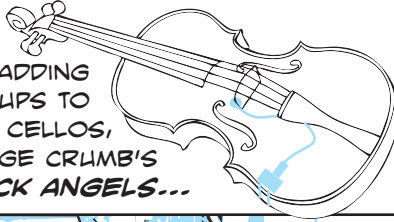


# Early Electronic Music

PERHAPS THE SIMPLEST FORM OF ELECTRONIC MUSIC INVOLVES USING **ELECTRICAL AMPLIFICATION** WITH **TRADITIONAL INSTRUMENTS**.

THIS CAN INCLUDE ADDING ELECTRIC PICKUPS TO VIOLINS, VIOLAS AND CELLOS, LIKE IN GEORGE CRUMB'S **BLACK ANGELS...**



OR CREATING A FULLY ELECTRIC VERSION OF AN **ENTIRE INSTRUMENT**, LIKE THE **ELECTRIC GUITAR!**



ANOTHER COMMON APPLICATION OF ELECTRICITY IN MUSIC INVOLVED RECORDING SOUNDS TO **MAGNETIC TAPE**, AND THEN **PHYSICALLY MANIPULATING** THAT TAPE BY **SPlicing** AND **RERECORDING** IT AT **VARYING SPEEDS** TO CREATE **STRANGE NEW SOUNDS!**

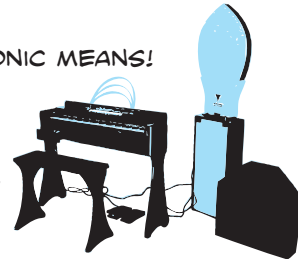
THIS TECHNIQUE, PIONEERED BY **PIERRE SCHAEFFER**, CAME TO BE KNOWN AS **MUSIQUE CONCRETE** AND WAS ONE OF THE TYPES OF MUSIC TECHNOLOGY EMBRACED BY **IRCAM**, AN INSTITUTE IN FRANCE FOUNDED BY COMPOSER **PIERRE BOULEZ** IN 1977.

WITH THE ADVENT OF **PERSONAL COMPUTERS** AND **DIGITAL AUDIO SOFTWARE**, **MUSIQUE CONCRETE** CAN NOW BE DONE FAR MORE **QUICKLY** AND **EASILY!**

BUT PERHAPS THE **CULMINATION** OF ELECTRONIC MUSIC IS THE CAPABILITY NOT TO **MANIPULATE EXISTING SOUNDS** BUT TO **SYNTHESIZE SOUND** THROUGH ELECTRONIC MEANS!

EARLY **SYNTHESIZERS** INCLUDED THE **THEREMIN**, PLAYED BY WAVING HANDS NEAR **ANTENNAS** WHICH CONTROL THE **PITCH** AND **EXPRESSION** OF THE SOUND...

...AND THE **ONDES MARTENOT**, WHICH HAS A TRADITIONAL **PIANO KEYBOARD** INTERFACE!



**COLUMBIA UNIVERSITY**, **PRINCETON UNIVERSITY** AND **RCA** COLLABORATED TO CREATE THE FIRST **PROGRAMMABLE SYNTHESIZER** IN 1957, AND THE CONCEPT WAS **PACKAGED**, **POPULARIZED** AND **MARKETED** IN THE 1960S BY **ROBERT MOOG**.

**MILTON BABBITT** WAS ONE OF A FEW COMPOSERS WHO WORKED EXTENSIVELY WITH THE **FIRST RCA SYNTHESIZER**, WHICH WAS **DIFFICULT TO USE** AND PRONE TO **MALFUNCTIONS!**



**WENDY CARLOS** USED MOOG SYNTHESIZERS TO RECREATE THE WORKS OF **J.S. BACH** AND TO CREATE **EERIE, FUTURISTIC SCORES** FOR FILMS LIKE **THE SHINING** AND **A CLOCKWORK ORANGE!**



RHYMES WITH "ROGUE"!

BY THE **1970S** AND **1980S**, MUSICIANS WERE INCORPORATING SYNTHESIZERS INTO POPULAR STYLES LIKE **FUNK** AND **ROCK**, WHERE THEY HELPED LAUNCH ENTIRELY NEW GENRES AND EVENTUALLY BECAME AS COMMON AS GUITARS AND DRUMS!



WHILE THE FIRST **RCA SYNTHESIZER** FILLED AN **ENTIRE ROOM**, MODERN SYNTHS ARE **SOFTWARE-BASED** AND CAN RUN ON A **SMARTPHONE!**