronism is established and maintained in a data-dependent manner. All recording tracks are automatically exited from record operation prior to any noncapstan servoed follow action.
	Format:	<CHASE>
54	reserved	
55	reserved	
56	reserved	
57	reserved	
58	TAPE RELEASE	(TMS) Releases the tape tension mechanism of the controlled ATR. All recording tracks are automatically exited from record operation prior to execution. This TMS is reset by STOP.
	Format:	<TAPE UNLOAD>
59	FIXED SPEED SELECT	Causes the controlled device to select the nominal tape speed.
	Format:	<FIXED SPEED SELECT> <SPEED>
		1-byte special binary code:
		10 _h = 1.875 ips 4.7625 cm/s
		20 _h = 3.750 ips 9.525 cm/s
		30 _h = 7.500 ips 19.05 cm/s
		37 _h = 9.606 ips 24.40 cm/s
		40 _h = 15.00 ips 38.10 cm/s
		50 _h = 30.00 ips 76.20 cm/s
		FF _h = as selected locally
5A	not used	
5B	not used	
5C	not used	
5D	not used	
5E	not used	
5F	not used	

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.

Permitted information field names for ATRs are:

TAPE TIMER	SYNC/LOCK ACCURACY
PREROLL DURATION	STRIDE LENGTH
SYNC POINT	SLEW RATE
LOCK TIME	REQUESTED OFFSET
TAPE LENGTH	

61	FAST FORWARD	(TMS) Causes the controlled ATR to go forward at its maximum speed without necessarily reproducing audio. All recording tracks are automatically exited from record operation prior to execution.
----	--------------	---

Format: <FAST FORWARD>

62	FAST REVERSE	(TMS) Causes the controlled ATR to rewind at its maximum speed without necessarily reproducing audio. All recording tracks are automatically exited from record operation prior to execution.
----	--------------	---

Format: <FAST REVERSE>

63 not used

64	RECORD READY SELECT	(ARC) Selects channels that will be record-enabled. These enabled tracks enter record upon receipt of a RECORD STROBE command. A track that is disabled from RECORD READY may be taken out of a recording condition through receipt of a RECORD STROBE or RECORD EXIT command.
----	---------------------	--

Format: <RECORD READY SELECT>
<CHANNELS>

8-byte bitmap:
 Bits 0 – 63 = audio channels 1 – 64
 Logic 1 = RECORD READY TRUE

Bits 0 – 7 form the least significant byte; this byte is transmitted last.

65 not used