

OTARI MTR-90 TLS-4000

INTERFACE DOCUMENTATION

Interface number : 1.812.458.20

IF - Doc number : 10.27.1600

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1 General

1.1 Modules, numbers

Order Number

- | | |
|--|---------------|
| ■ Interface kit, complete
(Interface, cable, documentation) | 21.812.458.20 |
| ■ Interface complete (HW,SW) | 1.812.458.20 |
| IF software set | 1.812.985.20 |
| IF-cable 5m | 1.023.769.00 |

1.2 Slave models

- OTARI MTR-90 MKII (multichannel audio tape recorder)
- Machines with compatible control: -

1.3 Software

- | | |
|----------------------------|--------------------|
| ■ Initial version index 20 | 1.812.985.20 40/89 |
|----------------------------|--------------------|

2 Installation

2.1 Requirements for TLS4000/interface

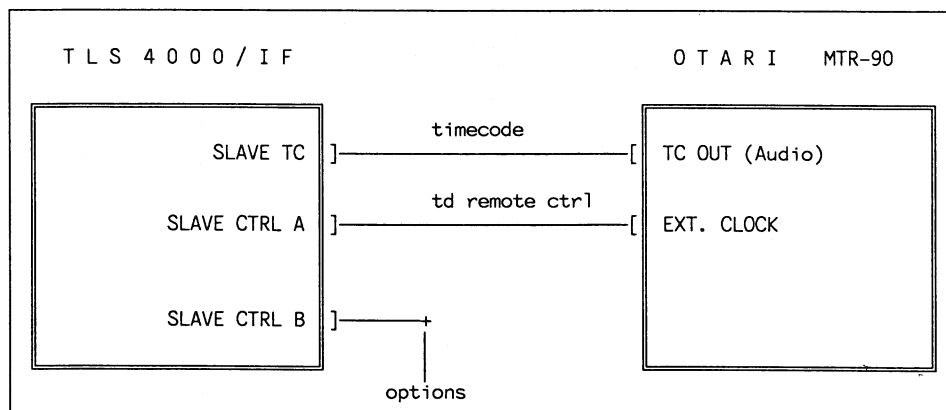
Order Number

- Synchronizer board 1.812.320.23 or newer
- Interface : correct setting of the DIL-switches (see Section 3.3)

2.2 Requirements for slave machine

- MTR-90: Switch on transport control PCB
(Operation and Maintenance Manual, Section 6.11)
SW1-4 ON (Play Start Inhibit)
(No muting of the TC-signal)
- Channel remote control CB113:
'Speed mode selector switch' in EXT position

2.3 Cabling TLS4000 - slave



2.4 Quick test, alignment

- After power has been switched on both LEDs must be dark (also refer to Section 3.5).
- Based on the indication of the slave time (LCU or controller) with interrupted TC line, the correct wiring of the move pulses can be checked. DIL switch 2 on the interface board must be set in accordance with the nominal speed (15/30 ips)!

3 Operating instructions

3.1 Technical data

- Slave type:
SMPTE/EBU-TC machine with move pulse information without code during spooling
 - GOTO function with PLAY-STOP sequence
 - Parking in LOCK with rollback offset
 - Transition CHASE-PLAY with preroll parking
- Tape deck control:
With parallel remote control
- Capstan servo control:
Frequency control, nom = 9600 Hz, +- 50%
- Move pulse information:
Clock/direction: 80 Hz at 30 ips
- Typical lockup time
(from CUED state, master start - SYNC) : < 3 sec
(from CHASE 10*vnom, master start - SYNC):
- DropIn delay: 75 msec (30 ips), 130 msec (15 ips)
- DropOut delay: 110 msec (30 ips), 170 msec (15 ips)
- TC compensation: 0 msec

3.2 List of functions

Tape deck functions:

- STOP
- PLAY, REC Nominal
Ext. varispeed (TLS-reference, +- 50%)
- EDIT Identical to STOP
- FORW, REW Variable wind with keying, 0 .. v_{max}, lifter defeat up to 4.5 v_{nom}
- SHTLF, SHTLR Identical to FORW/REW
- LOC, LOCREL Locate implemented in interface
- MUTE and REHEARSE
It was not possible to implement the MUTE and REHEARSE functions. For external retrofitting of REHEARSE, the REH_CMD signal on the SLAVE CONTROL A connector can be used (active low from drop-in to the drop-out point).
- EVENT RELAY
This relay can be controlled (see Section 3.4).

- **CONDITIONAL COMMANDS**
Code controlled initiation is feasible for the following functions:
Tape deck commands STOP, EDIT, PLAY, REC
Relay control EVON, EVOFF
- **STATUS INQUIRY**
The tape deck status of the MTR-90 is read via the parallel interface.
- **AUDIO channel remote control, TRANSPARENT commands, KEYBOARD DISABLE not implemented.**

3.3 DIL switch functions

The following functions can be set on the DIL switch SZ81:

- **Switch 1: Polarity of the RECEN-signal (see Section 3.4)**
Record inhibition is controlled with
ON : Active signal (LOW)
OFF : Inactive signal (HIGH or open)
- **Switch 2: Nominal speed in PLAY**
This switch must be set in accordance with the selected tape speed:
ON : 15 ips
OFF : 30 ips

3.4 Supplementary functions on slave control connector

- **RECEN (Pin2):**
Record enable for hardware-controlled inhibition of the RECORD function. Depending on the setting of DIL switch 1, the record function is inhibited by an active (LOW) or inactive (HIGH or open) signal.
- **REL1 (Pin6), REL2 (Pin7):**
The EVENT relay contact REL1/REL2 can be used for any purpose. It is controlled with the commands EVON, EVOFF via the serial TLS interface.
- **MVCL (Pin21), MVDR (Pin24):**
The move pulse information (outputs, open collector), derived from slave signals, can be used for wiring the master tallies when the MTR-90 is used.
MVDR : LOW = reverse
MVCL : The frequency at nominal play speed is 10 Hz.

3.5 Pilot LEDs

Two LEDs are arranged on the front for fault diagnosis and status indication:

DL 2 1 (viewed from the front)

- After power has been switched on both LEDs are light. After a brief self-test program any detected errors are signalled with flashing lights:

DL 2 1 (- LED dark, # LED flashing)

DL2	DL1	
-	#	EPROM checksum error detected
#	-	RAM error detected
#	#	no communication with synchronizer board

- After the successful start the 2 LEDs are used as status indicators.

DL 2 1 (- LED dark, * LED lit)

DL2	DL1	
-	-	Normal quiescent state
*	-	Port status interface - MTR-90: Is light between the time the command is issued and the correct acknowledgment or the expiration of a timeout of approximately one second.
-	*	Port status interface - synchronizer: Is light as long as the connection is interrupted.

3.6 Test points

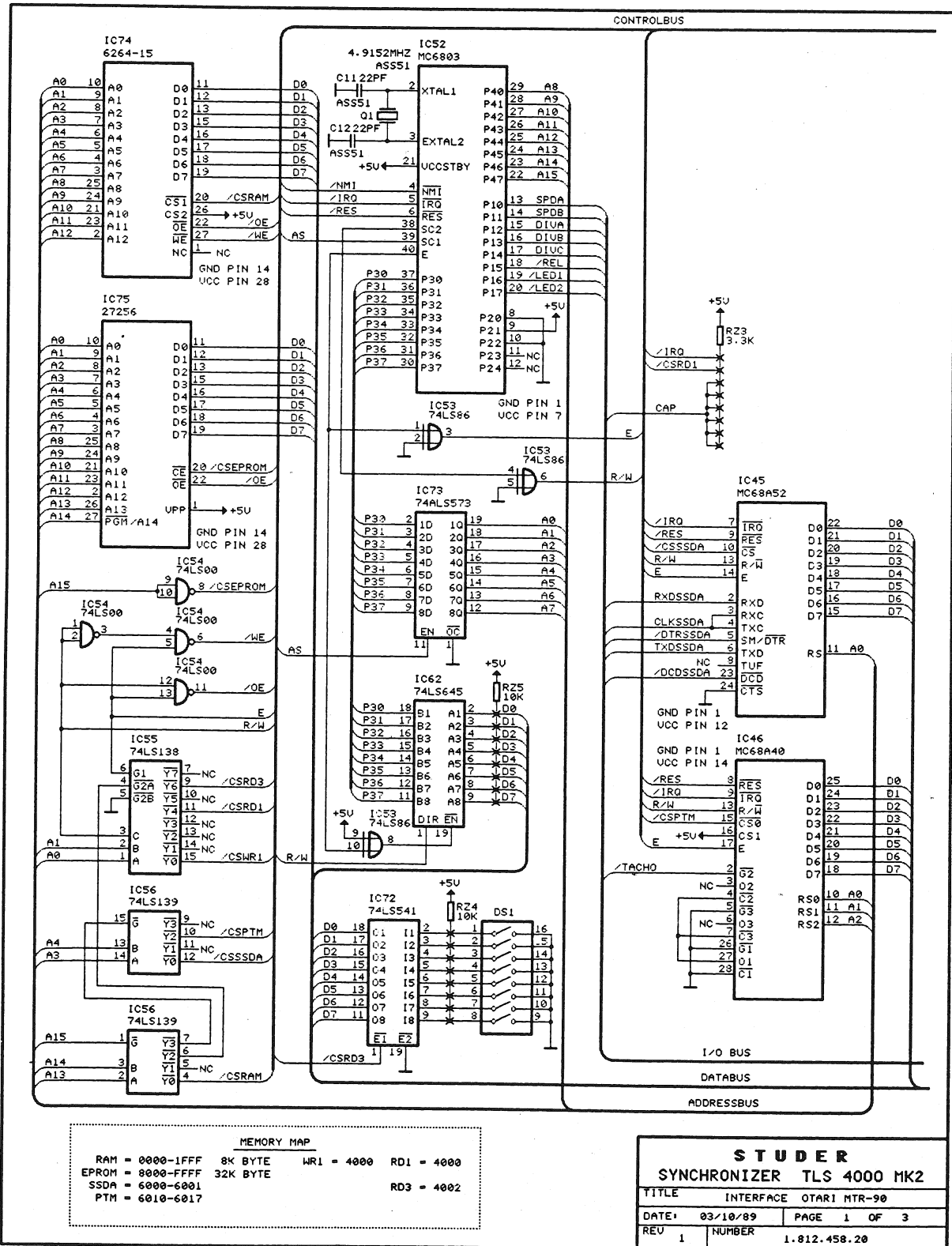
None

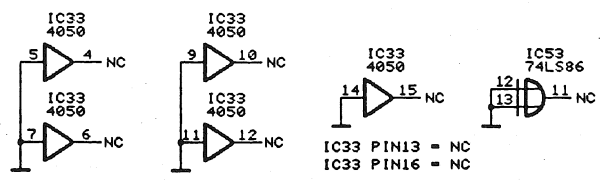
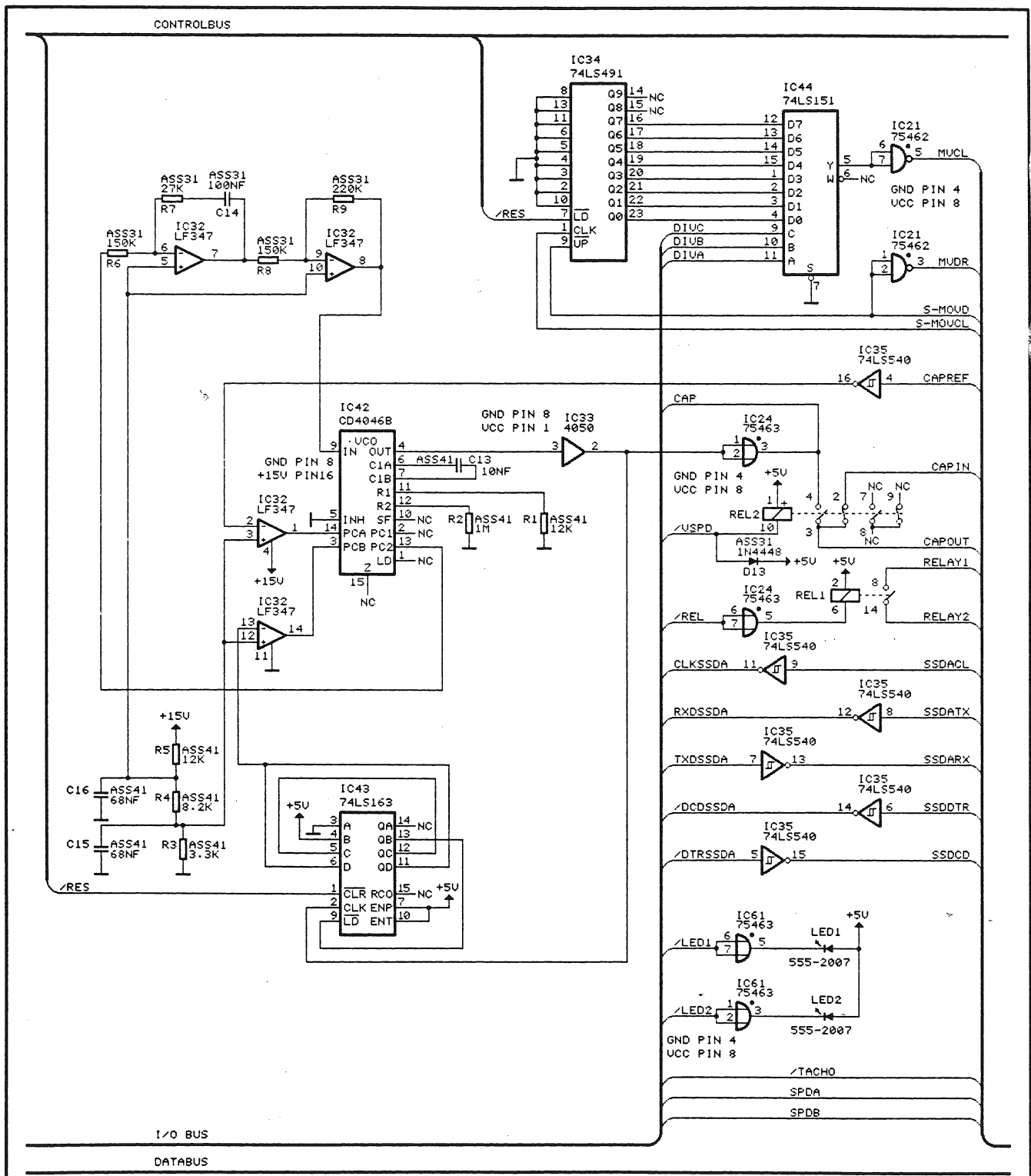
3.7 Application notes

- The hardware of the interface is identical with the one of the OTARI MX70/80 interface (1.812.460.20/1.812.462.20).
- Move pulse frequency as master tallies (see Section 3.3).

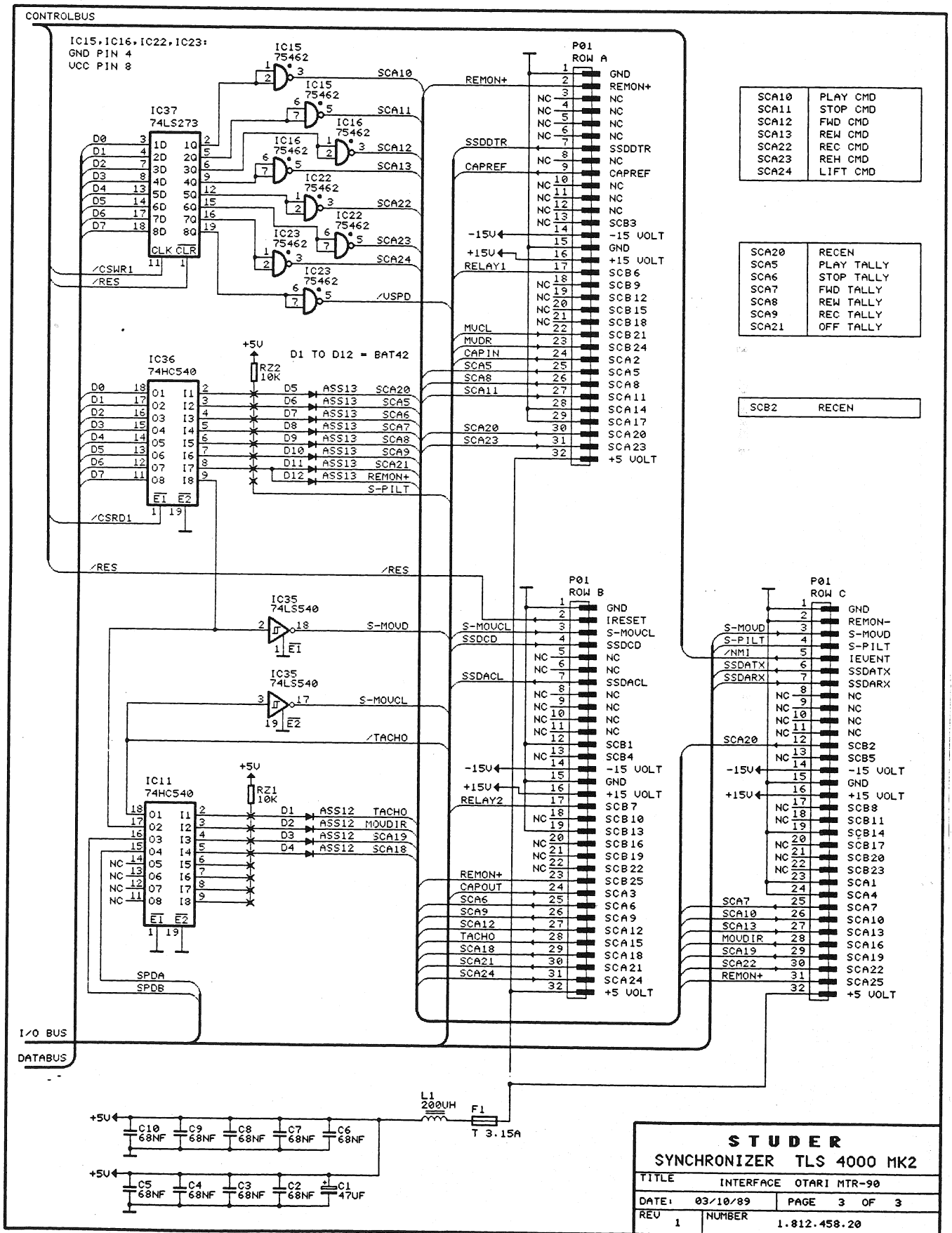
4 Service documentation

4.1 Diagrams

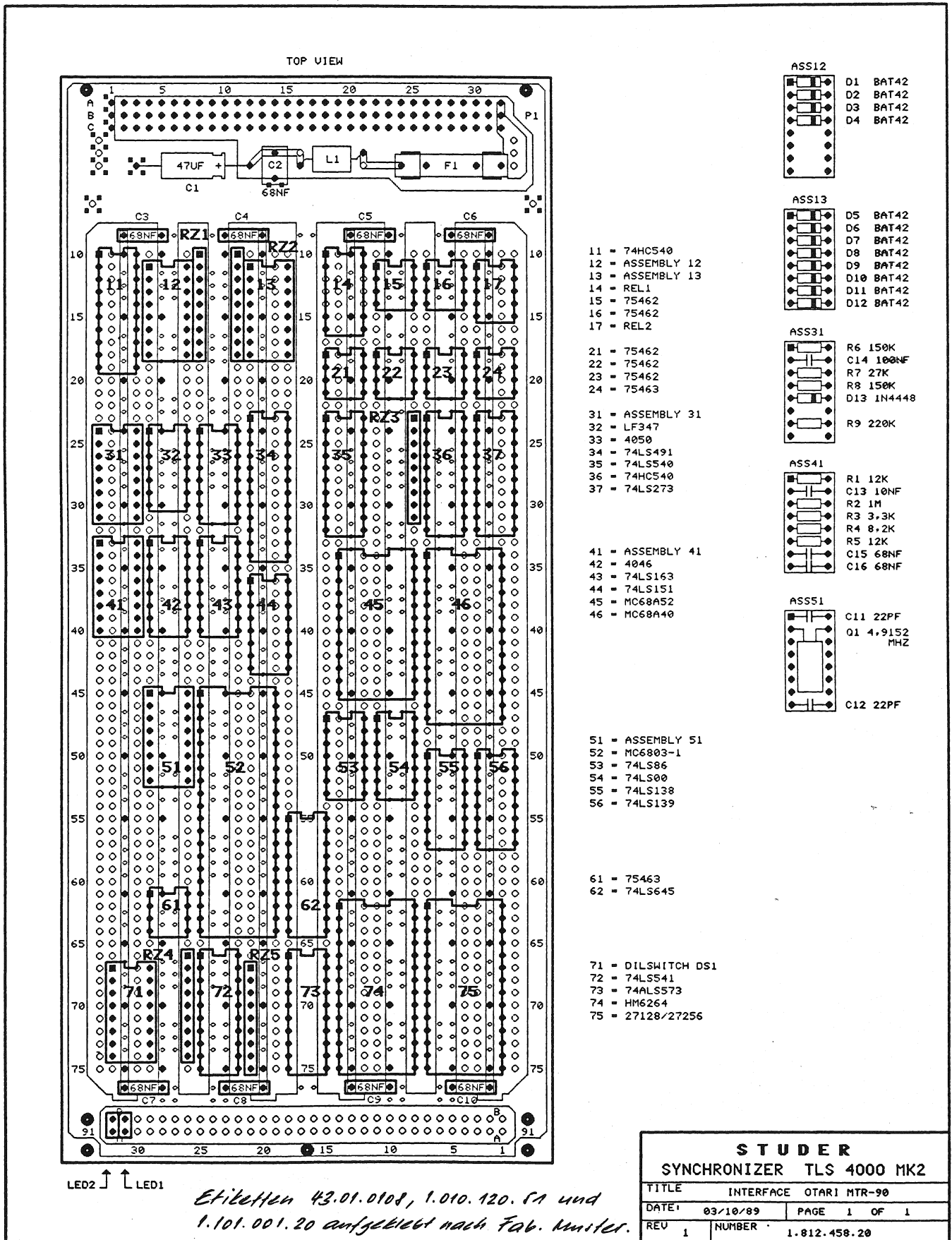




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SYNCHRONIZER TLS 4000 MK2	
TITLE INTERFACE OTARI MTR-90	
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4.2 Component arrangement



4.3 Component position list

IF OTARI MTR-90 1.812.458.20

Ad	POS	REF.No	DESCRIPTION	MANUFACTURER
A....12	1.812.218.00		Assembly 450-12	St
A....13	1.812.218.00		Assembly 450-12	St
A....31	1.812.228.00		Assembly 452-21	St
A....41	1.812.229.00		Assembly 452-41	St
A....51	1.812.201.00		Assembly 120-52	St
C....1	59.25.3470	47 uF	-20%, 16V, EL	
C....2	59.99.0205	68 nF	-20%, 63V, CER	
C....3	59.99.1200	68 nF	20%, 63V, PET	Quantity: 8
DL....1	50.04.2107		LED red ,555-2007	Di
DL....2	50.04.2107		LED red ,555-2007	Di
F....1	51.01.0122	3.15 AT	250V, 5 * 20	
IC...11	50.06.0540		SN 74 LS 540	
IC...15	50.05.0227		SN 75 462 JG, SN 75 472 P	
IC...16	50.05.0227		SN 75 462 JG, SN 75 472 P	
IC...21	50.05.0227		SN 75 462 JG, SN 75 472 P	
IC...22	50.05.0227		SN 75 462 JG, SN 75 472 P	
IC...23	50.05.0227		SN 75 462 JG, SN 75 472 P	
IC...24	50.05.0203		SN 75 463 JG, DS 75 463	
IC...32	50.09.0104		LF 347 N	
IC...33	50.07.0050		CD 4050 BE, MC 14050 BCP	,A RCA,MOT
IC...34	50.06.0491		SN 74 LS 491 NS	
IC...35	50.06.0540		SN 74 LS 540	
IC...36	50.06.0540		SN 74 LS 540	
IC...37	50.06.0273		SN 74 LS 273	
IC...42	50.07.0046		CD 4046 BE, MC 14046 BCP	,A RCA,MOT
IC...43	50.06.0163		SN 74 LS 163	
IC...44	50.06.0151		SN 74 LS 151	
IC...45	50.16.0114		MC 68A52 P	,A
IC...46	50.16.0113		MC 68A40 P	,A
IC...52	50.16.0107		MC 6803-1, HD 6803P-1	,A MOT,HI
IC...53	50.06.0086		SN 74 LS 86	
IC...54	50.06.0000		SN 74 LS 00	
IC...55	50.06.0138		SN 74 LS 138	
IC...56	50.06.0139		SN 74 LS 139	
IC...61	50.05.0203		SN 75 463 JG, DS 75 463	
IC...62	50.06.0645		SN 74 LS 645	
IC...72	50.06.0541		SN 74 LS 541	
IC...73	50.06.1573		SN 74 ALS 573	
IC...74	50.14.0133		HM 6264 LP-4,SRAM 8K X 8, 200NSEC	
IC...75	50.14.0125	SEE NOTE	HM 4827128 6-25, EPROM 16K X 8, 300NSEC	
K....14	56.02.1003	5 V 1*A	100V/0.5A, Print	
K....17	56.04.0195	6 V 2*U	125V/1.0A, Print	
L....1	62.01.0115		Wide Band HF-Choke	
P....1	54.01.0354		Card Connector 3 * 32 Euro Wrap	
RZ...1	57.88.4103	8 * 10K	2%, Single Line	
RZ...2	57.88.4103	8 * 10K	2%, Single Line	
RZ...3	57.88.4332	8 * 3.3K	2%, Single Line	
RZ...4	57.88.4103	8 * 10K	2%, Single Line	
RZ...5	57.88.4103	8 * 10K	2%, Single Line	
SZ...71	55.01.0168		8 * ON, DIL-Switch	

Notes : Software release 1.812.985.20 (IC 75)

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

MANUFACTURERS : Di = Dialco
 Hi = Hitachi
 Mot = Motorola
 RCA = RCA Corporation
 St = Studer
 TI = Texas Instruments

1.812.458.20 INTERFACE OTARI MTR-90 HST89/10/0309

4.4 Signal description, slave connectors

SLAVE CONTROL A:

Pin	Signal	Type	Description
1	GND		signal ground
2	CAPIN	I in	n.c.
3	CAPOUT	I out	capstan clock to MTR-90 (9600 Hz nominal)
4	GND		signal ground
5	PLAY_TLY	I in	PLAY tally
6	STOP_TLY	I in	STOP tally
7	FWD_TLY	I in	FAST FORWARD tally
8	REW_TLY	I in	FAST REWIND tally
9	REC_TLY	I in	RECORD tally
10	PLAY_CMD	I out	PLAY command
11	STOP_CMD	I out	STOP command
12	FWD_CMD	I out	FAST FORWARD command
13	REW_CMD	I out	FAST REWIND command
14	GND		signal ground
15	TACHO	I in	move pulse frequency (80 Hz 30 ips)
16	MOVDIR	I in	move pulse direction (low = reverse)
17	GND		signal ground
18	SPEED_A	I in	n.c.
19	SPEED_B	I in	n.c.
20	RECEN	I in	(= SLAVE CONTROL B, pin 2)
21	OFF_TLY	I in	n.c.
22	REC_CMD	I out	RECORD command
23	REH_CMD	I out	n.c. (see section 3.2)
24	LIFT_CMD	I out	LIFTER DEFEAT command
25	REMÖN+		power supply of MTR-90 (+5V)

- Signaltypes: I in logic input, activ low
- I out logic outputs, activ low
(open collector output, max 28V/0.3A)

SLAVE CONTROL B:

Pin	Signal	Type	Description	
1	GND	I in	signal ground	
2	RECEN		record enable/safe (see DIL switches)	
3	-			
4	-			
5	-			
6	REL1		relay contact 1 (100V/0.5A)	
7	REL2		relay contact 2 (100V/0.5A)	
8	-			
9	-			
10	-			
11	-			
12	-			
13	GND		I out	signal ground
14	GND	signal ground		
15	-			
16	-			
17	-			
18	-			
19	-			
20	-			
21	MVCL	buffered move clock from MTR-90 (10 Hz nom)		
22	-			
23	-	I out		
24	MVDR			buffered move direction (low = reverse)
25	REMON+		power supply from MTR-90	

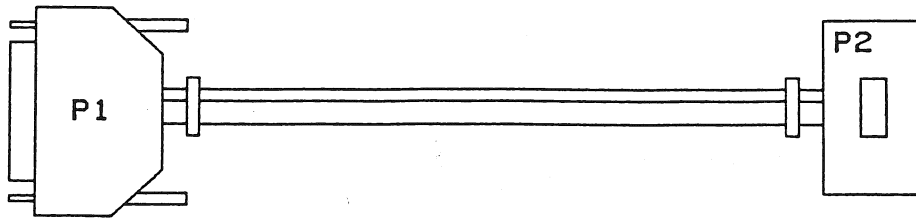
- Signaltypes:

I in	logic input with internal pullup driven by switch, o.c. or active driver activ: < 1V inactive: 2 .. 30 V or open
I out	logic output (open collector output, max 28V/0.3A)

4.5 IF-cable (drawing, wiring list)

TLS 4000
SLAVE CONTROL A

OTARI MTR-90
PARALLEL I/O



P1.10.....	PLAY_CMD.....	P2.11
11.....	STOP_CMD.....	12
12.....	FWD_CMD.....	13
13.....	REW_CMD.....	14
22.....	REC_CMD.....	10
24.....	LIFT_CMD.....	6
5.....	PLAY_TLY.....	2
6.....	STOP_TLY.....	3
7.....	FWD_TLY.....	4
8.....	REW_TLY.....	5
9.....	REC_TLY.....	1
25.....	REMON +.....	20
4.....	GND.....	17

3.....	CAPOUT.....	⊗.....	18
1.....	SHIELD.....	⊗.....	
15.....	TACHO.....	⊗.....	15
17.....	SHIELD.....	⊗.....	
16.....	MOUDIR.....	⊗.....	21
14.....	SHIELD.....	⊗.....	

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