

TrueTime

Model 560-5194 Composite Clock Output SILIOM Manual

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SECTION ONE

1. GENERAL INFORMATION

1.1. SCOPE OF MANUAL

This manual contains the information necessary to operate and maintain a TrueTime Model 560-5194 Composite Clock SILIOM. SILIOM stands for Single In-Line Input / Output Module.

1.2. PURPOSE OF EQUIPMENT

The Model 560-5194 card provides a method of adding a Composite Clock output to a 560-5153 E1T1 motherboard.

1.2.1. PHYSICAL SPECIFICATIONS

Dimensions:	4.25" long X .687" wide
Weight:	Approximately 2 ounces

1.2.2. ENVIRONMENTAL SPECIFICATIONS

Operating Temp:	0° to +50°C
Storage Temp:	-40° to +85°C
Humidity:	Up to 95% relative, non-condensing
Cooling Mode:	Convection
Altitude:	Sea level to 10,000 ft.

1.2.3. POWER REQUIREMENTS

Voltage:	+5 VDC ±10%
Current:	+50 mA
Power:	250 mW

1.2.4. OUTPUT RATING

Level:	Per G.703, G.704
Frequency:	64 kHz with 8 kHz embedded
Load:	120Ω

SECTION TWO

2. INSTALLATION AND OPERATION

2.1. INTRODUCTION

This section contains installation instructions and operating instructions.

2.2. REMOVAL AND INSTALLATION

CAUTION: All SILIOMS contain static sensitive semiconductor devices. Use a personal grounding strap and a static safe workstation while performing any handling of the SILIOM and/or the Motherboard.

This SILIOM is a customer installed option. To install the SILIOM in the motherboard, grasp it gently by the ends and insert it into the SIMM style connector on the motherboard while orienting it perpendicularly to the face of the motherboard. Then press the top of the SILIOM down and toward the bottom edge of the motherboard until the retainer clips snap down over the SILIOM. Removal is accomplished by spreading the retainer clips apart with your fingers while pushing the SILIOM top up with your thumbs. The SILIOM is keyed to prevent improper insertion, and only gentle pressure is required.

The proper location for the SILIOM is determined by deciding in which of the six possible channels you want the SILIOM to reside. If you are replacing a SILIOM simply use the same slot. If this is a new addition then you must wire the appropriate connector on the rear panel adapter associated with the Channel you decide to use. Any SILIOM can be used in any slot without restriction.

Each SILIOM edge connector is associated with an "Output Jumper" located on the 560-5153 Card, which must be set according to the type of SILIOM installed. JP1 is associated with Channel A (at the top of the 560-5153), JP2 is associated with Channel B, and so on through JP6 and Channel F. The card JP(X) must have a shunt installed across pins 1 and 2 (out of 4). Pin 1 is near the top of the card when viewed from an "as installed" perspective. The JP blocks are located near the end of the SILIOM edge connectors that are farthest from the Front Panel of the 560-5153 Card. Revision 2 and later cards have additional jumper blocks (JP7-12) that are used for special JTAG operations on the card. If shunts are installed on these jumper blocks they should be "stored" on only one pin of the jumper block.

2.3. OPERATION

There are no operator setup actions required by this SILIOM. All possible operator actions can only be carried out by use of software associated with the Fault Monitor card in a 56000 system.

You must also set or verify the Output Configuration Jumper (JP1-JP6) associated with the channel (A-F, J2-J7) that the card is installed in on the 560-5153 card. Set the shunt on this card to cover pins 1 and 2 of JP(X).

SECTION THREE

3. THEORY OF OPERATION

3.1. GENERAL INFORMATION

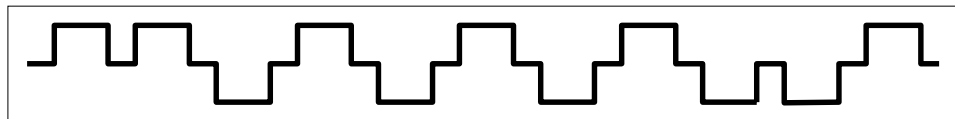
This section contains a detailed description of the circuits on this SILIOM. These descriptions should be used in conjunction with the drawings in SECTION FIVE.

3.2. SILIOM DESCRIPTION

The 560-5194 SILIOM contains all the circuitry needed to add a Composite Clock output to a 560-5153 E1T1 card. Fault monitoring circuitry watches the output for activity and reports faults back to the 560-5153 card and ultimately to the Fault Monitor card in the system. The Fault Monitor can reset the fault latch in the 560 -5194.

3.3. DETAILED DESCRIPTION

Reference drawing 560-5194, sheets 2 and 3 of 3. U4 is a CPLD which contains all the logic circuits needed on the SILIOM. U1 serves as a power amplifier to drive the output transformer T1 in a push-pull mode. The secondary of T1 is routed off the SILIOM to the rear panel. The secondary of T1 is also routed to U4 via R1-4 CR1-4, Q1 to determine if the output is active and in the proper state. If a failure is detected, that information is latched and reported to the 560-5153 card and thence to the Fault Monitor card if one is installed in the system. There are two ways to clear the fault. The preferred one is to use the Fault Monitor cards software. The other is to power down the system, necessary if there is no Fault Monitor card. U4 is programmed in-system using a JTAG port and a dedicated fixture or the JTAG port on the 560-5153, and a special cable and software running on a PC.



Repeating Pattern of CCLOCK. Baseline segments = $3/8$ duty cycle, pulses = $5/8$ duty cycle. Note that this is a pattern of all ones. Also this is an idealized waveform and the actual waveform will exhibit a certain amount of ringing.

SECTION FOUR

4. MAINTENANCE AND REPAIR

4.1. MAINTENANCE

This module requires no maintenance. Schematics are provided in SECTION FIVE for those who desire to troubleshoot a problem down to the component level. All parts are standard commercially-available parts except for the printed circuit board itself.

4.2. REPAIR

This module is constructed mostly of surface mount components. These components are extremely difficult to replace successfully without a great deal of specialized SMT rework equipment and specialized training. Additionally, the majority of the circuitry on this board resides in a programmable part which requires special equipment, software, and data files to program. For these reasons it is strongly recommended that you return any malfunctioning module to the factory where it can be repaired.

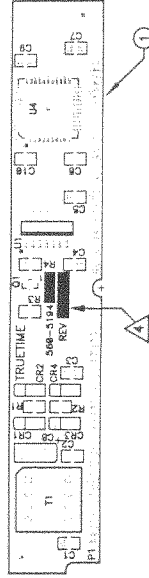
SECTION FIVE

5. DETAILED DRAWINGS

5.1. 560-5194 DETAILED DRAWINGS / BILL OF MATERIALS

NOTES: UNLESS OTHERWISE SPECIFIED

1. ASSEMBLE PER ASSEMBLY REQUIREMENTS DOCUMENT 421-11.
 2. RESISTOR VALUES IN OHMS; CAPACITORS IN MICRO FARADS.
 3. POLARIZED CAPACITORS ARE SHOWN WITH A ROUNDED EDGE INDICATING THE POSITIVE SIDE.
- A** STAMP DASH NUMBER & REVISION LEVEL.



REVISIONS

LTR	DESCRIPTION	DATE	APPROVED



Title		COMP. CLOCK SUB-MODULE	
Size	Number	Date	Rev
B	560-5194	12-30-97	01
File name		Date	
2194.PCB		Tue May 05 1998 16:42:02	
Sheet		of	
1		3	

CONTRACT NO.	APPROVALS	DATE
	DRAWN BY SRAMEK	12-30-97
	CHECKED	
	APPROVED <i>[Signature]</i>	5-11-98

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A B C D 1 2 3 4

MAX * BILL OF MATERIALS * SINGLE-LEVEL EXPLOSION BY PART IDENTIFIER W/REFERENCE

PART IDENTIFIER	DESCRIPTION 1	DESCRIPTION 2	EFF DATE	ECN #	QTY/ASSY	UGM LVL	REV REFERENCE DESCRIPTION
560-5194	ASSY COMP CLK OUT (T1E1)	MADE FROM 560-2194					EA
0000-APPROVAL	PARTS LIST APPROVAL		0000		1.0000	EA	<i>DTM FOR 5/98</i>
0000-PL	PARTS LIST REV LEVEL		0000		1.0000	EA	REV 01 (05-15-98)
0000-PRINT	REFERENCE PRINT		0000		1.0000	EA	560-5194 REV 01
0000-REV	PCB REV LEVEL HERE >>>>		0000		1.0000	EA	560-2194 REV 01
008S-1000	RES 100 OHM 1/8W 0805 1%	NIC NRC101000FTR	0000		2.0000	EA	R1,2
008S-101	RES 100 OHM 1/8W 0805 5%	NIC NRC12R101TR	0000		1.0000	EA	R4
008S-103	RES 10K OHM 1/8W 0805 5%	NIC NRC12R103TR	0000		1.0000	EA	R3
036S-Y5V104	CAP CER .1UF Y5V 50V 0B05	NIC NMC0805Y5V104Z50TR	0000		9.0000	EA	C1-7,9,10
037S-106-TL	CAP TANT 10UF 16V SIZE C	PANASONIC ECS-H1CC106R	0000		1.0000	EA	C8
054-050	TRANSFRMR, PULSE,5VX10MS	PICO 74025	0000		1.0000	EA	T1
057S-4148	DIODE 1N4148	ROHM RLS4148TR	0000		4.0000	EA	CR1-4
175S-3904	XSISTOR, SMALL SIG SOT23	MOTOROLA MMBT3904-LT1	0000		1.0000	EA	Q1
178S-74AC14	74AC14 (14SO)	RCA CD74AC14M	0000		1.0000	EA	U1
178S-MACH211SP	IC, PROGRAMMABLE, CPLD	VANTIS MACH211 SP-15 VC	0000		1.0000	EA	
185-007	PROGRAM (MACH)	FOR 560-5194	0000		1.0000	EA	FOR U2
560-2194	PCB COMP CLK OUT (T1E1)	FA6	0000		1.0000	EA	01
LA	LABOR ASSEMBLY COST HRS		0000		0	EA	
LT	LABOR TEST COST HOURS		0000		0	EA	
OSV560-5194	OUTSIDE LABOR 560-5194	PCA	0000		1.0000	EA	