FOSTEX D20
TLS-4000 MKII

INTERFACE DOCUMENTATION

Interface number : 1.812.444.21
IF - Doc number : 10.27.1751

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Summary

1 General Information

1.1 Ordering Information

	Order number
■ Interface Set (including Interface, Cable and Documentation)	21.812.444.21
■ Interface Board (Hardware/Software)	1.812.444.21
■ Hardware: TLS Serial Interface	1.812.490.20
■ Software Set	1.812.989.20
■ IF-Cable 5m	1.023.777.00
■ Interface Docu-number	10.27.1751
■ Hardware (serial IF) Docu-number	10.27.3050

1.2 Slave Model

- FOSTEX D 20
- Device with compatible connection: -

1.3 Software

■ First release (index 20)	1.812.989.20 (39/90)

2 Installing Procedures

2.1 TLS 4000 Requirements

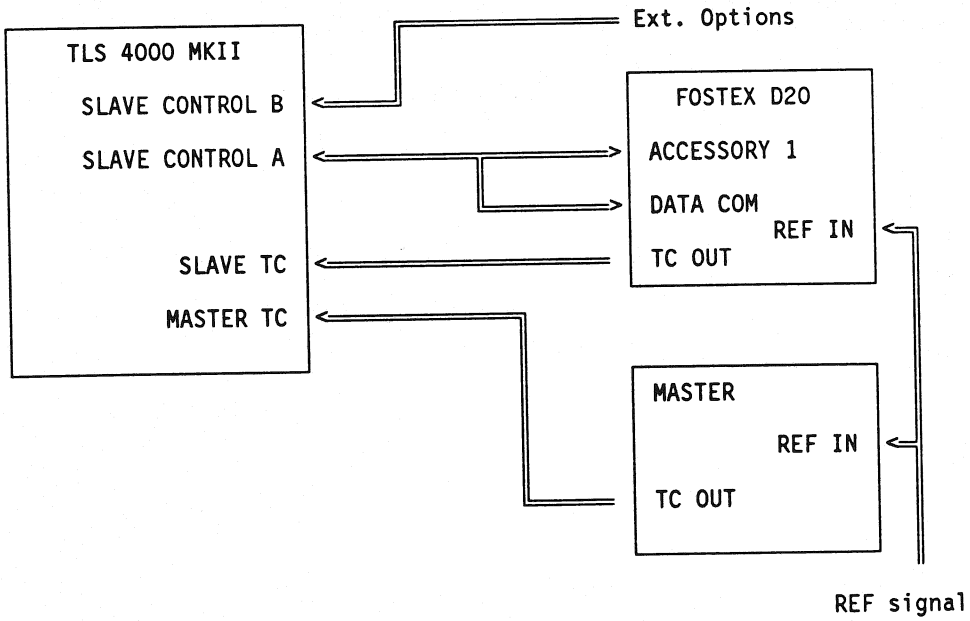
Order number

- Synchronizer Board — 1.812.320.23 or later
- Interface: — correct setup of the DIL-SWITCHES (see section 3.3)

2.2 Slave Requirements

- The FOSTEX D20 must be equipped with the option of serial link 8310.
  Software version: 1.0 or 2.2 or later versions.
- Position of the slave DIL-switch:
  On the back side of the FOSTEX D20 are three dil switches.
  Use DIP switch A 1 and 2 to select the right frame format.
  (see slave manual)
  Use DIP switch A 3 and 4 to select the SYNCH signal type.
  (see 3.6 Application Hints)
- REC MODE must be switched to "EDIT".

2.3 Connection Slave-Synchronizer



2.4 Quick Test, Adjustments

Insert the Interface after switching off the synchronizer. Connect the slave machine and switch on synchronizer and slave.
During the first 5 seconds the interface will perform a short selftest. The result is commented with some led messages. If no errors have been found, the display is available for operation messages (see section 3.5)

A good timecode on tape is essential for synchronizer operation and should be checked for master and slave.

No adjustments are necessary.

3 Operating Instructions

3.1 Technical Specifications

- Slave type:
  - RDAT
  - SMPTE/EBU timecode (available during wind modes) without move information
  - GOTO with PLAY - STOP sequence
  - Chase–Stop with waiting in advance
  - transition Chase to Playsync direct
- Tapedeck Control: - by serial communication RS 422 SONY protocol
- Capstan control: - frequency 9600 Hz nominal
- Movepulse information: - no movepulse information available

Compensation of Record Dropin/out Delays: compensated by synchronizer (includes both transmission delays and compensation of distance between erase and record head.

- Sync accuracy: ± 40 µs
- Park accuracy: < 40 ms
- Wow & Flutter: within slave specifications
- Lock time typical:

(in CUED status,	Master Start - SYNC)	:	2 sec
(in CHASE 10* vnom,	Master Start - SYNC)	:	10 sec

3.2 Summary of Supported Functions

Tape Deck Commands:

- STOP — shuttle still or stop
- PLAY — with available varispeed range (±12%)
- REC — with recording types (EDIT INSERT/ASSEMBLE)
- EDIT — the same as STOP
- FORW, — with parameter control only full speed (100 play)
- REW — and 5 play available.

- SHTLF, SHTLR — FORW/REW

- LOC, LOCREL — performed by interface

- REHEARSE: — available

- MUTE: — not implemented

- EVENT Relay: — is available (see section 3.4)

- CONDITIONAL COMMANDS: — A specific subset of single byte commands can be executed at certain timecode conditions. (PLAY, STOP, RECORD, RELAY ON, RELAY OFF)

- STATUS Request: — Status information is updated periodically by means serial communication.

- AUDIO Channel Control: — "READY/SAVE" of both channels (only together) can be controlled. Local changes of any status can be recognized and transferred to the synchronizer.

  CHANNEL 1 .. 2 = Audio Track 1 .. 2
  CHANNEL 7 = Timecode Track

- TRANSPARENT Commands: — Command and data request strings can be sent through the synchronizer to the slave. Parts of the protocoll (header and checksum) are added by the interface.

- KEYBOARD DISABLE: — Not implemented.

3.3 DIL-SWITCH Functions

DIL-Switch SZ81 allows the setting of the following modes.

- Switch 1: RECORD ENABLE
  Defines the polarity of RECEN (see section 3.4)
  OFF : RECORD enabled when
  - low level at RECEN pin

  ON : RECORD enabled when
  - high level at RECEN pin or input open

- Switch 2: SYNC MODE
  The interface can synchronize the slave in two different modes. The first mode is to use the FOSTEX D-20 in an environment with other digital machines or video machines. In this case it will be moved to the exact master position by using a 9.6 kHz signal. Afterwards the speed control will be given to an external reference signal like a composite video or a digital synchronous word signal. Be shure, that the slave dil switch are switched to the right reference signal. (see slave manual)

  The second one can be used, when the FOSTEX D-20 is whithin a system with analog audio machines. If the master is in blay, the slave speed will be controlled by the 9.6 kHz signal. So the slave can follow exactly the master time. If you need this mode the total harmonic distortion will be much bigger than described in the slave specifications.
  (it becomes about 0.14%)
  (machine specification: less than 0,05%)

  OFF : 1. mode (digital or video envirenment)
  ON : 2. mode (analog envirenment)

All other switches are not used and should be in OFF position.

Default settings: all switches in OFF position.

3.4 Additional Features at the SLAVE CONTROL B Connector

RECEN (PIN 2):
This signal is used to enable/disable the RECORD function with an external hardware. According to DIL–Switch position 1 and the level of the signal RECEN, RECORD commands are passed to the slave or modified to PLAY.

REL1 (PIN6), REL2 (PIN7):
A general purpose relay is controlled by EVON/EVOFF commands. The switch REL1/REL2 is closed with the command EVON.

XVSENB/
XVSREF (PIN5,PIN3):
An external varispeed circuit can be connected to the TLS.
The two signals are switched to the slave during the OFF mode of the synchronizer.

enable varispeed	XVSENB:	LOW = enabled
reference frequency	XVSREF:	9600 Hz nominal

3.5 LED Diagnostic Display

Three LEDs are situated at the front of the interface board. They provide information about the result of the initial selftest and the online status.

DL 1 2 3 **(front view)**
(# = LED blinking, - = LED off, * = LED on)

- An initialization procedure is executed after reset and the main hardware devices are tested. Any resulting error is signalled with a blinking left LED (DL1, about 1 Hz).
  If all LEDs are blinking, the internal EEPROM of the processor has to be reconfigured. This should only happen if the processor was replaced and the interface switched on for the first time. If this happend, you have to switch JS1 to position AB and reset the interface (power off - power on). After the initialisation the three LEDs should blink again. Put JS1 back to position BC and reset the interface again.
  Now the 68HC11 should be reconfigured and the LED message should not be the same.

DL1	DL2	DL3	
#	-	-	CPU RAM test failed.
#	-	*	RAM test failed.
#	*	-	SSDA test failed.
#	#	#	Microprocessor 68HC11 has to be reconfigured

- If no error was found, DL1 stays dark and the other two LEDs light, if communication with the slave or the synchronizer fails.

DL1	DL2	DL3	
-	*	*	no connection with the synchronizer board
-	*	-	no connection with the SLAVE
-	-	*	slave error (ex: tape out)

- If the left LED is on, a fatal processor error has occurred. A reset is necessary to return to operation mode. The interface board should be checked whenever such an error was encountered. In this case the interface should be resetted and this error message should not occur anymore.

DL1	DL2	DL3	
*	–	–	Fatal SW or HW error (eg ROM defect)
*	–	*	Watch dog error
*	*	–	Clock error
*	*	*	Illegal opcode

3.6 Applications Hints

- If you use the FOSTEX D20 in mode 2, you have to select the SYNCH type signal with DIP 3 and 4 of the machine dil switch A. The frame sync mode, field sync mode and composit mode are only usable, when the INPUT switch of the machine is in position "ANALOG".

- If you want to use the word sync mode, you have to switch on DIP 5 of dil switch A of the FOSTEX D20.

- The FOSTEX D20 can emulate three different SONY protocols.
  To have the best result, use Ed-00 (SONY RM 450).

  1. Switch on power and eject the cassette tape.

  2. Simultaneously press Z.LOC and P.LOC.
     Display will change to "2nd".

  3. When the EJECT key is pressed, the display will change from "2nd" to "Ed-XX".
     The necessary mode is set with the "up" and "down" keys while pressing the EJECT key.

  4. Release the EJECT key and press the DISP key to save the configuration. The modified data will be battery backed up.

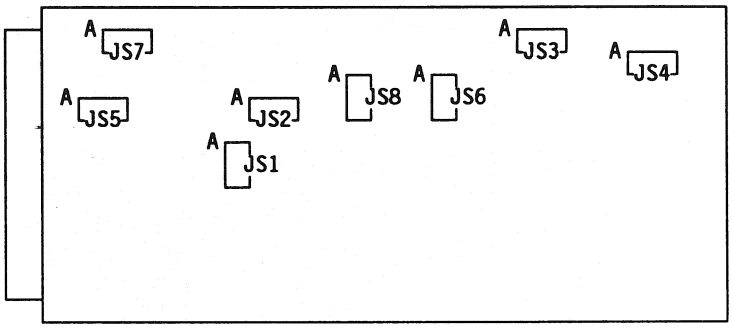
- Remote switching of the synchronizer from the slave machine is available.

- In chase mode the FOSTEX D20 has only three possibilities to control the speed. If you have the master in a loop, it can be faster to work with the EDIT WAIT mode than with the LOCK mode.

- The serial option of the FOSTEX D20 ver.: 1.0 (9-91, 9-99) has a software bug. So we had to compensate this bug. That is the reason why the interface does not accept a REWIND from the machine keyboard if the last state was PLAY.

4 Service Documentation

4.1 Jumper Settings



Functions of jumpers:

	Position AB	Position BC
JS1	Processor in special test mode	Processor in normal expanded mode *
JS2	PE6 input of the processor is LOW	PE6 input of the processor is HIGH *
JS3	Serial output TX/TA connected to MAX232 (RS 232)	Serial output TX/TA connected to 75176 (RS 422) *
JS4	Serial input of 68A50 is connected to MAX232 (RS 232)	Serial input of 68A50 is connected to 75176 (RS 422) *
JS5	IF ground is connected to the slave ground *	No connection between IF ground and slave ground
JS6	Capstan reference output has no pullup resistor *	Capstan reference output has a pullup resistor
JS7	Opto isolated inputs are supplied from the IF *	Opto isolated inputs are supplied from the slave
JS8	Capstan pullup resistor is supplied with 5V (or MVCC if JS7 'AB')*	Capstan pullup resistor is supplied with 15V

* Default setting for FOSTEX D20

4.2 Signal Description, Slave Connectors

SLAVE CONTROL A:

Pin	Signal	Type	Slave Sig.	Description
1	MGND		SYSTEM GND	ground of FOSTEX D20
2	–			
3	–			
4	–			
5	CAPEN	l out		(not used)
6	RX/RA		TXD	Tx A from FOSTEX D20
7	MOVCL	l in		(not used)
8	TX/TA		RXD	Rx A from FOSTEX D20
9	PAIN5	l in		(not used)
10	MOVDIR	l in		(not used)
11	+5V			(not used)
12	0.0V		SHIELD	screen
13	CAPCL	l out	SERVO OUT	capstan clock (9600Hz nominal)
14	RB		TXD	Tx B from FOSTEX D20
15	–			
16	–			
17	–			
18	–			
19	PAOUT5	l out		(not used)
20	–			
21	–			
22	–			
23	–			
24	TB		RXD	Rx B from FOSTEX D20
25	MVCC	+5V	+5V	supply voltage of FOSTEX D20

l. out logic output, active low
(open collector max 30V/0.3A)

l. in logic input, active low, optoisolated
(I-low > 10 mA)

SLAVE CONTROL B:

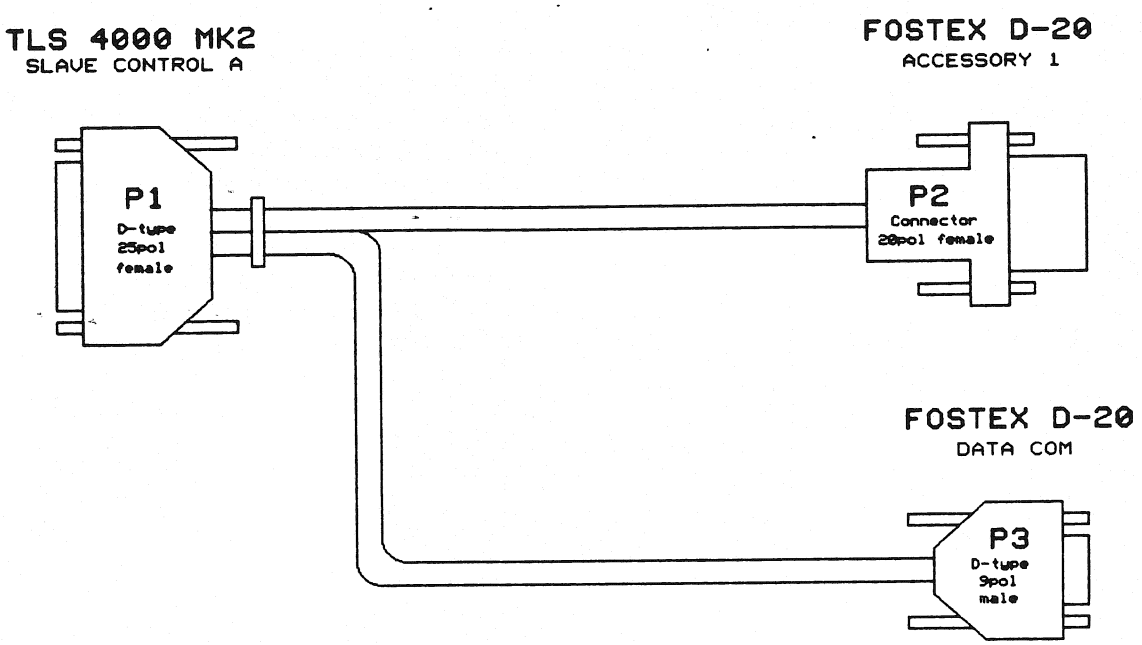
Pin	Signal	Type	Description	
1	0.0V			signal ground
2	RECEN/PAIN11	I in		record enable/safe input (see DIL Switch 3.3)
3	XVSREF/PAIN10	I in		external varispeed frequency
4	–			
5	XVSENB/PAIN9	I in		external varispeed enable
6	REL1			event relay contact 100V/0.3A
7	REL2			event relay contact 100V/0.3A
8	PAOUT6	I out		(not used)
9	–			
10	–			
11	+5V			IF power supply
12	PAIN12	I in		(not used)
13	–			
14	DC			(not used)
15	–			
16	–			
17	–			
18	–			
19	–			
20	0.0V			signal GND
21	MVCL	I out		(not used)
22	SCITX			(not used)
23	SCIRX			(not used)
24	MVDR	I out		(not used)
25	0.0V			signal GND

I. out logic output, active low
(open collector max 30V/0.03A)

I. in logic input, active low, optoisolated
(I-low > 10 mA)

Remark: Schematics → see universal serial IF

4.3 IF Cable Description



P1. 1	MGND	P2. 17
13	CAPCL	12
25	MVCC	19
	SCREEN	Case

P1 6	RX/RA	P3. 2
8	TX/TA	8
12	0,0V	1
14	RB	7
24	TB	3
	SCREEN	9

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