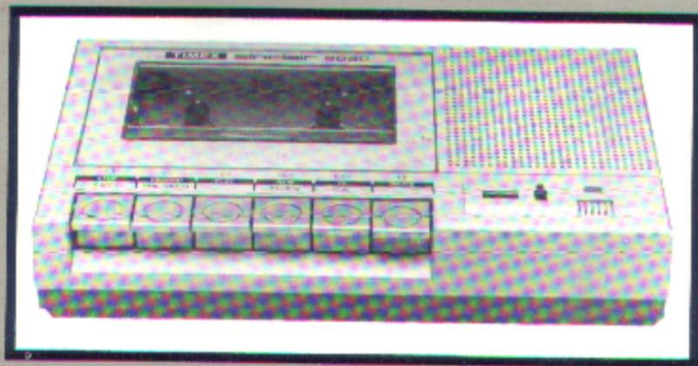


**TIMEX** **sinclair**

# 2020 Computer Program Recorder



**OWNER'S MANUAL**



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## IMPORTANT

Record in the space below the Model Number and Serial Number, which are located on the back of your set. Retain for future reference.

Model No. TS 2020 Serial No. \_\_\_\_\_

## WARNING

TO PREVENT FIRE OR SHOCK HAZARD.  
DO NOT EXPOSE THIS APPLIANCE TO  
RAIN OR MOISTURE.

## CONGRATULATIONS!

The TIMEX/SINCLAIR 2020 Computer Program Recorder is designed to reliably LOAD and SAVE programs when used with TIMEX/SINCLAIR computers. In addition, it may be used as a conventional audio cassette recorder for voice or music applications.

## PRECAUTIONS

- Do not install the recorder in a location near heat sources such as radiators or air ducts or in a space subject to direct sunlight, excessive dust, mechanical vibration or shock.
- When the cabinet is dirty, clean with a soft cloth soaked in soapy water.
- Remove the batteries if the recorder is not to be used for an extended period of time.
- The tape heads are precision parts. Be sure to keep them away from magnetized objects and to clean periodically. For cleaning purposes, use a Q tip moistened with a head solution or denatured alcohol.

## POWER SOURCES

### ● USING BATTERIES:

1. Open the lid of the battery compartment.
2. Install four 1.5V AA Alkaline penlight batteries observing the polarity marked on the inside of the battery compartment.
3. If you do not intend to operate the set on batteries for an extended period of time, remove the batteries to avoid possible corrosive leakage.

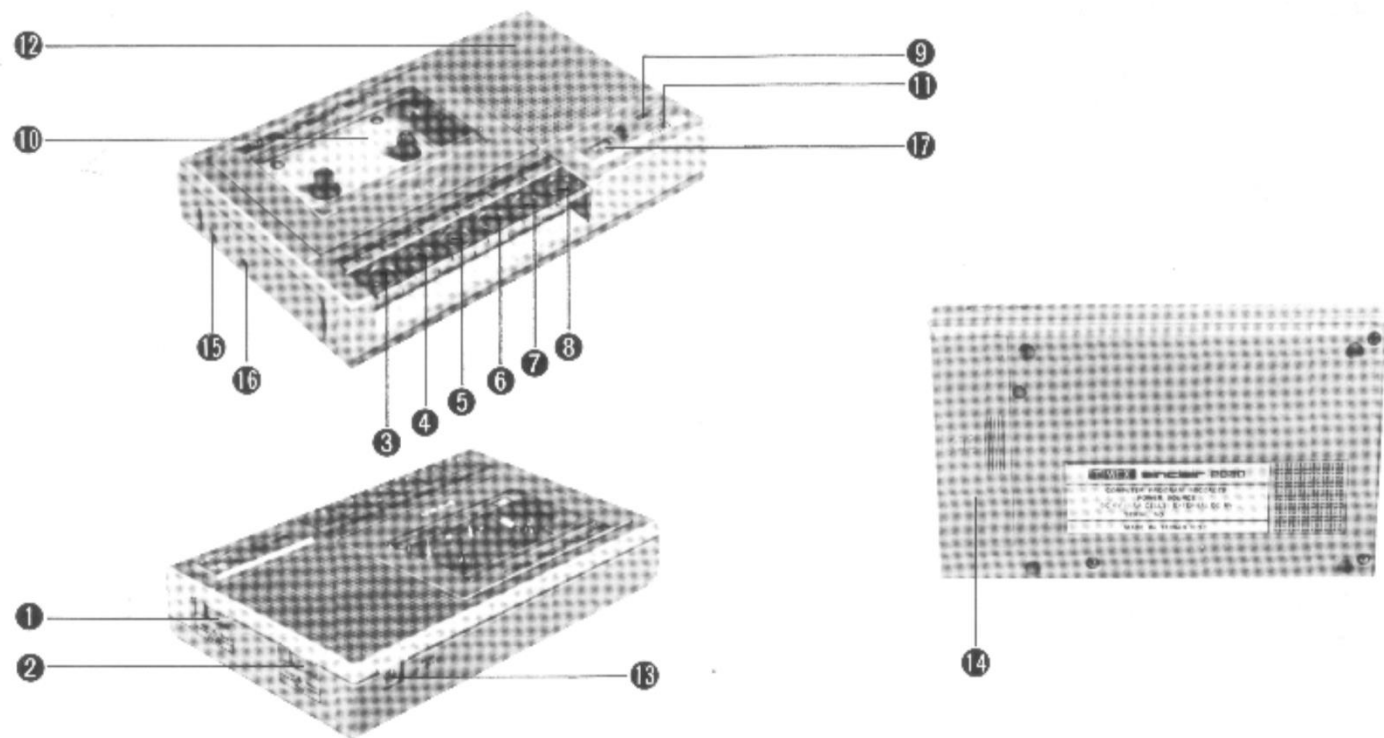
### ● USING TS 2020 AC ADAPTOR (OPTIONAL)

Connect the cable from the AC Adaptor to the external DC 6V jack on the rear of the computer program recorder. Connect the AC adaptor to the wall AC power source.

### NOTE:

Use of AC Adaptors other than the TS 2020 AC Adaptor is not recommended and may damage the recorder. If other adaptors are used, proper polarity must be observed. — ● — + DC 6V.

# CONTROLS, INDICATORS AND CONNECTORS



- |                           |                              |
|---------------------------|------------------------------|
| 1. VOLUME control         | 10. Cassette compartment lid |
| 2. TONE control           | 11. Built-in microphone      |
| 3. STOP/EJECT button      | 12. Built-in speaker         |
| 4. REC button             | 13. DC jack                  |
| 5. PLAY button            | 14. Battery compartment      |
| 6. REWIND (REVIEW) button | 15. EAR JACK                 |
| 7. FAST-F (CUE) button    | 16. MIC JACK                 |
| 8. PAUSE button           | 17. TAPE COUNTER             |
| 9. VU/LEVEL indicator     |                              |

## **LOADING AND UNLOADING CASSETTE TAPE**

1. Open the cassette compartment lid (10) by pressing the STOP/EJECT button (3).
2. Insert a cassette tape into the compartment.
3. Close the cassette compartment lid.
4. To unload the cassette tape, press the STOP/EJECT button (3) to release all other depressed buttons (4) ~ (7) and then press the STOP/EJECT button (3) to open the cassette compartment lid and remove the cassette tape with fingertips.

## **PLAY BACK**

1. Load a pre-recorded cassette tape into the cassette compartment and close the lid.
2. Start the tape by pressing the PLAY button (5).
3. Adjust the VOLUME control (1) to suit your listening preference.
4. To stop the tape, press the STOP/EJECT button (3).
5. When the tape reaches its end during playback or recording, it stops automatically and the power is turned off.

## **REWIND/REVIEW**

1. Use REW button (6) to rewind tape.
2. While playing back or recording, depress REW/REV button fully to rewind the cassette, and then release the button. The recorder will continue to play or record.



## **FAST FORWARD/CUE**

1. Use FF/CUE button (7) to forward the tape rapidly.
2. While playing back or recording, depress FF/CUE button to forward the cassette rapidly, and then release the button.  
The recorder will continue to play or record.

## **PAUSE**

1. Depress PAUSE button (8) to stop cassette movement temporarily during record or play.
2. To stop for a long period, use the STOP/EJECT button (3).

## **RECORDING**

### **A. RECORDING WITH THE BUILT-IN MICROPHONE**

1. Load a cassette tape.
2. Press the REC button (4) only. The VU/LEVEL indicator (9) will flicker when recording.
3. The distance to the recording source should be about 1 ft. to 5 ft. (30cm to 150cm).
4. After the recording is finished, depress the STOP/EJECT button (3).
5. When the tape reaches its end during recording, this function is automatically stopped.

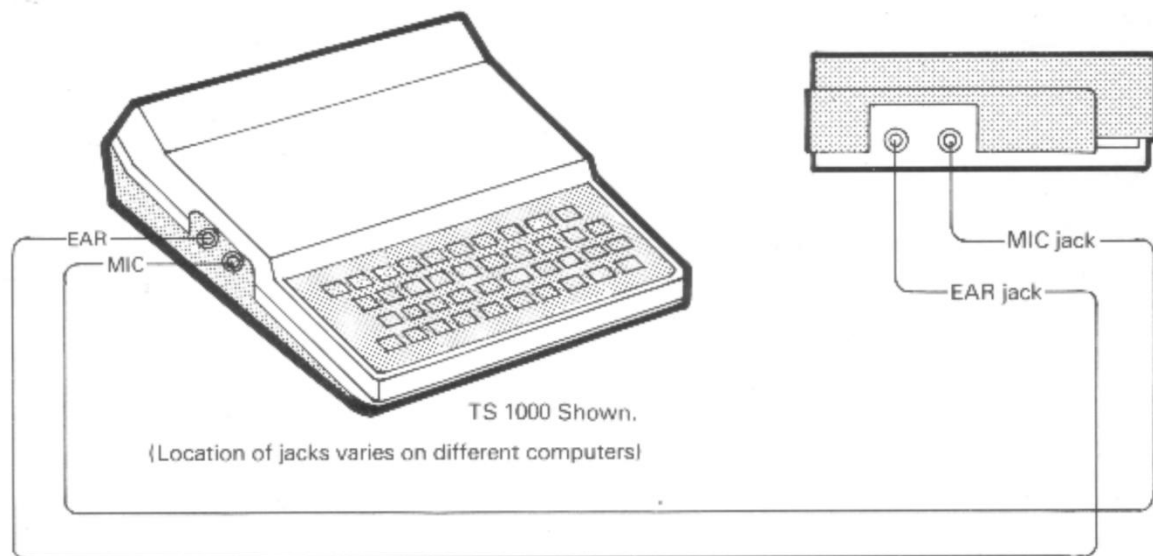
### **B. RECORDING WITH EXTERNAL MICROPHONE**

1. Connect the external microphone (optional) to the MIC jack (16).
2. The recording process is exactly the same as recording with built-in microphone.

## CONNECTION WITH COMPUTER

Connect one end of the computer cable supplied with your TIMEX/SINCLAIR computer to the computer EAR jack and the other end to the EAR recorder jack (15). Connect the other computer cable between the computer MIC jack and the recorder MIC jack (16).

For recording your own programs and data, it's important to start with a blank tape. Unless the tape is new, you should erase the tape before recording new information on it.



## SAVING A PROGRAM OR DATA FILE ON TAPE

1. Insert the tape on which you will be recording and rewind it to the beginning of the tape (if using tape with a leader, be sure to advance it past the leader to the beginning of the recording.)
2. Before the computer is ready to save the program or data, press REC button (4). You do not need to adjust the volume setting; the cassette unit does that automatically during record operations.
3. You can now save the program or data in tape (See the computer owner's manual for details). The VU/LEVEL indicator (9) will flicker when recording.
4. When the operation is complete, press STOP/EJECT button (3) on the recorder.

### NOTE:

It is possible to record two or more programs or data files on one side of a tape. However, this takes a little extra care and attention on your part. First rewind the tape to reach its end and reset the tape counter. Then keep a written account of the counter reading where each program or data file starts.

When you are ready to load in a particular program or data file, rewind the tape. Reset the counter, then use fast forward or rewind to position the tape to just ahead of the desired tape section.

## LOADING A PROGRAM OR DATA FILE FROM TAPE

**IMPORTANT:** Before attempting to load a program, refer to your computer instruction manual and any supplemental instruction sheets supplied with your recorder.

1. Set TONE CONTROL (2) to number 10 (HIGH).
2. The first time you use your recorder, you will need to determine the highest and lowest settings of the VOLUME control (1) that will work with your computer, by repeating steps 3, 4, and 5 at various volume settings. It is suggested that you start with number 10 on the volume control and work down to lower numbers. Once you know the highest and lowest settings, set the VOLUME control to the midpoint of those settings. Normally, this setting will cause the VU/LEVEL indicator (9) to light medium bright, with an occasional dim period. It will save you time if you use a short program tape to determine the best volume setting.
3. Press REW button (6) to rewind tape.
4. Follow computer instructions to prepare computer to LOAD tape. Press PLAY button (5) on the recorder. the VU/LEVEL indicator should light medium bright.
5. When the computer indicates it is finished loading, press STOP/EJECT button (3).

## ACCESSORY

Instruction Book

## SPECIFICATION

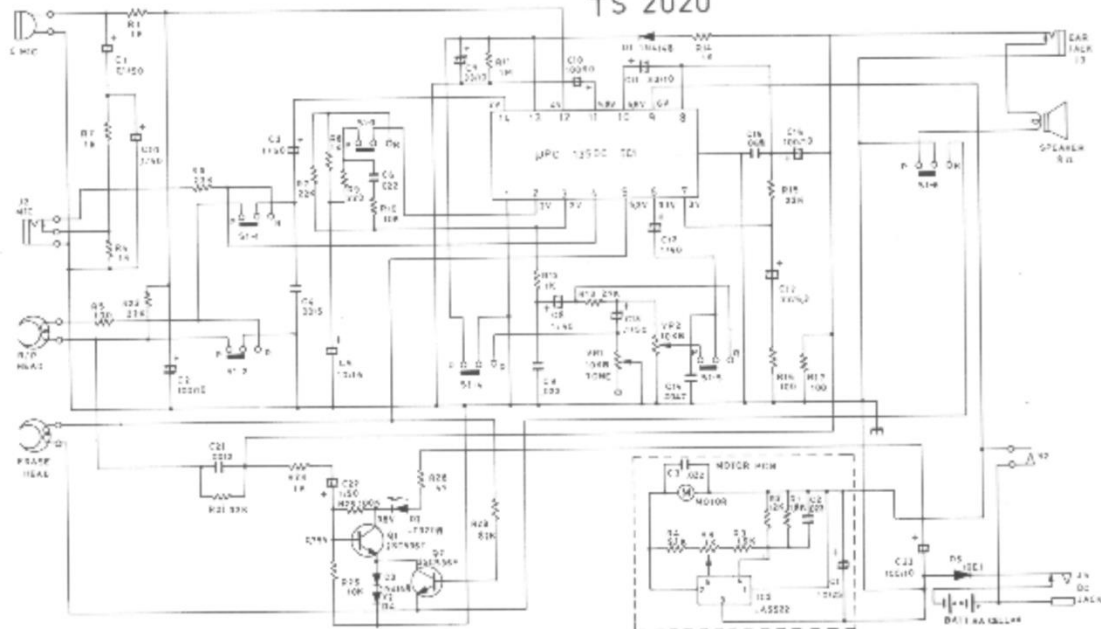
TYPE.....	computer program recorder AC 120V 60Hz (with optional AC Adaptor)
Power source.....	DC 6V AA-cells
Output Power.....	500mw
Speaker.....	2" (50mm) 8Ω
Tape speed.....	1-7/8" per second (4.75cm/sec)
Fast Forward and Rewind	
Time.....	135 sec.
Recording System.....	DC bias.
Erasing System.....	DC bias.
Frequency Response.....	200 ~ 6300Hz

## OTHERS

External Microphone jack....	3.5ø x 1
External Speaker jack.....	3.5ø x 1
Dimensions.....	(194mm x 120mm x 37.6mm)
Weight.....	1.5 lb (0.68 kg)

### SCHEMATIC DIAGRAM

TS 2020



10	00000000	01	48000000	PLAYBACK SWITCH POSITION	NOTES
11	00000000	02	80000000	POWER OFF SWITCH POSITION	1 All
12	00000000	03	00000000		1 All
13	00000000	04	00000000		2 All
14	00000000	05	00000000		2 All
15	00000000	06	00000000		2 All
16	00000000	07	00000000		2 All
17	00000000	08	00000000		2 All
18	00000000	09	00000000		2 All
19	00000000	10	00000000		2 All
20	00000000	11	00000000		2 All
21	00000000	12	00000000		2 All
22	00000000	13	00000000		2 All
23	00000000	14	00000000		2 All
24	00000000	15	00000000		2 All
25	00000000	16	00000000		2 All
26	00000000	17	00000000		2 All
27	00000000	18	00000000		2 All
28	00000000	19	00000000		2 All
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30	00000000	21	00000000		2 All
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42	00000000	33	00000000		2 All
43	00000000	34	00000000		2 All
44	00000000	35	00000000		2 All
45	00000000	36	00000000		2 All
46	00000000	37	00000000		2 All
47	00000000	38	00000000		2 All
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50	00000000	41	00000000		2 All
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52	00000000	43	00000000		2 All
53	00000000	44	00000000		2 All
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55	00000000	46	00000000		2 All
56	00000000	47	00000000		2 All
57	00000000	48	00000000		2 All
58	00000000	49	00000000		2 All
59	00000000	50	00000000		2 All
60	00000000	51	00000000		2 All
61	00000000	52	00000000		2 All
62	00000000	53	00000000		2 All
63	00000000	54	00000000		2 All
64	00000000	55	00000000		2 All
65	00000000	56	00000000		2 All
66	00000000	57	00000000		2 All
67	00000000	58	00000000		2 All
68	00000000	59	00000000		2 All
69	00000000	60	00000000		2 All
70	00000000	61	00000000		2 All
71	00000000	62	00000000		2 All
72	00000000	63	00000000		2 All
73	00000000	64	00000000		2 All

H51985.

3. A11. 28815185078 8.81112 689 15 11 5 = 1100 7 94 = 10008.2

1. A.1.1.  $C_{\text{eff}}(0) = 1.0$ ,  $C_{\text{eff}}(1) = 0.9$ ,  $C_{\text{eff}}(2) = 0.8$ ,  $C_{\text{eff}}(3) = 0.7$ ,  $C_{\text{eff}}(4) = 0.6$ ,  $C_{\text{eff}}(5) = 0.5$ ,  $C_{\text{eff}}(6) = 0.4$ ,  $C_{\text{eff}}(7) = 0.3$ ,  $C_{\text{eff}}(8) = 0.2$ ,  $C_{\text{eff}}(9) = 0.1$ ,  $C_{\text{eff}}(10) = 0.0$ .

[illegible]

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NOTE: 4.75 M WITH SOLUBLE 61.5% AND 50.24%.

## 90-DAY LIMITED WARRANTY

**BASIC COVERAGE:** This Timex Sinclair Computer Program Recorder is warranted to the owner for a period of 90 days from date of original purchase against defects in manufacture. This Limited Warranty is given by Timex Computer Corporation — not by the dealer from when it was purchased.

**WHAT TIMEX WILL DO:** If a defect in manufacture of the Recorder is discovered within 90 days from date of original purchase, Timex Computer Corporation will, at its option, repair or replace the defective unit.

**WHAT YOU MUST DO:** You must return the Recorder indicating date of purchase, to Timex Product Service Center with a written explanation of the reason for the return.

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Return your unit, postage pre-paid to:  
TIMEX PRODUCT SERVICE CENTER  
P.O. Box K  
7004 Murray Street  
Little Rock, AR 72203

To protect against in transit loss, we recommend you insure your Recorder.

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## LIMITATIONS:

THE ABOVE REMEDY IS EXCLUSIVE. TIMEX COMPUTER CORPORATION LIMITS THE DURATION OF ANY WARRANTY IMPLIED BY STATE LAW, INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, TO 90 DAYS FROM THE DATE OF ORIGINAL PURCHASE. TIMEX COMPUTER CORPORATION IS NOT LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGE. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, or the exclusion of limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you .

This warranty is void if the Recorder has been tampered with or ill-treated or if the defect is related to servicing not performed by us.



MEMO



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