

WSLEO DKU
 COURSE IN CONTROLLING THE EMS "STORA STUDIO" WITH THE AID OF
 THE PDP-15 COMPUTER.

W. SLAWSON

SESSION 1

- 1 TURN ON THE POWER.
- 2 TRY STARTING WITH 57646 (101.111.110.100.110) IN THE "ADDRESS"
 SWITCHES; PRESS "STOP", "RESET", AND THEN "START".
- 3 IF THAT DOES'NT WORK, READ IN THE "DISK BOOTSTRAP" PROGRAM
 THROUGH THE PAPER TAPE READER. START WITH 57637 (101111110
 011111) IN THE ADRESS SWITCHES. PLACE THE PAPER TAPE IN THE
 PAPER TAPE READER, PRESS "STOP", RESET", AND THEN "READIN".
- 4 IF YOU HAVE STARTED PROPEPLY, THE TELETYPE WILL TYPE SOME-
 THING LIKE: KM15 V5A

§

THIS MEANS THE MONITOR PROGRAM IS READY TO
 LISTEN TO THE TELETYPE. MOST COMMONLY THE NEXT THING TO
 DO IS TO CALL FOR THE EDITOR BY TYPING "EDIT" OR THE
 "PERIPHERAL INTERCHANGE PROGRAM" BY TYPING "PIP".

- 5 FOR THE OPERATION OF THESE PROGRAMS, SEE "PDP-15/20
 USER'S GUIDE". IT SHOULD BE LYING AROUND THE MACHINE
 SOMEPLACE.

- 6 ASSUMING THAT YOU HAVE PREPARED A PAPER TAPE TO BE READ
 BY THE WSLEO PROGRAM, YOU SHOULD DO THE FOLLOWING (THE
 ORDER IS IMPORTANT) IN ORDER TO READ IN AND USE THE PRO-
 GRAM:
 - A. MOUNT A TAPE ON THE DIGITAL TAPE DRIVER TO THE
 RIGHT OF THE COMPUTER. BE SURE THAT THE "REMOTE" BUTTON
 IS LIT.
 - B. TYPE AC <<<<TWICE!>>>> IN ORDER TO CLEAR A MYSTERIOUS
 ERROR IN THE SYSTEM AND TO THEN RETURN TO THE MONITOR.
 - C. AFTER THE 'S' TYPED BY THE MONITOR, TYPE:


```
SA MTF 7
SGLOAD
```
 - D. THE MONITOR WILL THEN TYPE OUT "LOADER V3A" (OR
 SOMETHING LIKE THIS) . AFTER THE '>', TYPE:


```
>OWSLEO,EMSTOT,WREMSM <<<ALT MODE>>>
(<<<ALT MODE>>> MEANS END THE LINE WITH AN  

        ALT MODE INSTEAD OF THE USUAL CARRAGE RETURN).
```
- 7 YOU ARE WELCOME TO CALL ME ANY TIME DURING BUSINESS
 HOURS AT EMS (20-24-13) OR AT HOME UNTIL 2200 IF YOU
 HAVE ANY QUESTIONS (HOME:33-77-58).

W. SLAWSON

C
 C
 C

WSLEO DKU
 PDP-15
 WAYNE SLAWSON
 25/3-71

FORTRAN PROGRAM
 PURPOSE:

TO GENERATE A DIGITAL TAPE FOR THE EMS LARGE STUDIO THAT
 PRODUCES "CONTINUOUS" CHANGES BETWEEN SUCCESSIVE SETTINGS
 OF THE STUDIO DEVICES. SPECIFICATIONS OF THE SUCCESSIVE
 SETTINGS ARE EITHER TYPED VIA THE TELETYPE OR THEY
 ARE PREPARED IN ADVANCE ON PAPER TAPE. INCLUDED
 IN THE SPECIFICATIONS IS A "TIME BETWEEN SETTINGS". LINEAR
 INTERPOLATIONS BETWEEN THE SUCCESSIVE SETTINGS ARE CALCULATED

FOR EVERY 22 MILLISECONDS OF ELAPSED TIME AND A RECORD IS "REGISTERED" ON THE DIGITAL TAPE. THE PROCESS CONTINUES UNTIL THE "TIME BETWEEN SETTINGS" IS EXHAUSTED. (NOTE: THE PRESENT VERSION OF WSLEO PERMITS ONE TO CONTROL ONLY CERTAIN OF THE DEVICES IN THE STUDIO.) THE PROGRAM CALLS 'EMSTOT' (SEE DOCUMENTATION FILE) AND, THROUGH THAT SUBROUTINE, WRITES MAGNETIC TAPES FOR CONTROLLING THE LARGE STUDIO.

USE:

- 1 THE PROGRAM IS BEGUN BY TYPING "1", "2", OR "3" IN RESPONSE TO THE QUESTION ASKED BY THE PROGRAM. "1" MEANS TELETYPE INPUT; "2" MEANS READER INPUT; AND "3" MEANS INPUT FROM DISK1. IF THE READER IS TO BE USED, BE SURE THAT THE PAPER TAPE IS PROPERLY POSITIONED IN THE READER BEFORE TYPING THE "2". IF YOU CHOOSE THE DISK1 INPUT, THE PROGRAM WILL ASK FOR A FILE NAME WHICH YOU SHOULD THEN TYPE IN THE FOLLOWING FORMAT:
 A NINE CHARACTER NAME INCLUDING THE EXTENSION (USUALLY "SRC"), IF THE FILE NAME ITSELF IS LESS THAN SIX CHARACTERS, FILL OUT THE SIX CHARACTERS WITH BLANKS. FOR EXAMPLE:
 NAME SRC
 TESTAPSRC
- 2 ENVELOPES ARE SPECIFIED BY TYPING STATEMENTS THAT SPECIFY THE STATE OF THE DEVICES (THE TONE GENERATORS, ETC.) AT A GIVEN POINT IN TIME FOLLOWED BY A STATEMENT THAT SPECIFIES THE TIME IN MILLISECONDS "SINCE THE LAST STATEMENT." THE PROGRAM WILL GENERATE EMS RECORDS EVERY 22 MILLISECONDS INTERPOLATING LINEARLY BETWEEN "THE LAST STATEMENT" VALUES AND "THE PRESENT STATEMENT" VALUES OF ALL THE PARAMETERS THAT ARE TO BE CONTROLLED. WHEN THE TIME "SINCE THE LAST STATEMENT" IS EXHAUSTED, THE PROGRAM WILL READ IN ANOTHER SET OF SPECIFICATION STATEMENTS; WILL CALL THE PRESENT SET OF SPECIFICATIONS THE "LAST STATEMENT"; WILL CALL THE NEW SET OF SPECIFICATIONS THE "PRESENT STATEMENT"; AND WILL REPEAT THE INTERPOLATION PROCESS.
- 3 EACH SPECIFICATION LINE OF TYPING BEGINS WITH A CODE WHICH TELLS THE PROGRAM WHAT DEVICES OR PARAMETERS ARE BEING SPECIFIED. EACH LINE OF TYPING MUST BE CLOSED WITH A CARRIAGE RETURN, BUT, IF ONE WISHES TO WRITE COMMENTS ASSOCIATED WITH THE LINES OF TYPING, A BLANK WILL TERMINATE THE LINE FROM THE POINT OF VIEW OF THE PROCESSING PROGRAM AND A COMMENT CAN BE TYPED FOLLOWING THE BLANK WITHOUT AFFECTING THE PROGRAM PROPER. IF THE PHYSICAL LINE ON THE TELETYPE IS NOT LONG ENOUGH, TYPE A \$ CARRIAGE RTN THE PROGRAM WILL TREAT THE NEW LINE AS A CONTINUATION OF THE PREVIOUS LINE.
- 4 THE FOLLOWING ARE DESCRIPTIONS OF THE STATEMENTS THAT ARE PERMITTED. THE FIRST NUMBER IN EACH STATEMENT IS THE TYPE OF STATEMENT. EXAMPLES ARE LITERAL.
 TIME: 0, TIME IN MILLISECONDS (, VOICE FOR THIS TIME)
 "VOICE NUMBER" IS OPTIONAL AND IS ASSUMED

TO BE ONE IF MISSING.

TONGEN: 1,N<TG#,DB,HZ,>
 EX: 1,15,45,5600,3,100,573,4,95,15000
 MEANS SET UP TG15 AT 45DB AND 5600HZ;
 SET TG3 AT 100 DB AND 573HZ; SET TG4
 AT 95 DB AND 15000HZ.

FILT1: 2,N<CH#,DB,>
 EX: 2,5,65,8,100,27,60
 THIS MEANS: IN FILTER 1, SET THE
 5TH CHANNEL TO 65DB; THE 8TH CHANNEL
 TO 100DB; AND THE 27TH CHANNEL TO
 60DB.

LAEGER: 4,DB IN K1,DB IN K2,DB IN K3,DB IN K4
 IN LAEGER 1, THE AMPLITUDES OF THE FOUR POSITIONS
 ARE SET CONSECUTIVELY.

BRUS: 5,FARG,DB
 IF FARG=1, NOISE IS WHITE; FARG=2, NOISE
 IS PINK. INTENSITY IS THE THIRD NUMBER.

FRMNT: 6,BANDWIDTH,FRMT FREQ,BW,FRQ,BW,FRQ,ETC.
 THE 'BANDWIDTH'S ARE THE 3DB DOWN
 POINTS OF RESONANCE FREQUENCIES IN
 A SERIES RESONANCE FILTER. THE
 FRMT FREQ ARE THE FREQUENCIES OF
 THE RESONANCES. THERE CAN BE UP
 TO 5 SUCH FORMANT FILTERS. THEY
 ARE REALIZED IN FILTER 2 IN THE
 STORA STUDIO. BANDWIDTHS OF 25
 AND FORMANT FREQUENCIES OF 220,550,
 2500,AND 3500 WILL RESULT IN THE
 VOWEL /U/ (SWEDISH 'O').

KANAL: 7,DB,DB,DB,DB
 THE LEVELS IN EACH OF THE FOUR CHANNELS ARE
 TYPED CONSECUTIVELY IN ORDER.

ECHO: 8,TIME CODE IN EK01,TIME EK02
 THE TIME CODES RANGE FROM 1-15.

AMPLI: 9,DB IN BS1,BS2,BS3,BS4,RM1,RM2,RM3,AM1,AM2,DG1,DG2
 ONE CONTROLS THE "AMPLITUDE" OF THE ABOVE
 DEVICES BY ENTERING DB IN THE POSITION
 CORRESPONDING TO THE DESIRED DEVICE.

PATCH: 17,N<FROM,TO,>
 THIS TYPE OF STATEMENT CONNECTS THE VARIOUS DEVICES
 IN THE STUDIO TOGETHER. THE CONNECTION POINTS
 ARE GIVEN IN TABLE 1, BELOW. THERE IS
 A NUMERICAL CODE FOR EACH POSSIBLE CONNECTION POINT
 IN THE STUDIO.
 EX: 17,22,14,23,14,2,34,34,19,34,20,34,21
 THIS COUPLES TG GROUP 1-3 TO LAEGER 1
 TG GROUP 4-6 TO LAEGER 1
 BRUS TO FILTER 1
 FILTER1 TO KANAL 2,3, AND 4

TEAR: 18,N<FROM,TO,>
 THIS IS THE REVERSE OF PATCH. IT UNCOUPLES
 DEVICES IN THE STUDIO.

TGWF: 19,1-24<WAVEFORM TYPE CODE,>
 THIS IS USED TO SET THE WAVEFORM TYPE FOR THE
 24 TONE GENERATORS. UP TO 24 NUMBERS CAN BE
 TYPED TO SET THE 24 INDICATORS. THE NUMBERS
 SHOULD BE LESS THAN OR EQUAL TO 7.

ASSIGN: 20,STATEMENT TYPE,(VOICE NUMBERS IN THE FORMAT

OF THE STATEMENT TYPE)
 BY MEANS OF "ASSIGN" THE VARIOUS PARAMETERS
 IN THE STUDIO ARE ASSIGNED TO DIFFERENT VOICES.
 TO ASSIGN TG4 TO VOICE 1 AND FILT1, CH3, TO
 VOICE 5, TYPE THE FOLLOWING:

20,1,4,1,1 IN TG4 DB AND HZ ARE VOICE 1
 20,2,3,5 FILT1 CH3 VOICE 5

SETUP: 21, NUMBER OF VOICES

THIS STATEMENT MUST OCCUR BEFORE ANY
 TIME STATEMENT IF MORE THAN ONE VOICE IS TO
 BE SPECIFIED.

5 TYPE A LINE CONTAINING 99 TO CLOSE THE RUN.

C
 C
 NUMBER AMPLIFIER

0	EK01	REVERBERATION UNIT ONE
1	EK02	REVERBERATION UNIT TWO
2	BRUS	NOISE GENERATOR
3	BS1	TAPE RECORDER INPUT CHANNEL ONE
4	BS2	TAPE RECORDER INPUT CHANNEL TWO
5	BS3	TAPE RECORDER INPUT CHANNEL THREE
6	BS4	TAPE RECORDER INPUT CHANNEL FOUR
7	RM1	RING MODULATOR ONE
8	RM2	RING MODULATOR TWO
9	RM3	RING MODULATOR THREE
10	AM1	AMPLITUDE MODULATOR ONE
11	AM2	AMPLITUDE MODULATOR TWO
12	DG1	AMPLIFIER ONE
13	DG2	AMPLIFIER TWO
14	L1	LAEGER ONE CHANNEL ONE
15	L2	LAEGER ONE CHANNEL TWO
16	L3	LAEGER ONE CHANNEL THREE
17	L4	LAEGER ONE CHANNEL FOUR
18	K1	OUTPUT CHANNEL ONE
19	K2	OUTPUT CHANNEL TWO
20	K3	OUTPUT CHANNEL THREE
21	K4	OUTPUT CHANNEL FOUR
22	TG3	SOUND GENERATORS GROUP 1-3
23	TG6	SOUND GENERATORS GROUP 4-6
24	TG9	SOUND GENERATORS GROUP 7-9
25	TG12	SOUND GENERATORS GROUP 10-12
26	TG15	SOUND GENERATORS GROUP 13-15
27	TG18	SOUND GENERATORS GROUP 16-18
28	TG19	SOUND GENERATOR 19
29	TG20	SOUND GENERATOR 20
30	TG21	SOUND GENERATOR 21 (GROUP 19-21)
31	TG22	SOUND GENERATOR 22
32	TG23	SOUND GENERATOR 23
33	TG24	SOUND GENERATOR 24 (GROUP 22-24)
34	F1	FILTER NUMBER ONE
35	F2	FILTER NUMBER TWO
36	RM1A	RING MODULATOR ONE INPUT A
37	RM1B	RING MODULATOR ONE INPUT B
38	RM2A	RING MODULATOR TWO INPUT A
39	RM2B	RING MODULATOR TWO INPUT B
40	AM1A	AMPLITUDE MODULATOR ONE INPUT A
41	AM1B	AMPLITUDE MODULATOR ONE INPUT B
42	AM2A	AMPLITUDE MODULATOR TWO INPUT A
43	AM2B	AMPLITUDE MODULATOR TWO INPUT B

44	L5	OUTPUT TO TAPE RECORDER CHANNEL ONE
45	L6	OUTPUT TO TAPE RECORDER CHANNEL TWO
46	L7	OUTPUT TO TAPE RECORDER CHANNEL THREE
47	L8	OUTPUT TO TAPE RECORDER CHANNEL FOUR
48	VITT	SET NOISE COLOUR TO WHITE
49	ROSA	SET NOISE COLOUR TO PINK
50	TG22B	SOUND GENERATOR BUS OUTPUT
51	FRO	FREQUENCY CHANGER

C

TABLE 2
PERMISSABLE COUPLING (PATCH)

```

-----TO-----
:EEDDL:KKKKT:TTTTT:FFRRR:RAAAA:LLLLV:RTF
DEVICE :KKG1:1234G:GGGGG:12MMM:MMMMM:5678I:OGR
NAME   :0012 :      6:91111:   112:21122:      T:S20
       :12   :      : 2589:   ABA:BABAB:      T:A2
       :   :      :   :   :   :   :   :   :   :   :   :   :
PATCH :   111:11222:22222:33333:34444:44444:455
NUMBER :01234:89013:45678:45678:90123:45678:901

```

```

-----
EKO1  0:  XXX:XXXX :      :      : X X:      :
EKO2  1:  XXX:XXXX :      :      : X X:      :
BRUS  2:X   X:XXXX : XX   :X   X: X:X
BS1   3:XX   :      : XX X :X X X:X
BS2   4:XX   :      : XX X :X X X: X
BS3   5:XX   :      : XX X :X X X: X
BS4   6:XX   :      : XX X :X X X: X
RM1   7: XXXX:XXXX : XX   : X X:
RM2   8: XXXX:XXXX : XX   : XX :
RM3   9: XXXX:XXXX : XX   : X :
AM1  10:   X:XXXX :      :      :
AM2  11:   X:XXXX :      :      :
DG1  12: X   :      : XX X :X X X:
DG2  13: X   :      : XX X :X X X:
TG3  22:   X:XXXXX:      :      :
TG6  23:XX   X:XXXX :XXXX :X X :
TG9  24:   X:XXXX : X   :      :
TG12 25:XX   X:XXXX : X   :XXXX :X X :
TG15 26:   X:XXXX : X   :      :
TG18 27:XX   X:XXXX : X:XX X :X X X:
TG19 28:   :      :      :      :      : X
TG20 29:   :      : X:   :      :      : X
TG21 30:   X:XXXX : X: X :      :      :
TG22 31:   :      :      : X:   :      : X
TG23 32:   :      :      :      : X   :      : X
TG24 33:XX   X:XXXX : XX X :X XXX:      : X
F1   34: XXXX: XXX :      : XXX :XX X:      :
F2   35: XXXX: XXX : X   : X XX :      :
-----

```