

## Description

The SU-5 Software/Speech-Synthesizer Upgrade Kit enables earlier users of the RFC-1/B Remote Control to obtain the expanded operating features enabled by the latest software and vastly improves the quality of the RFC-1's synthesized voice. This kit contains a new microprocessor chip for the RFC-1, a speech-synthesizer replacement module, a new Instruction Book, and these Installation Notes.

## Replacing the Speech-Synthesizer

The first step in the conversion process is to swap the original speech-synthesizer chip with the new speech-synthesizer replacement module. This is easy to do because the speech-synthesizer chip is mounted in a socket. To remove the synthesizer chip, first disconnect all cables from the RFC-1/B. Remove the two screws from the front panel. Remove the front panel and bezel. Slide the PC board out the front of the enclosure. The speech-synthesizer IC is U4 and is installed in a 28 pin DIP socket. With the connectors on the board facing down, U4 will be near the upper right corner. The part number on the chip is "SP0256".

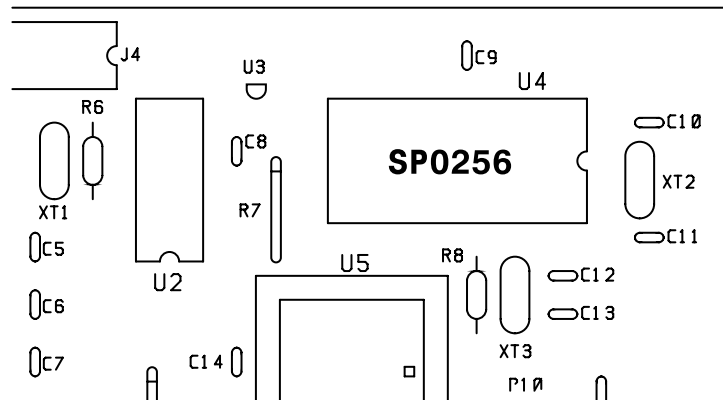


Figure 1; Location of speech IC SP0256

To remove the chip, alternately pry each end of the chip out of the socket with a small screwdriver. Handle and store both the old chip (and the new replacement module) observing normal CMOS precautions. Next, install the speech-synthesizer replacement module in the now-empty socket. Orient the module so the notch on the end of the module is on the same end as the notch on the end of the socket. Be sure all 28 pins on the module are inserted into the appropriate slots on the socket and firmly push the module down until it is seated.

To complete the speech-synthesizer portion of the modification, remove capacitors C2 and C3 from the PC board. These are located in a row of three capacitors (with C1) near the top left corner of the PC board. Do not remove C1.

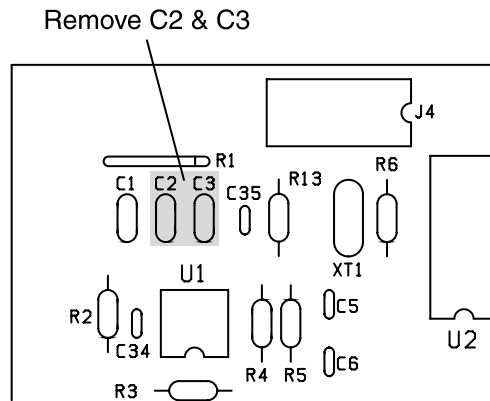


Figure 2; Location of capacitors C2 & C3 for removal

C2 and C3 may be pulled by desoldering the leads or they can be removed simply by rocking them back and forth until their leads break. This can be done with your fingers. Again, remove C2 and C3 but do not remove C1.

### Memory and User Options

All of the user options and programmable parameters of the RFC-1 are stored in non-volatile memory that remains intact if power is interrupted. However, since the memory is in the microprocessor, any settings that were programmed in the old processor are lost during the upgrade. Make notes on any settings that will be transferred to the new system before removing the RFC-1/B from service and pulling the microprocessor.

### Exchanging the Microprocessor

The next step is to swap the old microprocessor with the new one. The microprocessor is U5 and is installed in a square 52 pin socket. The microprocessor is the square black thing in the middle of the socket. Remove the existing microprocessor with a 52 pin PLCC extraction tool or make your own extraction tool using a jumbo paper clip (small paper clips may not be strong enough). Bend the clip as shown in Figure 3. The dimensions are not critical.

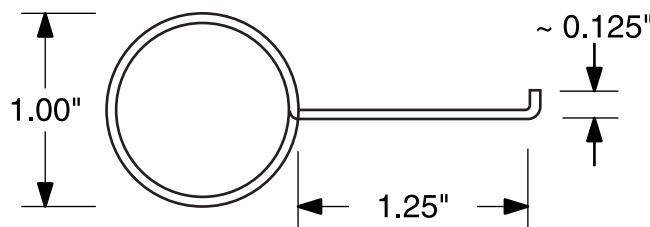


Figure 3; IC extractor from jumbo paper clip

To use the "paper clip" extractor, insert the end with the small (1/32") hook into one of the two diagonal corners of the socket which has a slot to accept it, with the hook pointing toward the microprocessor. With the hook portion worked under the microprocessor and your finger in the ring, pull straight out. Repeat with the other corner until the microprocessor is raised enough to remove it.

*It is tempting to insert a small screwdriver into the slots at the corners of the socket and attempt to pry the processor out of the socket. PLEASE DO NOT TRY THIS! The corners of the socket cannot take the pressure and they will break.*

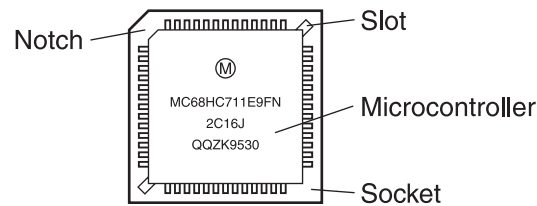


Figure 4; Microprocessor installed in PLCC socket

Handle and store both the old and new microprocessors observing normal precautions for static sensitive devices . Install the new microprocessor with the arrow inside the base of the socket pointed toward the top (beveled) end of the microprocessor. Be sure all contacts are aligned with the appropriate slots on the socket. Then simply push the microprocessor straight down until the top of the chip is flush with the top of the socket. Reinstall the PC board, bezel, front panel and screws.

## Programming the Hardware Version

Before the RFC-1 is used, you must first determine which of the two hardware versions of the RFC-1 you have: the "early" or the "late." The hardware version can be determined from the small label on the bottom of the RFC-1 case. The early versions range from Hardware Version 1.00 to 1.05. The late versions are 1.99 through 2.02. If the label is gone or illegible, there are other ways to tell which one you've got.

- If you purchased your RFC-1 new significantly *after* 8/26/90, you've most likely got a late version. If you purchased your RFC-1 new significantly *before* 8/26/90, you've most likely got an early version.
- Open up the RFC-1 case and examine the PC board. The early versions had a 1.25 inch by 1 inch black "Xecom" module in them. The late version has a 1.25 inch by 1 inch "Prem" transformer.
- Get the serial number of your RFC-1 and call Sine Systems. We can look it up and let you know which version you've got.

If you have a late version, no additional action is needed--your RFC-1 is ready to go. If you have an early version, one more step is necessary.

The following step should be performed *only if you have an early hardware version RFC-1/B*. This step must be performed one time when the new microprocessor is first installed and it is essential. Connect the RFC-1 to the ribbon cable and apply power to the RP-8 panel. Connect a telephone to the "TELEPHONE" jack. Pick up the telephone and push the "Local Control" button on the RP-8. The RFC-1 should say "This is RFC-1/B." Then:

<i>Press</i>	<i>RFC responds</i>
80	"Enter Advanced Programming Security Code"
4150	"Enter four digit address"
0996	"Memory address 0996."
0#	"Zero"
*	"Exit"
99	"Goodbye"

The RFC-1 is now ready for use.

## **Power Supply and Memory**

All of the user options and programmable parameters of the RFC-1 are stored in non-volatile memory that remains intact if power is interrupted. The clock/calendar requires continuous power and the system will lose the time and date if power is lost. When power is restored the clock does not advance. Resetting the clock/calendar is simple but programmed events may be missed if the clock is not running.

This problem can be eased by setting the Power Failure Alarm. This feature causes the RFC-1 to call and report power failures when AC power is restored. The operator that receives the call can reset the clock and calendar and check the status of devices connected to the RFC-1. For critical applications an uninterruptable power supply is a better solution.

With a proper UPS the RFC-1 can operate normally for extended periods without AC power. A small, inexpensive UPS designed for personal computers will power the RFC-1 for about 1.5 hours. These low end supplies are not "instant switching" but this should not be an issue because the filter capacitor in the RFC-1 will store enough energy to cover the switching time.

For those who are so inclined, the new instruction book includes a schematic for a do-it-yourself backup battery power supply as well as programming information for the power failure alarm discussed previously.

## **Exceptions for Early Hardware Versions**

Software version 5.00 for the Sine Systems RFC-1/B Remote Facilities Controller was released in February 1994 and is suitable for use with RFC-1/B hardware versions 1.99 and later. The software resides in the microprocessor (firmware) and determines all of the operating characteristics of the RFC-1/B. Version 5.x software may also be used with hardware versions preceding 1.99 if appropriately programmed (as described above). Due to the slightly different hardware configuration of the earlier units, the following exceptions apply to the operating characteristics discussed in the RFC-1 Instruction Book:

1. When operated locally, the RFC-1/B will not say "Ring-Ring" as an indication that someone is calling on the telephone line.
2. The RFC-1 will have no automatic hang-up detection. A timer will cause the RFC-1 to hang-up after 2.5 minutes (user-programmable) of non-use, or the operator may hang up manually with the command 99.
3. With hardware versions 1.99 and later, both the dial-up port and the dedicated control port can be activated for use at the same time (although they may not actually be used concurrently). In hardware versions 1.05 and earlier, it is an "either/or" situation. The dial-up port can be activated (this is the normal case) or the dedicated port can be activated, but they cannot be used together. In hardware versions 1.05 and earlier, if the dedicated control port is activated, the RFC-1/B will not respond to a telephone call on the dial-up port.