OPTION MANUAL
2290

1. TC 2290 SAMPLING.
2. PROCEDURE FOR EXCHANGING THE PROM.
3. HOW TO PREPARE THE ME00 MEMORY OPTION CARD.
4. INSTALLATION OF ME00/ME11/ME32.
5. INSTALLATION OF ME04 AND MS04 - (4 sec.memory).

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TC 2290 SAMPLING

DSA01 / DSA02

DFATR / DSTSA

SA01 / SA02

FATR / STSA

OWNERS MANUAL

☐ SA01 ☐ DSA01 ☐ SA02 ☐ DSA02 ☐ FATR ☐ DFATR ☐ STSA ☐ DSTSA

TC 2290 SERIAL NO.: ☐☐☐☐☐☐☐

SOFTWARE SERIAL NO.: ☐☐☐☐☐☐☐

VERSION 27.05 - 30.08 dec.89 t.c. electronic

SAMPLE POSSIBILITIES

* = Described features only working in mentioned options.

DOUBLE SAMPLE TIME
* ONLY DOUBLE SAMPLING

The DSTSA software will make up to 64 seconds of sampling or delay time in a fully expanded TC 2290. Every preset can be assigned either for normal sample time (32 secs.) or for double sampling time. The audio quality will not be affected appreciable by changing to double time.

HOLD FUNCTION
* ONLY DOUBLE SAMPLING

Can be assigned to a preset. It has a start and a stop command. The 2290 will then automatically make the loop. When the loop is running, new sounds can be added on top of what has already been recorded. This function also includes a reset command.

DEEPER MODULATION
* ONLY DOUBLE SAMPLING

A New very powerfull modulation can be selected in each preset. In a special number, you can select the new modulation or the standard modulation.

MIDI DUMP OF PRESETS
* ONLY DOUBLE SAMPLING

All presets can be dumped out to either a sequencer or another TC 2290. Even a single preset can be moved.

MIDI PROTOCOL
* ONLY DOUBLE SAMPLING

T.C. ELECTRONIC can supply you with a complete MIDI protocol including all MIDI exclusive codes.

STEREO SAMPLING
* 30.XX

Two TC 2290's can be locked together yo make true stereo sampling.

RECORD/EDIT OF SAMPLE

Front and rear point

PLAYBACK EDIT OF SAMPLE

Front and rear point

TRIG AND RETRIG FUNCTIONS

"Learn key" manual trig, Remote trig from foot controller, Midi trig from keyboard or sequencer, metronome trig. Built in metronome Audio trig. Input signal level trig looping. Rearpoint of sample trig. Next preset trig. Preset trig preset.

SAMPLING IN PRESETS.

A recorded and edited sample can be stored in a preset.

SAMPLING PLAYBACK THRESHOLD

For audio trig controlled by special codes

SAMPLING THRESHOLD HYSTERESIS

To avoid false triggering this function can be set from 1 to 20 dB drop in input signal level before retriggering occurs.

SAMPLING PLBACK CROSSFADE TIME
* 30.XX/29.XX/28.XX

The unit is equiped with two D/A converters. When retriggering a sample, it is possible to set a crossfade time from 50 ms to 31 sec. Example: you play a 10 sec. sample, and after 5 secs you make a retrig. A new sample will start from the beginning and the first sample will fade out in the time which was set in the crossfade time special no.

SOUND ON SOUND
* 30.XX/29.XX/28.XX

In a recorded window, you can record a new sample on top of the old one in the same memory space.

COPY OF SAMPLES
* 30.XX/29.XX/28.XX

You can move a sample from one place in the memory space to another. Example: a sample which is placed from 3 to 6 sec, can be moved to be in the window from 0 to 3 sec, and thereby utilize 29 sec in one piece.

SEQUENCE FUNCTION
* 30.XX/29.XX/28.XX

When a sample i stored in a preset, it is possible to assign an automatic preset shift to any preset no. A sequence counter function will count any no. up to

99 times before a preset shift is made.

PITCH SHIFT

Pitch shift can be adjusted 1 oct up/down in 12 steps. Or 1 oct up/down in 1500 steps. The DSA mode will not accept sample pitch down.

METRONOME

Working in two areas: A. one trigger from 1 to 255 times a minute. B. one trigger from 256 ms to 31 sec.

FAST TRIG
* 30.XX/29.XX

When using both optionel trigger input, and normal input.

PRERECORDING

When the 2290 is in samplerecord mode the unit will make a prerecording for 15 ms. When the recording is made, you can edit back from the front point 15 ms. This function will save the real front point.

USER EXAMPLES:

CONTENTS (alphabetical)

USER EXAMPLES

* = described features only work on some options.

SETTING UP IN STEREO:

PLACE THE STEREO CABLE CORRECTLY. If the units are in stereo mode they will not work if the stereo cable is not connected. PLACE MIDI CABLE IN MIDI OUT ON MASTER AND MIDI IN ON SLAVE.

SETTING TO MASTER:
* 30.XX

1. Press <SPEC.> <1> <0> <0> <ENTER> <2> <ENTER>
2. Turn off the power.
3. Turn on the power.

SETTING TO SLAVE:
* 30.XX

1. Press <SPEC.> <1> <0> <0> <ENTER> <3> <ENTER>
2. Turn off the power.
3. Turn on the power.

SETTING TO FATR:
* 30.XX

1. Press <SPEC.> <1> <0> <0> <ENTER> <1> <ENTER>
2. Turn off the power.
3. Turn on the power.

STEREO GENERAL OPERATING:
* 30.XX

Only operate on master when using stereo set up.

RECORDING A SAMPLE:

1. Press <SAMPLE> to enable sample mode.

2. Press <KEY A> (led lit) to enable recording.
3. The delay display now shows 2.81. meaning 2815 ms . This is your rear point for the sample you are going to record. If your unit is equiped with more than 4 sec. of sample time, you can make a longer recording time, by pressing <up> or <down> in the delay section, and then enter your new value on the keyboard.
4. Press <KEY B> Now the delay display shows .01. meaning 15 ms which is the starting point of the sample. It displays 15 ms because of the prerecording function which is one of the unique features of the TC 2290.
5. Press <learn> and the unit will make a recording.
6. If you want the recording to be started by an audio signal you press <DYN MOD>. A recording threshold can be set in spec. no. 30

PLAYBACK A SAMPLE:

1. Press <LEARN> and the sample will playback.
2. If you want playback by audio trig press <DYN MOD> You can use either the standard input or audio trig. When using audio trig input you are not able to get the sound from the trigger source through.

EDITING A SAMPLE:

1. Example: You have now recorded a sample start point = 15 ms and rear point = 2815
2. Press <KEY B> to get access to the start point.
3. Press <up> or <down> to get access to use the keyboard.
4. Press <5> <0> <0> <ENTER> This sets a new front point at 500 ms.
5. Press <KEY B> to get access to rear point.
6. Press <up> or <down> to get access to use keyboard.
7. Press <2> <5> <0> <0> <ENTER> This is setting a new rear point at 2500 ms.
8. Press <LEARN> the sample will now play from 500ms to 2500 ms.

STORE A SAMPLE:

1. Press <PRESET> <The preset no. you decide> <STORE>

HOLD FUNCTION:

1. Check how much delay time you have available. (Max delaytime)
2. Press <SPEC> <104> <ENTER> <1> <ENTER> to put the unit into hold mode. The Sample LED will start flashing to indicate hold mode.
3. The unit is now ready for hold function. You can store this function in a preset.
4. The following controls are now available:

<LEARN> : Starts and stops recording, and determines the length of loop.
<KEY A> : Punch in, Enables adding of new signal to to the loop.
<KEY B> : Erases the sound in the loop.

5. Special no. 105 (auto erase) Will make an automatic erase of the loop everytime the learn key is accessed as the loop starts recording.
Factory default on this function is 1 = auto erase on.
6. Special no. 106 (auto mute) Will automatically mute the delay output volume when erasing.

METRONOME ON HOLD FUNCTION:

1. The delaytime LED can be assigned as a "light metronome" for hold mode.
2. Press <SPEC> <107> <ENTER> Then enter any number from 0 to 32, as a division of beats per bar.
3. The TC-link jack plug can be used as a click track, when assigning spec. no. 108 to 1. The click track beat rate is adjusted in spec. no. 107.

DOUBLE DELAY TIME:

1. Select delay modulation in the modulation display. Then step through the waveforms until none of the lights are lit. This is position number five, and the indication of double delay time.
2. The <MOD.> key in the delay display has to be switched on. The 2290 is now in double delay time.

DEEP MODULATION:

1. Press <SPEC> <103> <ENTER> <1> <ENTER>. All modulations in the delay modulation are now switched to deep modulation. This function can be assigned to presets.

DOUBLE SAMPLE TIME:

1. Press <SPEC> <36> <ENTER> to call up double sample time.
2. Press <1> <ENTER> to set the unit to double sample time.
3. The MOD. LED will flash to indicate double sample time.
4. The display will still show standard sample time even though the sample time is double. Go to next point of the manual to see how to get double sample time on display.

DISPLAY SHOW DOUBLE TIME:

1. Press <SPEC> <109> <ENTER> to enable the display to show double sample time.
2. Press <1> <ENTER> to switch to double sample time on display. This function is global, and all sampling presets will now be displayed in double time, no matter if they are in double time or not. This function is to avoid problems with confusion of edit points between different presets at different sample rates.

LOOPING:

1. Press <SPEC.> <2> <8> <ENTER> The delay display now shows "SVAL". If your sample is 2000 ms long and you want it to be triggered once every 2000 ms then press <2> <0> <0> <0> <ENTER>
2. Press <LEARN> the sample will now play in a loop of 2000 ms

STOP PLAYBACK/RECORD:

1. Press <.> <.>

PITCH SHIFT:

1. Press <SPEC.> <3> <5> <ENTER> the delay display now shows "SVAL" and 12.
2. Press <1> <4> <ENTER> This makes the pitch one note higher.
3. Press <MOD. in the delay section)> This key will work as a bypass for the pitch function

COPYING A SAMPLE:
*** 30.XX/29.XX/28.XX**

1. Press <SPEC.> <3> <2> <ENTER>
2. Press <1> <ENTER> Now the unit

have seperate recording and playback points. (Be sure that you still have the same editing points from 500 ms to 2500 ms., as in user example: Editing a sample.)
3. Press <KEY A> for recording.
4. Select KEY B to front point. Press <up> or <down> <4> <0> <0> <0> <ENTER> to set a new front point.
5. Press <KEY B> <6> <0> <0> <0> <ENTER> to set a new rear point.
6. Select "Level" in feedback display. Adjust feedback level to 99.
7. Press <LEARN>. Now the sampling from 500 to 2500 ms wil be played and recorded from 4000 to 6000 ms.
8. Go out of this mode: Press <SPEC.> <3> <2> <ENTER> <0> <ENTER>.

SOUND ON SOUND:
* 30.XX/29.XX/28.XX

1. Go back to the edited sample from 500 ms to 2500 ms.
2. Press <KEY A>
3. Adjust the feedback level to 50. Feedback level will set the volumens between the old sample and the added sample. When triggered the unit will be able to record a new sample in top of the old sample.

SEQUENCE FUNCTION:
* 30.XX/29.XX/28.XX

1. Go back to the edited sample from 500 ms to 2500 ms.
2. Press <SPEC.> <3> <3> <ENTER> <5> <1> <ENTER> When you enter 51 into the next preset spec. no., the sample will switch to preset 51 after playback of the preset you are in.
3. Press <SPEC.> <2> <7> <ENTER> <2> <ENTER> This is sequence counter. Entering <2> here means that the preset will play twice before changing to preset 51.
4. Press <PRESET> <5> <0> <STORE> to store the new settings in preset 50.
5. Press <PRESET> <5> <0> <ENTER> The new settings will not work until you recall the preset.
6. Press <LEARN> to make one playback.

7. Press <LEARN> to make a second playback, and now the unit will automatically shift to preset 51. You can use any trigger source metronome, learn, MIDI etc.If you want to use the automatic sequencer then do this:
8. Press <SPEC.> <2> <7> <ENTER> <1> <0> <2> <ENTER> entering 102 instead of 2 means that you have made an automatic trigger so the preset will automatically play twice and then switch to preset 51.

SNAPSHOT OF EDITING:

If you want to edit out a small part of the sample, you must first make a playback. You can now listen and when you want to see the edit point, you hit <DELAY ON> key and the unit will show you the editing point for one second, then carry on to the end of the sample.

CROSS FADE:
***** 30.XX/29.XX/28.XX

1. Go back to the edited sample from 500 ms to 2500 ms.
2. Press <SPEC.> <3> <4> <ENTER> <2> <0> <0> <0> <ENTER> You have now changed the crossfade time from 50 ms to 2000 ms.
3. Press <LEARN> twice, very quickly. The first trigger of the sample will fade out in 2000 ms at the same time as the new second trigger will playback normally.

MIDI PRESET DUMP (ONE PRESET):

1. Link up two 2290's with MIDI cables. Send to receive on both units. The master unit will then become the unit you are operating.
2. Press <SPEC.> <110> <ENTER> on both units. Here you select the device number. Both units must work on the same device number. Press <Device no. from 0 - 127> <ENTER>.
3. Press <SPEC.> <112> <ENTER> on the master unit. This special number indicates to which preset on the master unit you want to fill with the new preset. Press <selected preset no.> <ENTER>.
4. Press <SPEC.> <111> <ENTER> on the master unit. This special

number calls up a preset number on the souce unit and have the preset setting transmitted to the master. Press <selected preset number on slave/source unit> <ENTER>. Now the preset number X on source/slave unit will be entered into preset X on the master unit.

MIDI PRESET DUMP (ALL PRESETS):

1. Follow the same procedure as MIDI PRESET DUMP (ONE PRESET), but use special number 113 instead of special number 112. Note that we are not only working with one preset but all preset numbers lower than the entered number. Example: if entering 50, all presets from 50 and down to 0 will be transmitted to the master.

MIDI DUMP (ALL PARAMETERS):

1. Link up two TC 2290's with MIDI cables from send to receive. Select special number 110 (device no.) to be equal on both units.
2. Press <SPEC.> <114> <ENTER> on the master unit. Press <1> <ENTER> on the master unit. All parameters in the master unit will now be copied down to the slave unit.

MIDI DUMP SPEC. NO.:

1. Follow same procedure as on "MIDI DUMP (ALL PARAMETERS)". Use special number 115 instead of special number 114. The master unit will then take all special number settings from the slave unit.

DISABLE KEYCODES ON SLAVE:

1. Follow same procedure as on "MIDI DUMP (ALL PARAMETERS)". Use special number 116 instead of special number 114. The master unit will then disable all keycodes sent out from the slave unit. This function is made for use with computers.

RESET ALL MEMORY:

1. Press <SPEC.> <37> <ENTER>. The machine should now display 2290 indicating that it thinks it is a TC 2290. You are going to tell it that it is not a TC 2290.
2. Press <0> <ENTER>. Turn the unit off. Turn the unit on. The machine wakes up, finds that it is a zero rather than a TC 2290, and therefore resets its battery

backed up memory, re-establishes its identity and displays ERROR 13. Preset 1 to 76 are all initialised to the same delay setting, presets 76 to 99 are set to factory defaults.
3. To avoid a total reset of the 2290 special number 120 has been introduced. Look at the special number additions.

ALLOCATING MEMORY:

1. Press <SPEC.> <7> <ENTER>. This is to tell the unit how much memory it has in seconds - 32 seconds in this case.
2. Press <32> <ENTER>
3. Press <SPEC.> <38> <ENTER> <1023> <ENTER>. This allocates 1023 ms for delay space.
4. Press <SPEC.> <39> <ENTER> <0> <ENTER>. This puts a zero value in special number 39. Turn the unit off. Turn the unit on. When it wakes up, the unit will calculate the remaining time available for sampling purposes. This will be special number 7 (seconds) minus special number 38 (ms). The result will be stored in special number 39. You can now look at special number 39 to see what the total sample time is.
5. The opposite procedure can be used to set the delay time.

HOLD FUNCTION (0144):

On the TC 0144 Serial Remote Controller: Key B = Learn Function. Key A = Punch in.

HOLD FUNCTION (0050):

On TC 0050 Remote Controller: Key LEARN/TRIG = Learn. Key 4 = Punch in. Key 3 = Erase.

SAMPLING SPECIAL NUMBER additions

spec No.	Min/max Value	Factory default	preset/ global	Name/ Function
0	26.00-30.99	SHOW	global	**Software revision** number.
1	26.00-30.99	SHOW	global	**Software sales type**
27	0-99	0	preset	**Sequence counter.** From 0-99 using trigger: source audio, MIDI, learn and metronome. From 100-199 using end of sample to trigger new sample. Eg.: value 110 will use sample trig sample as trigger souce, and will play the preset 10 times.
28	0-255	0	preset	**Metronome** beats/minute
	256-60.0	0	preset	milliseconds/beat
29	1-20	6	global	**Record/playback threshold hysterese.** 1 to 20 dB to avoid false triggering.
30	1-9	2	global	**Record threshold,** 9 thresholds for the input level trigged record. The higher the value the higher input signal is necessary to trig start of recording
31	1-9	5	global	**Playback threshold,** 9 thresholds for the input trigged playback. The higher the value the higher input signal is necessary to trig/retrig playback. The thresholds are from -48 dB to -24dB in 3dB steps.

spec No.	Min/max Value	Factory default	preset/ global	Name/ Function
32	0-1	0	global	**Equal record/playback points** when set to '0'. Seperate record / playback points when set to '1'
33	0-99	0	preset	**Next preset.** Automatic shift to another preset (only together with sequence counter). Eg. set next preset to 50 and sequence counter to 101. Store the setting and call it. Now your preset will play 1 time, and then shift to preset 50.
34	20-33.0	50	global	**Cross fade time.** When retriggering a sample, crossfade time tells how long it takes for the first playback to fade out. The retriggered sample will playback normal.
35	500-2000	12	preset	**Playback pitch.** 1000 = same pitch 500 = 1 octave down 2000 = 1 octave up
	0-24	12	preset	12 = same pitch 10 = one note lower 13 = one and a half note higher.
36	0-1	0	preset	**Double sampling time.** 0 = normal sampling time 1 = double sampling time
38	0-9999	1023	global	**Max delay time.** To achieve more than 9999 ms, press 0. The unit will use all available memory time for delay. Switch power on/off.
39	1000-32.0	2815	global	**Max sampling time.**

spec No.	Min/max Value	Factory default	preset/ global	Name/ Function
100	1-3	3	global	**Assign master or slave** 2= Stereo master 3= Stereo slave 1= Mono Fast trigger
103	0-1	0	preset	**Deep modulation** 0 = Standard modulation 1 = Deeper modulation
104	0-1	0	preset	0 = **Hold function** off 1 = Hold function on
105	0-1	1	global	**Hold auto erase** 0 = Auto erase off. 1 = Auto erase on.
106	0-1	0	global	**Auto mute on erase** 0 = Auto mute off 1 = Auto mute on
107	0-32	0	preset	**Metronome on hold func.** 0 = off 1-32 = steps in a period (bar) of the holdfunction.
108	0-1	0	global	**Click track on hold.** 0 = off 1 = click track on tc link
109	0-1	0	global	**Double sample time display.** 0 = off 1 = double sample time display.
110	0-127	0	global	**Device number.**
111	0-99	0	global	**Preset source** for MIDI dumping of one preset.
112	0-99	0	global	**Preset destination** for MIDI dump of one preset.
113	0-99	0	global	**Preset dump** from slave to master. All presets lower than a specific value will be dumped.

spec No.	Min/max Value	Factory default	preset/ global	Name/ Function
114	0-1	0	global	**Preset total dump** from slave to master unit. 0 = off 1 = dump
115	0-1	0	global	**Special number dump** from slave to master. 0 = off 1 = dump
116	0-1	0	global	**Disable keycodes** on slave. 0 = off 1 = disable keycodes
117	0-1	1	global	**MIDI error check.** 1 = only fatal error. 0 = all MIDI error id.
120	0-2	0	global	**Quick reset** 0 = off 1 = load factory presets 2 = reset spec. no. 27 + 32 + 33 + 24

PROCEDURE FOR EXCHANGING THE "PROM" IN TC 2290. 870102

EXCHANGING THE PROM WILL CAUSE ERASE OF ALL PRESETS AND SPECIAL-PARAMETERS, AND THE TC 2290 WILL HAVE TO BE RE-PROGRAMMED AGAIN BY THE USER.

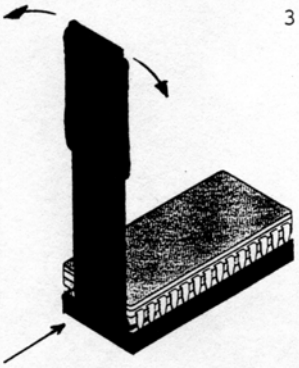
NOTICE: THE EXCHANGING SHOULD ONLY BE DONE BY TECHNICAL SKILLED PERSONS. FAILURES DUE TO FOULTY INSERT, ARE NOT COVERED BY THE WARRENTY.
Exchanging the PROM can normally be done in few minutes.

WARNING: UNCOVERING THE TC 2290 MAY COURSE SHOCK HAZARD, AND SHALL ONLY BE DONE BY AUTORIZED AND SKILLED PERSONS. T.C. ELECTRONIC HAS NO RESPONSIBILITY FOR ANY CONSEQUENCES WHICH MAY OCCUR IN SUCH CASE.

CAUTION: THE PROM IS A SENSITIVE ELECTRONIC DEVICE. DO NOT TOUCH, EXCEPT AT APPROVED ANTISTATIC WORK STATION.

1: WARNING: DISCONNECT POWER BEFORE REMOVING COVERS !

2: Remove the 5 screws in the top-cover. (PZ-1)



3: Remove the old PROM (the IC with a label and a blue strap, located just behind the PRESET-DISPLAY), by placing the tool in the gap between the old PROM and the PROM-socket, and then wriggle the tool from side to side until the PROM has moved a little upwards. Then place the tool in the opposite end of the PROM and again wriggle tool from side to side until PROM has mooved a little upwards in this end. Then go back to first end of the PROM, and continue so, until the PROM is lifted overall from the socket, constantly trying to keep the PROM parallel to the socket. BE CAREFULL TO REMOVE THE PROM IN VERTICAL DIRECTION AND BE CAREFULL NOT TO DAMAGE SURROUNDED COMPONENTS.

4: Place the blue strap around the new PROM, insert as follows:
   A) THE SMALL ROUND MARK ON THE IC MUST POINT ON THE REAR PANEL OF THE 2290.
   B) ALL THE PINS MUST FIT IN THE HOLES OF THE SOCKET, BEFORE PRESSING THE IC INTO THE SOCKET.
   C) CHECK THAT THE PROM IS PROPERLY PRESSED INTO THE SOCKET (ALL PINS PLACED CORRECTLY).

5: Check 4A, 4B, and 4C again, and mount top-cover again.

6: Connect mains-power.
   Type: <SPEC> <0> <ENTER> , and the DELAY-DISPLAY will show PROM VERSION NUMBER.

7: If "ERROR" 13 is dispalyed, all previous PRESETS and SPECIAL-PARAMETERA are erased and overwritten with FACTORY PRESETS and FACTORY SPECIALPARAMETER DEFAULTS, which means eventually specialparameters and presets have to be programmed by the user.

   "ERROR" 13 must be followed by typing "0" in SPEC no. 23 as follows:
   type <SPEC> <2> <3> <ENTER> <0> <ENTER>

t.c. electronic APPLICATION NOTE 2290-apn.08b

HOW TO PREPARE THE ME00 MEMORY OPTION CARD

- This note is valid only for P.C.B. with basenumber 2962 !
- Read the warning at the end of this note.
- The card cannot function unless the ME04 + SA01 (or SA02) option is already installed for the first 4 seconds.
- Get the correct ICs. Please find a list of useable types at the end of this note.
  If you want plus 28 seconds card then 28 pcs. of the ICs are needed. 4 ICs for each 4 seconds. Minimum 4 ICs at a time.
- As most ICs are made for automatic insertion equipment the pins are pointing outwards a little (15 degrees), the pins must be bend as shown on the figure before attempting to insert the ICs into the sockets

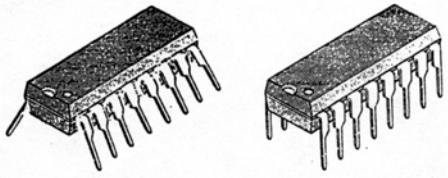


Fig.1. The IC pins must be bent before mounting into the sockets

- Now mount the ICs according to the instructions below.
- **Important :** Pin 1 on the ICs must be mounted in pin 1 on the P.C.B., orientations shown are for the 1M type only (ICs with 18 pins).

  The ICs does not function if they are not orientated correctly Do not count on the text printed on the ICs, but rely only on the PIN 1 indication.

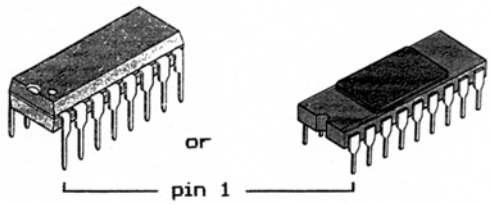


Fig.2. The pin 1 indication is as shown on one of the figures

- Take extreme care to get all pins into the sockets
  If **anyone** of the pins do not get proper connection, the result will be a desaterous 'hole' in the sound !!!

- Each filled row gives plus 4 second extra memory.

- A row **must** be filled completely (4 ICs). Thus filling all seven rows with 1Mega type Dynamic RAMs gives 4 x 7 = 28 seconds.

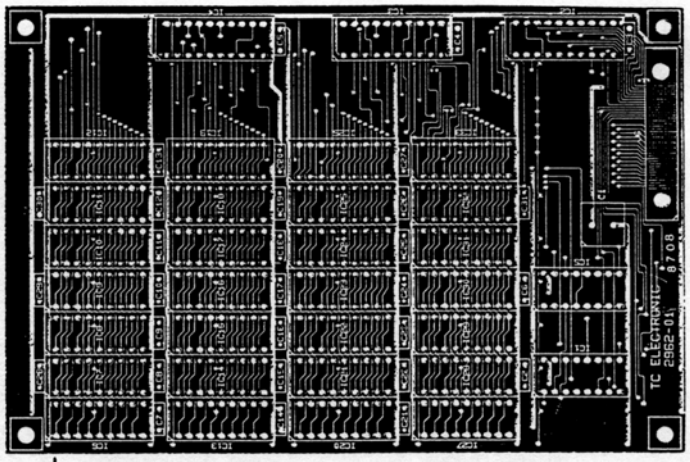


Fig.3.

- **Important:** The pin 1 on the ICs must be mounted in pin 1 on the P.C.B. The PIN 1 Indications shown are for the 1Mega type only (ICs with 18 pins).

- Allways fill the board starting with lowest row number !

- Do not attempt to mount the card into the TC2290 until you are 100% sure that you have made it correctly, so check all of the above mentioned points once again.

- Note that the 16 sockets in the TC 2290 itself (on the mainboard) must be filled completely with 256K type RAMs (MS or ME04+SA0* options) before this optioncard can be used, otherwise you'll get a quite noisy 'hole' instead of sound in the first 4 seconds of sampling.

- Now go to the application note 09 for mounting ME00 P.C.B. into the TC 2290. If you do not succeed in getting a properly functioning card, then return here to the faultfinding.

FAULTFINDING

Please go through the list above checking each point again

☐ Check each and every IC pin is 'in socket'. A common fault is that one of the IC pins are bent underneath the IC, not reaching the socket connection. You cannot possible see this fault except by pulling out again the ICs one by one.

☐ The TC 2290 uses the memory from row 1 and up so this can give you a clou to which row of ICs is malfunctioning. The following list will tell you in which row the fault possible is to be found:

Row	Using 1Mega RAMs	Apprx. sampling time
1	3071 - 7.16	4 - 8 seconds
2	7168 - 11.26	8 - 12 seconds
3	11.26 - 15.35	12 - 16 seconds
4	15.36 - 19.45	16 - 20 seconds
5	19.45 - 23.55	20 - 24 seconds
6	23.55 - 27.64	24 - 28 seconds
7	27.64 - 31.74	28 - 32 seconds

If e.g. a 'hole' appears around the 6000 mS when playing back a sample, it is in row 1.

☐ If the TC 2290 does not turn on light within 3 seconds of <POWER> ON, turn off <POWER> immidiately. Pull out the mains connection and check all of the above as well as the orientation of your EPROM is correct. Also check the L1 strap connection on the main board (L1 must be strapped from pin 2 to 3, when using sampling PROMs).

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Useable types 1Mega RAM IC's (for plus 28 seconds with this card)

Manufacturer	Type/Part number
Fujitsu	MB 811001-12/-15
Hitachi	HM 51100-10
Toshiba	TC 511000P-10/-12 or TC511000C-10/-12

WARNING WARNING WARNING WARNING WARNING WARNING WARNING

Never open the TC 2290 unless the power cord is disconnected. Call qualified personel to help you install any of the options. **t.c.electronic** cannot guarantee that the memory card will function properly. It is your own risk doing the job. Whether the card will function properly depends very much on the work of installing the ICs is done properly. Use only the listed types of ICs which have been found OK for the TC 2290, however we cannot guarantee anything about the quality of ICs from your source.

The market sees a lot of secondary quality type ICs which have not been tested and thus cannot be guaranteed functionally neither as delivered nor throughout time. Also, if you are in doubt about anything regarding this procedure, please do not try to continue, but hand over to a professional electronics engineer or order the fully populated and throughout tested cards from your t.c. electronics supplier.

Also we cannot guarantee that improperly mounted or faulty ICs does not destroy other parts of the TC 2290. An eventual repair is at your cost only.

WARNING WARNING WARNING WARNING WARNING WARNING WARNING

t.c. electronic APPLICATION NOTE 2290-apn.09

INSTALLATION OF ME00/ME11/ME32

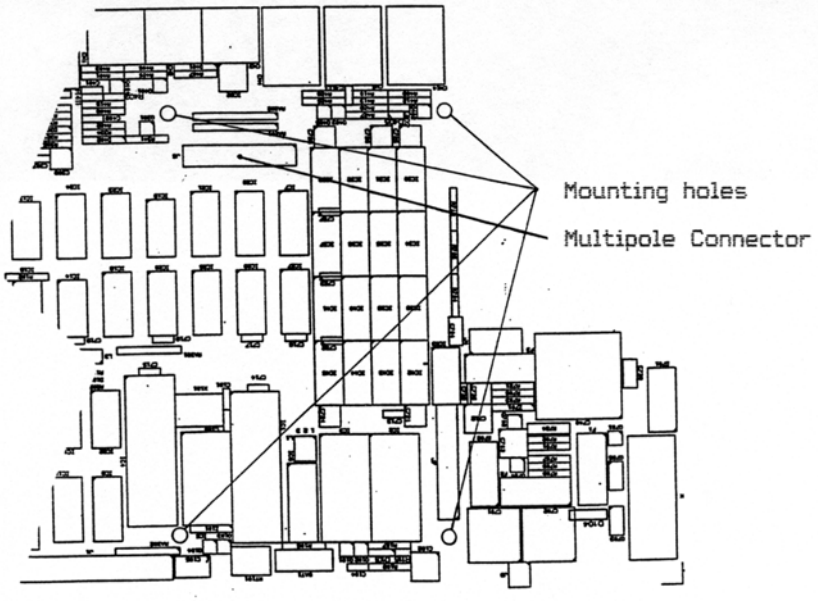
If you have bought a do-it-yourself-kit with an empty card (ME00, not available in all countries) please check with 2290-apn.08, that comes with the ME00 card on how to prepare the card before continuing here.

If you have bought a fully loaded and tested card please follow the instructions below.

Please note that the ME32 card requires that the EPROM is no. 27.03 or higher for more than 9999 mS delay/sampling time. The ME11 card will function with EPROM 26.5 (without sampling) and EPROM no. 27.02 or higher (with sampling).
Also, the ME seconds ME04 option must be installed already (standard in some countries.

MOUNTING INSTRUCTIONS FOR ME00/ME11/ME32

- ☐ **Unplug the TC 2290 from the mains !!!**
- ☐ Unscrew the top and bottom covers of the TC 2290
- ☐ If you need change EPROM do this first, then return here.
- ☐ Notice the 4 mounting stacks on the ME option card, locate the corresponding holes in the main board of the TC 2290 as shown on the figure 1.



☐ The memory card has a locking multipole connector, which must be locked into place **before** the memory card is mounted into place (the multipole connector is underneath the memory card when you have finished)
The red top of the connector part must be pushed completely toward one side to 'open' the lock (fig.1), then place the connector in the main pcboard as shown on fig.2 (shown from rear side of TC2290).

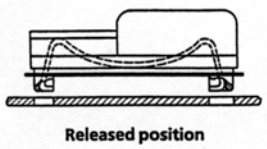


Fig.1

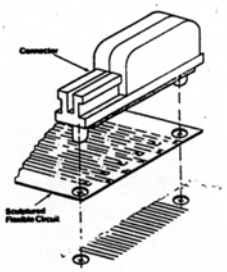


Fig.2

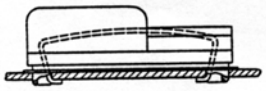


Fig 3.

☐ Lock the connector by pushing the top toward to the opposite side (take care that the connector is completely pressed down before doing this !)

☐ Having succeded the multipole connection you can now place the memory card into position, and, **important**, place the isolating washers on the screws before positioning (from underside) and fastening the 4 screws into the memory card standoffs.

☐ Mount the covers in place, connect and turn on mains power.
If the TC 2290 does not light up within 3 seconds (use your watch) then turn off the power immidiately and check below.

TROUBLESHOOTING

If the TC 2290 malfunctions after the installation of the ME11/ME32 card, you probably have not succeded in making the multipole connection.
Try taking out the card - again, take care not to pull in the multipole wiring when taking out the card. - Also check:

If the TC2290 has been into some 'harsh' environment the multipole connection pads on the pc-board might need cleaning (with isopropyl alcohol or tape recorder head cleaner fluid on a cotton cloth) before locking the connector into place.

On some early TC2290's an arrow on a little paperlabel just beside the connector indicates that the **black** part of the multipole connector must be pushed in the direction of the arrow, when locking the connector.

t.c. electronic APPLICATION NOTE 2290-apn.10

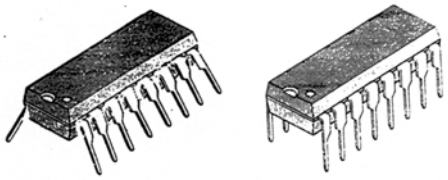
INSTALLATION OF ME04 and MS04 - (4 sec.memory)

ME/MS04 DESCRIPTION

The ME04 option expands the available 2290 delay/sample time to 4 seconds. The option is 8 fully tested IC's which must be plugged into the empty IC sockets on the mainboard of the TC2290. It will function with all available 2290 EPROMs. However, sampling requires a sampling EPROM (# 27.04 or higher) as well.
The MS04 option is the ME04 option and an EPROM for sampling.

MOUNTING INSTRUCTIONS FOR ME04

- ☐ **Unplug the TC 2290 from the mains !!!**
- ☐ Read the warning at the end of this note.
- ☐ Unscrew the top cover of the TC 2290
- ☐ If you are installing sampling as well (MS04 option), go now to the seperate instructions for sampling EPROM installation and initialization (Appendix B of the chapter [8.2], sampling text addition to TC2290 Owners Manual.) then return here.
- ☐ As most IC's are made for automatic insertion equipment the pins are pointing outwards a little (15 degrees), the pins must be bend as shown on the figure before attempting to insert the IC's into the sockets:



As delivered Bent correctly

Fig.1. The IC pins must be bent before mounting into the sockets

- ☐ Now mount the IC's according to the instructions below.

☐ **Important :** Pin 1 orientation
The IC's does not function if they are not orientated correctly
Do not count on the text printed on the IC's, but rely only on the PIN 1 indication:

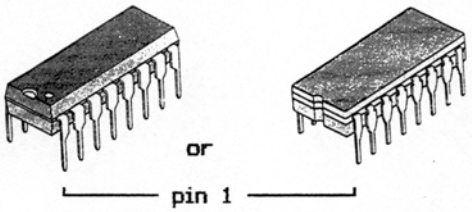


Fig.2. The pin 1 indication is as shown on one of the figures

☐ Now, locate the empty sockets for the 8 IC's in the figure below, and gently press the IC's into the sockets. Note the pin 1 indication.

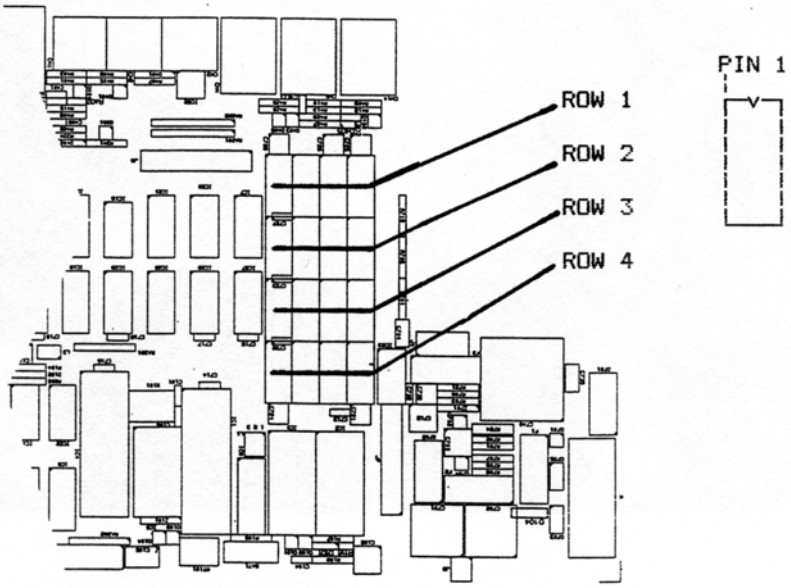


Fig.3. The ROW 3 and 4 sockets are for the ME04 option.

☐ Take extreme care to get all pins into the sockets
If **anyone** of the pins do not get proper connection, the result will be a desaterous 'hole' in the sound !!!

☐ Do not attempt to power on the TC2290 until you are 100% sure that you have made it correctly, so check all of the above mentioned points once again before you go to 'INITIALISATION'.

INITIALISATION

☐ Mount top cover in place, connect and turn on mains power.
If the TC 2290 does not light up within 3 seconds (use your watch) then turn off the power immidiately and check 'FAULTFINDING'

☐ The TC2290 should start up normally and all you have to do is write in spec.no. 7 the value 4 to tell TC2290 it now has 4 seconds:
<SPEC> <7> <ENTER> <4> <ENTER>
then turn off the power and turn on the power again.
The 4 seconds ME04 installation is now completed.

☐ If you are installing sampling as well (MS04 option), return now to the seperate instructions for sampling EPROM Installation/Initialization (Appendix B of the chapter [8.2], sampling text addition to TC2290 Owners Manual.)

FAULTFINDING

☐ The TC 2290 did not turn on light with <POWER> ON:
The mains cord was connected ? - If yes then disconnect and Check the 'MOUNTING INSTRUCTIONS' again, especially the PIN 1 orientation of the IC's.
Also, if you have changed EPROM, check the PIN 1 orientation of your EPROM, all the pins are 'in socket' and if it is a sampling EPROM (as delivered with the MS04) check the strap connection (L1) on the main board is done properly (strapped from pin 2 to 3, when using sampling EPROMs).

☐ The TC 2290 seem to ignore the extra memory :
Yes.- You have to tell TC2290 how much memory it has (spec.no 7) and also, if you've installed sampling EPROM, how you want to use the memory. (Spec.no 36 and 38). - Check 'INITIALISATION' again.

☐ Desaterous, noisy 'holes' in the sound:
Check each and every IC pin is 'in socket'. A common fault is that some of the IC pins are bent underneath the IC, not reaching the socket connection. You cannot possible see this fault except by pulling out again the IC's. The 'MEMORY-MAP' list below can help you pinpoint the IC(s).

☐ If the IC's are correctly mounted but the 'hole' is still there, contact qualified personel to help you (one of the IC's might be damaged).

'MEMORY-MAP':

If no sampling EPROM is installed (using all memory for delay), the IC row M1 is the first delay sec., row M2 the second etc.

With the sampling EPROM installed, and e.g. a 'hole' appears around 2500 mS of sampling, it is in row M3 of mounted IC's. If

there is faults only in delay mode (and Delaymax (spec.38) is set to '1023') the fault is in row 4 of IC's.

TC 2290 reserves memory for sampling from row M1 and **up**, the memory reserved for delay is used from row M4 and **down**, so this can give you a pretty good clou to which row of IC's is malfunctioning. Normally - (with 1023 millisec. reserved for delay i.e. special no. 38 set to '1023') the 'memory-map' looks like this:

Row	Milliseconds		
M1	0- 1023	1. sample sec.	factory installed
M2	1024 - 2047	2. sample sec.	
M3	2048 - 3071	3. sample sec.	ME04 option
M4	0 - 1023	1 delay sec.	

Possible replacement types 256K RAM IC's (for the ME04 option)

Manufacturer	Type/Part number
Fujitsu	MB 81256-10/-12/-15
Motorola	MCM 6256-10/-12/-15
OKI	MSM 41256-10/-12/-15
Sharp	LH 21256-10/-12/-15
Texas Instrument	
Toshiba	

WARNING WARNING WARNING WARNING WARNING WARNING WARNING

Never open the TC 2290 unless the power cord is disconnected. Call qualified personel to help you install the option.
t.c. electronic cannot guarantee that the ME04 option will function properly. It is your own risk doing the job. Whether the ME04 option will function properly depends very much on the work of installing the IC's is done properly.
If you accidentially destroy any of the IC's please use only pretested types from the listing above or order the pretested types from your t.c. supplier.
If you are in doubt about anything regarding this procedure, please do not try to continue, but hand over to a professional electronics engineer or ask your t.c. electronics supplier to do the job.
Also we cannot guarantee that improperly mounted IC's does not destroy other parts of the TC 2290. An eventual repair is at your cost only.

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