JVC BR-S610
TLS-4000 MKII

INTERFACE DOCUMENTATION

Interface number   : 1.812.464.21
IF - Doc number   : 10.27.1780

Summary

1   General Information

1.1   Ordering Information   Order number

- Interface Set
  (including Interface, Cable and Documentation)   21.812.464.21

- Interface Board (Hardware/Software)   1.812.464.21

- Software Set   1.812.987.21

- IF–Cable 5m   1.023.776.00

1.2   Slave Model

- JVC BR-S610E   S–VHS Video Tape Recorder

- Device with compatible connection: JVC BR-S611E,
                                        JVC BR-S810E,
                                        JVC BR-S811E

1.3   Software

- First release (index 20)   1.812.987.20 (42/90)
- SW update includes an additional adjust mode   1.812.987.21 (09/91)
  for the search control voltage (see 3.3)

2   Installing Procedures

2.1   TLS 4000 Requirements   Order number
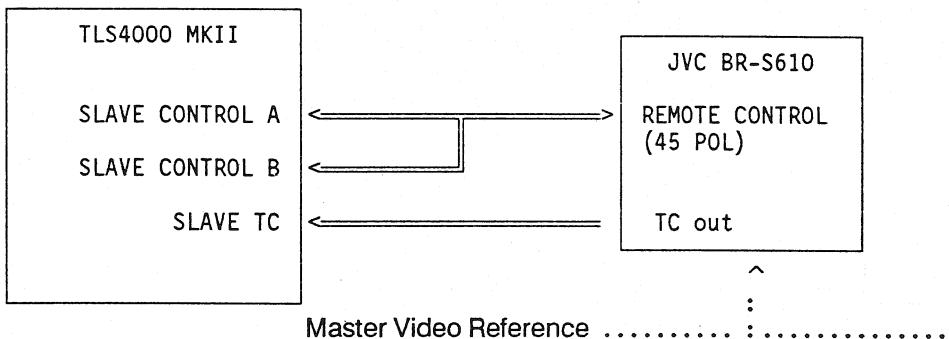
■ Synchronizer Board   1.812.320.23 or later

■ Interface: correct setup of the DIL-SWITCHES (see section 3.3)
                   and jumper positions of P91 (see layout)

2.2   Slave Requirements

■ "REMOTE" switch on front panel in position "REMOTE"

■ "TIMECODE – AUDIO" switch on backpanel in position "TIMECODE"

2.3   Connection Slave-Synchronizer

```
 ┌──────────────────────┐                    ┌──────────────────┐
 │  TLS4000 MKII        │                    │  JVC BR-S610     │
 │                      │                    │                  │
 │  SLAVE CONTROL A  <─────────────────────> │  REMOTE CONTROL  │
 │                      │                    │  (45 POL)        │
 │  SLAVE CONTROL B  <─────────────────┘     │                  │
 │                      │                    │                  │
 │  SLAVE TC         <───────────────────────│  TC out          │
 │                      │                    │                  │
 └──────────────────────┘                    └──────────────────┘
                              Master Video Reference . . . . . . . . . : . . . . . . . . . . . . .
```

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 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)

The correct wiring of movepulse information may easily be checked by disconnecting the slave timecode cable. The time display on the LCU or a controller should be updated with correct speed and direction.

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

An automatic adjustment of the search control voltage may be necessary (see 3.3).

3   Operating Instructions

3.1   Technical Specifications

■ Slave type:

- Video Tape Recorder with SMPTE/EBU timecode in PLAY and winding modes
- Move information with frequency and direction
- Direct parking in GOTO and LOCK
- Direct transition from chase to play
- Video type synchronisation (chase mode until 1 frame accuracy, then slave internal lock to video reference)

■ Tapedeck Control:

- with parallel control and dc search control.

■ Movepulse information:

- frame frequency (25 .. 30 Hz) and direction (LOW = reverse)

Record Dropin/out delays are compensated by the synchronizer.
(compensation to video track)

There is no compensation of the delay between video and tc head.

■ Sync accuracy: 0 frames

■ Park accuracy: ± 0.5 frames

■ Lock time: (in CUED status, Master Start – SYNC): < 3 sec

3.2 Summary of Supported Functions

Tape Deck Commands:

- STOP   is performed as SEARCH STILL command
- PLAY   external varispeed ±10% with BUMP-PLAY command
- REC   is performed with EDIT ON/OFF commands
  (BR-S810/811 only, see also section 3.6)

- EDIT   identical to STOP
- FORW,   search mode with dc control. The available steps are 1/30,
- REW   1/15, 1/8, 1/5, 1/2, 1, 2, 6 and 10 times nominal speed.

- SHTLF,
  SHTLR   identical to FORW/REW

- LOC,
  LOCREL   performed by interface

- REHEARSE: is not available. If a RECORD command is sent in REHEARSE mode, no command will be sent to the VTR, but the status response is simulated (RECORD).

- EVENT Relay: is available (see section 3.4)

- CONDITIONAL
  COMMANDS: are available for the following commands:
  STOP, EDIT, PLAY, REC, EVON, EVOFF

- STATUS
  Request: Status update from parallel tallies. A "Tape End" cannot be recognized in chase mode.

- MUTE, AUDIO
  Channel Control
  TRANSPARENT Commands
  KEYBOARD-DISABLE: are not available

3.3   DIL–SWITCH Functions

DIL SWITCH SZ52 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
■ Switch 3:   VIDEO FORMAT

Switch	2	3
25 fps	OFF	OFF
29.97 fps	ON	OFF
30 fps	OFF	ON

■ Switch 4:   AUTO SPEED CALIBRATION
              Calibrates the Search Control Voltage after PowerOn by moving
              the VTR at all speeds in both directions. The calibration
              procedure takes about 1 minute. If the default parameters of the
              interface match with the machine's values, it is better to disable
              the calibration mode. A mismatch results in unability to lock on a
              playing master.
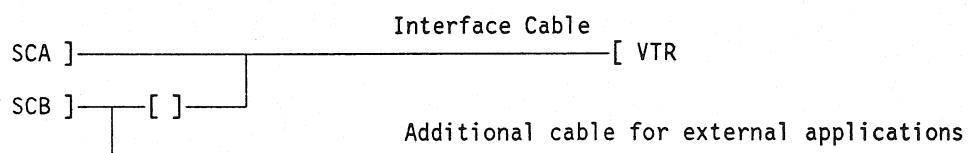
              OFF : Auto Calibration enabled
              ON   : Auto Calibration disabled

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

Some additional functions are wired to the SCB connector. Access to this
connector is possible with an additional cable which allows to connect the In-
terface Cable at the same time.

```
                              Interface Cable
        SCA ]———————————————————————————————[ VTR
        SCB ]——┬—[ ]——┘
               │                Additional cable for external applications
               └——————————————————————————————————————————
```

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.

MVCL   (PIN4), MVDR (PIN5):
                This output provides buffered movepulse information to supply
                further synchronizers with master movepulses.

                direction MVDIR   :   LOW = forward
                frequency MVCL   :   frame frequency (25 .. 30 Hz)

3.5   LED Diagnostic Display

**Two LEDs are situated at the front of the interface board. They provide in-
formation about the result of the initial selftest and the online status.**

DL 1 2   (Front view)
                (# = LED blinking, – = LED off, * = LED on)

■ An initialization procedure is executed after reset and the main hardware de-
vices are tested. During the test both LEDs are on. If there is no change at all
after the test, the processor system is probably not running. An encountered
error is signalled with a blinking display.

DL1	DL2	
–	#	EPROM error
#	–	RAM error
#	#	SSDA error

■ If no error was found, the LEDs are lighted if communication with the slave or
the synchronizer fails.
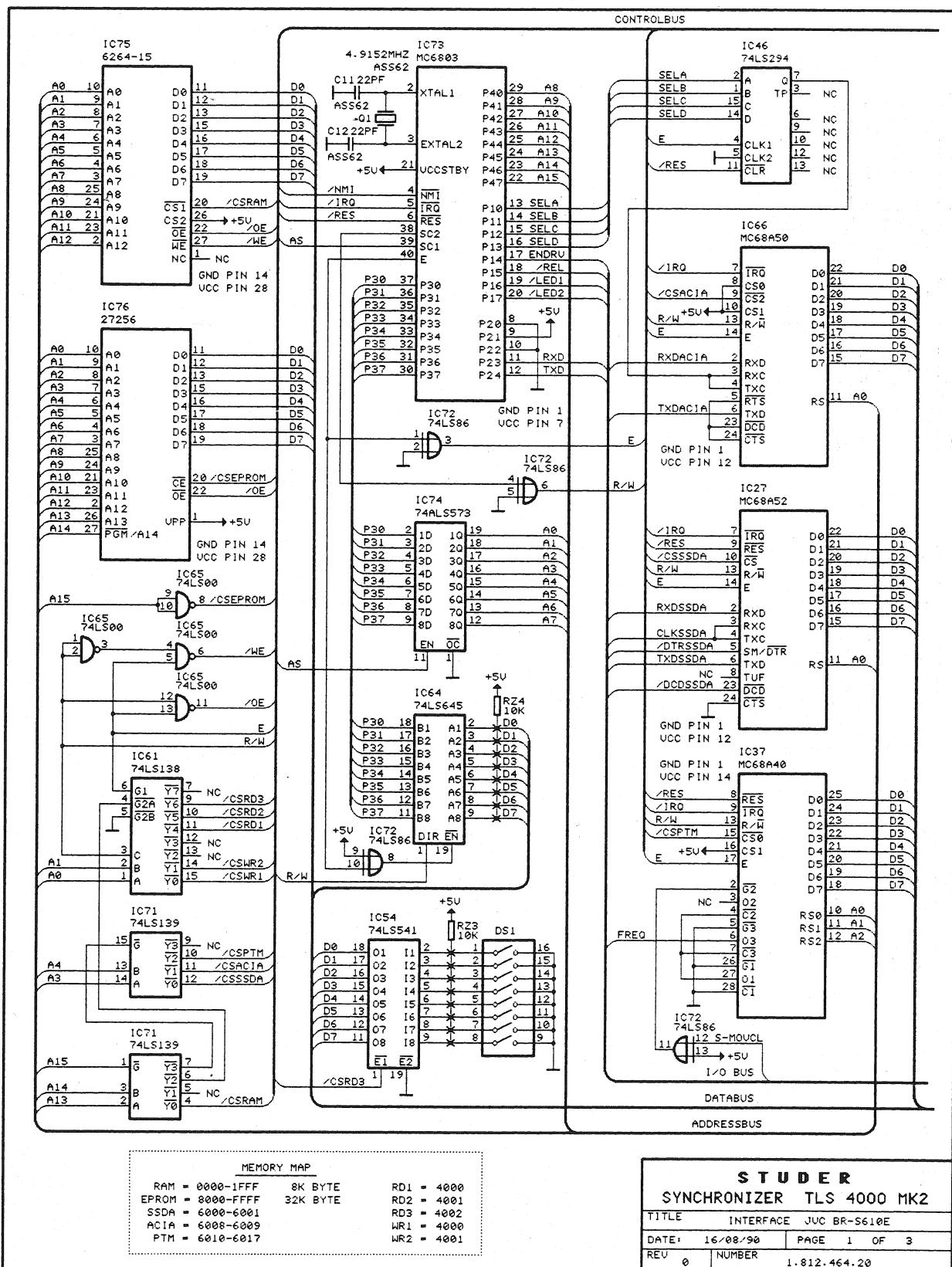
DL1	DL2	
–	–	no error
*	–	no communication with VTR DL1 is switched on at every command transmission. It is switched off when the command was acknow- ledged. If DL1 is on for more than 1 sec, the com- munication is considered as interrupted).
–	*	connection with synchronizer board failed
*	*	no connection with the synchronizer board
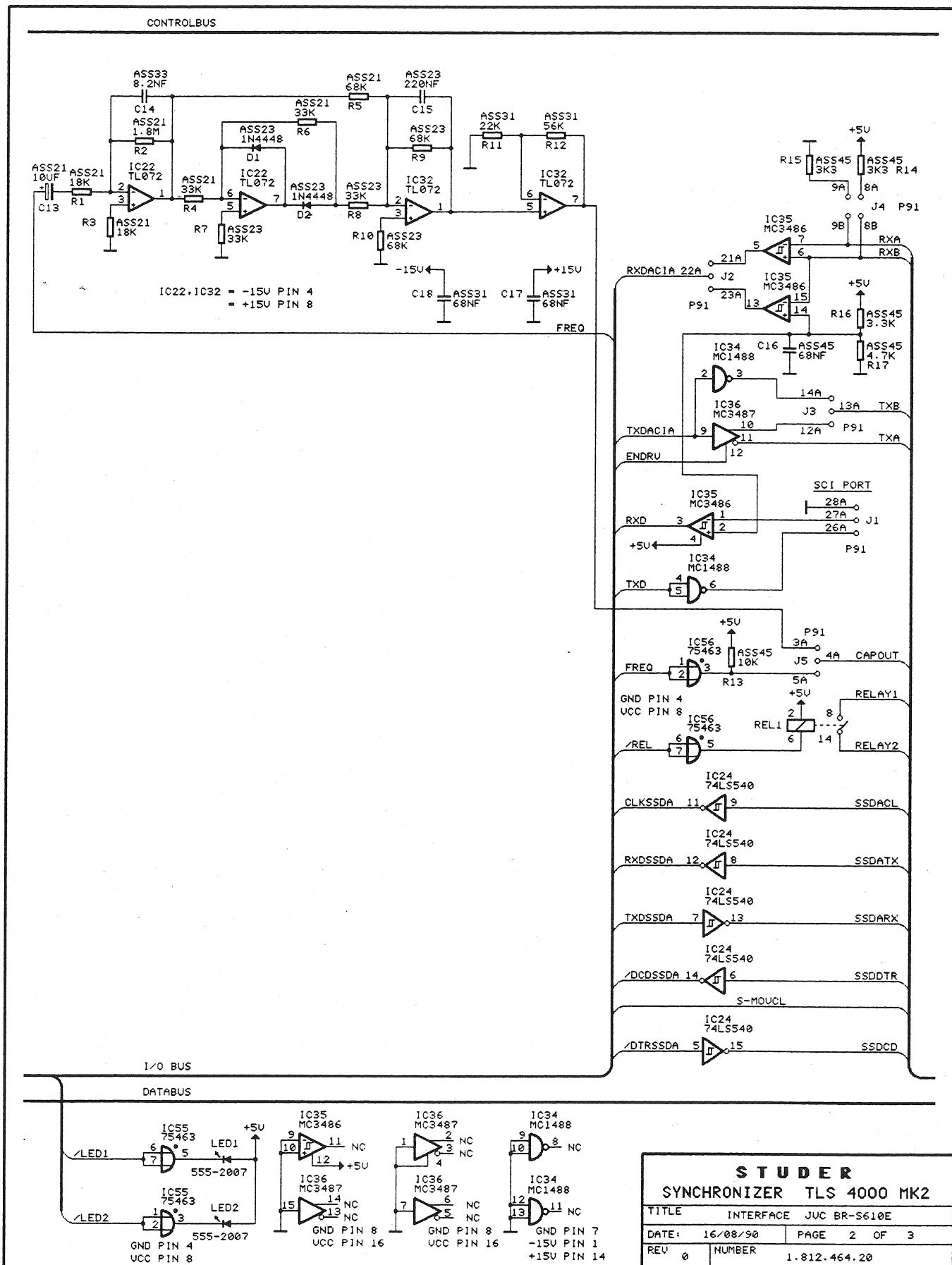
3.6   Applications Hints
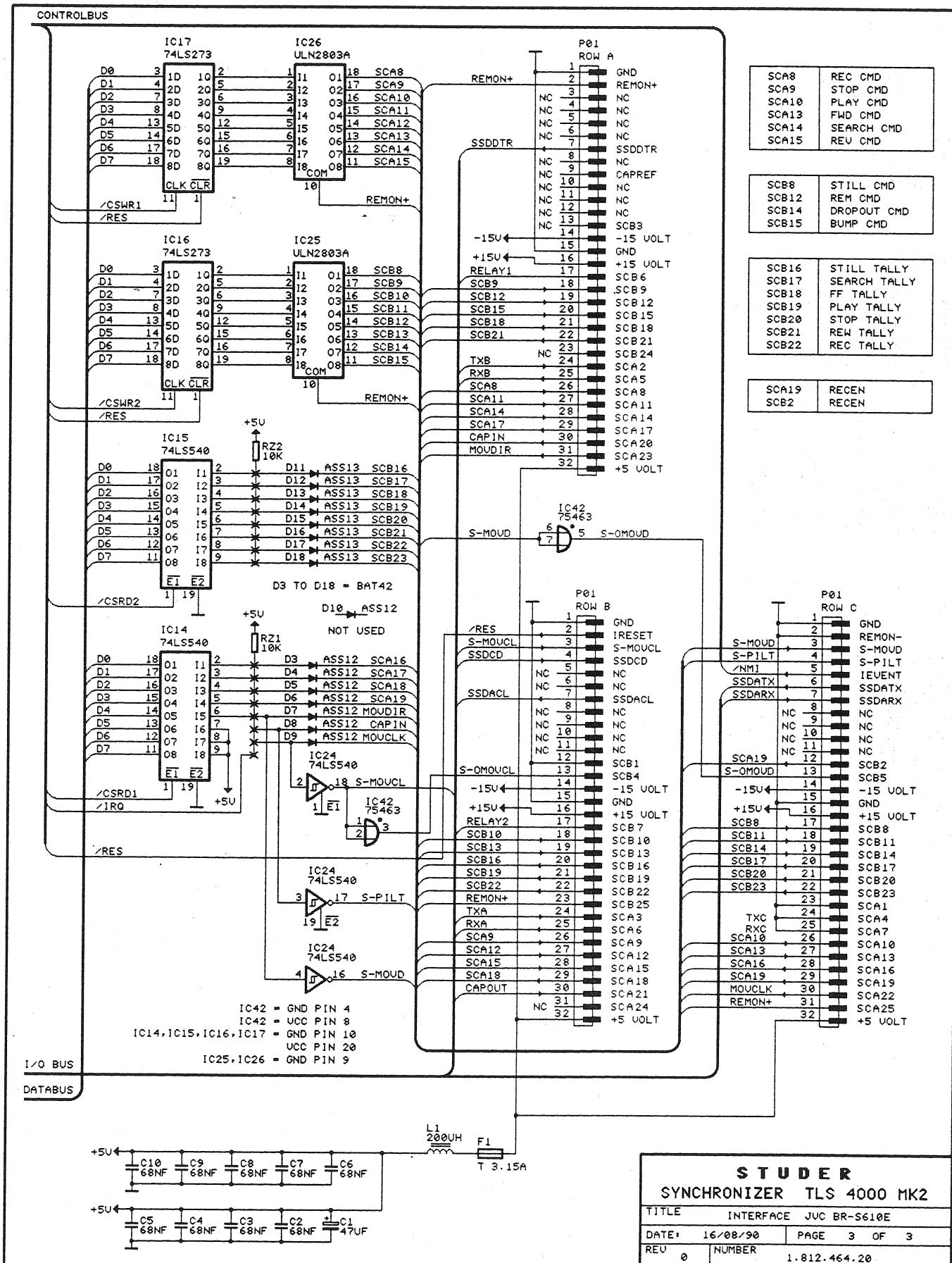
■ The synchronizer may be switched on by the VTR (remote switching, see TLS manual).

■ Recording is only possible with the editing machines (BR-S810/811). The recording tracks have to be selected at the local keyboard of the video recorder.
It is recommended to disable the record mode when working with the BR-S610/611 (see section 3.3).

■ The Hardware is identical to the JVC BR-6400 interface.

4 Service Instructions

4.1 Diagrams

MEMORY MAP				
RAM = 0000-1FFF	8K BYTE		RD1 = 4000	
EPROM = 8000-FFFF	32K BYTE		RD2 = 4001	
SSDA = 6000-6001			RD3 = 4002	
ACIA = 6008-6009			WR1 = 4000	
PTM = 6010-6017			WR2 = 4001	

S T U D E R			
SYNCHRONIZER TLS 4000 MK2			
TITLE	INTERFACE JVC BR-S610E		
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CONTROLBUS

SCA8	REC CMD
SCA9	STOP CMD
SCA10	PLAY CMD
SCA13	FWD CMD
SCA14	SEARCH CMD
SCA15	REV CMD

SCB8	STILL CMD
SCB12	REM CMD
SCB14	DROPOUT CMD
SCB15	BUMP CMD

SCB16	STILL TALLY
SCB17	SEARCH TALLY
SCB18	FF TALLY
SCB19	PLAY TALLY
SCB20	STOP TALLY
SCB21	REW TALLY
SCB22	REC TALLY

| SCA19 | RECEN |
| SCB2 | RECEN |

D3 TO D18 = BAT42

D10 = ASS12   NOT USED

IC42 = GND PIN 4
IC42 = UCC PIN 8
IC14,IC15,IC16,IC17 = GND PIN 10
UCC PIN 20
IC25,IC26 = GND PIN 9

I/O BUS

DATABUS

TITLE	INTERFACE JVC BR-S610E
DATE: 16/08/90	PAGE 3 OF 3
REV 0	NUMBER 1.812.464.20

S T U D E R
SYNCHRONIZER TLS 4000 MK2

4.2 Component arrangement

TOP VIEW

47UF +   C2   L1   F1
C1   68NF

11 =	REL 1
12 =	ASSEMBLY 12
13 =	ASSEMBLY 13
14 =	74LS540
15 =	74LS540
16 =	74LS273
17 =	74LS273

21 =	ASSEMBLY 21
22 =	TL072
23 =	ASSEMBLY 23
24 =	74LS540
25 =	ULN2803A
26 =	ULN2803A
27 =	MC68A52 SSDA

31 =	ASSEMBLY 31
32 =	TL072
33 =	ASSEMBLY 33
34 =	MC1488
35 =	MC3486
36 =	MC3487
37 =	MC68A40 PTM

42 =	75463
45 =	ASSEMBLY 45
46 =	74LS294

52 =	DILSWITCH DS1
54 =	74LS541
55 =	75463
56 =	75463

61 =	74LS138
62 =	ASSEMBLY62
64 =	74LS645
65 =	74LS00
66 =	MC68A50 ACIA

71 =	74LS139
72 =	74LS86
73 =	MC6803
74 =	74ALS573
75 =	6264 SRAM
76 =	27256 EPROM

ASS12

D3	BAT42
D4	BAT42
D5	BAT42
D6	BAT42
D7	BAT42
D8	BAT42
D9	BAT42
D10	BAT42

ASS13

D11	BAT42
D12	BAT42
D13	BAT42
D14	BAT42
D15	BAT42
D16	BAT42
D17	BAT42
D18	BAT42

ASS21

C13	10UF
R1	18K
R2	1,8M
R3	18K
R4	33K
R5	68K
R6	33K

ASS23

D1	1N4448
D2	1N4448
R7	33K
R8	33K
R9	68K
R10	68K
C15	220NF

ASS31

R11	22K
R12	56K
C17	68NF
C18	68NF

ASS33

C14	8,2NF

ASS45

R13	10K
R14	3,3K
R15	3,3K
R16	3,3K
R17	4,7K
C16	68NF

ASS62

C11	22PF
Q1	4,9152 MHZ
C12	22PF

LED2   LED130
J1 SCI PORT   GND / RXD / TXD   RS232   RS422   RS232   RS422   A / CAP / D   J5 CAPOUT
RXDACIA   TXA
J2 RECEIVER   J3 TRANSMITTER   RXA   J4 / RXB   TERM

STUDER		
SYNCHRONIZER TLS 4000 MK2		
TITLE	INTERFACE JVC BR-S610E	
DATE: 16/09/90	PAGE 1 OF 1	
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4.3　　　Component position list

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	A....12	1.812.218.00		Assembly 450-12	St
	A....13	1.812.218.00		Assembly 450-12	St
	A....21	1.812.219.00		Assembly 450-21	St
	A....23	1.812.220.00		Assembly 450-23	St
	A....31	1.812.232.00		Assembly 454-31	St
	A....33	1.812.226.00		Assembly 450-33	St
	A....45	1.812.222.00		Assembly 450-45	St
	A....62	1.812.201.00		Assembly 120-52	St
	C....01	59.25.3470	47 u	-20%, 16V , EL	
	C....02	59.99.0205	.068 u	-20%, 63V , CER	
	C....03	59.99.1200	.068 u	20%, 63V , PE	
	C....04	59.99.1200	.068 u	20%, 63V , PE	
	C....05	59.99.1200	.068 u	20%, 63V , PE	
	C....06	59.99.1200	.068 u	20%, 63V , PE	
	C....07	59.99.1200	.068 u	20%, 63V , PE	
	C....08	59.99.1200	.068 u	20%, 63V , PE	
	C....09	59.99.1200	.068 u	20%, 63V , PE	
	C....10	59.99.1200	.068 u	20%, 63V , PE	
	DL...01	50.04.2107		LED red , 555-2007	Di
	DL...02	50.04.2107		LED red , 555-2007	Di
	F....01	51.01.0122	3.15 AT	250V, 5 * 20	
	IC...14	50.06.0540		SN 74 LS 540 N	
	IC...15	50.06.0540		SN 74 LS 540 N	
	IC...16	50.06.0273		SN 74 LS 273 N	
	IC...17	50.06.0273		SN 74 LS 273 N	
	IC...22	50.09.0101		TL 072 CP, LF 353 N , A	
	IC...24	50.06.0540		SN 74 LS 540 N	
	IC...25	50.15.0119		ULN 2803, NE 5090	Mot,Sig
	IC...26	50.15.0119		ULN 2803, NE 5090	Mot,Sig
	IC...27	50.16.0114		MC 68A52, HD 68A52 , A	
	IC...32	50.09.0101		TL 072 CP, LF 353 N , A	
	IC...34	50.15.0106		MC 1488 P, DS 1488	
	IC...35	50.15.0104		MC 3486 P, DS 3486 N	

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	IC...36	50.15.0105		MC 3487 P, DS 3487 N	
	IC...37	50.16.0113		MC 68A40, HD 68A40 , A	
	IC...42	50.05.0203		SN 75463P	
	IC...46	50.06.0294		SN 74 LS 294 N	TI
	IC...54	50.06.0541		SN 74 LS 541 N	
	IC...55	50.05.0203		SN 75463P	
	IC...56	50.05.0203		SN 75463P	
	IC...61	50.06.0138		SN 74 LS 138 N	
	IC...64	50.06.0645		SN 74 LS 645 N	
	IC...65	50.06.0000		SN 74 LS 00 N	
	IC...66	50.16.0101		MC 68A50P, S 68A50 , A	
	IC...71	50.06.0139		SN 74 LS 139 N	
	IC...72	50.06.0086		SN 74 LS 86 N	
	IC...73	50.16.0107		MC 6803 P-1, HD 6803 P-1 , A	Mot,Hi
	IC...74	50.06.1573		SN 74 ALS 573 N	
	IC...75	50.14.0133		HM 6264LP-15, SRAM 8kx8, 150nsec , A	
	IC...76	50.14.0125	see note	HN 27128 AG-25, EPROM 16kx8, 250nsec , A	
	J....01	54.01.0021		Jumper	
	J....02	54.01.0021		Jumper	
	J....03	54.01.0021		Jumper	
	J....04	54.01.0021		Jumper	
	J....05	54.01.0021		Jumper	
	K....11	56.02.1003	5 V 1*A	100V/0.5A, Print	
	L....01	62.01.0115		Wide Band HF-Choke	
	P....01	54.01.0354		Card Connector 3 * 32 Euro Wrap	
	RZ...01	57.88.4103	8 * 10 k	2%, Single Line	
	RZ...02	57.88.4103	8 * 10 k	2%, Single Line	
	RZ...03	57.88.4103	8 * 10 k	2%, Single Line	
	RZ...04	57.88.4103	8 * 10 k	2%, Single Line	
	SZ...52	55.01.0168		8 * ON, DIL-Switch	

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.

NOTE :　Software release 1.812.987.20　(IC 76)

CER = Ceramic, EL = Electrolytic, PE = Met. Polyester

MANUFACTURERS : Di = Dialco, Hi = Hitachi, Mot = Motorola
Sig = Signetics, St = Studer, TI = Texas Instruments

ORIG 90/07/25

4.4   Signal Description, Slave Connectors

SLAVE CONTROL A:

Pin	Signal	Type	Description
1	GND		signal ground
2	TXB	RS422 out	(not used)
3	TXA	RS422 out	(not used)
4	GND		signal ground
5	RXB	RS422 in	(not used)
6	RXA	RS422 in	(not used)
7	GND		signal ground
8	REC	I out	EDIT ON command
9	STOP	I out	STOP command
10	PLAY	I out	PLAY command
11	–		
12	–		
13	FWD	I out	SEARCH forward direction
14	SEARCH	I out	SEARCH start command
15	REV	I out	SEARCH reverse direction
16	SCA16	I in	(not used)
17	SCA17	I in	(not used)
18	SCA18	I in	(not used)
19	RECEN	I in	RECORD ENABLE input
20	CAPIN	I in	(not used)
21	CAPOUT	dc out	SEARCH speed dc output
22	MOVCLK	I in	move clock input
23	MOVDIR	I in	move direction input
24	–		
25	REMON+	+12V	power supply from VTR

I out   logic output, active low
             (open collector, max 30V/0.3A)
I in   logic input, active low
             (Umax 40V)

SLAVE CONTROL B:
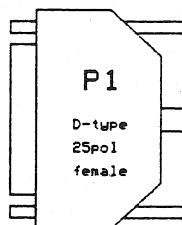
Pin	Signal	Type	Description
1	GND		signal ground
2	RECEN	I in	RECORD ENABLE input
3	–		
4	S–OMOVCL	I out	buffered move clock
5	S–OMOVD	I out	buffered move direction
6	RELAY1		relay contact 100V/0.3A
7	RELAY2		relay contact 100V/0.3A
8	STILL	I out	STILL command
9	SCB9	I out	(not used)
10	SCB10	I out	(not used)
11	SCB11	I out	(not used)
12	REM	I out	REMOTE command (enable CAPOUT)
13	SCB13	I out	(not used)
14	DROPOUT	I out	EDIT OFF command
15	BUMP	I out	BUMP command
16	B–STILL	I in	STILL status
17	B–SEARCH	I in	SEARCH status
18	B–FF	I in	FAST FORW status
19	B–PLAY	I in	PLAY status
20	B–STOP	I in	STOP status
21	B–REW	I in	REWIND status
22	B–REC	I in	EDIT status
23	SCB23	I in	(not used)
24	–		
25	REMON+	+12V	power supply from VTR
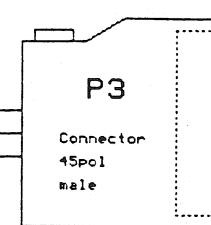
I out   logic output, active low
        (open collector, max 30V/0.3A)
**I in**   logic input, active low
        (Umax 40V)

4.5   IF Cable Description

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TLS 4000 MK2                              JVC BR-S610
SLAVE CONTROL A                           REMOTE CONTROL
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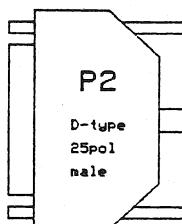


```
P1. 1 ........................... GND ........................... P3. 1
   8 ........................... REC ...........................    12
   9 ........................... STOP ..........................    3
  10 ........................... PLAY ..........................    4
  13 ........................... FWD ...........................    7
  14 ........................... SEARCH ........................    8
  15 ........................... REV ...........................    9
  21 ........................... CAPOUT ........................    21
  22 ........................... MOVCLK ........................    32
  23 ........................... MOVDIR ........................    31
  25 ........................... REMON+ ........................    34
  12 ........................... SCREEN ........................

P2. 8 ........................... STILL .........................  P3. 10
  12 ........................... REM ...........................    15
  14 ........................... DROPOUT .......................    13
  15 ........................... BUMP ..........................    42
  16 ........................... B-STILL .......................    23
  17 ........................... B-SEARCH ......................    24
  18 ........................... B-FF ..........................    25
  19 ........................... B-PLAY ........................    27
  20 ........................... B-STOP ........................    28
  21 ........................... B-REW .........................    29
  22 ........................... B-REC .........................    22
   1 ........................... SCREEN ........................
```

⊚ 01/11/90	PG	○		○		○		○	
		TLS4000 MK2						PAGE 1 OF 1	
STUDER	IF-KABEL JUC BR-S610			5M	Z	1.023.776.00			