

Pauline

CAMPUS PLAYBACK CENTER FOR MEDIA RESOURCES

A facility to provide all university departments with media playback services for instructional materials has been planned for Fall, 1977. The Center results from needs expressed over the past several years by a number of departments and is a joint project of the Office of Learning Resources, The Computer Center, OASIS, The Media Center, and the Chancellor's Advisory Committee on Instructional Improvement Projects (CACIIP). Funding has been provided by the Program Review Committee (PRC) and CACIIP. Several departments will contribute equipment and services.

The objective for the Playback Center is to provide a central storage and distribution facility for media and other self-instructional materials for all academic departments at UCSD. The Playback Center will be a library for media materials, open 66 hours each week and operated by a professional staff. Materials will be stored and distributed according to instructor needs -- pretests, posttests, workbooks, etc. will be dispensed along with video, audio or slide materials. Recordkeeping and other services useful to faculty will be provided to monitor usage or evaluate materials.

The Playback Center will have videocassette, slidetape, and audio-tape carrels, a small group viewing room for film or video, and carrels for workbook-paced individual study. Six computer terminals will be available for courses utilizing computer assisted instruction, statistical analyses, and similar programs. Reel-to-reel audio and video tape are additional possibilities.

It is our intention to make the Playback Center a useful facility for all departments. If you wish to place materials in the Center, if you have a question about types of media, if you have a suggestion for procedure or planning, if there is any way that this facility might help you in your course or department, let us know by filling in and returning the attached survey sheet to:

Jeff Glenn-Levin
OASIS B-030
x-3760

PLAYBACK CENTER USER SURVEY

NAME _____ DEPARTMENT _____

I. Do you teach courses which use media instruction and/or media for demonstration? yes ___ no ___ If yes, fill in the table below. If no, would you like to teach using such an option? _____

	<u>Course</u>	<u>No. Students</u>	<u>Type of Media</u>	<u>What Quarter</u>	<u>No. of Uses Per Quarter</u>
1.	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____

II. For each of the above courses, would simple check-in and check-out procedures satisfy your needs, or would you need additional services, such as the distribution of workbooks, exercises, or tests?

III. Are there other media formats, in addition to audio cassette, 2 x 2 slides, and video cassette, that you would use if available in the Playback Center?

IV. Do you have any suggestions for developing the procedure or facilities of the Playback Center?

Electronics / FTE Proposal

To the Faculty From Oliveros April 26, 1977

NEEDS TO BE COVERED :

I Courses (9 Total) 105 A B C Alt. 104 A B C (D E F) 200 205 (202) 299	Total number of Students 129 Total 60 32 (14) 20 11 (11) 6
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II Electronics Committee (weekly meeting)

III Studio Development (Electronic Music and Recording - B108, B104, B124, B202)

A. Organization
 B. Design
 C. Documentation

1. Technical
 2. Users

(not including maintenance. Maintenance is now covered with 100% assistant technicians)

IV Archives

A. Recording of Concerts and Lectures
 B. Cataloguing
 C. Dubbing

How to DO IT PROPOSAL :

I Course Coverage

	FTE%		Number of Courses				Total Courses	FTE%
Oliveros	.10	Supervisor	105 / 205 / 200				.50	
Liebig	.25	1	.50	.25	.25		2	
Grose	.25	105 C	205	299	200		2	
Rittenbach	.25 +	105 B	.50	.25	.25		2.25	
Ritscher (.25)		105 A	104 C	.25	200		(2.25)	
		104 A	104 B	.25	200		9	.85

Ritche's course load would not count against faculty. Therefore 9 courses would be covered by .85 FTE. This appears to be a better student faculty ratio than our average.

II Electronics Committee

All would attend

III Studio Development

If the remainder of the FTE, approximately .25 is not used to pay for specialist service from Gross, Liebig and Rittenbach, then some other source is needed. (This would leave part of the FTE free for the private lesson program)

Suggestions: 1.) Boost the level of the FTE to Assistant Prof. Step 3. 2.) Request I + R funding equivalent to .25 FTE 3.) Find a departmental grant. 4.) Request specialist funding.

Studio Development can not be neglected. Much of the equipment is old, the set-ups are not convenient, or efficient for the work. More students have to be processed more efficiently and with documentary guidance.

IV Archives

Recording of concerts

Cataloguing

Dubbing

- Workstudy and Ritche's

- Workstudy

- Workstudy

*Pauline -
sorry to hear the
proposal response was not -
Hope this interests
you anyway -
John*

COLLEGE OF FINE AND APPLIED ARTS

University of Illinois at Urbana-Champaign
Office of the Associate Dean
114 Architecture Building
Urbana, Illinois 61801
Telephone: Area Code 217 333-6061

April 18, 1977

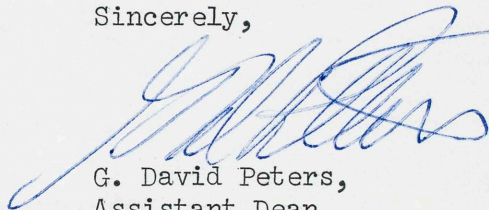
Dr. John Andrews
810 Crest Road
Delmar, California 92014

Dear Dr. Andrews:

Dr. Stan Smith of our Chemistry Department has forwarded your name to me requesting information on Music programs on the PLATO Computer System. I have taken the liberty of forwarding one article and a brief description of the PLATO Music Project at the University of Illinois for your information.

If you have any questions regarding the PLATO Music Program, I will be happy to correspond with you or members of your faculty at the University of California-San Diego.

Sincerely,



G. David Peters,
Assistant Dean

GDP/sh
cc: S. Smith
enclosures

CAPABILITIES OF COMPUTER-ASSISTED INSTRUCTION IN MUSIC:
THE PLATO MUSIC PROJECT

G. David Peters
University of Illinois

The PLATO Music Project at the University of Illinois began in 1970 with the investigation of the audio capabilities of the PLATO III computer-assisted instructional system. Two CAI projects were initialized in music during the later part of the 1969-1970 academic year; one designed to implement a random-access audio device in an elementary music fundamentals program by Placek, 1972, the other designed to interface the PLATO system to judge pitch and rhythm performance in instrumental music by Peters, 1974.

From 1970 to 1972 a number of CAI programs were written in various areas of music instruction for demonstration purposes. Programming areas included music theory, music history, music education methods, plus the programs developed in elementary music fundamentals and performance judging areas of the initial studies. Although the limited PLATO III facilities would only allow twenty students or authors to work with the computer at any one time, all University of Illinois graduate students in music education in 1972 became familiar with the available programs in music and learned basic programming technics on the PLATO III computer system. Several graduate students worked closely with School of Music faculty members in developing courseware for existing classes.

With the implementation of the PLATO IV system in 1973, larger numbers of classes and students could be accomodated. By January 1973, twenty-five programs were available to students in music, including a lessons series developed in instrumental music by Peters. The effective lessons developed on the PLATO III system were transferred to the new computer system. Several lessons developed by graduate students were tested in the elementary school for the first time in 1973.

By 1974, sixteen courses taught in the School of Music at the University of Illinois used PLATO programming to some extent. Several classes only used the computer for one or two lessons, while others had developed a lesson sequence from four to twenty hours of programming. Several of the courses used the same program or programs written and developed by other departments in the University. An example of this sharing of program materials is the use of physics programs by the students in Music Acoustics I and II taught by music staff members. Several programs have been developed in a cooperative effort by physics and acoustics/music staff members. Students in acoustics classes now work through a ten lesson sequence of physics/music oriented lesson material.

From 1975 to the present, a growing number of students and music faculty have used PLATO in course offerings. An experimental lesson sequence in music theory was initiated during the Spring of 1976, and has since been incorporated into the course as a weekly requirement. A growing number of competent authors have completed a PLATO authors' course and developed music lessons for courses and professors at the University. The undergraduate and graduate students, working with major professors to guide lesson content development, have created excellent lessons for specific courses.

RECENT DEVELOPMENTS:

Recent developments in programming computer-assisted instruction in music include advancement in three major areas:

1. hardware development and improvement
2. software development and evaluation
3. project objectives and participation

Hardware development and improvement:

The basic PLATO IV computer terminal and keyset have not changed in basic design or function. The optional peripheral equipment has been an improvement within the last year. Equipment available for use with the PLATO IV system includes: the touch panel (an input device), (a fourpart audio output device), an improved version of the random-access audio playback device, and a slide projector.

The most significant of the devices to the music project are those dealing with sound reproduction. The music box, although restricted in having no timbral variation and only producing four-part audio examples has been used successfully in dictation programs. Research work continues on a large, sixteen-voice tone generator for added flexibility in programing music. The new version of the music box will have the added capabilities of computer-controlled enveloping and timbre control. Work should be completed on the prototype of the sixteen-voice music generator within the calendar year.

An improved random-access audio device has been developed and is now capable of reproducing pre-recorded music examples of satisfactory fidelity. This commercially available device is adaptable to any computer system and gives much needed flexibility in music programing. This playback device presents a record-playback feature, as well as the quick access selection of any pre-recorded materials. Music programs using the random-access audio device have been developed to demonstrate the potential for the computer-controlled access of pre-recorded music examples. Further application is planned using the record-playback feature in "modeling" lessons, music appreciation, and music testing.

An interesting experimental device, used in music programing is the VoTrax voice synthesizer. With the addition of the voice synthesizer to the PLATO terminals, a program in vocal diction has been written. The computer-controlled voice output is generated from a programed vocabulary of phonemes. The application of phonemes programed by computer to vocal diction is almost direct. Other applications of the voice synthesizer has included work in elementary reading and speech. Although not being used in any music courses at present, the voice synthesizer experimentation is an example of the continued development of technical devices which may someday be added to the PLATO classroom.

Software development:

During the last year, several additions to the file of music lessons are noteworthy. Lesson materials have been added to the following program areas since 1975:

- 1.) acoustics and electronic music
- 2.) elementary-music fundamentals
- 3.) music theory fundamentals
- 4.) instrumental methods
- 5.) statistics in music research
- 6.) data-retrieval programming
- 7.) music terminology drills

The classification of programs for the PLATO project are based upon two criteria: the level of presentation and the intended audience. Most programs are and should be written, tested and used by a specific student population. This distinction in content and audience becomes necessary when considering the development of programs in more than one area of instruction.

Early programs written for the music fundamentals classes were successfully used in the introduction to music theory. A new lesson sequence developed by Beth and Kirk Gaburo was used experimentally in Music 100 during the Spring semester of 1976 and has since been scheduled as part of the theory curriculum for the 1976-77 academic year in Music 100 and 101 at the University of Illinois.

A lesson sequence in music acoustics has been developed by several music and physics staff members. Gary Loitz added a program which essentially reproduced a sound laboratory on PLATO, including an oscilloscope to plot wave forms, a frequency counter and various adjustments for the "equipment". Keith Lenenski graduate student in composition, has added to the acoustics programs with a new series on electronic music complete with "studio" lessons on standard electronic synthesizer operations. The student must complete several lessons before beginning actual hands-on operation of the electronic music studio.

A series of short lessons in statistics has been developed to aid the "novice" research student in music. The lessons are used as either a review for doctoral students or introductory lessons for masters degree candidates. The program sequence differs in basic approach from the Richard Colwell series on test and measurement in music. The lesson series is tutorial in design, giving the student remedial or background information on statistical tests. Examples of new statistics programs include the Uncorrelated T-Test by William Sanders and Non-parametric Statistics Techniques by Kate Rushford. Library Retrieval Techniques, programed by Dean Shoup, have been used as an early part of this series for over one year.

A group of experimental or demonstration lessons now exist which are not available to students in any course or curriculum. The retention of the experimental programs serve several purposes. Most of the programs in this classification were written by students learning to author CAI materials. Many ideas created in these programs are used as a testing of new programming techniques, strategies and lesson groupings. A group of music games has been developed within the last two years which have been improved greatly by interested students. The "Games-List" includes: music baseball, music password, music jeopardy, musical crosswords and music squares.

Non-instructional uses of the PLATO IV system have been employed in two data-retrieval programs developed by Peters. These programs, developed during the summer of 1975, aid in the advising of the undergraduate students in music education and the placement of recent graduates and alumni of the School of Music at the University of Illinois. A record of each undergraduate student has been entered into the PLATO IV computer including emphasis, classification, major instrument, minor instrument, accumulative average, semester average, transfer status, student teaching assignment, and major advisor. Current information is available to music advisors on the 380 music education students.

The computer placement program for graduates of the School of Music has been enhanced and is now managed and updated by the placement office with secretarial help. The computer matches a job description with as many candidates as possible. The program was written to search for candidates with at least eighty percent of the required qualifications for a specific opening. The placement officer can reset the search parameters in a matter of seconds if no viable candidates are found by the computer.

Software evaluation:

The PLATO IV system embodies a highly sophisticated data-collection and evaluation system for use by teacher-authors, programmers, and system personnel, as well as student users. It is possible to check student progress at any time from any terminal attached to the system. Many program sequences allow the student to check on completion time, test scores, and other feedback recommending review, additional work or "suggested" studies. All such feedback is based upon student answers, response time and study profile.

With precise information readily at hand, evaluation of a program or lesson series is facilitated. The author-teacher can readily run item-analysis checks on a lesson to determine the effectiveness or weakness of each lesson section. Lessons are continually improved with use. Some teacher-authors ask for comments at the end of each section of a PLATO lesson. Comments pertaining to lesson content and suggested improvement are used to great advantage in the development of lesson materials.

Questionnaires assessing student reaction to computer-assisted instruction have indicated a preference for "PLATO-sections" of classes in many fields, including music. Evaluation by questionnaire has been conducted both by computer and in the classroom. The individualized nature of CAI in drill materials seems to be the most popular feature of PLATO in music. The immediate feedback, for instance, of the interval recognition lesson cannot be equalled in any other mode of instruction. A student has successfully identified five intervals in 5.33 seconds, each interval answer being judged correct before the next was presented.

The evaluation of the instrumental methods series is now in its fourth year. Test scores indicate a consistent improvement in a pre-test/post-test, one-sample evaluation of students enrolled in the senior level instrumental methods class at the University of Illinois. The lesson sequence, which now includes brass, wind and percussion instruments, will be enlarged to include string instrument pedagogy in 1977. A short paper on the development and evaluation of the instrumental methods programs is available from the University of Illinois.

Project objectives and participation:

The goals of the University of Illinois PLATO Music Project and cooperative planning with "Off-campus" participants are closely related. Music programs developed at the University of Illinois are currently being used in several projects in junior colleges and other universities. Twenty off-campus PLATO "sites" have used the music materials developed at the University of Illinois. High usage of these materials has been recorded at Arizona, Purdue University, Purdue University at Fort Wayne, Indiana University, Connecticut, Chicago City Colleges of Illinois, Iowa State University, Cornell College, University of Delaware, and the University of Iowa. In addition to these Illinois PLATO users, lessons have been transferred to the Florida State University PLATO system and the CDC Corporation PLATO system in Minneapolis, Minnesota.

A major development in cooperative planning of CAI material in music began with the founding of the National Consortium for Computer-Based Musical Instruction (NCCBMI). The attached fact sheet was drafted by the consortium members subsequent to an organizational meeting. This document provides the most succinct statement of the organization and the purpose.

The consortium plan includes the development of courseware on the PLATO IV system, with a secondary goal of making lessons developed on PLATO transferrable to other CAI systems. In this manner, universities with other types of computer facilities could request a PLATO lesson, written in the TUTOR language transcribed into a general-purpose language such as ALGOL or BASIC.

A first step in the consortium efforts is the sharing of programs developed between the University of Delaware and the University of Illinois. As the consortium goals are met, other member schools will be actively developing CAI materials in music while avoiding needless duplication of lesson materials.

The University of Illinois PLATO Music Project is now being centered on the development of music fundamentals programs in music theory and elementary education, instrumental methods programs, and audio-playback programs in music testing. Students at the graduate and undergraduate level continue to experiment with gaming strategy which may prove useful in a curriculum based upon a lesson "strand" approach.

FACT SHEET

National Consortium for Computer-Based Musical Instruction

The National Consortium for Computer-Based Music Instruction (NCCBMI) is a non-profit organization which was formed on August 20, 1975 as a member of the Association for the Development of Computer-Based Instructional Systems (ADCIS).

The purposes of this organization are as follows: first, to provide a forum for the exchange of ideas among developers and users of computer-based systems for musical instruction; second, to establish and maintain a library of music courseware; third, to reduce redundant effort among courseware and hardware developers; fourth, to provide consultation for new users of computer-based musical instruction. Highest priority was given to the creation of a national library of courseware for the teaching of music fundamentals. Each member of the consortium was charged with the development of a lesson component or a hardware component in support of the library. It was also decided to deliver the library of music courseware through a variety of computer systems so that all music schools can take advantage of the consortium efforts.

Founding members of the consortium are as follows:

Michael Arenson, Iowa State University
Ned Diehl, Penn State University
Lee Garrett, Lewis and Clark College
Burdett Green, Ohio State University
Fred Hofstetter, University of Delaware
Earl Hultberg, State University College at Potsdam, New York
David Peters, University of Illinois
Robert Placek, University of Georgia
Jack Taylor, Florida State University
Gary Wittlich, Indiana University

The next national meeting of the NCCBMI will be held in Wilmington, Delaware, on February 20-24, 1977. Indicative of the widespread interest in CAI in music is the large growth of this organization of now over 100 members.

For further details about services available through the consortium or for information about how to join the consortium contact:

Dr. Fred T. Hofstetter, President
National Consortium for Computer-Based Music Instruction
University of Delaware
Newark, Delaware 19711

Pauline

I believe when you were gone there was a discussion of whether one could test out of the new technology course. Some of the faculty thought there should be the opportunity..On rethought it seems to me that even if one has very advanced technology people in the course they should "fake" the course but be used as coaches or helpers. This way we do not have a loose "test out" policy soewhere.

would you consider this? It will probably come up or I will bring it up.

T

8/25

Pauline -

Hal Clark asked
that I send this
to you. He is
hoping for
your support in
his admission
to our graduate
program. If
you wish to
include any
comments on his
file, please send
them to me.

Thanks, Corrie

BIOGRAPHY

Harold Clark
837 Geary No. 407
San Francisco, CA
94109

Born: 12/January, 1949 in Grand Island, Nebraska. Moved to California in 1956. Studied clarinet from age 9, contrabass from age 15. Performed in the American Youth Symphony under Mehli Mehta and studied and performed in Cerritos College Neophonic Orchestra under Stan Kenton 1965-68. Graduated from high school with the John Philip Sousa Award for Music Achievement and Bank of America Award in Music. Worked as apprentice in electronics workshop. 1967- won scholarship to attend the University of Southern California in music performance, however, because of fathers' death, financial reasons, entered California State University/Long Beach. Discontinued clarinet and concentrated on contrabass and composition studies. Attended Rio Hondo College during summer sessions of 1968-69. While at Cal. State Univ. was instrumental in building the electronic music laboratory and beginning experiments. Also became the founder of Music Students Union, a political organization to affect department policies. During 1967-70, performed with Stan Kenton, Don Ellis, La Mirada Symphony Orchestra and formed jazz ensemble Hal Clark Trio, an avant garde mixture of Afro-Cuban and West European new music tendencies. Studied composition, privately, with composer Edward Applebaum. Organized and assisted Norwegian composer Arne Nordheim in his first American concert performances. Left the State University after various disagreements, the general feelings of the late 60's in Universities in USA. Studied with Bertram Turetzky. Continued studies in Acoustics.

1971- Left to study the music and culture of Scandinavia. Attended Oslo Music Conservatory. Received work-study grant from the Henie-Onstad Foundations where I began a tape-sound composition group. Studied recording with the German tonmeister Meny Bloch. Began working as recording artist with Norwegian Philips/Polydor Group. Made several recordings of classical music. Composed and performed bass in isolation. 1972- Received permanent position at the Henie-Onstad Artcentre, organized concerts of contemporary music, video, dance and theater. Came in contact with visual artists to form a multi-media collective work group. Worked as free-lance recording artist. Began working with Arne Nordheim (composer). Taught classes for musicians in tape-sound composition for the Baerum Evening Classes (continued for 4 years). Received a commission to design and build a National studio for electronic music and to research other studios in Europe. 1973- Began studying music theory and the concepts of sonology (Utrecht and Paris) together with Olav Thommessen and a group of local composers. Discussed electro-acoustic music with this group to arrive at a design for the new studio based on the resources available and the needs of the community. Traveled to Cologne, Utrecht, London, Stockholm and corresponded with Paris, Hamburg and Warsaw. Received commission from the Norwegian Radio to compose for local ensemble. Consulted with D. Buchla on design for hybrid studio. 1974- Presented paper to the 50th congress of the Audio Engineering Society/Europe in London on the Norwegian Electronic Music Studio. Began a series of courses in electro-acoustics for musicians. Returned to the USA to study with Buchla the operations of the computerized analog system and to broadcast a radio program on Scandinavian music and cultural trends since 1940. Attended the Young Nordic Music Festival in Pitea, Sweden where I was performed. Received a commission from the Cramer Ballet, Stockholm. Was made director of the Norwegian Studio for Electronic Music.

Biography (con't)

1975- Studio opens. Teach classes for: The Norwegian Radio, The Music College of Oslo, The Norwegian Composers Association, The University of Oslo Institute for Music Research. Administrative work for studio, technical work in studio. Research continues in Sonological Group. Publish Operating Directive (University publisher). Become member of the TONO norwegian composers guild. (Performing rights society.) Various concerts. Recieve travel grant to Salzburg. 1976- Attend Salzburg Seminar in American Music since 1920. Study sessions. Give lectures on Electronic Instrumentation. Performances. Formed group MUSKAP to study and perform improvized music. Continue teaching courses and classes. Radio program for Norwegian Radio on Electronic Music in the USA, (history and development in contrast with Europe). Performances (include bass work with dancers.) Study course in London-computer programming courses. Record for gramophone with MUSKAP. Research leads me to question electronic instrumentation in music composition, need for tactile inputs; interest in ethnic music. Need for further study outside of Norway presses me to resign post as director of studio. Enroll in M.Phil/D.Phil. program at York University to study with B. Rands and N. Sorrell. Radio program for Norwegian Broadcasting on Music from California (developments in contemporary music- Daniel Lentz' music). Radio program for KPFA Berkeley; The Artist's Action in Norway, Music of Hal Clark, the Norwegian Electronic Music Studio. Documentary film done about me and NSEM by the Norwegian Television. Performances in Austria, Turkey and Denmark.

1977- Moved to York, England to study. Discover Rands is missing! Continue with the design of a new musical instrument (where the score is the actual instrument). Begin to write material on changing attitudes of our uses of compositional materials. Very influenced by Reynolds' Mind Models, concept of World Music to prompt writing own book on Music Ecology. Compositions take on a more vital social element. Attend seminar on the History of Western Musical Evolution by the German musicologist H. Schrieffer at Emerson College in Sussex. Give seminars on NSEM for classes at York. Performances in England, Norway and India. Radio program for Norwegian radio. Articles for Musics (UK), Contact (UK), Ballade (N). Study the works and thoughts of Rudolf Steiner and especially his Art in the Light of Mystery Wisdom. Momentum for the book gained, decide to persue my independent studies where I have access to more resources. Contact with University of California at San Diego. Work in Henie-Onstad Centre for preparation of Kagel concert (commissioned by the centre) for 1978. Return after 6 years in Europe to California.

The above statements are to the best of my ability, true.
Further information may be obtained by writing to me.

Harold Clark
19/August, 1977
San Francisco, CA.

Sept 6, 1977

To: Leonard Newmark, Chairman

From: Pauline Oliveros, Chairman Electronics Committee

Subject: ^{Office Space,} Recording Policy, ^{Archives Access,} Recording Class 104,
Repair Priorities, and Acoustic space.

Members Present: Balzano, Erickson, Jones, Francis

Gross, Rittenbach;

Guest: Lytle

I Office Space

The committee recommends as first priority that an office space, properly equipped with tape recorder, amplifier and speakers (equivalent to a performance faculty member's need for a piano) be provided for part time lecturers Gross, Liebig and Rittenbach.

It is absolutely essential that this be provided by the beginning of the fall quarter. Critical listening for the preparation and evaluation of student projects is necessary. It will not be possible to do this in 206 or B104 because these spaces are dedicated. This office is a normal requirement, and ~~will take care of the~~ ~~104 and 20~~ 104 ~~and~~ 105A and 200 will be taught in the fall quarter.

The office sound system would cost \$1500.

II Recording Policy:

A. Concert Recording

Erickson Motion: "I move ~~we~~ that we base our recording policy on a plan of concerts to be determined as Class 1 concerts, Class 2 concerts and Class 3 concerts: "Class 1 Concerts will be recorded and archived by the staff. "Class 2 Concerts will be recorded but not archived.

Tape to be provided by the person requesting the recording. "Class 3 Concerts will not be recorded by the Dept. Staff, but may be recorded by students with ~~student~~ Dept. student equipment.

Discussion - We are interested in preserving for the archive, concerts of greatest quality and interest. We insist that these recordings should be of highest quality. Since recordist time is paid for by the Dept. careful discrimination of Class 1 Concerts will be needed. This is also true of Class 2 concerts which will be of high quality but probably of more limited interest.

We hold that an important aspect of student education is learning to make high quality recordings with limited equipment.

Class 3 concerts will provide opportunity for practice without exploiting student labor.
Motion Carried unanimously

(who ranks 1-2-3?)

B. Ericksen Motion: B. Seminar Recordings

"I move that we record and archive all Departmental Seminars and formal lectures by visitors."

Discussion - Much of this material may seem inconsequential, however 5 years later it's history. We have lost many interesting lectures which could be of value for instruction and research.

Motion passed unanimously

C. (Ritcher Motion): Tape Copies

1) For every concert which is recorded, one personal copy will be made if the performer(s) provide the necessary tape one week in advance.

The appropriate request form will be available in the Music Office.

2) Additional Copies:

Faculty members will be allowed a maximum of 2 copies of their performances recorded by the dept. (Tape to be supplied by Faculty members) Additional copies will be charged at regular student rate.

3) Students wanting additional copies of Dept performances in which they participated must provide tape, and pay a fee based on operators' time.

Motion passed unanimously

D. Special Recording Sessions

Erickson motion: "All other requests for special recording should be referred to the Chairperson of the Electronic Committee with a letter of explanation from the student's advisor. Faculty members should submit requests for special recordings to the electronic committee."

Motion passed unanimously

Request Form

2. For all concerts to be recorded, whether upon performer's request, or automatically, the recording staff needs a form filled out with the works to be performed and the timings. This should be done at least one week before the performance (longer is better). Recording forms are available in the Concert Office.

From whom?
When?

If the recordist is informed of the time and place of the dress rehearsal, one week in advance by the person in charge of the concert, the recordist will attend.

Motion passed unanimously

III Archive Accessibility

In order to make the archives useful and accessible for research and instruction this year, the committee recommends:

one $\frac{1}{4}$ time work study assistant (Terry Setter) 10 hrs per week
Dubs for instruction and research. Tape costs \$500

Discussion: Archive tape may not be handled directly by anyone other than the staff. ~~Therefore~~ all this is in the interest of preservation of invaluable materials. Therefore all access to the archives must be through dubs made by the staff.

Future

If the archive proves to be as useful to the Dept as we think, then we must consider computer retrieval and cross referencing of the Archive materials. This would involve classification + programming with the assistance of a professional archivist and a programmer. We anticipate this would cost several thousand dollars.

IV Recording Class 104

Rittenbach reported that he will teach undergraduates how to record with the equipment provided in classrooms. Professional equipment located in 206 will be utilized for demonstration purposes and one shot project. ~~the~~ the students will be directed to recording projects in conjunction with various Music Dept performance classes.

Repair Priorities
V. the committee concurs that repair priorities can not be established in advance. All electronic maintenance problems should be addressed to the Dept. Technician. Any grievances arising will be reviewed by the committee.

Acoustic Space

VI The committee wishes to note that all persons wishing to do quality work with recording and electronics are suffering the handicap imposed by the poor quality of the spaces we inhabit in the Mandeville center. Concrete boxes are impossible to say the least. We ask that attempts be made to adjust these spaces with sound proofing and acoustical materials as needed. Also we think it is imperative that we regain entry to such spaces as 409 and some of the quonsets on Matthews campus where it is possible to do much better work. The committee will address this problem more extensively in the future.

(Please send copies to

Cecil Lytle

George Ritscher

P. Oliveira

Michael R. Hyman
5004½ Field St.
San Diego, Ca 92110

26 Aug 1977

Dear Miss Oliveros,

I was advised to write you a letter about myself by Mr. Farrell with whom I had an interview with last week.

I am a full time music major, (transfer), and will start attending this fall. Due to the time element involved I must be under concurrent enrollment this fall. I have two required courses in music for my B.A. degree to complete. They are 102 ABC and 105 ABC. Since you are the professor for 105, Mr. Farrell said I should let you know my situation. I attended S.U.N.Y. at Fredonia, N.Y. and earned 94 semester hours. I have 3 semester hours from UNIV. of Hartford, Conn., which gives me a total of 145.5 quarter hours. If you could make room in your class for me, I would greatly appreciate it. Since Music 105 is a required course for me, If I miss the fall semester in it I must wait a year to take it again. If the class is crowded I would even appreciate just sitting in for the information so I could take a placement, (or makeup), exam to allow me to attend the winter and spring classes. Mr. Farrell told me that there should not be an over load in the class but just incase, I thought I'd mention it.

Right at the moment I am working as an electronic test and calibration technician at Gamma Scientific Inc. I have had extensive training in the field, including Recording technician at S.U.N.Y. Fredonia, N.Y., 4Yrs electronics in Submarine force USN, and my present job. I hold a second class radiotelephone FCC license. Since you are incharge of the electronic music area of the school I would like to inform you of my capabilities. If I could help work on the equipment in the Lab I would consider it an honor. I would also like to attend your classes in the field. I am including an old resume of mine to show you my background. Please do not think of this as a job application. I just want to show you what I

am capable of doing and handling.

Thankyou so much for your consideration in reading my letter. I am looking forward to meeting you in September.

Respectfully.

Michael R. Hyman

MICHAEL R. HYMAN
5004½ Field Street
San Diego, Ca. 92110
(714) 276-6306

.....
OBJECTIVE

Full time position in the electronics communications field

EDUCATION

(Formal) 1977 Microprocessor operation and repair. In house course given at Gamma Scientific Inc for repair and calibration of CR-1 Computing Radiometer.
1975 University of Hartford, Conn., Course in Modern Mathematics.
1969-1972 State University of New York at Fredonia. Courses included Calculus, Biology, Computer programming
(MILITARY) 1975 Submarine Antenna Maintenance and Repair (including BRA SC)
Electronics Technology 1 and 2 (Graduated first in class)
Sonar Plotting
International Morse Code School (26 W.P.M.)
1974 Digital Computers
Electronic Communications 1 and 2
Advanced Calculus
1973 Radioman 'A' School

EXPERIENCE

(MILITARY) Radioman 3rd Class, U.S.N. Submarine Force
1975-1976 Radio supervisor on U.S. Nuclear Ballistic Missile Submarine. Duties included operation and maintenance of all radio communication equipment, (including Cryptographic). A complete knowledge of the military supply system was also required.
1973-1974 Submarine Broadcast operator at NAVCOMMSTA GUAM, Marianas Is. Also Fleet locator, NAVCOMPARS operator, and Merchant ship Broadcast operator.

NON-MILITARY

1976-present Repair, Test and Calibration Technician at Gamma Scientific. Position makes extensive use of Operational Amplifiers, Digital Techniques and Microprocessors. (For use in instruments to measure light)
1971-1972 Electronic Technician, State University of New York at Fredonia

PERSONAL

Born.....2/17/52 Marital Status.....Single
Height....5'7" Security Clearance..TS
Weight....180lbs Finances.....Good
Health....Excellent Willing To Relocate

LICENSES

F.C.C. Radiotelephone 2nd P2-11SD-5770
Amateur radio (general class) WA6JXF
Submarine, (Nuclear) Qualification Certificate

A G E N D A

Electronics Committee Meeting

Tuesday, September 6, 1:00 pm

- 1) Department Recording Policy - 25% time
 - a) What concerts to be recorded?
 - b) Dubs - charge students?
- 2) Set priorities as to what gets fixed first

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

Given below is a program containing bugs. Locate the bugs, and mark the program in some way that corrects the bugs you have located. Write out the line(s) that this program should print (it is intended to print at least one line). (Syntax diagrams for UNIT 1 are posted in the Quiz room for your reference.)

```
PROGRAM QUIZ1 ;
VAR (AP&IS), SIXTYONE, S, T: TEXT;
```

BEGIN

```
APIS (AP&IS) := 'AP&IS';
SIXTYONE := '61';
S := ' ';
T := CONCAT(AP&IS, S, SIXTYONE);
WRITELN(T);
```

END.

AP&IS 61

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

Given below is a program containing bugs. Locate the bugs, and mark the program in some way that corrects the bugs you have located. Write out the line(s) that this program should print (it is intended to print at least one line). (Syntax diagrams for UNIT 1 are posted in the Quiz room for your reference.)

PROGRAM QUIZ1;

VAR AP, S1, T; TEXT;

START

AP

APIS := 'AP&IS';

S1 := 'SIXTY ONE';

T := CONCAT(AP; S1);

WRITE(T);

WRITELN(T);

END.

AP&ISSIXTY ONEAP&IS SIXTY ONE

Ⓢ

Ⓢ

Begin

Ⓢ

Ⓢ

CONCAT

UNIT 2

SIMPLE TEXT COMPUTATIONS
-----1. Goals

- 1a. Refer to specific characters within a TEXT <variable>
- 1b. Use INTEGER and CHAR (character) variables
- 1c. Use Built-In ("Intrinsic") functions for manipulating TEXT variables
- 1d. Use <comment>s to make a program more readable.
- 1e. Study programs POINT, INTRINSIC, and CHOP. If you don't understand fine points, run any of these programs on the computer and experiment with results.
- 1f. Write, and debug on the computer, a program to convert one slogan to another (See Homework section).

2. Overview of this Unit

In this Unit we continue the process of showing by example how one can write simple programs to handle TEXT. By introducing several additional features of PASCAL, we make the range of programs you can write more interesting. As in Unit 1, the features introduced are described by simplified syntax diagrams that avoid confusing you, quite yet, with the full programming power that PASCAL allows.

3. Sample Program POINT

```

1: PROGRAM POINT; (*POINTING TO SPECIFIC CHARACTERS IN TEXT*)
2: VAR T: TEXT;
3:     NS: INTEGER;
4:     C: CHAR;
5: BEGIN
6:   T:='EVEN IF HE SAW ME';
7:   WRITELN(T);
8:   C:=T[7]; (*SEVENTH CHARACTER*)
9:   WRITELN(C); (*      'P'*)
10:  NS:=12;
11:  WRITELN(T[NS],T[12]); (*THEY'D BETTER BE THE SAME*)
12:  C:='X';
13:  T[4]:=C; (*ASSIGN NEW VALUE TO THE 4TH CHAR*)
14:  WRITELN(T)
15: END.

```

This program should print the following lines:

```

EVEN IF HE SAW ME
F
SS
EVEX IF HE SAW ME

```

3a. Analysis of POINT

Lines 2,3,4:

Line 3 introduces the declaration of a <variable> of TYPE INTEGER, Line 4 a <variable> of TYPE CHAR (character). See the syntax diagrams in Figures 1.2,1.3 of Unit 1 for syntax rules. Notice that the separate declarations are separated by semicolon ';' and that the last declaration terminates with a semicolon.

A <variable> of TYPE=INTEGER may hold a value belonging to the set 0,1,2,... On the B6700 the largest integer may be 11 digits long. On the PDP11, the largest integer may be 32767 at most. An integer may be either POSITIVE or NEGATIVE. Here are some examples of legal integers:

```

0
12345
-15
+747

```

Here are examples of numbers that are not legal integers:

```

0.1
-.5
2.
1/2

```


A <variable> of TYPE=CHAR may hold a value consisting of one printable character. Any character that the computer's printer can handle is legal. On the B6700, if a CHAR <variable> holds a non-printable character, an attempt to WRITE out that character will produce a question-mark '?' in the print-out. On the PDP11, some characters are automatically converted for you (for example 'c' becomes 'C'). You will see, in a later Unit, that the PASCAL program can handle values that cannot be printed within a <variable> of TYPE=CHAR without getting into trouble.

Lines 6,7:

These statements are similar to those discussed in Unit 1.

Line 8:

This statement assigns to the <variable> C a value equal to the seventh character of the TEXT <variable> T. In this example that value is the character 'F' because of the <string> value assigned to T in line 6. The individual characters of a TEXT <variable> may be extracted individually and assigned to a <variable> of TYPE=CHAR. (see Line 13 for the reverse of this process.)

Line 9:

As shown by the print-out from this program, this line simply displays the value currently stored in the <variable> C. The PASCAL compiler knows that C is a <variable> of TYPE=CHAR, and consequently causes just one character to be displayed.

Line 10:

This statement assigns the INTEGER value 12 to the <variable> NS. If you had tried to assign a value of TYPE=CHAR to NS, the compiler would have printed a syntax error message because the TYPE on the right didn't agree with the TYPE of the <variable> on the left.

Line 11:

Two character values are extracted from the TEXT <variable> T for printing. The value currently in T was assigned in line 6. The first character extracted is the one selected by the value of the INTEGER <variable> NS. The characters in T are numbered from 1 up to a maximum of 80. In line 6, only 17 characters were assigned to T. Therefore the value of NS in line 11 cannot be smaller than 1, nor larger than 17. Otherwise your program should fail with an EXECUTION ERROR message saying something like

```
INVALID INDEX
```

This message can occur when your program tries to refer to positions in a TEXT <variable> where no characters have yet been assigned.

When Line 11 is "executed", the value of T is still the same as it was after Line 6, while the value of NS is still 12. Therefore Line 11 selects the 12th character of T twice, yielding the line 'SS' in the printout.

Lines 12,13,14:

In line 12, the <variable> C is assigned the character 'X' as its value. In Line 13, that value is then assigned also to the 4th position in T (thus wiping out the old value there which was 'M'). Line 14 simply prints out the new contents of T. Notice that the 4th character now differs from the value it had at the time Line 7 was executed.

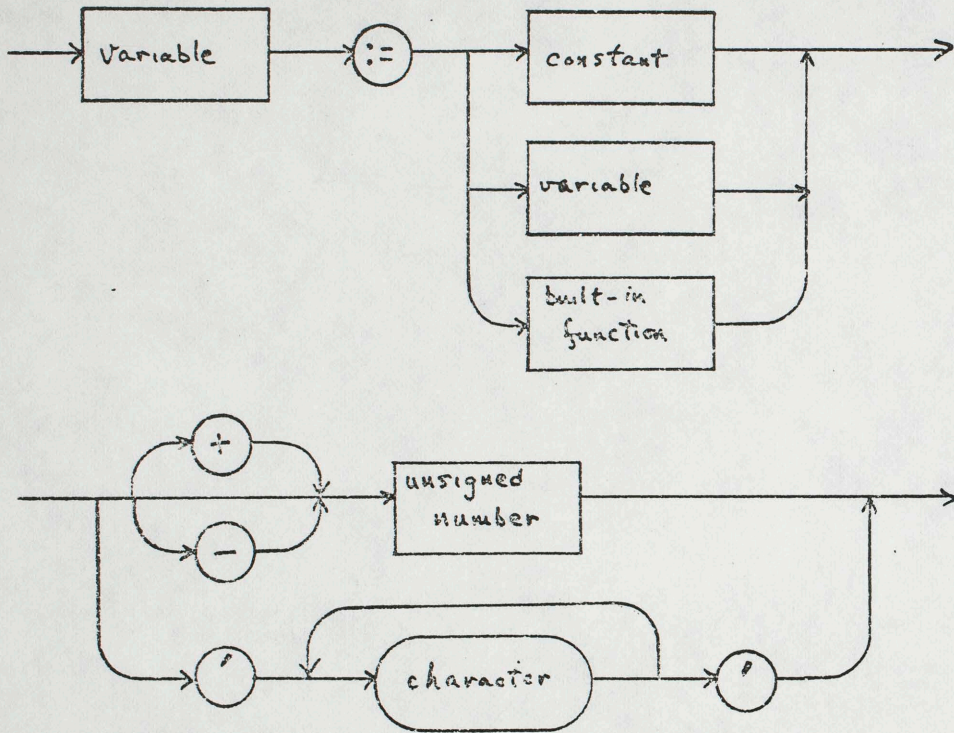
3b. More about Syntax

Figures 2.1 & 2.2 show revised, but still simplified, syntax to cover the program POINT. Refer back to <block> in Figure 1.2 regarding the new VAR declarations.

As we add discussion of features of the PASCAL language, some of the shortcomings of syntax diagrams will become apparent. Syntax Diagrams are intended to be quick-reference statements of the rules whereby a program may be written. The diagrams become unwieldy if they are too explicit. For example to show in the diagrams that an integer value cannot be assigned to a TEXT <variable>, we would have to have a separate diagram for each new TYPE of <variable> allowable in the language (and there are several that you have yet to see). Thus we end up with a diagram such as the one for <assignment-statement> in Figure 2.1, giving no information on the TYPE associated with any of the items shown. As you may notice by comparing our syntax diagrams with those in the back of the Jensen & Wirth book, we are using explicit syntax references as we introduce new items. As your familiarity with the language grows, we shall shorten our diagrams so as to keep them useful for reference purposes.

Figures 2.3 & 2.4 show syntax for several <functions> and <procedures> that will be used in the next Subsection. They can be ignored for understanding the POINT program example.

<assignment-statement>



<constant>

Figure 2.1 Simplified Syntax for <assignment-statement> and <constant>

<variable>

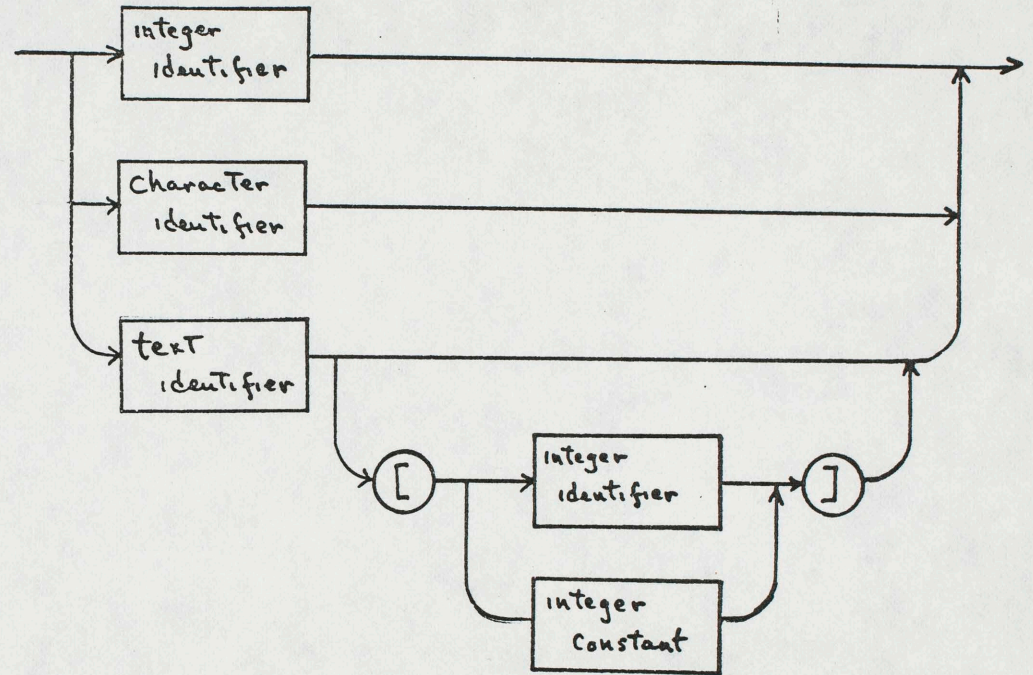


Figure 2.2 Simplified Syntax for <variable>

<built-in procedure>

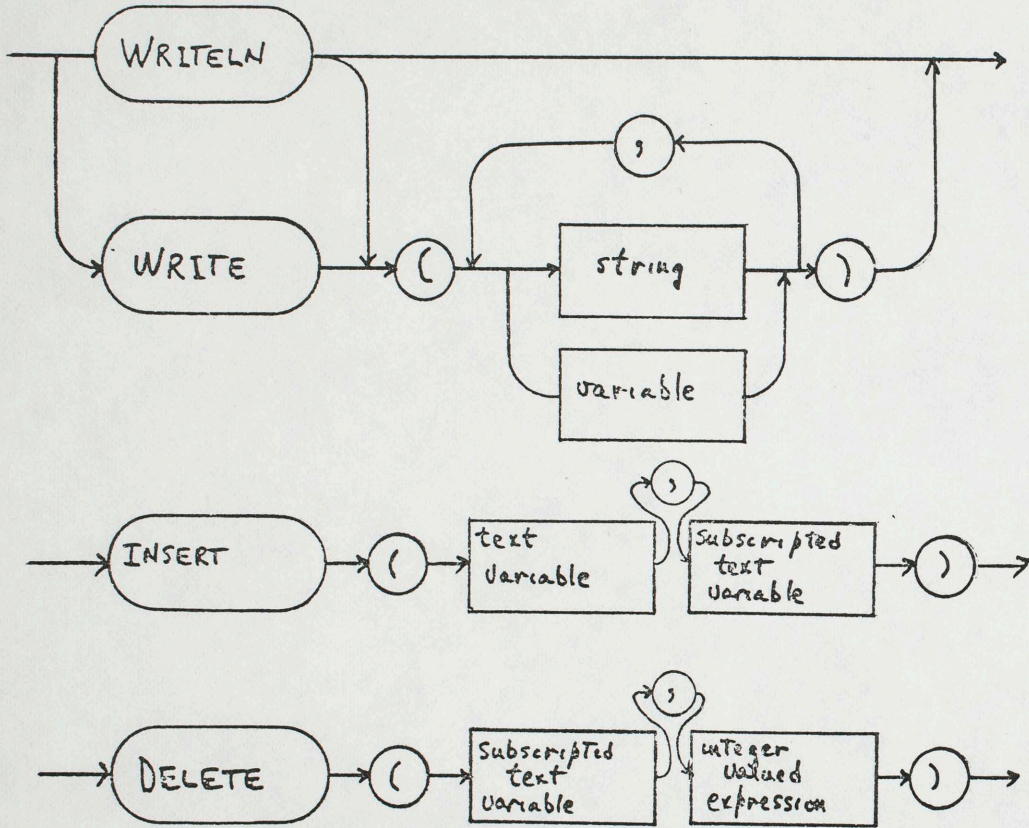


Figure 2.3 Syntax for Built-in Procedure

<built-in function>

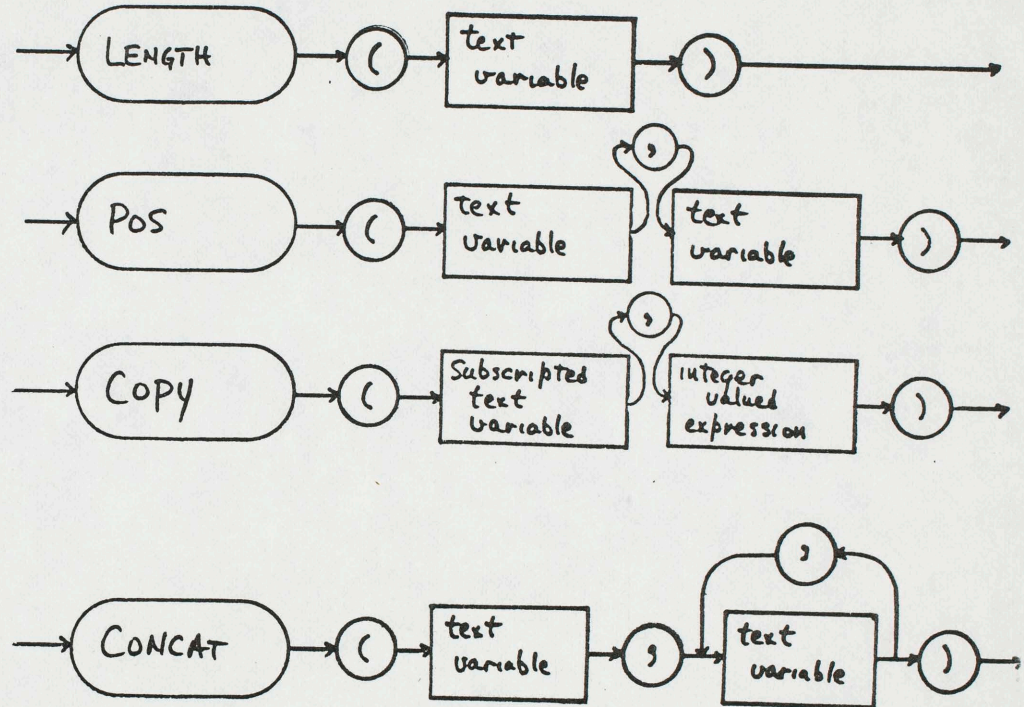


Figure 2.4 Syntax for Built-in Function

4. Sample program INTRINSIC

```

1: PROGRAM INTRINSIC; (*ILLUSTRATION OF BUILT-IN TEXT FUNCTIONS
2:   AND PROCEDURES*)
3: VAR T,TP,TD,TS: TEXT;
4:   I,N: INTEGER;
5: BEGIN
6:   T:='EVEN IF HE SAW ME';
7:   N:=LENGTH(T); (* SET N TO NUMBER OF CHARS IN T*)
8:   WRITELN('LINE 7:',N), (*PRINT OUT VALUE OF N WITH A LABEL*)
9:   TP:='SAW'; (*SET UP A PATTERN*)
10:  N:=POS(TP,T); (*FINDS TP IN T, SETS N TO POSITION NUMBER*)
11:  WRITELN('LINE 10:',N);
12:  INSERT(TP,T[N]); (*INSERTS VALUE OF TP STARTING JUST BEFORE
13:    THE N-TH POSITION OF T*)
14:  WRITELN('LINE 12:',T); (*PRINTS THE NEW VALUE OF T*)
15:  DELETE(T[N-6],3); (*DELETE 3 CHARACTERS STARTING AT T[N-6]*)
16:  WRITELN('LINE 15:',T);
17:  TD:=COPY(T[5],5); (*PUT COPY OF 5 CHARS FROM T INTO TD -
18:    T IS NOT CHANGED*)
19:  WRITELN('LINE 17:',TD);
20:  TS:=' I WILL DENY IT';
21:  TD:=CONCAT(T,TS); (*MAKE A NEW STRING IN TD BY CONNECTING TS
22:    AT THE TAIL OF T*)
23:  WRITELN('LINE 21:',TD)
24: END.

```

This program should print the following lines:

```

LINE 7:      17
LINE 10:     12
LINE 12: EVEN IF HE SAWSAW ME
LINE 15: EVEN HE SAWSAW ME
LINE 17: HE S
LINE 21: EVEN HE SAWSAW ME, I WILL DENY IT

```

4. Analysis of program INTRINSIC

This program is presented to illustrate the use of 3 new functions, and two new procedures that have been built-in in our PASCAL system to make it easier to handle TEXT variables. These functions and procedures are not mentioned in the book by Jensen & Wirth. Because of their names, the actions carried out by these functions and procedures should be apparent to you just from studying the program and the printout.

Functions and Procedures are sub-programs, i.e. they are sections of program that can be "called" into action from other places in your program. Unit 3 goes into the process whereby you can write simple procedures, while the construction of functions is deferred until later in the course. Built-in functions and procedures are sub-programs that

have been provided for you as part of the facilities of the PASCAL compiler. Jensen & Wirth refer to built-in subprograms as "standard". We will sometimes call them "standard" and sometimes "intrinsic", reflecting common variations in the jargon.

Figure 2.3 shows syntax rules for the built-in procedures that have been introduced so far. Figure 2.4 does the same for built-in functions. The basic difference between the two is that you put a <function> on the right side of an <assignment statement>, while a procedure stands by itself. Following the name of the <procedure> or <function> there is generally a list of items known as PARAMETERS. Some <function>s and <procedure>s require a specific list of parameters. Others, such as the built-in WRITE procedure, accept a variety of parameters in a list of variable length. The syntax diagrams provide us with the clearest way to express those differences. Notice that the list of <parameter>s is enclosed in parentheses. (Later we will see cases of procedures which use no parameters, thus needing no parentheses either.)

The syntax for the built-in procedures and functions calls for something called an <arithmetic-expression> in several places. Figure 2.5 provides simplified syntax for this. We'll defer detailed consideration of the many possible ways in which one can construct an <arithmetic-expression> until Unit 5. Meanwhile, it is sufficient that you know that an <arithmetic-expression> can consist of any one of the following:

- a) Integer valued <constant>, or simply <integer-constant>
- b) Integer valued <variable> or simply <integer-variable>
- c) Integer valued <built-in function>
- d) The sum ('+') or difference ('-') of two items, either of which may be an <integer-constant>, an <integer-variable>, or a <built-in function> whose value is an integer. (LENGTH and POS for now - others later)

In this Unit, <arithmetic expression>s occur in Line 15 of the program INTRINSIC, and in Line 11 of the program CHANGE (Section 6).

Line 7: LENGTH <function>

The LENGTH <function> "returns" as its value the number of characters in the single parameter, which is a TEXT variable. If there are no characters assigned to the TEXT variable, LENGTH returns the value 0 (zero). In Line 7, the INTEGER N is set to the integer value 17, since that is how many characters were assigned to T in Line 6.

Note that each of the WRITELN statements in this program has been identified in the printout with a Line number showing the place where it refers in the program. These line numbers, or any other identifying message, can be very helpful when you are debugging larger programs, for they verify where in

the program a line of printout originated.

Line 10: POS <function>

The POS <function> is used to locate the position of some "pattern" string of text in a second TEXT <variable>. POS requires two parameters, both of which are TEXT <variable>s. The first is the pattern, the second the string which is the subject of the search. Line 10 says:

```
"find out if the pattern string in TP can be located
anywhere in T. If it can, then set N to the position number
of the first character in T where the pattern is found.
If not, then set N to 0 (zero)."
```

Note that if the pattern appears more than once in T, then the value returned by POS will be the first position found.

As an exercise, see if you can think of a way to get POS to return the location of the second of two occurrences of the same pattern in T.

Line 12: INSERT <procedure>

INSERT is used to add new strings to a TEXT variable - generally one whose content is not "empty" (i.e. with length=0). In Line 8, the TEXT <variable> TP was set to the value 'SAW'. In line 12, INSERT adds the value 'SAW' to the previous value of T, starting at position number N. Since N had the value 12 before line 12 was entered, this means that the value 'SAW' occurs twice starting at position number 12. INSERT has to open up a "gap" in T in order to make the insertion. You could also INSERT a string from one TEXT <variable> starting at the end of another TEXT <variable>. CONCAT is provided for those cases in which several strings are to be pieced together in this way.

Line 15: DELETE <procedure>

DELETE is almost the reverse of INSERT. DELETE is used to take a string out of an existing TEXT variable. The first <parameter> of DELETE names the TEXT <variable> and location where the removal of characters is to begin. The second <parameter> tells how many characters to remove.

Notice that the position number, as used in DELETE in Line 15, can be more complicated than a simple INTEGER <variable> or <constant>. In the illustration, the deletion of text starts 6 positions earlier (to the left) than T[N]. Had we wished deletion to start 2 character positions to the right of T[N], the parameter could have read "T[N+2]".

Line 17: COPY <function>

COPY is provided to allow you to extract a partial string from a TEXT variable, assigning the value of the extracted string to the TEXT <variable> on the left of the assignment operator ':='. COPY has two parameters. The first tells where the copying operation is to start. The second tells how many characters are to be copied. The value of the first TEXT <parameter> is not disturbed by this operation, unless of course the <variable> on the left of ':=' is the same TEXT <variable>.

Line 21: CONCAT <function>

CONCAT is used to "concatenate", i.e. piece together, two or more string values from TEXT <variable>s, assigning the result to the TEXT <variable> on the left of the assignment operator ':='. The new value can be assigned to any TEXT <variable>, whether included in the parameter list of CONCAT or not. Any value that was in the <variable> from an earlier statement is replaced. Unlike WRITE, and WRITELN, CONCAT cannot currently handle quoted <string>s as parameters. CONCAT is primarily intended for building TEXT values within the computer's memory, and not for generating arbitrary printout lines, as are WRITE and WRITELN.

The next two sample programs give examples of how these Intrinsics are used to accomplish computations with a visible purpose. Peel free to experiment with these programs to produce other results that you may find interesting.

5. Sample Program CHOP

```
-----
1: PROGRAM CHOP;
2: VAR T,
3:     TP: TEXT;
4:     N: INTEGER;
5: BEGIN
6:   T:='EVEN IF HE SAW ME, I WILL DENY IT';
7:   WRITELN(T);
8:   TP:=' '; (*SINGLE SPACE*)
9:   N:=POS(TP,T);
10:  DELETE(T[1],N);
11:  WRITELN(T);
12:  N:=POS(TP,T);
13:  DELETE(T[1],N);
14:  WRITELN(T)
15: END.
```

This program should write out the following three lines:

```
EVEN IF HE SAW ME, I WILL DENY IT
IF HE SAW ME, I WILL DENY IT
HE SAW ME, I WILL DENY IT
```


Notice that lines 9, 10 and 11 form a group that is repeated again in lines 12, 13 and 14. Additional groups could be added to continue chopping away at this phrase. Obviously it would get pretty tedious writing out all of the statements needed to eliminate all of the words of even this short phrase. Starting in Unit 3 we will be seeing ways of reducing the amount of writing for programs that involve repetition of various kinds.

Lines 2 and 3 illustrate the continuation of a VAR declaration over two lines. Any number of lines could be used, as a "run" of blanks has the same syntactic significance in PASCAL as a single blank. In principle, you could squash all of your program statements into very few lines. In practice this would make it hard for you to understand the program for debugging purposes, and it would make extra work when you decide to change one statement or insert a new statement.

6. Sample Program CHANGE

```

1: PROGRAM CHANGE; (*CHANGING SELECTED WORDS*)
2: VAR T, TNEW, T1, T2: TEXT;
3:     N1, N2: INTEGER;
4: BEGIN
5:   T:='TOO WISE YOU ARE';
6:   TNEW:='OLD';
7:   T1:='WISE';
8:   T2:='YOU';
9:   N1:=POS(T1,T);
10:  N2:=POS(T2,T);
11:  DELETE(T[N1],N2-N1); (*TAKE OUT 'WISE'*)
12:  WRITELN(T);
13:  INSERT(TNEW,I[N1]);
14:  WRITELN(T)
15: END.

```

This program should print out the following:

```

TOO YOU ARE
TOO OLDYOU ARE

```

Why is there no blank space following 'OLD' ?? As an exercise, consider how you would go about changing EVERY occurrence of the word 'WISE' with the word 'OLD' in the little poem used in Unit 1. With this substitution you would end up with:

```

TOO OLD YOU ARE
TOO OLD YOU BE
I SEE YOU ARE
TOO OLD FOR ME

```

7. Homework

Write, and debug on the computer, a program to convert one slogan to another, for example:

YOU DESERVE A BREAK TODAY

could be changed to:

YOU MERIT A RAISE THIS MONTH

At minimum, the program should use POS to find a word, such as 'DESERVE', DELETE to remove it from the original TEXT, and INSERT to complete the replacement of the old word with a new one, such as 'MERIT'.

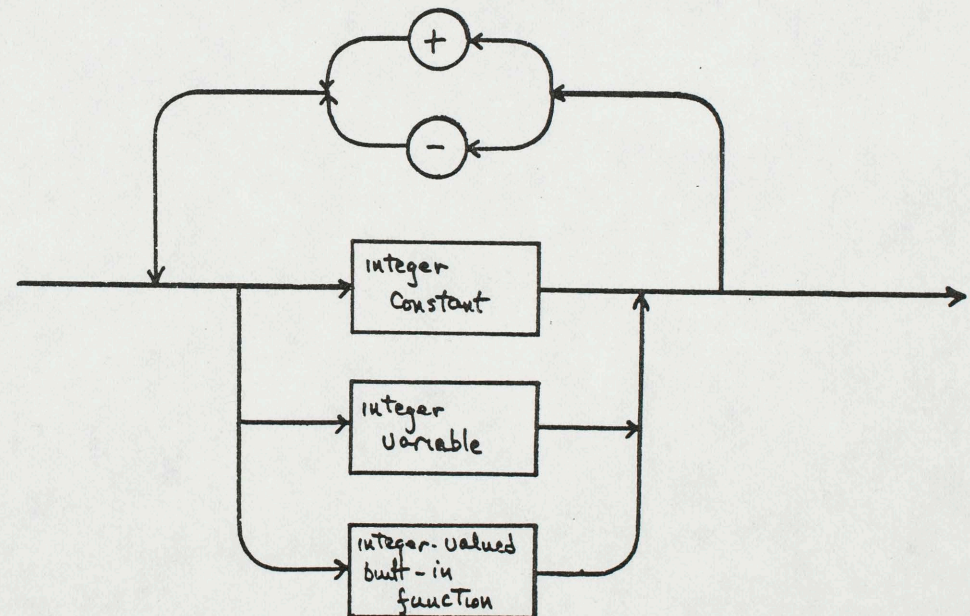
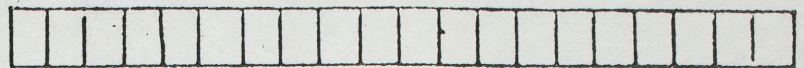
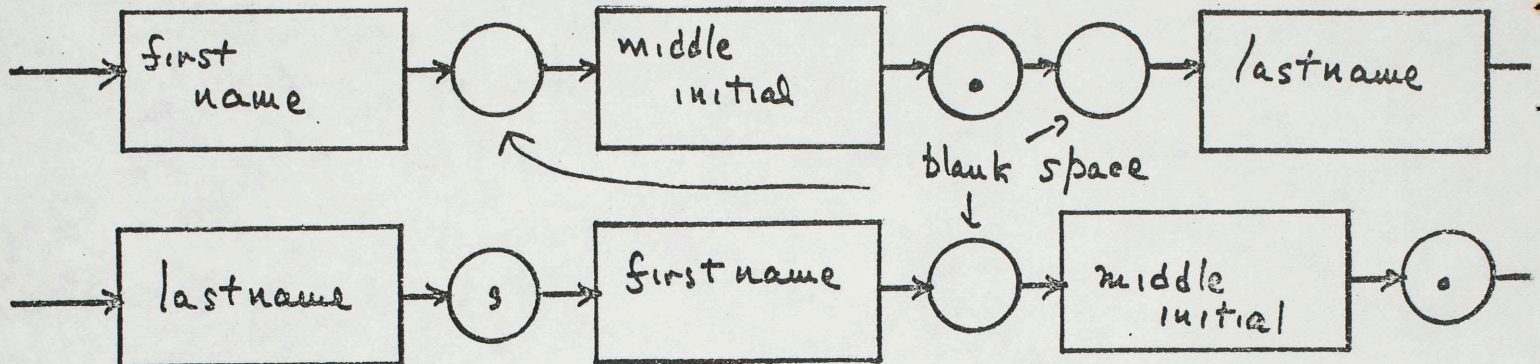


Figure 2-5 Simplified Syntax for <arithmetic-expression>



LAST NAME, FIRST

Shown below are syntax diagrams for describing the construction of typical American names of people, the first in normal order, the second in lastname first order generally required on application forms. Also shown is the first part of a PASCAL program intended to convert any such name, assigned to SOURCE, into the lastname-first order for assignment to DEST. Complete the program, including a statement to print out the resulting last-first form of the name.



```
PROGRAM LASTFIRST;
```

```
VAR SOURCE, DEST, PATTERN: TEXT;
    COMMA: TEXT;
    NL: INTEGER;
```

```
BEGIN
```

```
SOURCE:='JOHN Q. PUBLIC'; (*any name agreeing with the syntax*)
```

```
PATTERN:='.';
```

```
NL:=POS(PATTERN, SOURCE);
```

```
DEST:=SOURCE;
```

```
DELETE(DEST[1], NL+1); (*leaves only lastname*)
```

```
SOURCE := COPY(SOURCE[1], NL); (*deletes last name*)
```

```
COMMA:=' , ';
```

```
DEST := CONCAT(DEST, COMMA, SOURCE);
```

```
WRITELN(DEST)
```

```
END.
```


--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

In some programs for editing text, one can display a line of text on a TV-like screen for possible alteration. To point at a place where a change is wanted, the line may be split in a manner similar to the following:

QUICK BROWN FOX

becomes:

BROWN FOX
QUICK

The point where the line jumps is where the change is wanted. The program below is intended to illustrate this. Add PASCAL statements to those given in order to complete this program. The program should print out the split line.

PROGRAM TRANSFER;

VAR TOP,BOTTOM,BLANKS,S: TEXT;
T: TEXT; NS: INTEGER;
BEGIN

BLANKS:= ' ';

TOP:= 'QUICK BROWN FOX';

S:= ' ';

NS:=POS(S, TOP);

BOTTOM:=COPY(TOP[1], NS);

DELETE(TOP[1], NS);

T:=COPY(BLANKS[1], NS);

INSERT(T, TOP[1]);

WRITELN(TOP);

WRITELN(BOTTOM);

END.

BROWN FOX

QUICK

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

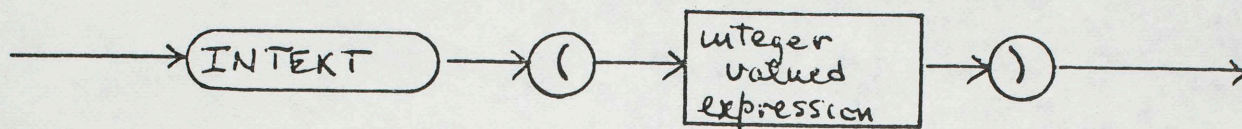
The program below is intended to count the number of characters in a sentence, to replace two stars in that sentence with the character count, and to print out the resulting version of the sentence. For example, if the sentence is

THIS SENTENCE CONTAINS ** CHARACTERS.

then the program should print out

THIS SENTENCE CONTAINS 37 CHARACTERS.

To complete this program we need to invent a new built-in function (just for this quiz) called INTEXT which converts an integer to a text string, obeying the following syntax.



If S is a TEXT variable, and I is an INTEGER variable with the value 37, then S:=INTEXT(I) will do the same thing as S:='37'

Add PASCAL statements to complete the program below, so that it will replace the '**' with the character count of the sentence assigned to T, and then print the result.

```

PROGRAM SELF CNT;
  VAR T, STARS, COUNT: TEXT;
      L, POSTARS: INTEGER;

BEGIN
  T:='THERE ARE ** CHARACTERS IN THIS SENTENCE';
  STARS:='**';
  POSTARS:=POS(STARS,T);
  L:=LENGTH(T);
  COUNT:=INTEXT(L);
  DELETE(T[POSTARS],2);
  INSERT(COUNT,T[POSTARS]);
  WRITELN(T)

END.

```


UNIT 3

PROGRAM STRUCTURE

1. Goals

- 1a. Learn to write your own Procedures
 - 1a1. Lump actions into convenient conceptual units, and give each unit a name.
 - 1a2. Reduce writing, over-and-over, actions that take place more than once.
 - 1a3. Learn basic rules about the SCOPE of a variable.
- 1b. Learn to use IF statements to control choice of action.
 - 1b1. Decide WHICH of two actions to take.
 - 1b2. Decide WHETHER to take a single action or skip over it.
- 1c. Learn to use <compound statement>s.
 - 1c1. BEGIN & END serve as program brackets enclosing a group of statements to be considered as one unit (not named).
- 1d. Handle Recursive use of Procedures to achieve repetition.
- 1e. Familiarize yourself with Flow Charts as a medium for describing program structure.
- 1f. Study & understand the sample programs presented in this Unit

2. Overview of this Unit

You have already seen that programs to handle even fairly simple tasks for changing TEXT variables can become quite tedious. PASCAL has facilities, as do most programming languages, which allow breaking the program up into small manageable units, and for repeating the same actions over and over where appropriate. This Unit and the next, introduce the main features of PASCAL for this purpose. Another purpose of this Unit is to show how the program can be used to make a CHOICE of whether to perform an action or not, or a choice of which of two or more actions to follow.

To see the need for breaking a program up into small manageable chunks, try to remember the following two strings of 10 characters each:

BIGTENTTEAM YCSHWMCDE

Flip over this page after concentrating on these strings for just a moment, and then see how long you can remember each one. Chances are pretty strong that you had little trouble remembering the first string. Unless you are a wizard with photographic memory, you probably would have to expend some real effort to memorize the second string.

Those of you who study psychology will no doubt learn of explanations for this difference involving short vs. long term memory, and involving the number of independent items we can relate in memory directly to another item. A simple explanation is as follows: Because of the way you have learned to read, you automatically break up the first string into three familiar smaller strings on a second level.

```

      BIGTENTTEAM
     /   |   \
    BIG  TEN TEAM
  
```

Each of the smaller second level strings is a familiar word to you. With the other string there are really no familiar sub-strings to use as an aid to memory. Of course we could break it up:

```

      YCSHWMCDE
     /   |   \
    YCS  HWC DTE
  
```

But these new short groupings of letters are not very helpful in remembering the whole string, because none of the short groupings has any meaning to us.

The point of all this is that a program should be broken up into small groups of statements (sometimes called "modules"), each of which can be thought of as performing a single action. Inside the group, several statements must be performed in order to cause that action to take place. Once the group has been written, you can think of it as one unit and forget the fact that it really consists of several independent statements. The small programs we have been using as illustrations are

about the right size to be thought of as individual modules. When a module gets longer than about 25 statements, it gets too complicated to think of as a simple unit. Then you run into troubles associating the module with other parts of your program.

3. Sample Program BITE - Using a simple Procedure

```

1: PROGRAM BITE;
2:   VAR SPACE,T: TEXT;
3:
4:   PROCEDURE ONEWORD;
5:     VAR N: INTEGER;
6:   BEGIN
7:     N:=POS(SPACE,T);
8:     DELETE(T[1],N);
9:     WRITELN(T);
10:  END (*ONEWORD*);
11:
12: BEGIN (*MAIN PROGRAM*)
13:   T:='NOW IS THE TIME FOR ALL GOOD PEOPLE';
14:   SPACE:=' '; (*ONE BLANK SPACE*)
15:   WRITELN(T);
16:   ONEWORD;
17:   ONEWORD;
18:   ONEWORD;
19:   ONEWORD;
20:   ONEWORD
21: END.
```

Here is what this program should print out:

```

NOW IS THE TIME FOR ALL GOOD PEOPLE
IS THE TIME FOR ALL GOOD PEOPLE
THE TIME FOR ALL GOOD PEOPLE
TIME FOR ALL GOOD PEOPLE
FOR ALL GOOD PEOPLE
ALL GOOD PEOPLE
```

3a. Analysis

This program provides a simple illustration of the idea of a <procedure>. In Figure 3.1, we have added syntax to <block>, in lines 4 & 5 showing how a <procedure> declaration is constructed. Compare lines 6 thru 10 of the program BITE with this syntax description.

As illustrated by Figure 3.2, a <procedure> is really a program within a program. You give a name to a <procedure>, its identifier, as on line 4 of this example. Lines 4 thru 10 are only the DECLARATION of the procedure. The program itself starts at line 12 and runs through line

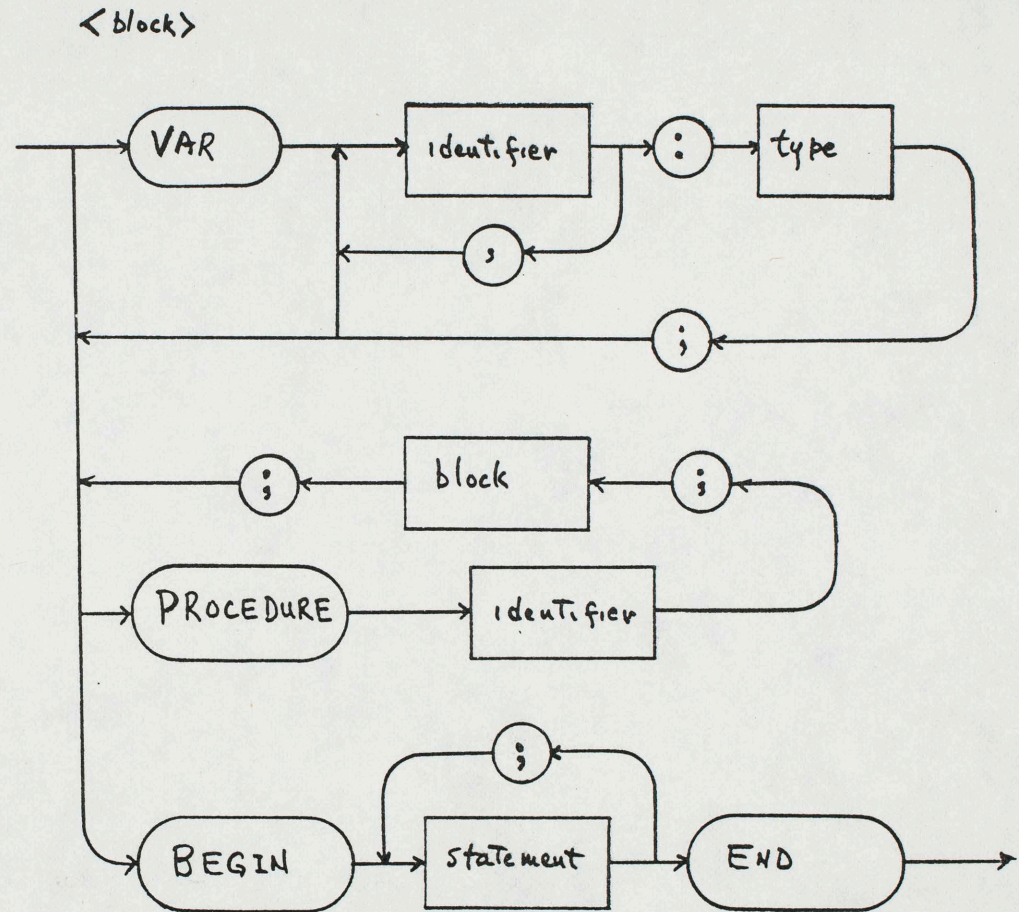


Figure 3.1 Syntax for <block> incorporating
PROCEDURE declaration (no parameters yet)

21. Line 16 is the first time that the <procedure> is entered. We say that the <procedure> ONEWORD is "called" once on Line 16, and once each on lines 17,18,19 and 20. In other words the sub-program ONEWORD is executed a total of five times, as a result of being called in lines 16..20.

Each time the procedure ONEWORD is called, it processes the same group of three statements (lines 7,8 and 9). The results differ for each of these times, as shown in the printout, because the data contained in the variables N and T changes as a result of processing the procedure. Each time ONEWORD is called, it does the following:

- 1) sets N to the position number of the first blank character in the TEXT variable T
- 2) deletes the first word, and following blank space, from T
- 3) prints out the new value of T

4. Sample Program IFDEMO1 - Using IF Statements for CHOICE

```

1: PROGRAM IFDEMO1;
2:   VAR SPACE,T: TEXT;
3:
4:   PROCEDURE ONEWORD;
5:     VAR N: INTEGER;
6:   BEGIN
7:     N:=POS(SPACE,T); (*FIND FIRST BLANK SPACE IN T*)
8:     IF N>0 (*CHECK TO SEE IF A BLANK SPACE WAS FOUND*)
9:       THEN DELETE(T[1],N); (*DON'T DELETE IF NONE FOUND*)
10:    WRITELN(T)
11:  END (*ONEWORD*);
12:
13: BEGIN (*MAIN PROGRAM*)
14:   T:='NOW IS THE TIME';
15:   SPACE:=' ';
16:   WRITELN(T);
17:   ONEWORD;
18:   ONEWORD;
19:   ONEWORD;
20:   ONEWORD;
21:   ONEWORD
22: END.
```

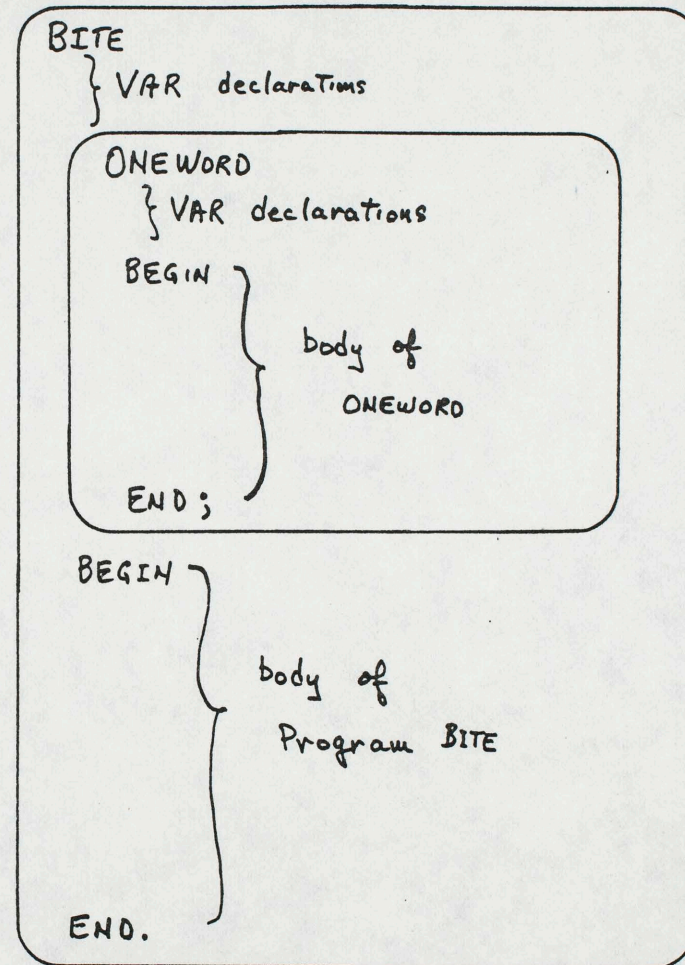


Figure 3.2 Relationship of Procedure ONEWORD to Program BITE

This program should print out the following:

```
NOW IS THE TIME
IS THE TIME
THE TIME
TIME
TIME
TIME
```

4a. Analysis

This program is almost the same as the program BITE discussed in section 2. We have added a test, using an IF statement, to prevent DELETE from being used if no blank space is found in T in line 7. (POS sets N to zero if the value of the first TEXT parameter is not found in the second.)

The general syntax for an <IF statement> is shown in Figure 3.3. Use Figure 3.4 for the syntax of <expression>. Stated differently, the general form of an <IF statement> is as follows:

```
IF <expression>
  THEN <statement>
  ELSE <statement>
```

As the diagram shows, the third line of this group can be left off, giving the following form:

```
IF <expression>
  THEN <statement>
```

Here are some examples of legal IF statements (presuming that the appropriate <identifier>s have already been declared earlier in the program):

```
IF GRADE > 2 (* IF GRADE IS GREATER THAN 2 *)
  THEN PASS

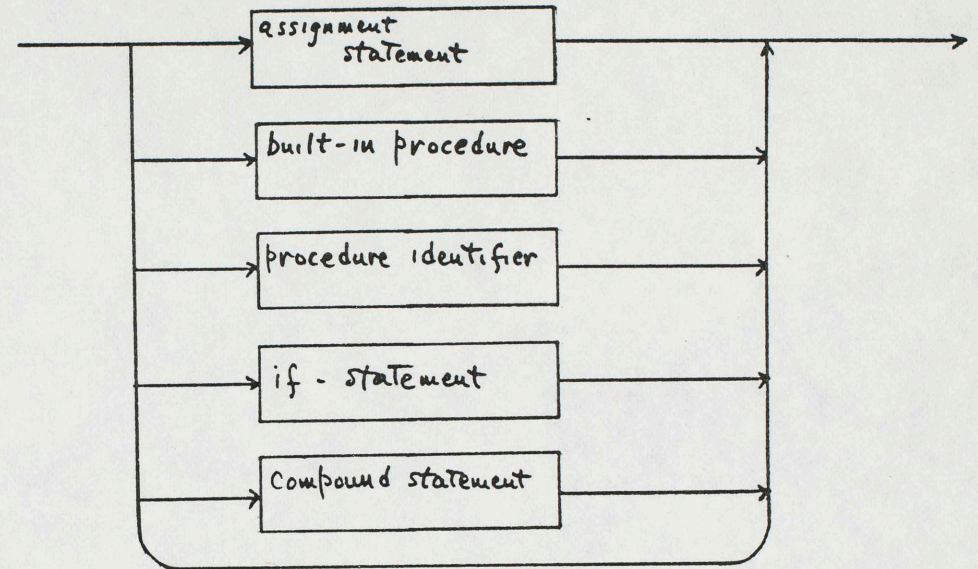
IF DAY = 4
  THEN T:='WEDNESDAY'

IF TOTAL >= MC (* IF TOTAL IS GREATER THAN OR EQUAL TO MC *)
  THEN PAYCHECK
  ELSE PAYCASH

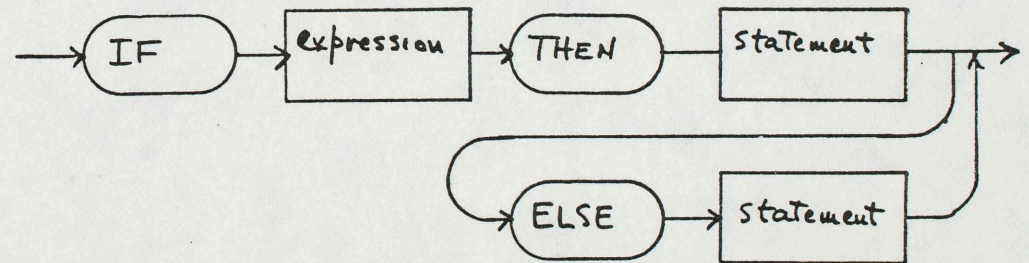
IF T <> PATTERN (*IF T NOT EQUAL TO PATTERN - BOTH TEXT VAR'S*)
  THEN NEXTWORD
```

In these examples, the <identifier>s PASS, PACHECK, PAYCASH, and NEXTWORD, are presumed to be the names of procedures previously declared in the program. You can compare an INTEGER <variable> with another INTEGER, or with an INTEGER <constant>. You can compare two TEXT

<statement>



<if - statement>



<Compound-statement>

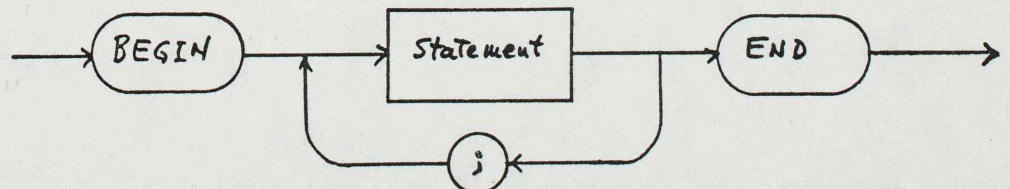


Figure 3.3 Sytan for <statement> incorporating <if statement> and <compound statement>

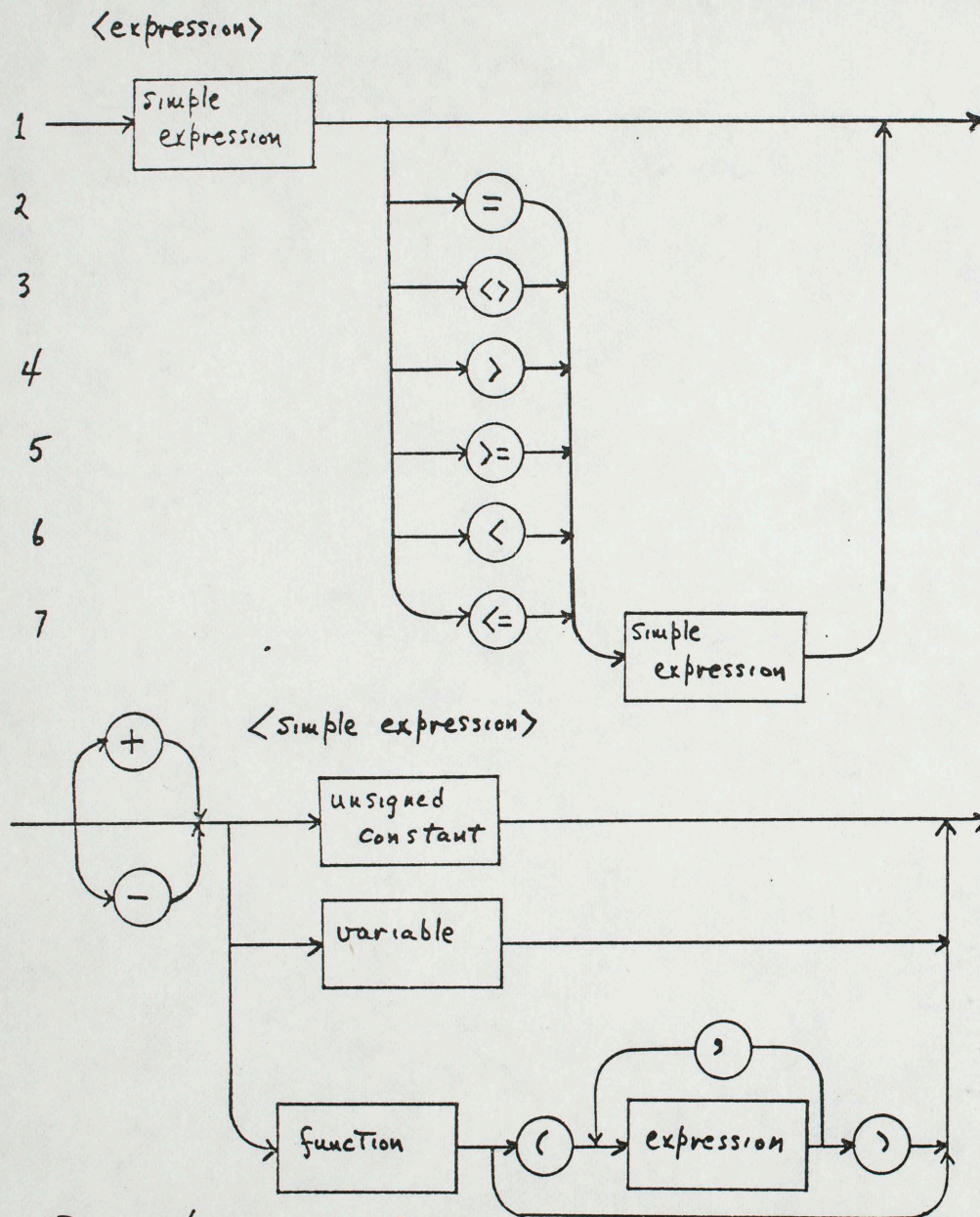


Figure 3.4 Simplified Syntax
for <expression>

<variables>. (Our PASCAL system does not presently let you compare a TEXT <variable> with a string <constant>. You have to assign the string to another TEXT <variable> first, then make the comparison in an IF statement.) You will get "flagged" with a Syntax Error if you try to compare two items that are not compatible. The Syntax for <expression> (Figure 3.4) contains no information regarding this compatibility problem. The diagram would quickly become very large and confusing if it were to contain sufficient information to express all of the compatibility relationships that are allowed in PASCAL.

In Figure 3.4, lines 2 through 7 show the six symbols you can use to form an <expression> by comparing two <simple-expression>s. From top to bottom in the figure, they stand for the following:

= equals
 <> does not equal
 > greater than
 >= greater than or equal
 < less than
 <= less than or equal

These symbols are often called <relational-operator>s. The content of one TEXT <variable> is greater than the content of another if the first comes later in the alphabet than the second. Comparisons of TEXT <variable>s involving characters other than those in the English alphabet follow an order known as the "collating sequence". We'll defer discussion of that complication until later in the course.

5. Sample program IFDEMO2 - Demonstration of two-way IF statement

```

1: PROGRAM IFDEMO2;
2:   VAR SPACE,T: TEXT;
3:
4:   PROCEDURE ONEWORD;
5:     VAR N: INTEGER;
6:   BEGIN
7:     N:=POS(SPACE,T);
8:     IF N>0
9:       THEN DELETE(T[1],N)
10:      ELSE WRITELN('NO MORE SPACES');
11:   WRITELN(T)
12:   END (*ONEWORD*);
13:
14: BEGIN (*MAIN PROGRAM*)
15:   statements here are same as in IFDEMO1
23: END.
```


This program should print out the following:

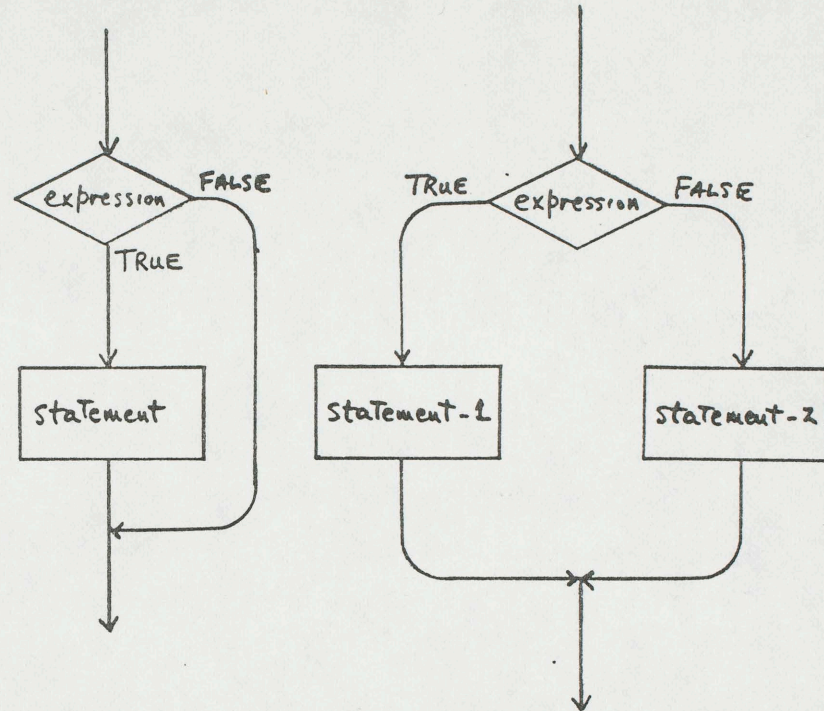
```
NOW IS THE TIME
IS THE TIME
THE TIME
TIME
NO MORE SPACES
TIME
NO MORE SPACES
TIME
```

5a. Analysis - Flow Charts

This example differs from the previous example by the addition of the ELSE clause on Line 10. Notice that there is no longer a semicolon ';' following DELETE on Line 9. Remember that the semicolon is not a statement TERMINATOR but rather a statement SEPARATOR. In the two-way IF statement, the ELSE functions as a separator between the first <statement> (the one following THEN) and the second <statement>.

As a further aid to understanding how the two forms of IF statement work, refer to Figure 3.5 which explains these forms in "Flow Charts". We will occasionally use Flow Charts for explaining the logical sequence that a program or part of a program follows. The rectangular boxes in a flow chart signify that some ACTION is to take place, generally a PASCAL <statement>. The diamond-shaped boxes in the flow chart signify that a CHOICE is to be made between two alternate paths, depending upon the value of the <expression> shown within the diamond. In this context, the <expression> must be one whose value can only be either TRUE or FALSE. Thus the form of <expression> shown in line 1 of Figure 3.4 (a single <simple-expression>) will not work using the TYPES of <variable> that you have seen so far in this Study Guide. In other words, you must use the form of <expression> in which one <simple-expression> is compared with another.

The lines in a Flow Chart, those headed by arrows, signify that processing is to follow the path shown. If you have been reading ahead in Jencen & Wirth, or are familiar with some other programming language, you may be familiar with the GOTO statement. In a flow chart, a line with an arrow means that the program will "go" from one box to the next. All of the major programming languages provide a way for the programmer to specify that processing should "go", i.e. jump, suddenly from one line to another. By the time PASCAL was developed, it had been realized that misuse of the GOTO statement in earlier languages had become a major source of confusion and program errors. PASCAL provides only a limited form of the GOTO statement. At UCSD, we prevent the beginning student from using the GOTO at all during the first few weeks of this course. By the time you get to Unit 11, you will know enough about program structure to be able to use the GOTO without getting in trouble. When you are ready for Unit 11, a TA/Tutor will show you how to make the GOTO statement work in PASCAL. Later in this Unit, we present flow charts for a program complicated enough to make the charts interesting.



IF <expression>
THEN <statement>

IF <expression>
THEN <statement-1>
ELSE <statement-2>

Figure 3.5 Flow Charts illustrating two forms of IF statement

6. Sample Program PROCDEMO - Demonstration of Use of Procedures

To avoid getting bogged down in irrelevant detail, we now show a simple program whose only purpose is to help you understand how procedures are declared and used in a PASCAL program.

```

1: PROGRAM PROCDEMO;
2:
3:   PROCEDURE P1;
4:   BEGIN
5:     WRITELN('P1 ENTERED');
6:   END (*P1*);
7:
8:   PROCEDURE P2;
9:   BEGIN
10:    WRITELN('P2 STARTING');
11:    P1;
12:  END (*P2*);
13:
14:  PROCEDURE P3;
15:  PROCEDURE P3A;
16:  BEGIN
17:    WRITELN('P3A BEGINNING');
18:    P2;
19:    WRITELN('P3A ENDING');
20:  END (*P3A*);
21:  BEGIN (*P3*)
22:    WRITELN('P3 COMMENCE');
23:    P1;
24:    P3A;
25:    WRITELN('P3 QUIT');
26:  END (*P3*);
27:
28: BEGIN (*MAIN PROGRAM*)
29:   P1;
30:   WRITELN('LINE 30');
31:   P3;
32:   WRITELN('LINE 32'); (*NOT LEGAL TO CALL P3A FROM HERE*)
33:   P2;
34:   WRITELN('GOING AWAY')
35: END.
```

This program should produce the following printout:

```

P1 ENTERED
LINE 30
P3 COMMENCE
P1 ENTERED
P3A BEGINNING
P2 STARTING
P1 ENTERED
P3A ENDING
```

```

P3 QUIT
LINE 32
P2 STARTING
P1 ENTERED
GOING AWAY
```

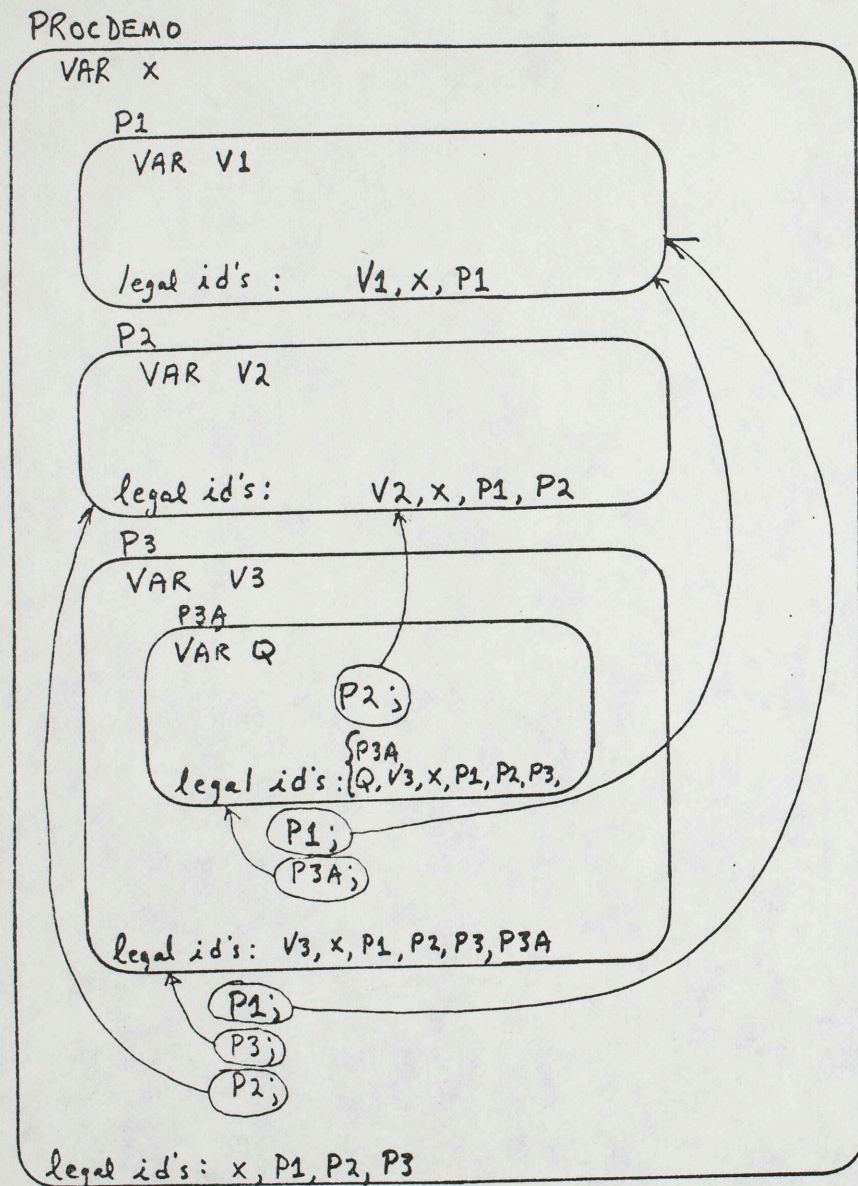
6a. Analysis - Scope of Identifiers

The WRITELN statements in this program have been placed strategically so that you should be able to follow the path of processing easily, even though the program is more complex than others we have seen so far. The first statement in the program (Line 29) calls P1, which simply prints the message "P1 ENTERED". Next is the WRITELN on line 30, which prints as a "trace" to show that the program has returned from P1 and has "fallen through" to Line 30. As programs become more complicated, you will find it increasingly useful to place printing statements like these at locations which prove that the path of processing has come a certain way. After you have proven that the program is logically correct, you can remove the tracing print statements to get presentable output.

In Line 31, P3 is called. This results in processing the first statement in P3, which prints out "P3 COMMENCE". Following that, P1 is called, and then P3A. P3A calls two other procedures, so it seems useful to print a message when P3A is first entered, and another just before processing terminates in P3A. In between these messages, P2 is called by P3A. P2 prints its own message, then it calls P1, thus accounting for a total of 4 messages printed by P3A either directly or indirectly. After leaving P3A, all that remains of P3 is the WRITELN statement on Line 25, which notifies us that P3 is about to quit. Finally, after the trace line for Line 32, P2 is entered for the last time. Once again P2 calls P1, accounting for the two last lines printed.

When one procedure is declared inside another, we say that the first is "nested" inside the second. Figure 3.6 shows one way of representing the nested block structure of the program PROCDEMO. To keep PROCDEMO uncluttered, we have avoided declaring or using <variable>s in the main program or in any one of the procedures. Of course all of the procedures, as well as the main program, obey the syntax rules for <block>. Samples of <identifier>s that might have been declared in each of the procedures, or main program, are shown in Figure 3.6 as an aid to understanding the SCOPE of identifiers in PASCAL.

You can think of each of the boxes in Figure 3.6 as a one-way "window". When you are inside a box, you can "see" identifiers that are declared outside that box and within the larger enclosing boxes. You cannot "look" from outside into any box to see the identifiers that are declared there. In addition to the <variable> X, the procedures P1, P2 and P3 are all declared at the first LEVEL of nesting inside the main program. That is why the <identifier>s for P1, P2 and P3 are visible (and hence "legal") for use by program statements in the main program. Main program statements cannot look into the BODY of P3 to see the <variable> V3 declared there. Nor can they see V1, V2, Q or P3A.



Once inside P3, your program statements can see P3A and V3. They can also see all of the identifiers outside P3 but not inside some other procedure at LEVEL=1. Inside P3 you cannot use either V1 or V2 because they are declared to be "local" to P1 and P2 respectively. Moreover, to use the <variable> Q in a statement located in the executable part of P3, you would have to look into P3A from outside - a violation of the rules.

Inside P3A, you can see Q (which is local to P3A), V3 (local to P3), as well as X, P1, P2 and P3. The arrows in Figure 3.6 show in which direction the program has to "look" for each of the procedure statements in the program PROCDEMO. Notice that the arrows can cross the boundary of a box if they are outward bound - never inward bound. An <identifier> that is visible from within a procedure, but not declared within the procedure (i.e. LOCAL), is said to be GLOBAL to that procedure. The <variable> X, and the procedure <identifier>s P1, P2, P3 are global throughout the program. However a statement inside P1 cannot refer to P2 or P3, since neither of these <identifier>s has been declared when the PASCAL compiler processes statements in P1. Later in the course you will see that there are occasions when you may need to call one procedure from statements inside a procedure declared earlier. There is a way to accomplish this that we'll defer discussing until later.

7. Recursive Procedures

One of the more interesting possibilities of PASCAL arises because you can call a procedure from program statements inside that very same procedure. For example, it is perfectly legal to have a line like this inside the procedure P3A:

```
P3A;
```

This method of calling a procedure from within itself is called RECURSION (or we use a RECURSIVE procedure call). Before going on to the next section (where we'll use recursion to control repeated computations) think about what would happen if our P1 procedure in the sample program had been written as follows:

```
PROCEDURE P1;
BEGIN
  WRITELN('P1 ENTERED');
  P1;
END;
```

It should be no surprise to you that, upon being called for the first time in line 29 of PROCDEMO, P1 would output the line:

```
P1 ENTERED
```

It would then immediately call P1 again in the fourth line of the new

Figure 3.6 Nested Block Structure of PROCDEMO

version of P1. This too would output "P1 ENTERED", and it would go on to call P1 again. The effect would be to output the same line over and over again endlessly:

```
P1 ENTERED
P1 ENTERED
P1 ENTERED
P1 ENTERED
P1 ENTERED
P1 ENTERED
... and so on ...
```

In fact P1 would keep on calling itself again and again, and the main program would never progress beyond line 29! Processing would continue until the program were forced to stop by one of the following conditions:

- a) Memory space is exhausted ("Stack Overflow") - explained below.
- b) (PDP11): You get bored and press the "BREAK" key.
- c) (B6700): You run out of your allocation of processing time.

Recursion is an extremely powerful technique that can be used to make simple the logic of programs that would otherwise be very confusing. Of course we need a way to stop the endless repetition when it is appropriate. This can be done easily using IF statements. The next subsection shows a simple example.

7a. Sample Program CHEW - Putting Recursion to Work

```
-----
1: PROGRAM CHEW; (*REMOVE ONE CHARACTER AT A TIME UNTIL
2:                NOTHING REMAINS*)
3: VAR T: TEXT;
4:
5: PROCEDURE NIBBLE;
6:   VAR N: INTEGER;
7:   BEGIN
8:     N:=LENGTH(T);
9:     IF N>0 THEN (*STILL CHAR'S LEFT, NIBBLE OFF ONE MORE*)
10:      BEGIN
11:        DELETE(T[1],1);
12:        WRITELN(T);
13:        NIBBLE
14:      END ELSE
15:        WRITELN('THAT''S ALL FOLKS');
16:      END (*NIBBLE*);
17:
18: BEGIN (*MAIN PROGRAM*)
19:   T:='DISAPPEARING ACT';
20:   WRITELN(T);
21:   NIBBLE
22: END.
```

Here is what this program should print out:

```
DISAPPEARING ACT
ISAPPEARING ACT
SAPPEARING ACT
APPEARING ACT
PPEARING ACT
PEARING ACT
EARING ACT
ARING ACT
RING ACT
ING ACT
NG ACT
G ACT
ACT
ACT
CT
T
THAT'S ALL FOLKS
```


7b. Analysis

All of the important action in this program is concentrated in the procedure NIBBLE. The main program first "initializes" the TEXT variable T (i.e. sets it to an initial value), and then prints out the initial value. The only other statement in the program is a call to NIBBLE, but notice how much that accomplishes.

On entry, NIBBLE checks to see if there are still characters in the TEXT <variable> T. If there are (signified by N being greater than 0), the first character in T is deleted, the result is printed, and NIBBLE is called again. On this next call NIBBLE will find that N is smaller by 1, and the whole process is again repeated. Finally, enough characters are deleted to reduce T to zero length. This time the print statement puts out a blank line. Then when NIBBLE is called, it finds that N equals zero (hence $N > 0$ is no longer TRUE). Therefore the ELSE path is chosen, thus preventing NIBBLE from getting called again. IF NO TEST WERE PROVIDED TO STOP CALLING NIBBLE AFTER REACHING AN APPROPRIATE CONDITION, THE RECURSIVE CALLS TO NIBBLE WOULD CONTINUE INDEFINITELY (AND YOUR PROGRAM WOULD ULTIMATELY "BLOW UP"). Never use recursive procedure calls without providing an IF statement, or equivalent test, to stop the calculations after the desired results have been reached.

7c. Compound Statements

The program CHEW provides the first example of the program structure <compound-statement>. Starting at Line 10, and including everything up through the END in Line 14, we have a <compound-statement>. In fact the BODY of a procedure or program is also a <compound-statement>. Thus the Syntax for <compound-statement> is given as lines 6 and 7 of the syntax for <block> in Figure 3.1. In words: A <block> consists of a series of <variable> declarations following VAR, followed by one or more <procedure> declarations, followed by a single <compound-statement>. The <compound-statement> starts with BEGIN and terminates with END. Syntax for <compound-statement> is also given in Figure 3.3. As you can see, a <compound-statement> is one type of <statement> and can be used anywhere a <statement> is legal. In effect, BEGIN and END amount to program "brackets" which enclose a group of <statement>s, making them operate as if they were a single <statement>. Thus the <compound-statement> is a way to lump statements together, but it does not require creating a special name, nor a declaration, as is true for a procedure.

8. Understanding Recursion

The effect of a recursive procedure is equivalent to putting the statements into your program for a complete new copy of the procedure EACH TIME THE PROCEDURE IS CALLED from within itself during execution of the program. If you did in fact put more than one copy of the same procedure into your program, each copy would have to be given a different name. Recursion saves you this trouble, by allowing one set of program statements to act as if many copies had been written into the program. Each copy acts as if both the procedure name, and the names of all its identifiers, had been declared to be completely distinct from all other identifiers in the program.

Many students find it hard to understand recursion and recursive procedures, and conclude that they can safely move on to other topics in this course that are easier to comprehend. Our experience has been that students who do this find themselves in progressively deeper trouble in understanding the later materials in the course. The main reason is that they fail, in UNIT 3, to understand how procedures work, and thus cannot make complex programs function as expected. Our main reason for emphasizing recursion, this early in the course, is that it forces you to understand how procedures work.

The next few subsections provide various ways of looking at the operation of recursive procedures.

8a. Sample Program RECURSIVE

```

1: PROGRAM RECURSIVE;
2: VAR G: INTEGER; (*THE ONLY "GLOBAL" VARIABLE*)
3:
4: PROCEDURE PR;
5:   VAR L: INTEGER; (*THE PROCEDURE'S "LOCAL" VARIABLE*)
6: BEGIN (*PR*)
7:   G:=G+1;
8:   L:=G; (*SAVE CURRENT VALUE OF G IN L FOR THIS COPY OF PR*)
          (*L IS NUMBER OF THE COPY IN THIS EXAMPLE *)
9:   WRITELN('ENTER: G=',G, ', L=',L);
10:  IF G<4 THEN PR (*RECURSE IF G LESS THAN 4*)
11:    ELSE WRITELN('WE ARE DONE');
12:  WRITELN('LEAVE: G=',G, ', L=',L);
13: END (*PR*);
14:
15: BEGIN (*MAIN PROGRAM*)
16:   G:=0;
17:   PR;
18: END.
```


This program should print out the following:

OUTPUT	REMARKS
ENTER: G= 1, L= 1	copy # 1, called in line 17
ENTER: G= 2, L= 2	copy # 2, called in line 10 of copy # 1
ENTER: G= 3, L= 3	copy # 3, called in line 10 of copy # 2
ENTER: G= 4, L= 4	copy # 4, called in line 10 of copy # 3
WE ARE DONE	line 11 of copy # 4
LEAVE: G= 4, L= 4	last statement in copy # 4, go back to # 3
LEAVE: G= 4, L= 3	last of copy # 3, L value still the same
LEAVE: G= 4, L= 2	last of copy # 2, only one copy of G
LEAVE: G= 4, L= 1	exit from copy # 1, was called in line 17

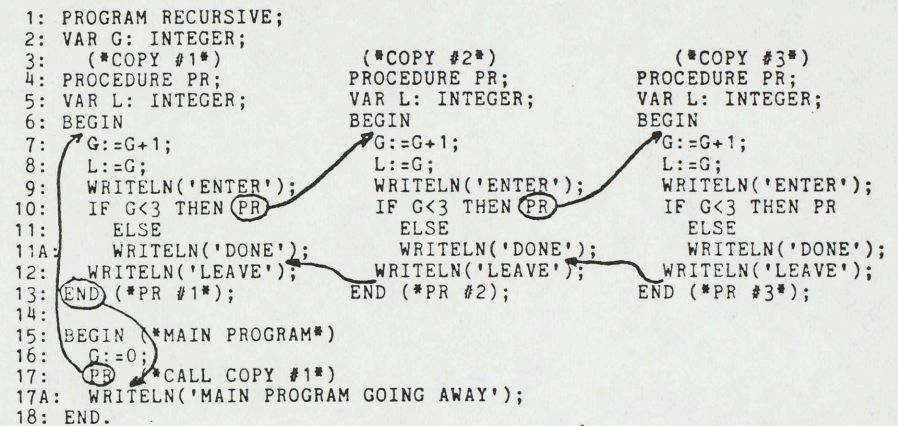
Notice that each copy of the procedure PR has its own copy of the local variable L. Since copy # 1 has not terminated when PR is called again in line 10 (of copy #1), the value of L=1 is retained until execution resumes later in copy # 1. Meanwhile all three other copies complete their execution before control returns to line 12 in copy #1. Similarly, copy # 2 retains its local value of L=2 until copies 3 and 4 have completed their execution. Copy # 3 retains its local value of L=3 while copy # 4 completes its processing.

While all of this is happening, all copies of the procedure have to share the same global variable G. Each time G is changed by line 7 of PR, the new value is retained until G is changed by execution of another statement. As you can see, G is changed four times, once by each copy of PR. The final value of 4 is not changed by any other statements in the program and hence stays constant while each copy of PR terminates.

8b. Sequence of Execution

Figure 3.7 illustrates the path that the program follows in a version of Program RECURSIVE using G<3 in line 10.

Figure 3.7:



When a procedure is called, control transfers to the statement immediately following the first BEGIN of that procedure. When the procedure terminates, control returns to the point immediately following the point where the procedure was called. When PR is called in line 17, the return when PR terminates is to line 17A where the whole program terminates. In line 10 of copy #1, PR is called and control passes to line 7 of copy #2. In line 10 of copy #2, PR is again called and control passes to line 7 of copy #3. In copy #3, G=3 at line 10 and control passes to line 11A. The next statement in the sequence is line 12 of copy #3 where 'LEAVE' is written out. After the WRITELN finishes in copy #3, the procedure terminates and control returns to the next point in the sequence following 'PR' in line 10 of copy #2. This too is line 12, in copy #2, since the ELSE clause is not used in copy #2. After writing out 'LEAVE', copy #2 terminates and returns control to line 12 of copy #1. Finally, copy #1 terminates and the program goes away.

8c. The STACK

Another way to understand how recursion works is to see how the values of the different variables are stored in the computer's memory. As we have said before, the memory is like having a large number of post office boxes mounted one next to another. Each box can hold the value of only one variable at a time. The PASCAL compiler keeps track of which box will be assigned to each identifier, so that you need only to remember the name of the identifier in writing your program.

The compiler and the PASCAL system use a sequence of boxes in the computer's memory called the 'STACK' for keeping track of the various identifiers. The stack is illustrated in Figure 3.8 for the program RECURSIVE. The boxes containing either "G" or "L" are for the corresponding variable. The boxes containing hash lines are used by the PASCAL system for keeping order, and are called stack 'markers'. You don't need to know anything about how the system uses these markers, at least in order to understand the materials in this course. Notice that when the program is first entered, the stack is marked, and space is allocated for the variable G. When copy #1 of PR is entered, the stack is marked again, and space is also allocated for the local variable L used by copy #1. When copy #2 is entered, the stack is again marked, and yet another box is allocated for the variable L, this time the L used by copy #2. Similarly the stack is marked and additional boxes are allocated for the variables L used by copies #3 and #4 of PR in the appropriate sequence.

When a procedure terminates, the boxes allocated for that procedure's local variables and its marker are removed from the top of the stack. (It's a little like taking trays from the stack of trays you find in the cafeteria.) Only at that point does the program control return to the part of the stack referred to by the calling procedure. However, the box used for the global procedure G is visible at all times from any copy of the procedure PR. When all of the copies of PR have finished execution, control returns to the main program and all of the stack areas used by the procedures have been removed. Those areas of the stack could be re-used by other procedures if the program were larger.

8d. Scope of Variables for Recursive Procedures

To understand the scope rules for recursive procedures, it is probably easiest to expand a program to show it as it would appear if all copies of the recursive procedure had been written into the program separately. Figure 3.9 shows a program, in skeleton form, which imitates RECURSIVE with the separate copies of the procedure explicitly declared.

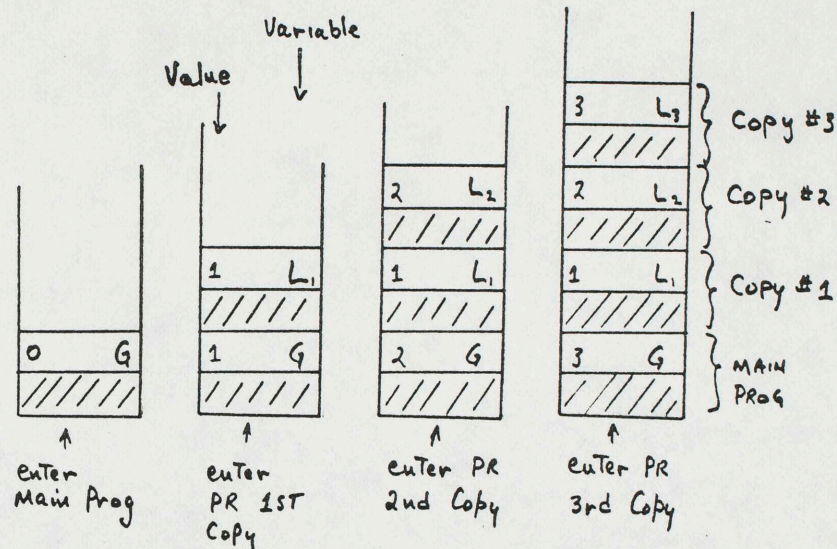


FIGURE 3.8 ILLUSTRATION OF THE STACK

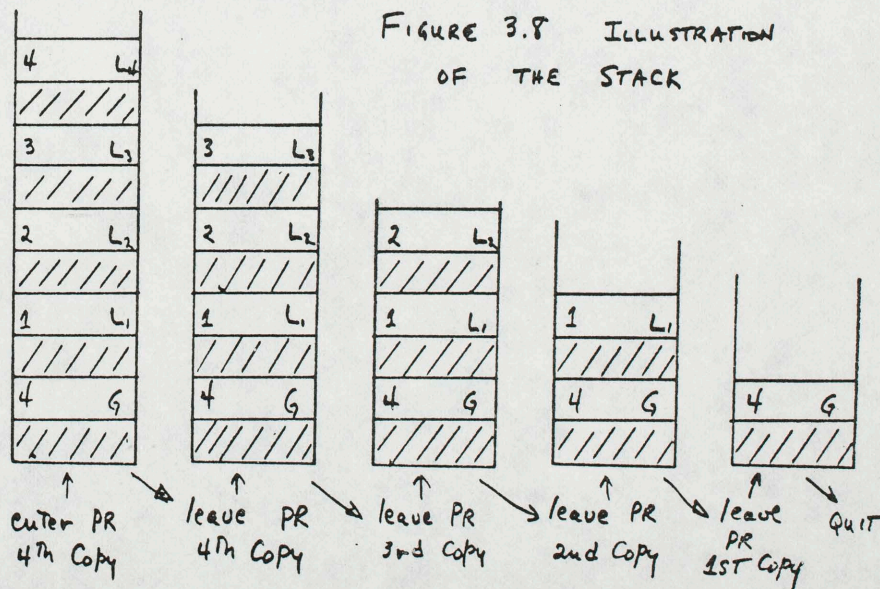


Figure 3.9:

```

1: PROGRAM IMITATE;
2: VAR G: INTEGER;
3:
4: PROCEDURE PC3;
5: VAR L3: INTEGER;
6: BEGIN (*PC3*)
7:   G:=G+1;
8:   L3:=G;
9:   WRITELN('ENTER');
11:  WRITELN('DONE');
12:  WRITELN('LEAVE');
13: END (*PC3*);
14:
15: PROCEDURE PC2;
16: VAR L2: INTEGER;
17: BEGIN (*PC2*)
18:   G:=G+1;
19:   L2:=G;
20:   WRITELN('ENTER');
21:   IF G<3 THEN PC3
    ... etc. ...
24: END (*PC2*);
25:
26: PROCEDURE PC1;
27: VAR L1: INTEGER;
28: BEGIN (*PC1*)
29:   G:=G+1;
30:   L1:=G;
31:   WRITELN('ENTER');
32:   IF G<3 THEN PC2
    ... etc. ...
33: END (*PC1*);
34:
35: BEGIN (*MAIN PROGRAM*)
36:   G:=0;
37:   PC1;
38: END.

```

This imitation is only approximate, since the main program is only allowed to call PC1, and cannot call PC2 or PC3. Similarly PC1 can only call PC2 and not PC3. PC2 can call only PC3. In other respects, the scope rules in this illustration do imitate the scope rules for local and global variables in recursive procedures. For example L1 can only be used inside PC1, L2 inside PC2, and L3 inside PC3. However the global variable G can be used anywhere in the program.

8e. Try Some Experiments

If, after all this discussion, you are still having difficulties visualizing how recursive procedures (or procedures in general) should work, it may be time for you to do some experimenting on the computer. You might try variations of our sample program RECURSIVE to see what happens when you change specific features, like the value of the constant (4 in "G<4") used to determine how many times the procedure will be called.

Remember that unless instructed explicitly by your program to do otherwise, the order of processing your instructions goes strictly from beginning to end. Any instruction not yet processed must therefore be processed eventually before the program can terminate. When you call a procedure, the processing does jump TEMPORARILY out of the strict top to bottom sequence. However a call to a procedure is like any other statement in the sense that it must eventually be completed, after which control then passes to the statement immediately following. In this Unit we have also discussed the IF statement briefly as a means of altering the flow of program control from one statement to the next. In Unit 4 we will see several other statement types used to alter the flow of program control when the desired conditions are satisfied.

9. Sample Program CHOMP - Showing Nested Compound Statements

```

1: PROGRAM CHOMP; (*WHOLE WORDS AT ONE GULP*)
2:   VAR T,SPACE: TEXT;
3:
4:   PROCEDURE GULP;
5:     VAR NL,NP: INTEGER;
6:   BEGIN
7:     NL:=LENGTH(T);
8:     IF NL>0 THEN
9:       BEGIN
10:        NP:=POS(SPACE,T);
11:        IF NP>0 THEN
12:          BEGIN
13:            DELETE(T[1],NP);
14:            WRITELN(T);
15:            GULP
16:          END
17:        END
18:      END (*GULP*);
19:   BEGIN (*MAIN PROGRAM*)
20:     T:='EVEN IF HE SAW ME, I WILL DENY IT';
21:     SPACE:=' ';
22:     GULP;
23:     WRITELN('AT END, T CONTAINS:',T)
24:   END.

```

This program should print the following lines:

```

IF HE SAW ME, I WILL DENY IT
HE SAW ME, I WILL DENY IT
SAW ME, I WILL DENY IT
ME, I WILL DENY IT
I WILL DENY IT
WILL DENY IT
DENY IT
IT
AT END, T CONTAINS:IT

```

9a. Analysis

This program is another example of the use of recursion to achieve repetition. Most of the action is accomplished by the single call to GULP in line 22. Immediately after entering GULP, the length of T is checked. If greater than zero, then the position of the first blank space character, if any, is found. If NP is greater than 0, then a blank space has been found, and everything up to and including that space is deleted. Then the new content of T is printed, and GULP is called again. The repetition stops in the example given after the last blank space has been found. If the TEXT <variable> T had been

initialized with a string ending with a blank space character, such as 'EVEN IF HE SAW ME, '

then the test of NL in Line 8 would have stopped the recursive calls to GULP.

Notice that Lines 12 thru 16 constitute a single <compound-statement>, which itself is contained as one statement within the <compound-statement> running from Line 9 thru Line 17. We say that the <compound-statement> of lines 12 to 16 is "nested" inside the <compound-statement> of lines 9 thru 17.

Figure 3.10 illustrates the program CHOMP in the form of flow charts. Notice that the flow chart, as a mode of expression, does not provide us with a convenient mechanism to express the concept of recursion graphically. If you work with other people who handle large programs, you will sometimes see flow charts containing hundreds of separate boxes. This is a mistake, for it makes such a chart extremely difficult to comprehend. As a rule of thumb, no flow chart should be larger than can easily be fitted into one sheet of ordinary notebook or letter paper. If the program is more complicated than that, it should be broken up into procedures (and functions) with a separate flow chart for each procedure.

10. Homework

10a. Part 1:

Modify the program CHOMP to make it delete ALL of the contents of T on the last call to the GULP procedure. The last WRITELN statement should then produce the following:

AT END, T CONTAINS:

10b. Part 2:

Write and debug a program which uses recursive calls to a procedure to change every occurrence of the letter 'O' to the letter 'E' in the following phrase:

OYSTERS WILL SPOIL IF YOU BOIL THEM IN OIL

The program should alter this to print out as follows:

EYSTERS WILL SPEIL IF YEU BEIL THEM IN EIL

HINT: Assume that T is the TEXT <variable> containing the phrase to be altered, and that I is an INTEGER <variable>. It is legal to use an IF statement such as the following:

```
IF T[I] = 'O'
  THEN T[I] := 'E'
```

If you wish to use a statement that increases I by 1 each time it is used, the following will do very nicely:

```
I := I + 1
```

This says: Add 1 to the old value of I and assign the result to I.

Second Hint: Another method would be to use POS repeatedly.

This illustrates the fact that there are often several good ways to accomplish the same objective in computer programming.

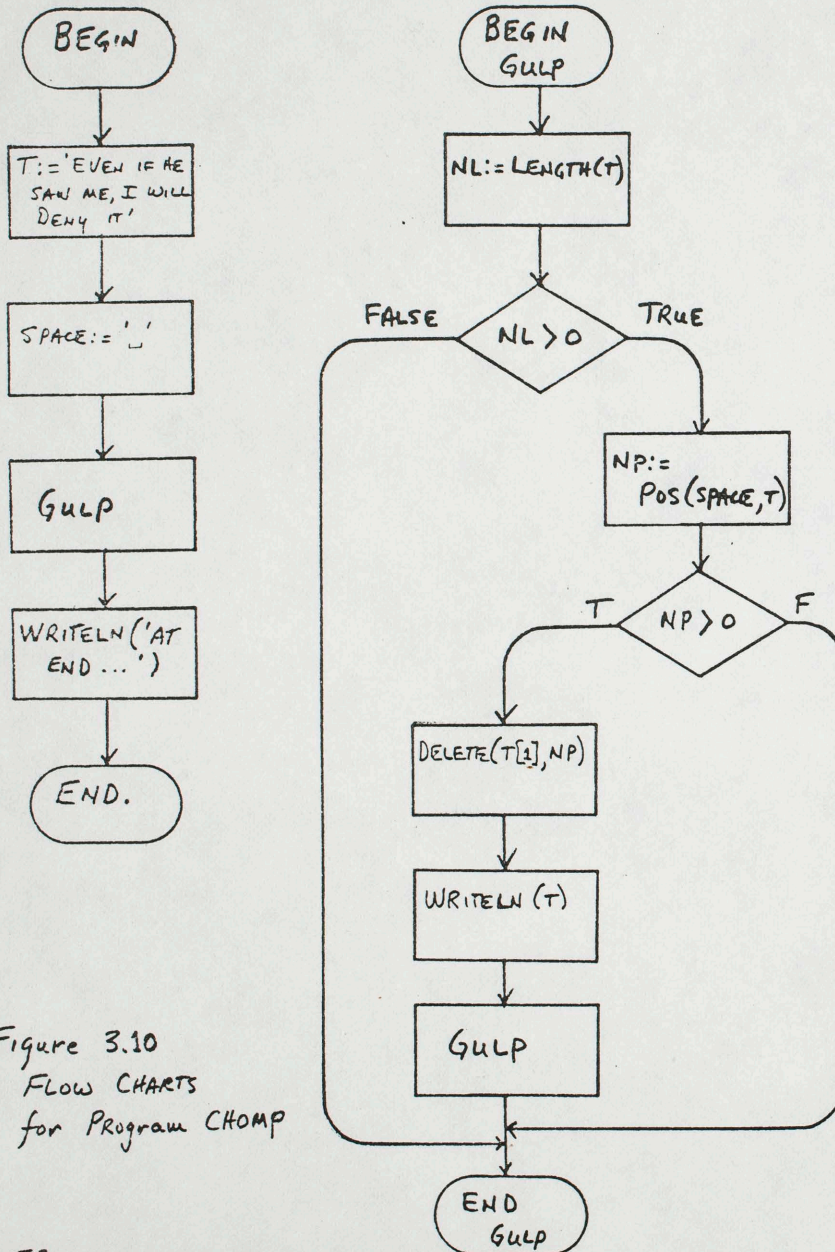


Figure 3.10
Flow CHARTS
for Program CHOMP

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

The program below is a modified version of the program CHEW from the Study Guide. Revise it so that it will count and print the number of A's in the string assigned to T.

PROGRAM COUNTAS;

VAR T: TEXT;

NAS: INTEGER;

PROCEDURE NIBBLE;

VAR N: INTEGER;

BEGIN

N:=LENGTH(T);

IF N > 0 THEN

BEGIN

IF T[i] = 'A' THEN NAS := NAS + 1;

DELETE(T[1],1);

NIBBLE

END ELSE

WRITELN('NUMBER OF A'S=', *NAS*)

END (*NIBBLE*);

BEGIN

T:='DISAPPEARING ACT';

NAS := 0;

NIBBLE

END.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

Below is a small PASCAL program. Write out what this program should print.

```
PROGRAM QUIZ3C;
  VAR T: TEXT;

  PROCEDURE P;
  BEGIN
    WRITELN('ENTER P');
    WRITELN(T);
    WRITELN('EXIT P')
  END;

  PROCEDURE Q;
  VAR T: TEXT;
  BEGIN
    WRITELN('ENTER Q');
    T:='HI THERE';
    WRITELN(T);
    P;
    WRITELN('EXIT Q')
  END;

  BEGIN (*MAIN PROGRAM*)
    T:='MAIN PROGRAM';
    WRITELN(T);
    Q;
    WRITELN(T)
  END.
```

MAIN PROGRAM

ENTER Q

HI THERE

ENTER P

MAIN PROGRAM

EXIT P

EXIT Q

MAIN PROGRAM

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME,

FIRST

Write out what the following program should print out.

```
PROGRAM QUIZ3E;
```

```
VAR T,R: TEXT;
```

```
PROCEDURE REV;
```

```
VAR L: INTEGER;
```

```
CPY: TEXT;
```

```
BEGIN
```

```
L:=LENGTH(T);
```

```
IF L > 0 THEN
```

```
BEGIN
```

```
CPY:=COPY(T[L],1);
```

```
WRITELN('T[L]=' ,T[L]);
```

```
INSERT(CPY,R[1]);
```

```
DELETE(T[L],1);
```

```
REV
```

```
END ELSE
```

```
WRITELN(R);
```

```
WRITELN('L=' ,L)
```

```
END (*REV*);
```

```
BEGIN(*MAIN PROGRAM*)
```

```
T:='REVERSE';
```

```
WRITELN(T);
```

```
R:=' ';
```

```
REV
```

```
END.
```

```
REVERSE
T[L]=E
T[L]=S
T[L]=R
T[L]=E
T[L]=V
T[L]=E
T[L]=R
REVERSE
L=      0
L=      1
L=      2
L=      3
L=      4
L=      5
L=      6
L=      7
```


UNIT 4

 REPETITION WITHOUT RECURSION

1. Goals

-
- 1a. Learn to use the following new PASCAL statement types for controlling repeated actions without using recursion.
 - 1a1. WHILE statement
 - 1a2. REPEAT statement
 - 1a3. FOR statement
 - 1b. Learn to use BOOLEAN <variable>s and <expression>s.
 - 1c. Revise the examples given in Unit 3 to use these PASCAL constructs rather than recursion.
 - 1d. Study & understand the sample programs presented in this Unit

2. Overview of this Unit

Recursion is the best way to control program repetition in some applications, but it has some shortcomings and should not be used for other applications. In this Unit, we introduce three PASCAL statement types that are intended to control repeated processing of a portion of a program without using recursion.

PASCAL as well as ALGOL, APL and PL/1 allow the use of recursion. BASIC, COBOL and FORTRAN do not. Even if the programming language you eventually decide to use for serious work allows recursion, there may be better ways of causing repetition. On the other hand, recursion does allow one of the simplest ways to express what often is a complicated concept. When the objective is program simplicity to save your time and effort, then by all means use recursion if it is available.

Each time you call a procedure, cells have to be allocated in the computer's memory for the variables declared in that procedure. In addition a number of cells are used up for "overhead" purposes to keep track of the procedure while it is invoked, and to provide temporary storage needed for calculations that are in progress. If your program requires a large number of repetitions of the same procedure, then the recursive method requires the allocation of a large amount of space in the computer's memory - possibly unnecessarily. Moreover, the processing time needed to keep track of all the invocations of the recursive procedure may also be unnecessary if the action being repeated is quite simple.

The three statement types discussed in this Unit all depend upon the fact that a digital computer can be programmed to "jump" from one place in the program to another if some test condition is found to be satisfied. In the traditional method of introducing a programming language, students are shown rather early how to use the GOTO statement to control jumps directly. As we have already pointed out in Unit 3, use of the GOTO statement without considerable caution has been found to lead to errors, and to large amounts to time spent in debugging programs. The WHILE, REPEAT, and FOR statement types discussed in this Unit are all ways of using the "jump" feature of the computer's hardware in a software way that avoids many of the programming errors.

Having introduced these three new statements for controlling repetition, we will also show that a program designed to use recursion can usually be modified, without great difficulty, to use these new statements instead. This possibility leads to the suggestion that an error-free program can often be designed most easily by first using the concept of recursion. After the basic design has been completed you can then convert the recursive repetition to use one of the three repetition control statements to achieve a more efficient program.

Also introduced in this Unit are BOOLEAN <variable>s. A BOOLEAN <variable> is one that is allowed to take on just two possible values - either TRUE or FALSE. Often it is convenient to evaluate the <expression> that compares two values, and then to store the resulting

TRUE/FALSE value in a BOOLEAN <variable>. You can also combine several BOOLEAN <expression>s (i.e. <expression>s that evaluate to a TRUE/FALSE value) and assign the result to a BOOLEAN <variable>.

3. Sample Program WHILE1

```

1: PROGRAM WHILE1;
2:   VAR T: TEXT;
3: BEGIN
4:   T:='GOING AWAY';
5:   WRITELN(T);
6:   WHILE LENGTH(T)>0 DO
7:     BEGIN
8:       DELETE(T[1],1);
9:       WRITELN(T);
10:    END (*WHILE*)
11: END.

```

Here is what this program should print out:

```

GOING AWAY
ONG AWAY
ING AWAY
NG AWAY
G AWAY
AWAY
AWAY
WAY
AY
Y

```

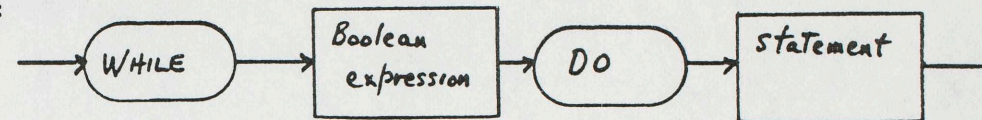
3a. Analysis

This program illustrates the use of the WHILE statement, syntax for which is shown in Figure 4.1. In this Unit we will be using two kinds of <expression>, viz:

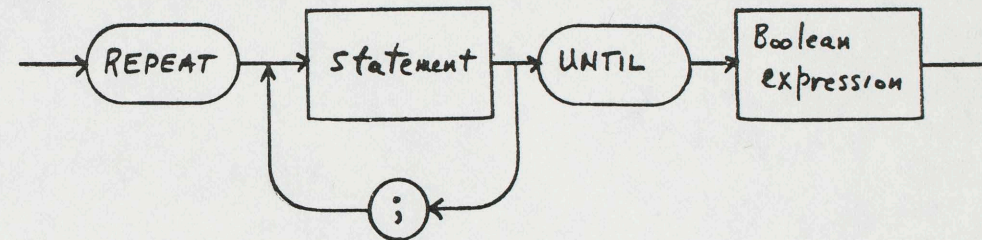
- 1) those that evaluate to a TRUE or FALSE value
- 2) those that evaluate to an INTEGER value

Whereas the syntax diagrams in Jensen & Wirth do not distinguish between these two, we have marked the appropriate boxes in Figure 4.1 to indicate what type of value should result from each <expression> called for in the syntax. At a later stage of the course, the boxes in the FOR statement that call for <Integer-expression>s will be made more general. <Integer-expression>s will be discussed later in this Unit in connection with the FOR statement. <Boolean-expression>s will be discussed in more detail after the three types of repetition control statements have been introduced.

<while statement>



<repeat statement>



<for statement>

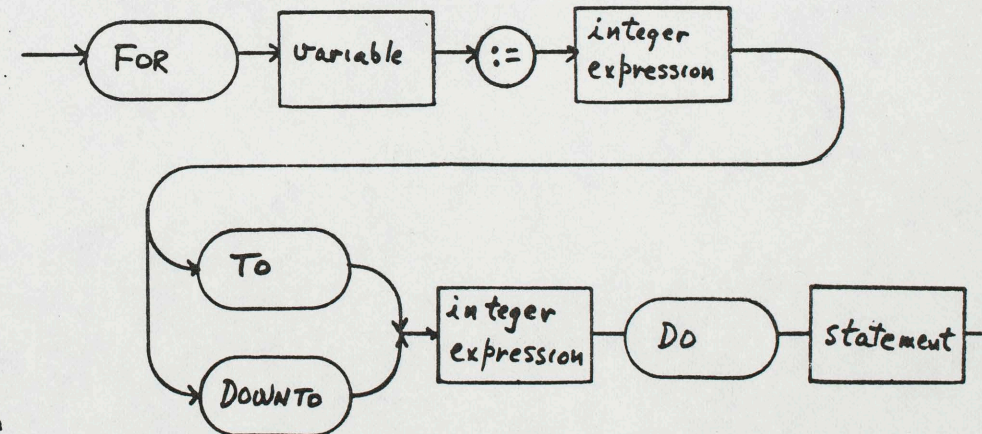


Figure 4.1 Syntax of WHILE, REPEAT and FOR statements

Figure 4.2 illustrates the program WHILE1 in terms of flow charts. Part a of the figure shows the general form of the WHILE statement. Upon first entering the statement, a test is made to determine if the <Boolean-expression> evaluates as TRUE. If so, then the <statement> is executed once. Remember that this <statement> can be of any of the allowable statement types, including all of those shown in Figures 4.1 and 3.3. After executing the statement, control of the program jumps back to the point at which the <Boolean-expression> is again evaluated. It is expected that one of the effects of the actions performed by the <statement> will be some change in one or more <variable>s that are combined in the <Boolean-expression>. Eventually the <Boolean-expression> will evaluate as FALSE, because of such a change, and the "looping" through the <statement> over and over again will cease. At that point, control of the program jumps to the point immediately following the end of the <statement>.

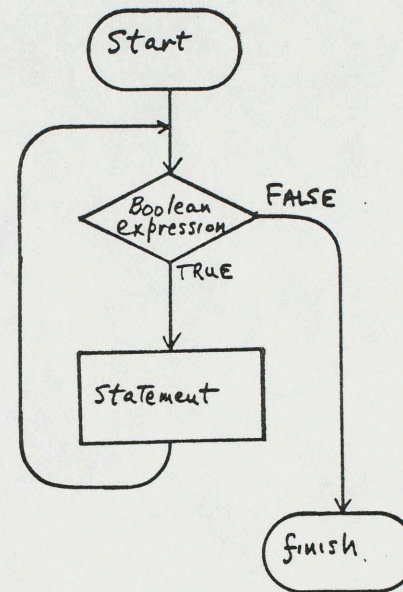
Part b of Figure 4.2 is an explicit illustration of the program WHILE1 in the form of a flow chart. In this case, the <Boolean-expression> is

LENGTH(T) > 0

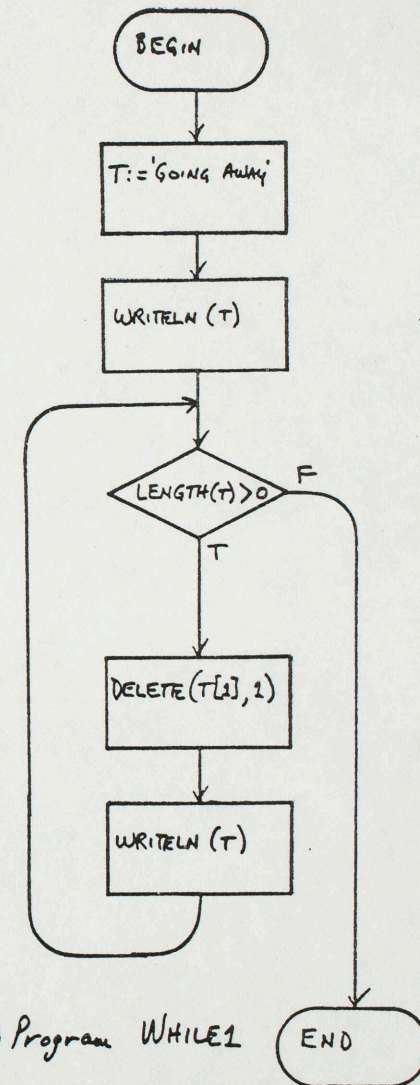
testing whether the length of the TEXT <variable> T is still greater than zero. If it is, then the two statements in Lines 8 and 9 of the program are executed as a unit, since they are enclosed by the program-brackets BEGIN ... END. As further examples of appropriate <Boolean-expressions>, refer back to the four examples of IF statements in Section 3a of Unit 3. Here are the <Boolean-expressions> used to control those IF statements:

```
GRADE > 2
DAY=4
TOTAL>=MC
I<>PATTERN
```

As you can see, the action performed on each "loop" of this sample program is quite simple. On each loop, one character is removed from the beginning of the TEXT <variable> T, and the resulting value is then printed. Looping stops when no more characters are left in T, and the program then terminates.



a) WHILE <Boolean-expression>
Do <statement>



b) Program WHILE1

Figure 4.2 Flow Charts illustrating WHILE Statement

4. Sample Program WHILE2

```

-----
1: PROGRAM WHILE2
2: VAR T: TEXT;
3:   L,N: INTEGER;
4: BEGIN
5:   T:='DASHITALL';
6:   N:=1; (*INITIALIZE N TO POINT TO BEGINNING OF T*)
7:   L:=LENGTH(T);
8:   WHILE N<L DO
9:     BEGIN
10:      WRITE(T[N],' ');
11:      N:=N+1
12:    END;
13:  WRITELN(T[L])  (*PRINT LAST CHARACTER WITHOUT TRAILING DASH*)
14: END.

```

This program should print out the following single line:

D-A-S-H-I-T-A-L-L

4a. Analysis - Initialization & Cleanup

The only new feature introduced in this sample program is the WRITE statement, as contrasted with WRITELN. WRITE causes the parameters to be prepared for printing in the "buffer" area of memory reserved for printed output. WRITE does not call for the information to be sent to the printer. You can use as many WRITE statements as you wish (up to the maximum width of a line, i.e. 132 characters) before calling WRITELN to have the information saved in the buffer area actually printed. A series of individual WRITE statements, followed by WRITELN, is equivalent to stringing all of the parameters to be printed into a single WRITELN statement. The method used in this sample program saves having to write out something like:

```
WRITELN(T[1],' ',T[2],' ',T[3],' ',T[4]) ... and so on
```

On the first "loop" through the WHILE statement (Lines 8 thru 12), N=1 and L=9, so the <Boolean-expression> clearly evaluates true. T[1] is then printed followed by a dash. N is then increased by 1, the new value of 2 replacing the old value in memory. Now the test whether N<L (N less than L) is made again, and of course it tests true. This time T[2] is printed, and so on.

Notice that before we entered the WHILE statement, it was necessary to "initialize" N and L. Using L instead of LENGTH(T) for the comparison in the <Boolean-expression> saves a little computing time, since L does not change in this program. (In WHILE1, the length of T changed on each loop of the WHILE statement.) N is changed by the statement in Line 11. However N is used twice before it is changed in Line 11, and this means

that the correct value of N has to be established before the WHILE statement is ever entered. Otherwise one may get bizarre and unexpected results - or your program may "bomb-out" with an execution error.

Similarly, it is often necessary to have the program do something immediately after a WHILE statement finishes its work, in order to "clean up" any work not completed in the main loop. In the case illustrated here, had we tested WHILE N<=L in Line 8 (N less than or equal to L), the program would have printed the second 'L' of 'D-A-S-H-I-T-A-L-L' followed by an unwanted dash '-'. In addition it would still have been necessary to use a WRITELN statement after the end of the WHILE statement in order to cause actual printing of the information accumulated in the output buffer by the WRITE statements of Line 10.

To summarize, you have to:

- 1) Prepare the <variable>s that will be used inside a WHILE statement, before that statement is entered, in order that they will have the correct values on the first loop.
- 2) Perform certain actions after the WHILE statement terminates, so that the wanted final values may be reached.

The whole point of the WHILE statement is to control repetition in an orderly fashion so as to save you from having to write out a large number of statements in between initialization and clean-up. Indeed, it is not at all unusual for a program to go around the loop of a WHILE statement several million times in the course of only a few seconds of computation. Clearly it is much better to allow the computer to control all of that looping, except for parts of the first loop and the last loop.

5. Sample Program REPEAT1

```

-----
1: PROGRAM REPEAT1;
2: VAR T,TG: TEXT;
3:   L,N: INTEGER;
4: BEGIN
5:   T:='GROWING BIGGER';
6:   N:=1;
7:   L:=LENGTH(T);
8:   REPEAT
9:     TG:=COPY(T[1],N);
10:    WRITELN(TG);
11:    N:=N+1
12:  UNTIL N>L
13: END.

```

Here is what this program should print out:


```

G
GR
GRO
GROW
GROWI
GROWIN
GROWING
GROWING
GROWING B
GROWING BI
GROWING BIG
GROWING BIGG
GROWING BIGGE
GROWING BIGGER

```

5a. Analysis

Syntax for the REPEAT statement is also shown in figure 4.1. Flow charts illustrating this program are shown in Figure 4.3. The REPEAT statement is very similar in form to the WHILE statement, except that the <Boolean-expression> is tested at the end of the loop. The two forms are provided mainly as a convenience for programmers. In this case the program ALWAYS makes one transit of the group of statements between REPEAT and UNTIL, regardless of the value of the <Boolean-expression>. Looping continues until the value of the <Boolean-expression> is found to be TRUE.

Notice also that the reserved words REPEAT and UNTIL both play double roles. In effect, the group of statements between REPEAT and UNTIL function is a <compound-statement> even though neither BEGIN nor END is used. REPEAT doubles for BEGIN, in addition to signifying that controlled repetition is to start. UNTIL doubles for END, in addition to signifying that the <Boolean-expression> is to follow. Of course it would also have been correct to use the following sequence:

```

REPEAT
BEGIN
  TG:=COPY(T[1],N);
  WRITELN(TG);
  N:=N+1
END
UNTIL N > L;

```

However the syntax for the REPEAT statement shows that the BEGIN and END here are redundant, and not needed.

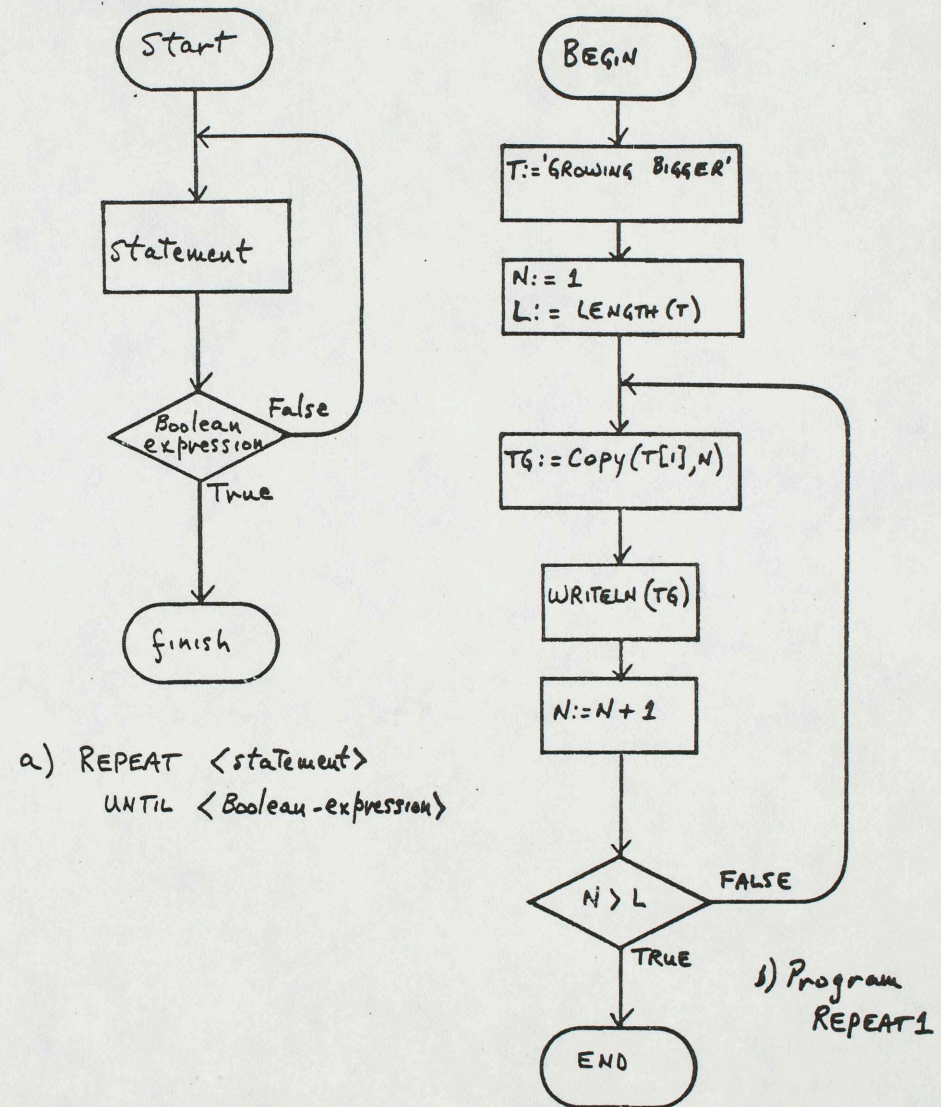


Figure 4.3 Flow Charts illustrating REPEAT statement

6. Sample Program REPEAT2 - Combining Repetition with Procedures

```

1: PROGRAM REPEAT2;
2:  VAR T: TEXT;
3:  PROCEDURE REVERSE; (*REVERSE THE ORDER OF CHAR'S IN T*)
4:    VAR NB,NE: INTEGER;
5:    SAVE: CHAR;
6:  BEGIN (*REVERSE*)
7:    NB:=1;
8:    NE:=LENGTH(T);
9:    REPEAT (*EXCHANGE CHAR'S NB & NE, THEN CHANGE POINTERS*)
10:      SAVE:=T[NB];
11:      T[NB]:=T[NE];
12:      T[NE]:=SAVE;
13:      NB:=NB+1;
14:      NE:=NE-1;
15:    UNTIL NB>=NE;
16:  END (*REVERSE*);
17: BEGIN (*MAIN PROGRAM*)
18:  T:='BACKWARDS'; (*TEST WITH ODD NUMBER OF CHARACTERS*)
19:  REVERSE;
20:  WRITELN(T);
21:  REVERSE;
22:  WRITELN(T);
23:  T:='EVENWORD'; (*TEST NOW WITH EVEN NUMBER OF CHARS*)
24:  REVERSE;
25:  WRITELN(T)
26: END.

```

Here is what this program should print out:

```

SDRAWKCAB
BACKWARDS
DROWNVEE

```

See if you can predict what this program would do if the <expression> in Line 15 were changed to:

```
NB=NE
```

If changed in that way, would it matter whether the string being reversed contained an ODD number (1,3,5,7,...) or EVEN number (2,4,6,8,...) of characters??

6a. Analysis

Clearly the main action in this program takes place in the procedure REVERSE. In Lines 7 and 8, we initialize with NB the number of a character in the first half of the string to be reversed (i.e. Near the Beginning), while NE is the number of a character in the second half (Near the End). Lines 10,11 and 12 accomplish the exchange of the two characters pointed to by NE and NB. The exchange is like a simple version of the familiar Chinese puzzle problem in which you rearrange the order of blocks in a square board that looks like a Checkerboard. The space for one block has to be left available so that one block at a time can be moved without disturbing the others. In our case, we have only two items to exchange at one time, and the <variable> SAVE serves as a temporary location to which the first character can be moved. If we had used the following sequence:

```

T[NE]:=T[NB];
T[NB]:=T[NE];

```

the result would be that BOTH locations would end up with the same value - the value that T[NB] had before the sequence started.

Before continuing to the next loop, Lines 13 and 14 change the values of NB and NE, moving each one so that it points to a character one-closer to the middle of the string to be reversed. The repetition ends, for a string of ODD length, when NB equals NE, since both will then be pointing at the middle character of the string which does not need to be exchanged with itself. For a string with an EVEN number of characters, the last loop will end with NB greater by 1 than NE. If the looping were to continue from that point, the characters would be again reversed and end up back where they started.

The statements of the main program in this case consist of calls to REVERSE under several conditions, and WRITELN statements to prove what has happened.

6b. Comment on Programming Style

This program provides us with an opportunity to comment on an issue of some importance regarding your programming style. Notice that the <variable>s NB,NE and SAVE are used only inside the procedure REVERSE. In the sample program illustrated we have declared these variables to be LOCAL to the procedure. The program, being a simple one, would have worked equally well had these variables been declared as GLOBAL and hence usable throughout the program. Doing that is a dangerous practice. If the program is made considerably larger, you may eventually come to the point where you again wish to use NB, NE or SAVE as identifiers for some other context. When writing the program you may only be thinking at one time about one of these contexts. If you forget that the same GLOBAL variable is also used elsewhere (and forgetting turns out to be all too easy), then one part of the program can do

entirely unexpected things (called "side-effects") to another.

One of the basic aspects of Structured Programming intended to reduce programming errors is the idea of reducing the amount of COMMUNICATION needed between distinct parts of a program. In the case illustrated here, we can prevent communication of the values of NB, NE and SAVE either in-to or out-of the procedure REVERSE by declaring those <variable>s to be LOCAL to the procedure. Of course it is necessary to communicate the effect of REVERSE to the main program, via the TEXT <variable> T, in order that the program can do its work. You can see parallels between this programming concept, and communications among groups of people in everyday life. Communication of some information is essential, but sometimes too much communication can turn out to be troublesome. Side Effects in a computer program are like RUMORS in everyday life.

Like most other good ideas, this idea of reducing communication among program modules does lead to problems in some situations. When working with large programs, questions of program running time or the amount of memory used can become paramount. Sometimes when this happens, it turns out to be more efficient to use <variable>s that are declared to be GLOBAL, yet are intended only for use inside certain procedures. In PASCAL, these questions might arise because of special characteristics of the model of computer being used. In other programming languages the same might also be true, but also the design of the language might raise efficiency questions of this kind. In this course you will not generally be working with programs large enough to raise serious efficiency questions. Therefore you should try to declare <variable>s LOCAL to a procedure whenever possible so as to avoid Side Effects. As you progress to larger programs, it often will be best to use LOCAL variables whenever possible during debugging stages, even if you expect efficiency to become a problem when the program is used later for serious computations. After the program has been debugged, you could then change the declarations to make them GLOBAL, while taking care not to cause side-effects as you do so.

7. The FOR Statement - Control of a Definite Number of Repetitions

Quite often in designing a program, you need to have a simple way to do both of the following:

- 1) Cause a <statement> to be repeated a definite number of times.
- 2) Cause some INTEGER <variable> to increase (or decrease) by 1 on each repetition.

For example, you might wish to have the variable K take all of the following values in a uniform progression:

1,2,3,4,5,6,7,8,9,10

A frequent use in handling TEXT variables might be to check whether each character in a TEXT variable satisfied some condition. One application would be to count the total number of vowels ('a', 'e', 'i', 'o' or 'u') in

a line of text. In such a case, you would like to have the CONTROL variable K take on values equal to all of the possible position numbers of the TEXT variable from 1 up to L (if L were previously set by L:=LENGTH(T)). You already know how to control the repetition, and K, using either a WHILE or a REPEAT statement. However the FOR statement makes it easier to handle situations like this.

In this section, we present two small sample programs to show how the FOR statement can be used for these purposes. Figure 4.4 presents the syntax of the FOR statement in a form more explicitly related to what it does. Figure 4.5 shows the FOR statement in flow chart form. (IF you already have some familiarity with the ALGOL or PL/1 programming languages, it would be best to read Section 4.C.3 of Jensen & Wirth carefully. PASCAL differs from these languages in that the <limit-value> is evaluated once at the beginning of the FOR statement, and changes within the controlled <statement> will have no effect on the <limit-value>.)

7a. Sample Program FOR1

```

1: PROGRAM FOR1;
2:   VAR T,W: TEXT;
3:     N: INTEGER;
4: BEGIN
5:   W:='HEAP*';
6:   FOR N:=1 TO 6 DO
7:     BEGIN
8:       T:=CONCAT(T,W);
9:       WRITELN(T);
10:    END
11: END.
```

Here is the output that this program should produce:

```

HEAP*
HEAP*HEAP*
HEAP*HEAP*HEAP*
HEAP*HEAP*HEAP*HEAP*
HEAP*HEAP*HEAP*HEAP*HEAP*
HEAP*HEAP*HEAP*HEAP*HEAP*HEAP*
```

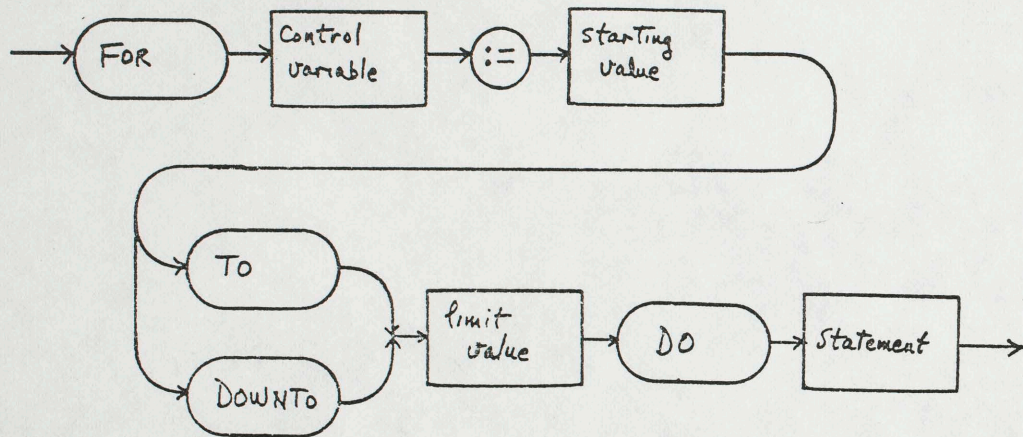
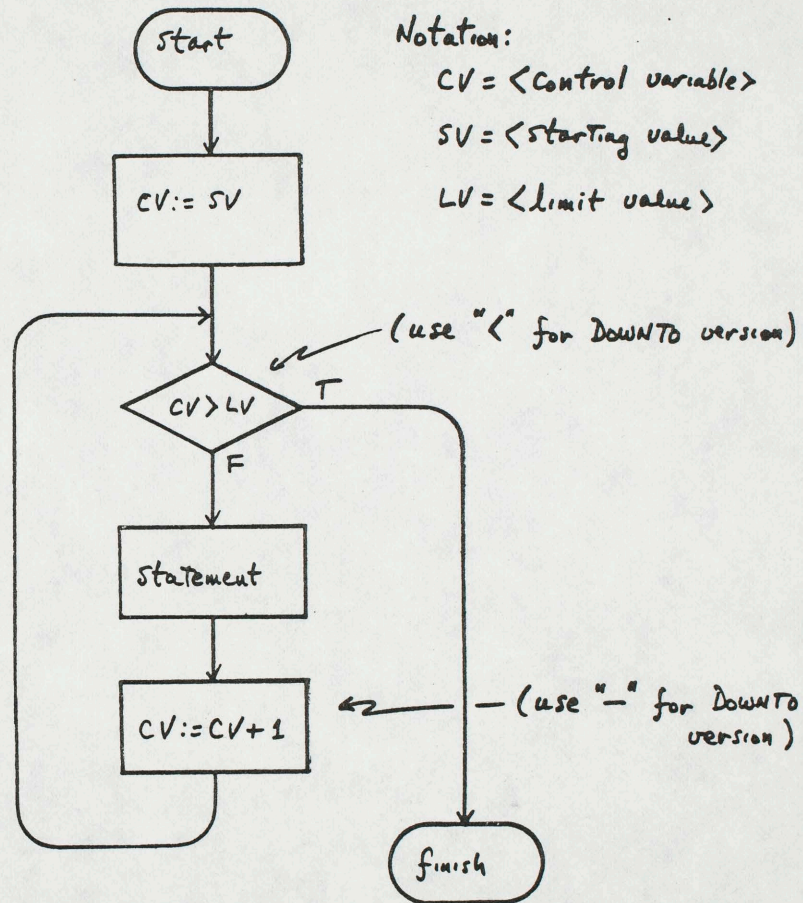



Figure 4.4 Explicit Syntax of FOR Statement



FOR CV := SV TO LV DO <statement>

Figure 4.5 FOR Statement in Flow Chart form

7b. Sample Program FOR2

```

1: PROGRAM FOR2;
2:   VAR T: TEXT;
3:     K,N: INTEGER;
4: BEGIN
5:   T:='DIAGONAL';
6:   N:=LENGTH(T);
7:   FOR K:=N DOWNTO 1 DO WRITELN(' ':K,T[K])
8: END.

```

Here is the output that this program should produce:

```

      L
     A
    N
   O
  G
 A
I
D

```

7c. Analysis

In addition to the FOR statement, the program FOR2 introduces one other new programming construct that you have not seen before in this Study Guide. In Line 7 of FOR2, the first list item of the WRITELN statement, i.e.:

```
' ':N
```

signifies that the number of blank characters to be written should be equal to the value of N. When you see "[:expression]" in a WRITE or WRITELN statement, then the total width of whatever is to be written-out will be <expression> characters. In some cases, the item to be written may not fill up that many characters. The result will be that the WRITE statement automatically fills the unused spaces with blank-spaces ON THE LEFT. So Line 7 of FOR2 could also be written as:

```
FOR K:=N DOWNTO 1 DO WRITELN(T[K]:K+1)
```

to yield the same result as given in section 7b.

8. Introducing the BOOLEAN <variable>

You have seen how to use a Boolean <expression> for the purpose of controlling an IF, WHILE or REPEAT statement. In all three cases, the value of the Boolean <expression> is either TRUE or FALSE. Sometimes it proves to be convenient to save the value of a Boolean <expression> at the time it is evaluated, for later use - frequently to control an IF, WHILE or REPEAT statement. This is the reason for having BOOLEAN <variable>s in PASCAL.

The declaration of a BOOLEAN <variable> follows a form very much like what we have been using to declare <variable>s of the TYPES TEXT, INTEGER, and CHAR. For example:

```
VAR BOOL,BEXP,B: BOOLEAN;
```

You can set the value of a BOOLEAN <variable> to be equal to the value of a Boolean <expression>. Assuming that CH is of TYPE CHAR, I1,I2 are of TYPE INTEGER, and T is of TYPE TEXT, here are some examples:

```
BOOL:=CH=';'; (*BOOL IS MADE TRUE IF CH EQUALS A SEMICOLON*)
```

```
BEXP:=(I1 >= I2) (*BEXP SET TO TRUE IF I1 GREATER OR EQUAL TO I2*)
```

```
B:=(LENGTH(T)>I1) (*B SET TRUE IF T IS LONGER THAN I1 CHARACTERS*)
```

In the examples shown, the use of parentheses '(' and ')' to ENCLOSE the Boolean <expression>s is optional. We are about to show examples in which two or more Boolean <expression>s can be combined to produce a single TRUE/FALSE result. In such cases, the parentheses are required by the syntax of PASCAL (but often not required in some other programming languages). As a rule of thumb for Boolean <expression>s: "If in doubt, use parentheses". They will do no harm, and may save you some confusion.

Here are examples of Boolean <expression>s combining the values of other Boolean <expression>s:

```
UPPERDIV:=(YEAR>2) AND (YEAR<=4)
```

```
LOWERDIV:=(YEAR=1) OR (YEAR=2)
```

```
UNDERGRAD:=UPPERDIV OR LOWERDIV
```

```
UNDERGRAD:=UPPERDIV OR (YEAR=1) OR (YEAR=2)
```

```
UNDERGRAD:=( (YEAR>2) AND (YEAR<=4) ) OR LOWERDIV
```

In this example, UPPERDIV, LOWERDIV and UNDERGRAD are BOOLEAN <variable>s, while YEAR is an INTEGER <variable>. The last three assignment statements all set UNDERGRAD to the same value, assuming that the first two statements had first been executed.

Figure 4.6 is an abbreviated Syntax Diagram for <expression> to cover cases that can evaluate to a Boolean result. Compare this diagram with the syntax diagrams for <expression> on page 117 of Jensen & Wirth. Their version provides a good reference for many types of <expression> in a small space, but it is confusing to separate the portions of this syntax that are legal for specific types of <variable>.

8a. Sample Program BOOLDemo

```

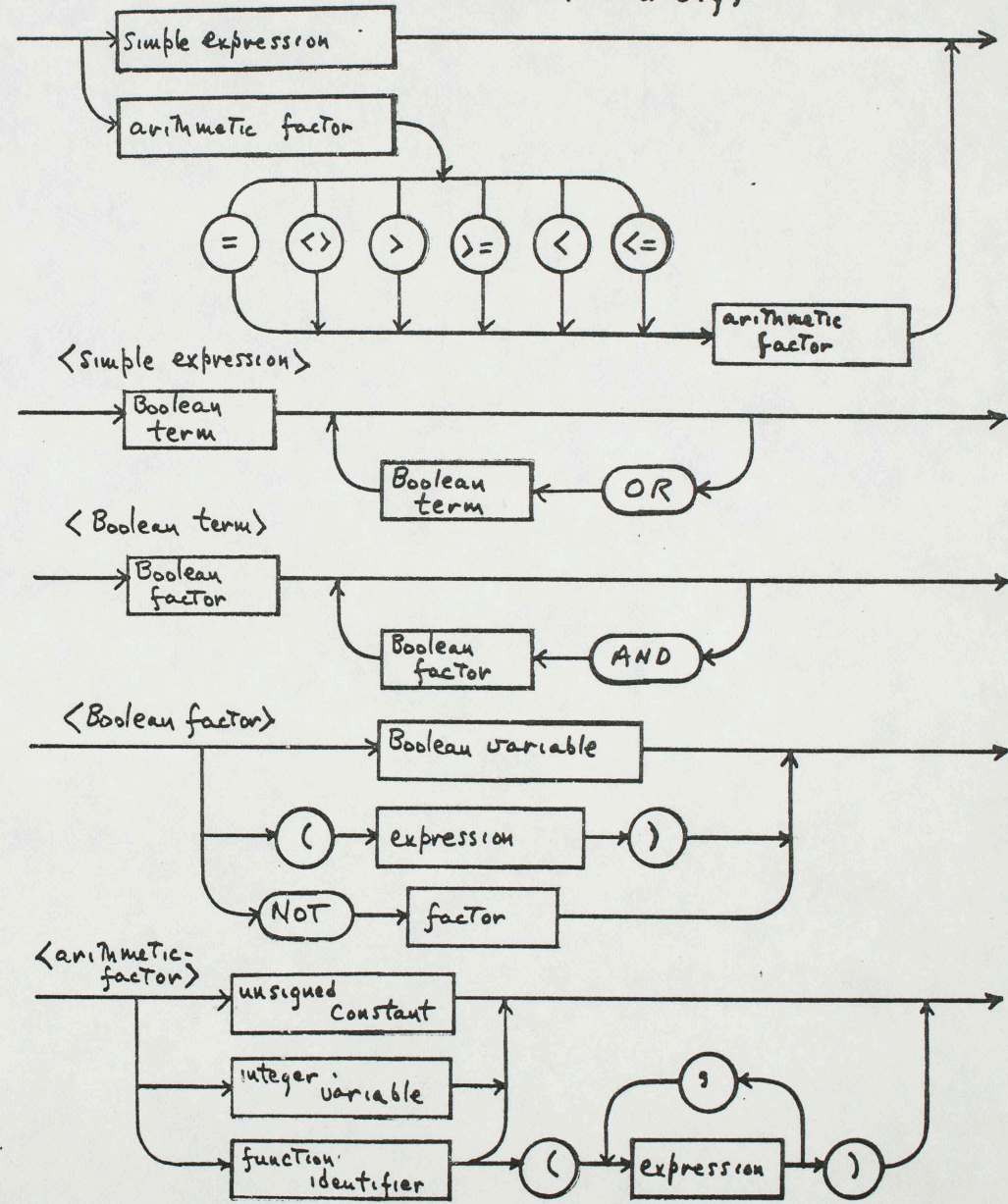
1: PROGRAM BOOLDemo;
2:   VAR CH: CHAR;
3:     NAME,T: TEXT;
4:     BCOMMA: BOOLEAN;
5:     LN,LT,KT: INTEGER;
6: BEGIN
7:   T:='ALICE, BARBARA, CHARLIE, DORIS, ED, FRANK';
8:   KT:=1;
9:   LN:=1;
10:  LT:=LENGTH(T);
11:  REPEAT
12:    WHILE (T[KT] <> ',') AND (T[KT] <> ' ') DO KT:=KT+1;
13:    BCOMMA:=(T[KT]=' ');
14:    NAME:=COPY(T[LN],KT-LN);
15:    WRITELN(NAME);
16:    KT:=KT+1;
17:    LN:=KT;
18:  UNTIL (NOT BCOMMA) OR (KT > LT);
19: END.
    
```

Here is what this program should print out:

```

ALICE
BARBARA
CHARLIE
DORIS
ED
FRANK
    
```

Figure 4.6 Abbreviated Syntax for <expression> (Boolean values only)



8b. Analysis of BOOLDemo

The task performed by this program is similar to one of the common tasks of a compiler (translator for a programming language) or of a data input program. In this case the "data" is the series of people identifiers in line 7. To simulate a commonly encountered situation, the last few characters of this line of data are all blank spaces. Otherwise, the identifiers are separated from each other by commas. The task of the program is to scan the input line, extracting each identifier in the sequence separately so that it may be worked on by some other part of the program. In this illustration, all the program needs to do is to print each identifier on a separate line.

The tasks performed within the REPEAT loop are as follows:

- 1) In line 12, successive characters are examined until a separator character, either comma ',', or space ' ', is found.
- 2) In line 13, the BOOLEAN BCOMMA is set TRUE if the scan in the previous statement was stopped by finding a comma, otherwise it is set FALSE.
- 3) In line 14 the COPY function is used to extract the latest identifier, which is KT-LN characters long (i.e. the value KT minus the value of LN). The NAME string thus separated from the data is printed out.
- 4) In lines 16 and 17, both KT and LN are pointed at the first character of the next identifier (if any).

9. Homework

- 9a. Write and debug a program to perform the same actions as the program CHEW of Unit 3, using a WHILE statement rather than recursive procedure calls to achieve repetition.
- 9b. Write and debug a program to perform the same actions as CHOMP, using a REPEAT statement rather than recursion.
- 9c. Write and test a program that prints out a geometric pattern like the following, using FOR statements.

```

-----
I*                               *I
I *                             * I
I *                             * I
I * *                           * I
I * * *                         * I
I * * * *                       * I
I * * * * *                     * I
I * * * * * *                   * I
I * * * * * * *                 * I
I * * * * * * * *               * I
I * * * * * * * * *             * I
I * * * * * * * * * *           * I
I * * * * * * * * * * *         * I
I * * * * * * * * * * * *       * I
I * * * * * * * * * * * * *     * I
I * * * * * * * * * * * * * *   * I
I * * * * * * * * * * * * * * * *
-----

```

HINT: Use statements of the form WRITE('*');
Or use the form T[N]:='*'; after filling
text variable T with blanks.

FOR PDP11 Screen, you may turn this on
its side



and use just 12 lines for height.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

Rewrite the programs WHILE1 and WHILE2 (reprinted below) to produce the same effect using REPEAT statements instead of WHILE to control looping

```

PROGRAM WHILE1;
  VAR T: TEXT;
BEGIN
  T:='GOING AWAY';
  WRITELN(T);
  WHILE LENGTH(T) > 0 DO
  BEGIN
    DELETE(T[1],1);
    WRITELN(T)
  END (*WHILE*)
END.

```

REPEAT

UNTIL LENGTH(T) = 0

```

PROGRAM WHILE2;
  VAR T: TEXT; N, L: INTEGER;
BEGIN
  T:='DASHITALL';
  N:=1;
  L:=LENGTH(T);
  WHILE N < L DO
  BEGIN
    WRITE(T[N], '-');
    N:=N+1
  END;
  WRITELN(T[L])
END.

```

REPEAT

UNTIL N >= L;

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME, FIRST

Rewrite the programs REPEAT1 and REPEAT2 (reprinted below) to produce the same effect using a WHILE statement in place of REPEAT in each program to control looping.

```
PROGRAM REPEAT1;
  VAR T,TG: TEXT;
      L,N: INTEGER;
BEGIN
  T:='GROWING BIGGER';
  N:=1;
  L:=LENGTH(T);
  REPEAT
    TG:=COPY(T [1],N);
    WRITELN(TG);
    N:=N+1
  UNTIL N > L
END.
```

WHILE $N \leq L$ DO
 BEGIN
 END

```
PROGRAM REPEAT2;
  VAR T: TEXT;
      PROCEDURE REVERSE;
        VAR NB,NE: INTEGER;
            SAVE: CHAR;
      BEGIN (*REVERSE*)
        NB:=1;
        NE:=LENGTH(T);
        REPEAT
          SAVE:=T [NE];
          T [NE] :=T [NB];
          T [NB] :=SAVE;
          NB:=NB+1;
          NE:=NE-1
        UNTIL NB >= NE;
      END (*REVERSE*);
  BEGIN (*MAIN PROGRAM*)
    T:='BACKWARDS';
    REVERSE;
    WRITELN(T);
    REVERSE;
    WRITELN(T);
    T:='EVENWORD';
    REVERSE;
    WRITELN(T)
  END.
```

WHILE $NB < NE$ DO
 BEGIN
 END

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

LAST NAME,

FIRST

Rewrite the program FOR1 (reprinted below) to produce the same result using a WHILE statement in place of FOR

```
PROGRAM FOR1;
```

```
  VAR T,W: TEXT;
```

```
  N: INTEGER;
```

```
  BEGIN
```

```
    T := ' ';
```

```
    W := 'HEAP*';
```

```
    FOR N:=1 TO 6 DO
```

```
      BEGIN
```

```
        T:=CONCAT(T,W);
```

```
        WRITELN(T)
```

```
      END
```

```
  END.
```

```
N := 1;
```

```
WHILE N <= 6 DO
```

```
  BEGIN
```

```
    T := CONCAT(T,W);
```

```
    WRITELN(T);
```

```
    N := N + 1
```

```
  END
```


to Tom Lee, Chairman

McColm June 10, 1977

From Pauline Oliveira, Chairman Electronics Committee
Members present: Ritscher, Francois, Jones, ~~Thomas~~ (for John MacColm), Guest: Rob Gross.
Subject: Job Description for technician trainee, Recording
Dubbing, Archiving and other matters

Job Description technician trainee

Technician trainee shall maintain, diagnose and repair all ^{Dept.} electronic equipment and certain CME electronic equipment. Limited fabrication and construction projects will be assigned. ~~including~~ (circuits, cables and etc.) trainee will be responsible for installation of equipment and other limited duties as assigned by the Senior technician. 80% of trainee-time will be devoted to the Music Department under the supervision of the Senior technician. 20% of the trainee's time will be spent at CME under the supervision of the CME Studio Head.

xx

Summer studio use ~~was~~ of B108 ^{+ B106} was reviewed. Faculty Sponsorship was deleted from the policy as stated in the report of May 9, 1977.

The Committee concurs with the Space Committee that Ritscher will move into B206 July 1.

xx

The Committee recommends that undergraduates take 105 ABC before petitioning for 200.

xx

All concerts must be recorded. George Ritscher will supervise recording of concerts. Ritscher will be responsible for recording those concerts deemed important by the Concert Committee. Other concerts will be recorded by assistants. One assistant to be paid for by workstudy the other assistant ^{to be} unpaid 199. Both assistants to be selected by Ritscher. Dubbing and archiving will also be handled by Ritscher and assistants. A policy will be developed.

xxx

The committee will review the Electronic Music
and Recording Curriculum beginning in the
Fall.

x x

In order to mitigate conflicts,
the Committee requests that all decisions
concerning electronics, recording, dubbing,
archiving, space needs for electronics,
technical help, be made on the basis
of the committees deliberations.

Sept 6 1977

To: Leonard Newmark, Chairman

From Paulini Olvicio, Chairman Electronics Committee

Subject Recording Policy, Recording Class
Access to 8104 Faculty Studio, Repair Priorities.

Members Present Balzano, Erickson, Jones Ritscher,
Rittenbach

Guest- Lytle

Priority
\$1500 for system and office space for Rittenbach
Gross, Liebig for 105 abc 104. and 200 205
To meet students evaluate project.
Quality of ~~the~~ space.

June 10, 1977

To the Electronics Committee:

This is to confirm the meeting of the Electronics Committee on
Friday, June 10 at 12:00 noon.

Kyle Thomas will be serving as the undergraduate representative
in place of John McColm.

Cherie

Agenda

Sept. 6, 1977

- 1 Recording Policy - Dubbing, Archiving
Rittenbach Letter -
- 2 10A - what it is - where it is
taught
- 3 Access to B 10A Faculty Studio
- 4 Priorities for repair

Erickson "in house" concerts
Class concerts

noon concerts not recorded
by Dept.

All concerts sponsored by the Dept.

Special Situation Faculty

When tape recording a necessary part of
them then Dept. technical help could be
requested by students' their committee

what does dept. sponsorship mean?

Record or not

Atomic Cafe - ?

Erickson - Fairness? if composers recorded how about performers doing Mozart?

Middle level - Graduates who are interested to record.

Definition of Dept. Sponsored Concerts

Faculty

Class Related Concerts

Sponsorship includes
Some times as well.

Erickson - Class 1. Recorded and archived
Big public Concerts Archived Recorded

Class 2. Recorded but not archived ^{to be} Tape provided by person requesting recording

Class 3. Recorded by students with student equipment.
not as dept. policy but ^{may be} recorded informally by students with student equipment.

Erickson move we base our recording policy on a plan of
Concerts to be determined as Class 1, ^{concerts} 2, ^{concerts} 3, ^{concerts}

and by Jones -

Motion Passed

Erickson
+ archive all
Record all Dept.

Summar lectures and formal lectures by visitors.

~~Motion Record all lectures that fall into this~~

Motion passed

Erickson - Move we accept Tape copy Policy Passed

Additional copies -

For both students + faculty a charge for multiple dubs -

Motion passed

Faculty members will be allowed a maximum of 2 copies of performances recorded by Dept. (take supplied by ^{parenting requesters} pers) any more copies to be paid for at student rates.

Ritscher's course load would not count against faculty. Therefore 9 courses would be covered by .85 FTE. This appears to be a better student/faculty ratio than our average.

II Electronics Committee

All would attend

III Studio Development

If the remainder of the FTE, approximately .25 is not used to pay for specialist service from Gross, Liebig and Rittenbach, then some other source is needed. (This would leave part of the FTE free for the private lesson program)

Suggestions: 1.) Boost the level of the FTE to Assistant Prof. Step 3. 2.) Request I & R Funding equivalent to .25 FTE 3.) Find a departmental Grant. 4.) Request Specialist funding.

Studio Development cannot be neglected. Much of the equipment is old, the set-ups are not convenient, or efficient for the work. More students have to be processed more efficiently and with documentary guidance.

IV Archives

Recording of concerts

Cataloguing

Dubbing

- Work study and Ritscher

Workstudy

Workstudy

Pedagogical use of

In order to make the dept. archive useful and accessible for research & instruction this year

1/4 time work study assistant (Terry Setzer) 10 hrs a week

\$500 Tape costs (Dubs for instruction) estimate

If this proves ^{future} useful then we should consider computer retrieval and cross referencing of the archive.

\$500 2 weeks of programmer time
Entry time + Classification

Prof. Archivist →
Cost in several thousand

Special - Recording sessions - Town Dept. sponsored

Complain about the quality of spaces in Mandeville
how to get access to 409 or quarters or ? or
modify.

Endson Motion

All other requests for special recording should be referred to the chair of Electronics Committee with a letter of explanation from the students' advisors. Faculty members should ~~also~~ submit requests for special recording to the Electronics Committee.

Passed -

SB recording ~~staff~~ is informed of time & place of dress rehearsal ^{one week in advance} the
recording will attend. - → by the person in charge of concert

Passed.

Electronics / FTE Proposal

To the Faculty From Oliveros April 26, 1977

NEEDS TO BE COVERED :

<p>I Courses (9 Total)</p> <p>105 A B C Alt.</p> <p>104 A B C (D E F)</p> <p>200 Alt.</p> <p>205 (202)</p> <p>299</p>	<p>Total number of Students 129</p> <p>Total 60</p> <p> 32 (14)</p> <p> 20</p> <p> 11 (11)</p> <p> 6</p>
--	---

II Electronics Committee (weekly meeting)

III Studio Development (Electronic Music and Recording - B108, B104, B124, B202)

A. Organization

B. Design

C. Documentation

1. Technical

2. Users

(not including maintenance. Maintenance is now covered with 100% assistant technicians)

IV Archives

A. Recording of Concerts and Lectures

B. Cataloguing

C. Dubbing

How to do it Proposal :

I Course Coverage						Total Courses	FTE %
	FTE %	Number of Courses					
Oliveros	.10	Supervisor	105 / 205 / 200			.50	
Liebig	.25	1	.50	.25	.25	2	
Grose	.25	105 C	205	299	200		
Rittenbach	.25 +	1	.50	.25	.25	2	
Ritscher (.25)		105 B	205	299	200		
		1	.25			2.25	
		105 A	104 C	200			
		1	104 A	104 B	200	(2.25)	
						9	.85

U.C. S.D. - Recording Policy
Music Dept.

9/6/77

①

I. Concerts

All concerts sponsored by the Music Dept. and held in the area will be recorded upon request of the performer(s) at no charge.

A. The following concerts will automatically be recorded and filed in the Archives (tape to be provided by Department):

1. All Faculty ~~mus~~ concerts
2. Department ensembles (choir, orchestra, jazz band, Opera, etc.) when performing in regularly scheduled departmental events.
3. Thursday Noon Seminars
4. All student concerts required in the course of pursuing a degree

B. All other concerts may be recorded upon performers' request, but there will normally be no archive copies made, except on request of Faculty sponsor.

II. Tape Copies

A. For every concert which is recorded, one personal copy will be made if the performer(s) provide the necessary tape one week in advance. The appropriate request form will be available in the Music Office.

B. Additional copies

2. Faculty members will be allowed ~~a limited number of~~ ^{a maximum of} copies of their performances

recorded by the Department. (Tape to be supplied by Faculty members.) **Additional copies will be charged at regular student rates.**

2. Students wanting additional copies of Departmental performances in which they participated ~~will~~ must provide tape, and pay ~~a~~ fee ~~of~~ **\$4.00/hour of operator's time based on**

III. Recording Sessions & Other Concerts

~~Recording of non-Department-sponsored concerts and special recording sessions such as Full bright tapes, school admission tapes, class project tapes, etc. must be arranged with the recording staff. A recording and editing fee of \$8.00/hour of assistant operators time will be charged. These recordings will be made only as recording staff time allows.~~

For all concerts to be recorded - whether upon performers request or automatically, the recording staff needs a form filled out with the works to be performed and the timings. This should be done at least one week before the performance (longer is better).

Concert Music Recording Request forms are available in the office.

Sep 2

Dear Pauline,

George Patches & I have a conflict that needs to be resolved by you or Dr Newmark. The conflict is that I have been refused access (eg a key) to B206 (containing the recording facilities & now G's office).

I maintain that since I a faculty member teaching the class (104) in recording technology, that I need a facility of high quality to listen to students tapes and to prepare materials for the class which means recording & editing materials myself. I feel that I should not have to use a class room or the grad or undergrad studio for this purpose. B206 is the only available location except for B104 (faculty studio) which I am also denied for the required activities.

George maintains that since it is his office & since it contains a large amount of equipment, that no one but himself should have a key. Furthermore that since 104 was changed from 6 quarter to 1 quarter class, that the class is not teaching recording technology in general (ie broad scope with need to give students exposure to many different types of equipment) but rather only teaches students to use equipment that they can have access to when they finish the course. He maintains that since the Mus. Dept. is not in the business of teaching recording technology, that B206 is for making recordings of concerts & dept. seminars & therefore is under his complete control (since he is in charge of recording) and not available to any faculty.

So I need to know two things

1. What is the nature, scope, and intent of Mus 104. I would also like to know who determines this, the whole faculty? A faculty committee? The Dept. chairman?
2. What space may I use to prepare and audition materials for this class?

Peace

Bruce Patten

RAP/MUSIC

*Pauline: Please note
vis à vis
job description plans*

Staff Salaries Request:

Electronics Technician Trainee (@ 10,944 annual salary). . . . \$8,208 *cg*

We are requesting funding in the amount of \$8,208 for an Electronics Technician Trainee. If funded, the department will transfer \$2,736 in general assistance funds to create a full-time, twelve month position.

The value of the total department electronics inventory will soon reach \$350,000 (with new Groups II and III acquisitions). Our Senior Electronics Technician is our only source for maintenance and repair of this inventory, and we have his services only for 80% time. Due to contractual arrangements with the Rockefeller Foundation regarding the provisions for CME, we are obligated to provide 20% of his time to the Center for Music Experiment. Not only do we have less than 1.0 FTE to handle the level of inventory, our equipment is located in both the Mandeville Center and in the Humanities Library and this frequently causes logistical problems. There is just no way one person can handle the repair and maintenance for the level of electronics inventory we now have.

Two other factors are important. The Senior Electronics Technician must devote a good share of his time to advising faculty and students on technical research projects. He has worked with the Electronics Committee to coordinate purchase of electronics equipment with Groups II and III monies; he has set up control procedures for electronics inventory; he has been actively involved in devising and implementing security measures for the inventory and supervises part-time helpers who issue keys and lock and unlock doors; he has been responsible for faculty and student training sessions in the use of electronics equipment, through seminars and individual instruction.

Def: We are also in great need for technical assistance in the recording studio. This full-time person would also have responsibility for preparing dubs of tapes, assisting in the archiving of all recorded materials, and recording all concerts and presentations. The faculty member who supervises these activities at the present time is terminating his employ on June 30. We need someone on the staff side who can maintain continuity in these activities. The department archives are a very important resource for teaching: many performances here on tape are the only aural record of certain compositions; tapes are reviewed carefully for analysis of performance in class and faculty research projects; students and faculty have access to the tapes for study purposes.

The Department received a start in this direction with an allocation of \$4,100 in general assistance funds in the 1975-76 budget. We have used these funds, and other general assistance funds, to hire a variety of part-time student technical assistants -- Lab Assistants I and II, Recording Technician, Electronics Technician. As our technical inventory grows, it becomes more and more unfeasible to have such a variety of employees brought on (and trained) for each particular need. The continuity of one person's services would be of great advantage to the department. We ask for twelve month's salary since the summer months are a prime time to do thorough maintenance and repairs, and to prepare for the fall training sessions for TA's.

RAP/MUSIC

The balance of funds from the \$4,100 provision will remain in General Assistance for hiring part-time student Laboratory Assistants. We have on-going needs for instrument moving, concert set-ups, minor repairs, instrument repair and construction, key checkout, orchestra rehearsal set-ups, etc. Because there is such a rich variety of activities underway in our space, we have a continual need for part-time help to rearrange instruments and keep class projects running smoothly. Music I has a continuing need for a part-time person to build instruments, keep them in good repair and tune.

We request this position at the title of "Trainee" so that the person can handle a wide scope of activities, and train in as an assistant to our Senior Electronics Technician.

All of our courses are on the "laboratory" model--all require a turntable, tape system, speakers, piano, chalkboards with ledger lines, etc. This means that the department has laboratory expenses for servicing both the electronics involved and for upkeep of the musical instruments. The commitment of a full-time staff person to oversee a large part of these needs is essential to maintaining our commitment to the technical emphasis in this department.

We will pursue discussion with the Visual Arts Department and Mandeville Center staff regarding future set-up of an electronics/video workshop to service needs for the entire Mandeville Center, with a central service area. In regard to long term staffing needs, we feel that with the addition of this additional technical person, our staffing should be adequate to handle department needs.

May 11, 1977

TO THE FACULTY:

We are compiling a list of last-minute possibilities for equipment purchase on this year's funds. If you wish to add something to the list, or have comments on priorities or specific items, please leave a note in my box at your earliest convenience. This list is not in priority order. Items which cannot be covered now will be considered for next year's budget.

Secondly, please review your teaching assignments for next year and try to get an estimate of the kinds and amount of course support you will need for next year: guest artists/lecturers, classroom texts, movies-audio visual, music, tape, small equipment, accompanists, etc.

I would like to meet with each of you before the end of the academic year to discuss these needs so that the budget can be put together earlier this year. Any general comments on general improvements for the department--facilities, student and faculty well-being, etc.--will be greatly appreciated.

- Scalatron cart (@ \$165) to facilitate moving this very expensive and delicate instrument.
- Volume II, Harvard Anthology of Music (30 copies) for classroom use only
- piccolo @ ca. \$1,000
- contrabassoon @ ca. \$1,600
- additional lockers for B-160 (3 contrabasses are parked in the office each day for lack of storage in existing lockers)
- acoustic insulation of classrooms and faculty offices (purchase of material now, installation over the summer)
- carpeting for B-210 to create a performance area (present carpet to be cleaned and dyed? for use of Music I in B-150)
- acoustical shell for B-210 (and shell outside?) for chamber music concerts
- construct a wooden enclosure for the new grand piano (Grotian Steinweg) B-210
- modifications for B-206 to create practice room, workshop, offices? ?
- shelving for faculty offices
- renovation and construction of Music I instruments
- purchase of additional tape units for Music I
- Walter Wood amplifier and cabinet
- baffles and speaker stands for graduate EMS B-108
- display case outside recital hall for advertising concert events
- display case in department offices for faculty accomplishments
- tables and chairs for student study in B-160

SPECIAL NOTE: We have just been allocated a \$4500 advance on next year's equipment funds for purchase of a Zuckerman French double harpsichord (highly recommended by Elizabeth Hamilton). This should be available in the Fall if delivered from the factory.

Cheryl

cc: Staff

April 19, 1977

Dear Tom,

Could you for the record clarify the following situation:

- A. Are there faculty "performance electronics present"?
- B. Are they the ones in the following list?

For the record: The first year I returned, I was made chairman of the performance committee. As a faculty member we were apprised of the funding of a faculty Electronics Studio (\$70-80,000??). Although the performance committee supported the studio concept, we did enter objections to "studio electronics" as a sole model for faculty research (I had just come out of a similar situation at CME and I was particularly aware of the difficulties). Upon hearing my objections you asked the committee to develop a list of performance electronics for faculty research - roughly \$10,000 was then taken from the original "studio" pie.

*Group II + III
\$7,000 was
approved.*

We developed a list called "Performance Electronics" (for faculty research purposes !! -- R of I & R). As you know there has been difficulties about this from George and I am sure interested students and your office. I personally could care less about this - but it is essential that these things be set right. There was no doubt in our minds of the origin of the funds, their function as to faculty research, etc. Memories are clear on the issue and origin.

*Lab fee for summer use -
Proposal for use
during summer -
David Jones organize use -*

*Stems may have to be
called back - for use -*

John Silber

ask Brent Rodgers for list - documentations

cc: G. Ritscher
P. Oliveros

*How to reconfigure studios
what is general usage?*

*need facility + Studio
for live electronics
for performance -*

Log

*Facility with
set of policies -*

Portable performance electronics

*II + III
for Mandivilla
not HL*

Facility for Perf. Electronics

*"Performance Electronics
should exist in some form."*

*HL 431
Maintenance problem if at
HL*

PERFORMANCE ELECTRONICS

Quantity	Item	Unit Price	Total Price
10	Small audio <u>transducers</u> (speaker minus coil) to drive resonators (Encinitas)	25 est.	250
4	Base portable "instrument" <u>speakers</u>	700 (2)	1,400
2	Crown D-150 Stero <u>Amps</u>	300	600
1	Portable <u>mixer</u> , 8 in, 4 out (Shure)	,500	1,500
3	Morley boost <u>Pedal</u> (WaWa+)	119	357
1	Tel Ray <u>Echo Unit</u> (list 195)	79	79
4	Contact <u>Mikes-piano</u>	135 (60% +)	640
6	Contact <u>Mikes-winds</u>	40 (60% +)	240
6	Contact <u>Mikes-strings</u>	40 (60% +)	240
4	<u>Pre Amps</u>	42 (60% +)	168
MISC.	<u>Cable box and cable</u> (instrument pickups to amps and speakers)		400
12	Tuned <u>filters</u> (electronic), <u>mikes</u> and <u>pre-amps</u>	125	1,500
12	Helmholtz <u>resonators</u> , <u>limiter</u> , and <u>amps</u>	80 est.	1,000
10	Assorted reed mouthpieces plus ligatures (acoustic accessories)	12	120
10	Adaptor bits for mouthpieces (acoustic accessories)	5	50

PERFORMANCE ELECTRONICS, cont'd.

Quantity	Item	Unit Price	Total Price
2	Four channel mixer <u>pre-amp</u> for instrument pick-ups	125 (60% +)	250
2	Four in, one out (Shure) <u>Mixer</u>	200	400
5 or 6	<u>Air mikes</u> (high quality) and <u>stands</u>	200 30	1,240
	Fabrication of triggering access system from instruments (4) to computer and/or synthesizer (electronic and mechanical)		CME development or present system Buchla?

TOTAL 10,440

approved

1800

December 15, 1976

TO: Thomas Nee, Chairman

FROM: Pauline Oliveros
Chairman Electronics Committee

SUBJECT: Replacement of Stolen HL Editing Equipment

Replace tape recorders with 13* Sony 377 quarter tract stereo recorders.

Replace mixers with 12 Sonic Research Associates 4 in, 2 out mixers.

Replace headsets with 12 headsets.

* The 13th machine to be added to the multi-purpose roll around dubbing equipment.

Budget \$5,000	\$3,250
13 sony 377 at \$250 each	660
12 sonic research mixers \$55 each	240
8 headsets \$30 each	240
	<u>\$4,390</u>
Contingency	610
	<u>\$5,000</u>

Recommendations:

- I. Make HL secure.
- II. Consider cassettes for use in Music 1 and 11 and other courses where appropriate.
- III. Provide for routine replacement of two editing stations per year at \$4000- \$5000 each.

cc: Cheryl Montano
George Ritscher
Pat Olson
Cherie Gallager, committee files

April 15, 1977

PROFESSOR THOMAS NEE
Chairman, Department of Music

SUBJECT: Space Committee Requests and Recommendations for Groups
II and III Monies
Members Present at April 12th Meeting: Francois, Ritscher,
McColm and Jones

In the event that more Group II and III money can be made available,
the committee recommends the following:

B108	1 $\frac{1}{4}$ inch 4 channel tape machine or 1 $\frac{1}{4}$ inch 2 channel tape machine (to be determined by users' vote)	\$ 5,000
B204	2 quality Neumann mics	1,300
B122	(undergraduate studio) Update the studio - replace all modules or provide filters 1 tape machine 15 ips The present system is ready to fall apart	20,000 700 3,000

Recommendations:

- I B108 Provide Speaker Stands, Baffles and Dispenser for
splicing tape.
Consider if mixing facilities are necessary besides
the new Buchla system.
- II The committee concurs with Burt Turetzky's request
that the performance committee purchase 2 Barcus
Berry Transducers for strings, a Walter Woods Amp
and another to be chosen in consultation with
George Ritscher.

Pauline Oliveros

Chairman, Electronics Committee

November 30, 1976

To: Thomas Nee, Chairman
From: Pauline Oliveros, Chairman
Electronics Committee

Subject: Priorities Groups II and III equipment purchases, recommendations and questions concerning budgetary statement issued to the faculty and staff dated October 27, 1976.

According to the Operating Budget issued October 1976 the Group II and III "Available Balance" was \$10,727. On Monday November 22, 1976 upon inquiring of Pat Olson, the available balance was \$14,936.18. The Committee would like clarification of this discrepancy.

According to our figures the following amounts of money remain as our allocation in the following areas:

(Figures approximate within \$5.00)

B108 Grad Electronic Studio	\$2230.00
B104 Faculty tape Composition	\$1410.00
Performance Electronics	\$475.00
Faculty Playback Systems	\$500.00

Of the \$2,000, Equipment and Facilities (-4), Ritscher was "allocated" \$1200. The committee would like to remind the chairman that former technician, Lew Prince was promised \$2000 per year, Equipment (-4), in order to replace classroom equipment. Where is the other \$800? And why is the category now called equipment and facilities?

Furthermore, due to inflation and in order to maintain the status quo, the committee sees a necessary increase of this fund to at least \$4000. For instance, one complete playback system costs at least \$2000 at today's prices.

On the next page the following statement should be corrected "equipment and mo ies (-4) are for the purchase of inventoriable items over \$200 in value". Please insert the word "electronics" between inventoriable and items.

Under the title Technical Support, the following corrections: Electronics (Ritscher): tools, parts, supplies, Moog and Buchla items, test equipment, replacement items-audio equipment UNDER \$200. (Audio equipment items over \$200 belong to Equipment -4)

Under the title Faculty Research : Archive Tape and supplies \$1,200 belongs under INSTRUCTION not research.

- continued -

Thomas Nee
November 30, 1976
Page two

Priorities for 1976-77 by space and original Electronics Committee Allocation:

B108	two little dipper filters	\$1100.00
	two uher 4200 portable recorders	\$1350.00
	(the \$200 overage here will be snatched from another pot)	

Faculty Playback Systems

Oliveros office	\$2000.00
Portable Roll Around Multipurpose System Including Cassette	\$3000.00

Replacement Audio Equipment (Equipment -4)

System for technician room	\$500.00
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Interconnection of classrooms B104, B108, B150, B152, courtyard and three practice rooms, B202, B206 B210 and Mandeville lighting booth	\$3000
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(NOTE: this has not been completed. We recommend that the job be completed by Pacific Recorders and not by amateurs. Also the money should come from some other fund, which should have been budgeted for the completion of the building, not groups II and III)

B206	Microphones for high quality recording	\$750
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Recommendations

- I All purchases of electronics over \$10.00 must go through the Electronics Committee for the following reasons:
 - a. Discounts are available. A lot of money has been wasted by individuals who do not know how and where to buy.
 - b. The technician should be consulted on the practicability of maintenance.
 - c. The committee wishes to maintain consistency for the overall program since equipment is used communally.
- II An instrument Committee, aside from the Performance Committee should be appointed to coordinate purchases
- III According to Harold Cohen, Visual Arts Department, \$250,000 in equipment replacement money came down from Berkeley. The committee for dispersal of these funds was headed by Rotenberg. Our Department and Visual Arts each received 1% of this money. According to Cohen, Rotenberg said that neither Department asked for such funds. That is why we received so little.

Thomas Nee
November 30, 1976
Page three

The committee wishes the chairman to investigate this matter. The committee urges immediate action on these matters so that second quarter may begin with items purchased and installed.

February 10, 1977

JOHN SILBER
KIVA Ensemble

Please prepare a list of all of the electronic equipment being used in HL for the KIVA ensemble, and forward it to Pauline, as head of the Electronics Committee. Please prepare a similar list of all the instruments being used for Bert, as head of the Instruments/Performance Committee. We are quite concerned that we are prepared in case of another theft, and are also bringing all inventory records up to date.

Tom
T. Nee

cc: Pauline Oliveros
Pat Olson/inventory
Bert Turetzky ✓

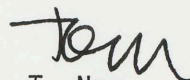
February 10, 1977

PAULINE OLIVEROS

RE: Music 202 allocation \$700

As you know, we did not have a line item in our budget for the 1976-77 year for your Music 202 class. The general provision we made for "all other curriculum expenses" (\$2,000) was overdrawn by \$476 as of January 11. In this category we tried to set aside funds for general expenses and unanticipated requests.

We will allow \$700 for your class, to be taken out of our administrative contingency funds. This is quite a hefty amount, though, and we would appreciate your efforts to keep under this amount.


T. Nee

cc: Pat Olson
George Ritscher

February 10, 1977

TO THE FACULTY

SUBJECT: Groups II and III Report

At the start of the '75-'76 school year, the following commitments were made against the available balance of Groups II and III monies:

Electronics:	B-104 Faculty EMS	\$44,544
	B-108 Graduate EMS (Buchla)	16,000
	Faculty playback systems	4,000
	Performance/portable electronics	7,800
		\$72,344

Instruments:	Vibraphone	\$ 1,776
	Harpsichord	3,000
	Electric piano	1,250
	Faculty piano (Farrell)	1,000
	Xylophone	1,600
	Glockenspiel	1,200
		\$ 9,826

Specific purchase instructions have been made by the electronics and performance committees, and have not necessarily stayed within the above recommendations.

The present status and available balances are as follows:

Electronics

Allocation		\$72,344
Buchla system	13,037.58	
	308.45	
	52.27	
Electronic sound modification	1,331.78	
Portable amp	1,163.23	
Miscellaneous/Music 1	262.51	
2 spectrum equalizers	5,962.41	
4 speaker stands/turntable stand	566.04	
B-104 EMS	40,033.52	
*Little dipper	1,195.68	
*Recorders/turntable/speakers	1,359.98	
*Tape recorders	1,513.04	
*Stereo amplifiers/carrying case	715.74	
Measuring equipment	2,305.15	
	69,807.28	
AVAILABLE BALANCE 2/10/77		\$2,536.72

* PO amount

Groups II and III Report

Instruments:

Allocation		\$9,826.00	
Piano/Farrell	1,076.68		
Electric piano	1,226.42		
Vibraphone	1,669.50		
Xylophone/orchestra bells	575.00		
Latin percussion	505.82		
Temple blocks/custom charges	113.60		
Credit from Frank's Drum Shop	(113.41)		
	<u>5,054.61</u>	(5,054.61)	
AVAILABLE BALANCE 2/10/77			<u>\$4,773.39</u>

NOTE: The available balance plus research committee funds, would be adequate to purchase a celeste and electronic organ.

The status of joint purchase with Mandeville Center of a concert harpsichord has never been established. Presumably Alan Johnson was investigating the best purchase with Elizabeth Hamilton.

All funds must be committed by June 30, 1977.

Cheryl Montano

cc: Pat Olson

✓ Pauline: re: additional technical time

This year George asked for additional responsibilities for overseeing keys, and building security . This obviously represents a drain on his time, which could otherwise be devoted exclusively to electronics.

He has been provided with the opportunity ^(funding) for a half time technical assistant.

Howard Weber was hired, and funds are reserved for him to work half-time. Whether or not he actually works half time, or at optimal productivity, is up to George's supervision. In addition, we have hired Terry Setter to handle miscellaneous work (making tapes for Music 11, recording assistance) and to free up George's

time at CME (6 hours per week). Kenneth Pang is also on the payroll for miscellaneous assistance. (keys, and could give other support to George)

I am not in disagreement with any of this, except that if we are to successfully request ~~for~~ additional support, we will first have to show why what we have is

inadequate. With the freeing of the CME time, we have actually .95 of George plus .50⁺ of the assistance of an Electronics Technician I plus various hours

of Terry at Recording Specialist title.

Whether this combination functions efficiently is another question which we discuss, if you'd like.

Cheryl 2/8/77

December 15, 1976

TO: Thomas Nee, Chairman

FROM: Pauline Oliveros
Chairman Electronics Committee

SUBJECT: Recommendation IV, Letter dated November 30, 1976

Recommendation IV was inadvertently omitted by the typist from the November 30, 1976 letter on Priorities Group II and III. It was stated as follows:

The committee recommends that Oliveros receive \$1,000 in support of her course, Music 202, "The Specialized Use of Electronics During Performance." The money is for microphones of various types for comparative studies, cables, connectors and especially fabricated amplifiers as appropriate.

PO/mw

UNIVERSITY OF CALIFORNIA, SAN DIEGO

To.....

Date..... Time..... A.M.
P.M.

WHILE YOU WERE OUT

Dr.
Mr.
Ms.

From.....

- Telephoned Will phone again Please phone
- Came to see you Will come again Rush

MESSAGE

Pauline - I corrected
the original copy &
gave it to Lou

Mary

Phone party at.....

Taken by.....

November 30, 1976

To: Thomas Nee, Chairman
From: Pauline Oliveros, Chairman
Electronics Committee

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November 30, 1976
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Thomas Nee
November 30, 1976
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The committee wishes the chairman to investigate this matter. The committee urges immediate action on these matters so that second quarter may begin with items purchased and installed.

Electronics / FTE Proposal

To the Faculty From Oliveira April 26, 1977

NEEDS TO BE COVERED :

<p>I Courses (9 Total)</p> <p>elect. 105 A B C Alt.</p> <p>Recording 104 A B C (D E F)</p> <p>200 Tech. con. cum. for grad. Alt.</p> <p>205 (202) perf. elect.</p> <p>299</p>	<p>Total number of Students 129</p> <p>Total 60</p> <p>32 (14)</p> <p>20</p> <p>11 (11)</p> <p>6</p>
---	---

II Electronics Committee (weekly meeting)

III Studio Development (Electronic Music and Recording - B108, B104, B124, B202)

A. Organization

B. Design

C. Documentation

1. Technical

2. Users

(not including maintenance. Maintenance is now covered with 100% assistant technicians)

IV Archives

A. Recording of Concerts and Lectures

B. Cataloguing

C. Dubbing

How to do it Proposal :

I Course Coverage		Number of Courses				Total Courses FTE %	
	FTE %	Supervisor	105 / 205 / 200				FTE %
Oliveira	.10					.50	
Liebig	.25	1	105 C	.50	.25	.25	2
Grose	.25	1	105 B	.50	.25	.25	2
Rittenbach	.25 +	1	105 A	.25	.25	2.25	
Ritscher	(.25)	1	104 A	.25	.25	(2.25)	
						<u>9</u>	<u>.85</u>

Ritscher's course load would not count against faculty. Therefore 9 courses would be covered by .85 FTE. This appears to be a better student faculty ratio than our average.

II Electronics Committee
All would attend

III Studio Development

If the remainder of the FTE, approximately .25 is not used to pay for specialist service from Gross, Liebig and Rittenbach, then some other source is needed. (This would leave part of the FTE free for the private lesson program)

Suggestions: 1.) Boost the level of the FTE to Assistant Prof. Step 3. 2.) Request I & R Funding equivalent to .25 FTE 3.) Find a Departmental Grant. 4.) Request Specialist funding.

Studio Development can not be neglected. Much of the equipment is old, the set ups are not convenient, or efficient for the work. More students have to be processed more efficiently and with documentary guidance.

IV Archives

Recording of concerts

Cataloguing

Dubbing

- Workstudy and Ritscher

- Workstudy

- Workstudy

Electronics / FTE Proposal

To the Faculty From Oliveros April 26, 1977

NEEDS TO BE COVERED :

<p>I Courses (9 Total)</p> <p>105 A B C Alt.</p> <p>104 A B C (D E F)</p> <p>200 Alt.</p> <p>205 (202)</p> <p>299</p>	<p>Total number of Students 129</p> <p>Total 60</p> <p>32 (14)</p> <p>20</p> <p>11 (11)</p> <p>6</p>
--	---

II Electronics Committee (Weekly meeting)

III Studio Development (Electronic Music and Recording - B108, B104, B124, B202)

A. Organization
 B. Design
 C. Documentation
 1. Technical
 2. Users

(not including maintenance. Maintenance is now covered with 100% assistant technicians)

IV Archives

A. Recording of Concerts and Lectures
 B. Cataloguing
 C. Dubbing

How to DO IT Proposal :

I Course Coverage

	FTE%		Number of Courses			Total Courses	FTE%
Oliveros	.10	Supervisor	105 / 205 / 200			.50	
Liebig	.25	1	.50	.75	.25	2	
Grose	.25	105 C	205	299	200	2	
Rittenbach	.25 +	105 B	.50	.25	.25	2	
Ritscher (.25)		105 A	104 C	.25		2.25	
		104 A	104 B	.25		(2.25)	
				200		9	.85

Ritscher's course load would not count against faculty. Therefore 9 courses would be covered by .85 FTE. This appears to be a better student faculty ratio than our average.

II Electronics Committees
All would attend

III Studio Development

If the remainder of the FTE, approximately .25 is not used to pay for specialist service from Gross, Liebig and Rittenbach, then some other source is needed. (This would leave part of the FTE free for the private lesson program)

Suggestions: 1.) Boost the level of the FTE to Assistant Prof. Step 3. 2.) Request I & R Funding equivalent to .25 FTE 3.) Find a Departmental Grant. 4.) Request Specialist funding.

Studio Development can not be neglected. Much of the equipment is old, the set ups are not convenient, or efficient for the work. More students have to be processed more efficiently and with documentary guidance.

IV Archives

Recording of concerts	-	Workstudy and Ritscher
Cataloguing	-	Workstudy
Dubbing	-	Workstudy

June 1977

Agenda

1. Job Description for Technician Description —
a - George
b - Assistant
2. CME 20%
3. Summer use of CME for SC Francois
4. Consultation Consciousness raising on Summer
Letter to students contact of George
5. Report of on Summer Studio Use Jones
6. 199 + 200 for Undergraduate
7. Report on B206 - Committee concurs
8. Electronic Music + Recording Curriculum
9. Recording - Dubbing - Archiving -

tell Tom that any decisions regarding electronic curricula Recording Dubbing Archiving Space etc. must be made by the committee that Cheryl must respect this and not try to make unilateral decisions.

Electronics Committee Report

1. Maintain, diagnose + Repair all electronic equipment for the Music Dept. and 20% time for CME.
2. Limited construction projects (circuits, cables etc.)
3. 80% Music Dept. Supervised by Senior Technician
20% CME Supervised by Studio Head.
4. Installation of equipment -
5. Other limited duties as assigned by Senior Technician
Summer use is limited at CME

B108 -

Undergrads
Take 105 sequence before consideration of 200

Recording ~~of~~ concerts - All concerts must be recorded

George - Important - big concerts - Concert Committee
should decide and inform Geo. what to record
2 Assistants to handle the rest of concerts and dubbing -
1 work study \$6.50 one of 199 Michael Harris

Archiving - Full scale investigation

Dubbing related to course work - priority
Faculty second
Student 3

To the faculty

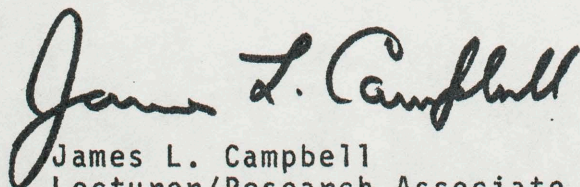
An up-date on the course: Music 104abcdef

This is the first year in which the undergraduate two-year specialty sequence, Sound Recording Techniques, has been truly given. A total of 12 students finished the first year while 5 are currently enrolled in the second, one less than the maximum possible for this independent study. Of the five, one is currently enrolled in the communications program of Visual Arts, two are in drama productions and two in music. All are quite good within their individual limits which are indigenous to their personal tastes.

As you know the second year of the program is geared towards independent study with all students involved in recording departmental events. In addition, the students are quite capable of working recording sessions with over-dubs a specialty. It is this point to which I am addressing myself. We have had a few requests for recording sessions, two of which were requests for a technician not a member of the recording staff. We, of course, honor these requests (as long as the technician has been checked out in the recording studio) but hope that you will avail yourselves of the recording staff whenever possible. Your requests should be in our hands hopefully one week before the session is to take place. The general meeting of the staff occurs every Thursday at 12:00 noon or thereabouts.

Those of you producing recitals and concerts are urged to submit information pertaining to those events including date, time, place, estimated length of compositions, dress rehearsal time and place, and, if possible, instrumentation placements along with normal rehearsal times. With this information those technicians assigned for recording can gain a better insight into the necessary recording requirements.

Any questions pertaining to the above (or to any facet of the recording program in the department) may be submitted to me for further clarification.



James L. Campbell
Lecturer/Research Associate
February 14, 1977

INSTRUCTIONAL MEDIA PROGRAM ADVISORY COMMITTEE MINUTES
Wednesday, October 6, 1976, 3:30 p.m.
Conference Room 201, Media Center

Members Present: A. B. Anderson
 B. Bellman for H. Schiller
 W. D. Gray
 L. James
 H. B. Mehan
 D. M. Sullivan

Members Absent: D. A. Antin
 L. D. Newmark
 P. Oliveros

Consultants Absent: E. R. Marchand
 A. L. Witte

In view of Chairman Antin's absence, Sullivan opened the meeting at 3:40 p.m. by asking the members in attendance which day of the week would be best for them to meet in the future. He also asked how often they felt it necessary to meet. It is already time to set up a schedule for the next quarter so some kind of decision needed to be made at today's meeting. Following discussion the members present concluded that one meeting a month was sufficient and selected the first Wednesday of each month at 2:00 p.m. Meeting place will continue to be the Conference Room in the Media Center.

Sullivan reported that everything so far had been running smoothly in the Media Center since the Fall Quarter had begun. He was concerned with setting up a schedule with the various departments using the Media Center in order to avoid confusion and to be able to accommodate all of them. Next year's curriculum also needs to be projected now as much as possible so that the Media Center staff can have an idea of what to expect.

Anderson stated that planning too far ahead might cause a problem due to the possibility of going to the semester system from the present quarter system in the near future. Any plans made would have to be modified in the event of such a change. Sullivan agreed that such a change would have to be considered, but he still wanted to look to the future as much as possible.

Gray asked what was done in the Media Center between quarters. Sullivan replied that maintenance occurs such as setting up a color switcher, which is scheduled for the Christmas break.

INSTRUCTIONAL MEDIA PROGRAM ADVISORY COMMITTEE MINUTES
October 6, 1976
Page Two

Sullivan presented a progress report relating to the various Media Center facilities in operation at this point as follows:

Studio 139 (Black & White) - Fully operational except for an 8mm film source that is missing, but expected soon. There is also a 16mm projector in the film chain that is temporarily out of service. Lighting system is in and fully operational. Draperies are missing, but to be installed Thursday morning of this week.

Studio 222 - Equipment has been ordered and should be in at the end of October or early November.

Video Editing Rooms - Four are operational; three of the four are 3/4" cassette and one is 1/2" reel-to-reel.

Film Editing Rooms - The flatbeds are not here yet for the 16mm editing rooms, but the ancillary equipment is so at least two more rooms should be in service very soon.

Upright Moviola Editing Rooms - One is set up for use and two more should be operational by the end of the week.

Transfer Studio 229 - This facility will be set up to transfer media from format to format. It will be a completely patchable system. ~~On~~-the-air recording can also be accomplished in this room.

Audio Studio - This studio will not be ready until Christmas.

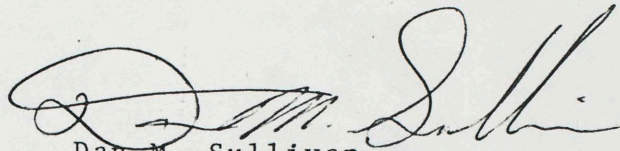
Gray asked if this committee would be making any requirement requests to the Program Review Committee. Mehan asked what the relationship of the Wagner Committee to this one was. Gray answered that the Wagner Committee was a policy making committee and this one was a users committee for the Media Center facility to act in an advisory capacity to the Director.

Sullivan mentioned that there was no place in the Media Center for displaying media produced here. A multi-purpose media display room is needed, as well as a library for tapes. OASIS of this campus is trying to develop a Playback Center for the campus. At some point down the road it might be a good idea to put into future plans to convert the two existing classrooms in the Media Center Building

INSTRUCTIONAL MEDIA PROGRAM ADVISORY COMMITTEE MINUTES
October 6, 1976
Page Three

into a Playback Center. The conduits are already in so the foundation has been laid. Perhaps when the second phase of Third College is built, this could be accomplished at the same time.

Meeting adjourned at 4:20 p.m. so the members who were interested could take a tour of the Media Center facility. The next meeting will be held Wednesday, November 3, 1976, 2:00 p.m. in the Conference Room 201 of the Media Center.



Dan M. Sullivan
Executive Secretary

By: Judy Harris
Recording Secretary

cc: W. D. McElroy
P. D. Saltman

Resume of Possible Applicants - Selected by Tom Nee

- BABCOCK, Michael (1940) B.M., PhD (near) Iowa; composition
- BENTLY, Andrew B.A., D.Phil. York; composition, electronics
- BURT, George B.A., M.A., M.F.A.; composition, electronics; teaches at Michigan, Associate Professor
- BRITTAN, Tom M.A. Michigan State, oboe major; recording expert, no electronics
- BYRD, Joseph M.A., Ph.D course work, many records, electronics, recording, composition
- BASHOU, F.J. PhD electronics, recording; college musician, organist, jazz, 15th century music articles, teaches at Michigan
- BASHER, Michael M.A. Illinois; composition, recording, electronics
- CHADABE, Joel A.B., M.M.; composition, electronics, publications
- COHEN, Marcia M.M., composition, electronics; at Art Institute in Chicago
- DVORAK, P.E. PhD composition, publications, computer, electronics, teaches at Carnegie-Mellon
- FELDER, David M.M., composition, electronics
- FROHMANDER, J. M.M., ABD composition, electronics, winds
- GATWOOD, Dwight PhD, electronic design, singer, composition, commercial music
- GNAZZO, A.J. MFA, composition, electronics, recording
- ★ GROSS, Robert M.M. composition, pianist, computers, CME Fellow
- HARRIS, Daniel PhD (Yale, Eastman, Wisc); composition, head of electronics studio at Illinois, clarinet teacher Wisconsin
- KIMMEL, W.S. M.A. composition, theory, electronics various places, several prizes Assistant Professor Sangaman
- LIPP, Charles DMA Illinois, composition, bassoon, taught electronic music Canada
- MATTILA, Ed PhD composition, electronic composition and teaching; a Full Professor but interested in leaving Kansas
- MUSSER, Phillip DMA composition, taught electronic music at Illinois, pro recordist, broad background (PhD course work in musicology), piano
- MINTNER, Thomas BM (clarinet), recording engineer, composer-performer at Iowa, computer work
- NIELSON, J. PhD composition Iowa, French grant, prizes, composition, electronic teaching, teaches at University of Iowa
- PELLEGRINO, Ron PhD composition, electronics, Oberlin, Ohio, Wisconsin; computer, wide variety of courses, clarinet
- QUESADA, Virginia MFA, composition, electronics
- RIEPE, R.C. PhD (composition, Eastman), piano, director of electronic studio Southwestern Texas University, Assistant Professor

ROXBURGH, Edwin Piano, oboe, composition; conducting (no electronics?)
RAFFERTY, James PhD (nearly complete, University of Washington), musicology,
choral conducting, minor in composition, head of electronic studio
SCHNEIDER, PhD University of Cardiff, other degrees in composition, guitar,
electronic music
SCHAAD, Roar BS, MM, DMA (to come), nuclear data analyst, electronic courses
at Illinois State, trumpet
SWAFFORD, J. MMA (Yale), course requirements for PhD, composition, piano,
electronic music, recording
TANENBAUM, E. MA composition, director of studio, Manhattan School of Music
WAILES, Carter DMA composition, studio head of maintenance, flutist

This list is made to assist you. Look through the files and see if I missed
some interesting people.

Dear Pauline -

Re - Perf. Electronics

and hard nosed "indeed what services are being given
when stopped of relations & positions taken
a few years ago ~~and~~ ^{when} squirrels were born -

Annex 1

A. When CME was being into "building a faculty" &
electronic edicts were writ-

The external member of the Board (physics)
although he concurred as demurred

He did remark that he was not used to

research groups being assimilated
into a larger "semi all" frame

but guessed that it might work

Annex II (demon aide)

B. Do you think it could be over done -
as CME composed of a # of projects

which need to be analyzed in an individual sense
as research B & in - etc

C. - a thought

Frank

John

Agenda

1. Cheryl/Saltman Tour

2. Perf. Electronics ^{ask Cheryl} voice boxes

#3253.00 3. \$2000 replacement ^{use for music I - II}

4. Assist. for George 100%
CME

5. Studio open in summer
^{provided close down -} George Pitscher

6. Digital Electronics

7. Lab Fees -

Line from CME to Dept. very limited

Line to Burroughs \$5000 Music II

Access to microprocessors in APIS?

Adapt APIS to Dig. Syn - for real time -
\$8000

Members ~~present~~ present - of 14,000

JC Francois

Handle 15
students

Cheryl

Rob

David Jones

George Pitscher

Suggest adding Balgare to committee -
^{how business}

conversions of 206
for George workshop.

Old business

Pitscher see money for replacement

\$45 Baffles \$150 Speaker stands

4 baffles \$200

Request money for furnishing studios.

Electronic Committee

Pauline

When you get opportunity..discuss John Silbers letter on the electronic performance instrs..

I think he is correct; we did speak of it at that meeting as the equivalent of the faculty electronic studio. I dont think they were just for him, though) He may have made a mistake in going off on his own and purchasing them without much consultation but, I believe they were under faculty research..

It would be good if we could get an approval for their use by others of us for instruction and performance because we dont have enough money to ~~do both~~ purchase both research and instructional electronic instrs...at least yet.

Tuesday

TN

Pauline

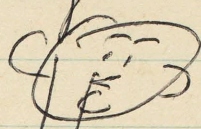
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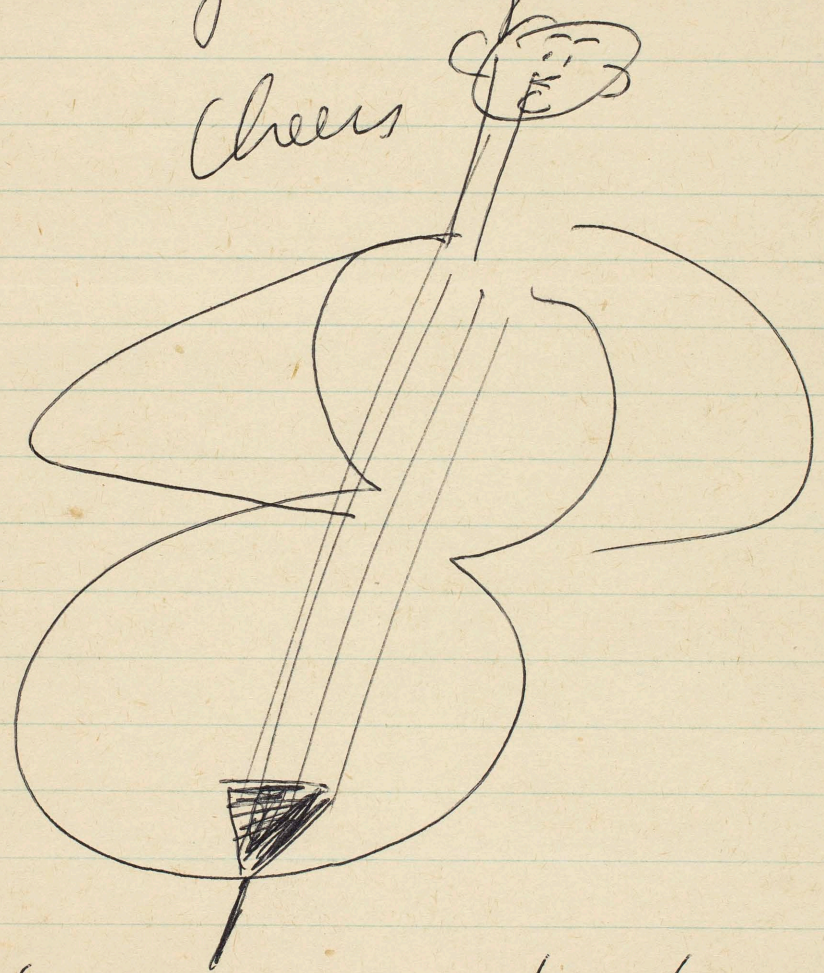
#2416.05

Dear P.O.,

We need at least, 2 amps
for amplified 'GUITAR + BASS
WORK + a few Transducers
for W.W., Piano, Harp (Bass, Bery)

lets get together on this!

Cheers 



GUESS WHO

23 March

Pauline:

Are there extra electronic needs
that should be on our
requests for next year i.e. not in
our groups 2-3 requests.

Give a list so we can add it to our
requests.

We sent in the dept. request
while you were gone

Twee

Parline
Oliver

T

Tom
San Felipe

Recording

we simplify?
7 courses out of 17TE?
b. c

Teach - 1 quart

alternate

-c-

Rittenbach Document
Studioz

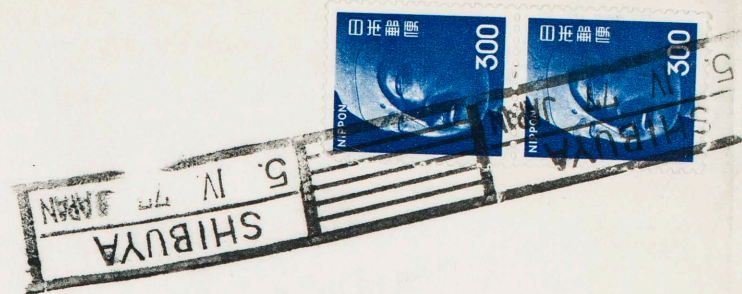
about
Recording

Pool Maintenance Tech
Mandville
Art
Music

三南画廊

〒103 東京都中央区日本橋 3-7-20 DICビル 電話(271)8616・1661

Reynolds
Daikanyama Annex 402
24-7 Sarugaku-cho
Shibuya-ku, Tokyo (150)
JAPAN



AIR MAIL

AIR
MAIL

PAULINE OLIVEROS
CME Q037
UCSD
LA JOLLA, CA 92093
USA

AIR
MAIL

AIR MAIL

Bios users recommend -

1/4 in - 4 channel

or ~~the~~ Ampex 2 ch -

alternatives

35 to 49K

can we work out dubbing with
Alan Johnson 1/4 in. 4 channel
or audio visual? not CME.

(5K)

Speaker Stands

Head cleaners ?
Bios

Baffles

De mag -

Dispenses for splicing

Monitoring system for Studio -

good quality Neumanns 2 \$1300

Recording Studio
update Undergrad Studio \$20,000
outdoor specialized mic -

3rd 15 IPS machine - for undergrad studio -

Filters for undergrad studio - \$700

Performance

Barcus Berry Transducers 2 for strings

Guitar Bass Amps -

Waltz Woods Amp - \$400-500
chosen in consultation with Tech -

April 8, 1977

DEPARTMENTAL COMMITTEE CHAIRS:

We would like to begin a reference file on each of our departmental committees. Would you please have someone on your committee take minutes at each meeting and turn in to Cherie for filing.

Agenda

Tom Nee

Spend Money - Turetzky Proposal

Digital Electronics

Recording Tech Electronics Portion

Space

FREE

ARP SYNTHESIZER CLINIC

FREE

FEATURING TOM PIGGOTT

MONDAY FEBRUARY 14

7:00 PM

REGISTER TO WIN A FREE ARP SYNTHESIZER AT THE CLINIC
(WINNER MUST BE PRESENT TO ACCEPT PRIZE)

CALL APEX MUSIC FOR RESERVATION 239-2321

SPECIAL CLINIC SALE - FEBRUARY 14TH ONLY

ARP EXPLORER	629.00	ARP 2600	1688.00
ARP AXXE	629.00	ARP OMNI	1388.00
ARP ODYSSEY	949.00	ARP STRING ENS	1288.00
ARP PRO SOLOIST	749.00	ARP SEQUENCER	537.00

ALL OTHER BRANDS OF SYNTHESIZERS ON SALE!

BRING A DEPOSIT IF YOU DON'T HAVE THE MONEY

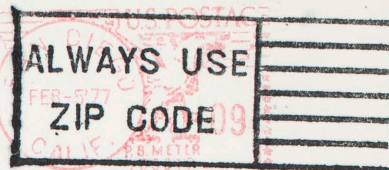
ALSO IN FEB-TASCAM RECORDING CLINIC-CALL FOR DETAILS

APEX MUSIC CO.

702 Broadway

San Diego, California, 92101

Phone: 239-2321



ELECTRONIC MUSIC DEPT.

UCSD

GILMAN DR & LA JOLLA VILLAGE DR.

LA JOLLA, CA.

92037

December 6, 1976

To: Composition faculty
R. Erickson, W. Ogdon, P. Oliveros, B. Rands, R. Reynolds

From: John Celona

This is to remind you that members of my 103 composition class will be presenting their compositions this Friday, December 19, in B-210, from 12:00 - 1:30. The program will include works by Larin, Klempe, Douglass, Galas, Levine, and Uberti.

Thank you for your support. They are looking forward to your presence and comments.

JC/mw

No. By Spring Quarter, we may be able to project extra funds for assistance with faculty projects. When we do the budget request for next year, perhaps we should figure an amount for him and count it under the support we give to faculty research.

Jan 18, 1977

Cheryl -

CM

Did we agree that Terry Setter would do recording for CME?
(This has nothing to do with the agreement that he would do routine calibrations instead of George.)

If so how many hours would he be available to us and has he been informed?

Pauline

Agenda for Electronics Committee

Use of B 104 (Turetzky)

Request for Yamaha Electric Organ (Rands)

Technician support and priorities
crisis operation

Video Equipment for classrooms

Matching fund for music equipment

ELECTRONIC MUSIC FESTIVAL

The Virginia Commonwealth University Music Department is sponsoring a festival for electronic music to be held on the campus of V.C.U. in Richmond, Virginia on January 14th and 15th, 1976. Three concerts and two workshops will be given.

The concerts will include compositions chosen according to three categories:

- 1) elementary and secondary (elementary through high school)
- 2) college (undergraduate and graduate)
- 3) post-graduate and professional.

Students and others need not be presently enrolled in an electronic music course in order to submit a composition. Those interested should submit tapes for audition no later than December 16th, 1976. Send to:

Dr. Loran Carrier
Music Dept.
Virginia Commonwealth University
919 W. Franklin Street
Richmond, VA 23284

All entries should include the following information: name of composer, title of composition, length of composition, brief program notes, category. Tapes should be ¼ track stereo at 7½ ips.

Audition priorities will include content and performance practices (synthesis, musique concrete, live synthesizer, mixed-media, etc...). Composers will be required to provide their own performers. Audio-visual and sound equipment other than standard playback and amplification equipment must also be provided by the composers.

The workshops will deal with practical matters concerning electronic music labs and equipment. Details will be supplied to those interested.

Reduced rates for lodging at the Holiday Inn (1½ blocks from campus) will be available. For details please contact Dr. Loran Carrier at Virginia Commonwealth University Music Department by December 1, 1976.

Pauline .

Our H/L tape decks were
stolen. Would like recommendation

from elec comm (if needed) as to

what to replace.

Cheryl or my tail about Keith Grant

TNee

Murder

I

Purchase

Projected life

II

Maintain

Life

what are
maintenance costs?

Time, \$

III

Replace

Life

End of useful life

Budgetary Principles: Be obscure -

s/ too specific everyone complains -

Faculty Meeting
Minutes

January 11, 1977

Present: J. Celona, P. Farrell, J.C. Francois, E. Harkins, D. Kavasch,
J. Large, C. Lytle, T. Nee, W. Ogdon, P. Oliveros, B. Rands,
J. Silber, B. Turetzky, T. Ungar; P. Rodgers (student),
C. Gallagher, C. Montano (staff)

Not Present: Wm. Brooks (sabbatical), R. Druian, R. Erickson,
R. Reynolds (sabbatical)

Approval of Minutes:

The minutes of the previous meeting were approved with two corrections.

Committee Reports:

Concert Committee - C. Lytle reported that this committee is in good shape financially.

Sonor - This group will hold its first concert January 17 in Los Angeles. They will then begin work on their March concert.

Graduate Entrance Committee - Irene Solomon has sent out a late recruitment poster to various universities and state colleges.

Space Committee - This committee is no longer ad hoc. Its permanent members are P. Oliveros (Chair), W. Ogdon, J. Silber and G. Ritscher. P. Rodgers suggested voting on a student member for this committee at the department seminar. G. Ritscher is currently in the process of working on security and new tape machines for HL and is investigating the space with Anton Witte. The major problem is: to what extent should the space be secured and who is to pay for it.

Curriculum Review Committees - B. Rands reported that the Undergraduate Review Committee plans to call one more meeting before writing their document of the revised undergraduate curriculum. B. Turetzky reported that R. Erickson has prepared the report of the Graduate Curriculum Review Committee and is ready to present it for faculty discussion.

Coordinators' Reports - The Undergraduate Coordinator, Peter Farrell, reported that those people who flunked his Music 101 class last year are back to try again and are doing well. The Graduate Coordinator, W. Ogdon, reported that a statement of graduate student progress (committee, tentative statement, prospectus, etc.) is being prepared. He expressed concern that all committees are not giving their recommendations to the Curriculum Review Committees.

Jack Moorhead
262-2421
Chair mel 10

New Registration:

C. Montano reported to the faculty that only those students officially registered, whose names appear on class rosters, are counted by the administration in statistical reports. The faculty were advised not to let auditors into their classes because their teaching will also not be represented. Everyone involved in classes should be registered so the department gets full credit for them.

P. Farrell moved that once a student audits a class, he cannot then take a proficiency exam for that class to get credit for it. The motion was seconded.

T. Ungar felt that auditors should enroll through the University extension.

Music 133/201 - B. Rands reported that only a few undergraduates and about a third of the graduate students had enrolled in this course so far. (Many students claim that they are too busy to participate). Investigation revealed that a department can not hold a student to any requirements other than those in the catalog current when they entered. The student can, however, opt for the new requirements if he so desires.

It was mentioned that enrollment has dropped considerably according to Winter Quarter pre-enrollment figures. W. Ogdon requested that the Chairman address the Registrar's Office about why pre-enrollment figures arrive so late.

Discussion of Voting Procedures:

At the request of the Chairman, a proposal on voting procedures for important departmental business was submitted by R. Reynolds. The four-part proposal was discussed by the faculty, and the Chairman asked that written comments be submitted. The Executive Committee will put these ideas into a policy to be voted on.

Old/New Business:

B. Turetzky discussed his plans in coordinating the Winter Quarter Department Seminars. He has coordinated them with a theme, demonstrations of extended techniques in performance. (A copy of the scheduled events for each seminar has been placed in each faculty box).

C. Montano announced that the Academic Senate has money for awards and advised faculty to get their proposals in.

J. Celona announced that Ernst Krenek would be a CME working with computers January 17-19.

W. Ogdon requested that the faculty begin thinking about graduate seminars for next year and turn them in to him.

The meeting adjourned at 1:30, and was followed by a meeting of the tenured faculty.

Committee of graduate students
 decide whether the student has
 the necessary technical background.
 George Parker will have the power
 to vote on technological grounds.

STUART LARSON, baritone, is cast as Max for the UCSD Young Artist Opera Theater's Spring production of Donizetti's Betty, a United States premiere. Mr. Larson, a student of John Large, was heard last year in The Magic Flute and Riders to the Sea.

Before coming to UCSD, Mr. Larson attended El Camino Real High School and was a featured singer with the vocal groups. He began his musical training as a clarinetist and later sang in musical theater.

Mr. Larson has recently enrolled in a full time course of study in the UCSD Music Department. He plans to follow a career in music, but has not decided whether to specialize in opera or art song.

Accompanying Mr. Larson at the piano is MICHAEL PARKER, currently on the coaching staff of the San Diego Opera. Mr. Parker is a graduate of the University of Illinois.

Williamson

Editing Faculty

1. Recording in Keller
2. Technician Tim Budget
3. Video equipment
4. Redistribution of equipment
5. Ampex buttons prepared

Special thanks to Irene Solomon, programs and publicity.

He studies with necessary background
 have access to that attack ^{with graduate students}
 we suggest that ^{with} graduate students acquire technological
 background from their colleagues.
 Committee to decide of grad students and George -
 stay close apart on commencement

Spindler area

Paed

B108

Lost \$6,000

10 Sony mixed 650, 756, 856
4 headphones

Replace - with 13 Sony 377 1/4 track
\$250 per. ~~\$3000~~*

\$5,000 replacement -

4 in - 2 out

Sonic Research Associates \$55 per unit 12
if nothing commercially available which
is cheaper -

13th machine for Roll around Dubbing Techniques -

\$1,190 balance

Headphones \$35 per

Replace All or ?

4 \$60 240

8 \$30 " 240

\$480

55
12
110
55
660

Consider Cassettes for mus 1, 2, 11 etc.
Recommend routine replacement
1 or 2 per year -

Users' meeting to be organized by David Jones
a committee to be developed.
Usage ^{Administration of studio} problems
Technicians problems
organization of studio

Ought to hire cheap labor no not reasonable

20% CME
80% Dept.

50% Assistant technician $\frac{1}{2}$ FTE
Not workstudy

{ Media Center Maintenance Pool.
Mandeville Shop
Visual Arts

- 1 Hire directly
- 2 Media Center Sincerely
- 3 Visual Arts Sincerely Talk up on site repairman
- 4 Mandeville Shop electronics shop is way to go.
- 5 Contract out (Cost too much?)

Workload

needs

make specs for new tech.

25% Speculation

20% Consultation

Routine Heavy maintenance

Plan in terms of Student population is going to increase
60 grad
125 undergrad

Title II Video-Audio

Is it legal to add funds to replacement money.

Next Committee Meeting

Recording guide lines — Jim's Policies
Who gets paid and how and for what —

How to get access to archive —

two types of dubbing

Dubbing for concerts

Dubbing for classroom work

Theft. Review security

Draft Policy letter as per our recommendations —

Draft our understanding of meeting with Tom on letter —

RECORDING EQUIPMENT AND FACILITIES
School of Music
The University of Iowa

Microphones

- 4 ● Neumann KM-84 condenser cardioid
2 Neumann SM-69FET stereo condenser, with matrix transformer pairs
4 Neumann KM-86 condenser (switchable polar patterns), auditorium use
4 Neumann U-87 condenser (switchable polar patterns), studio use
2 Electro-Voice RE-15 dynamic cardioid
1 Electro-Voice 644 "sound-spot" dynamic
1 Electro-Voice RE-85 lavalier dynamic
2 RCA 77-DX ribbon (switchable polar patterns)
6 Sony ECM-22P electret condenser cardioid
Also available: numerous Sennheiser 105 and 405 condenser, Electro-Voice RE-15, RE-16, and RE-55 (Hancher Auditorium); 2 Fairchild F-22 condenser, 3 B&O ribbon (L. Cross).

Mixers

- 1 Langevin AM4A mixing system: 8 line or microphone inputs each with reverb send and equalization, 4 main outputs with reverb receive, 2 additional independent outputs for monitoring or stereo applications, talkback module.
2 Ampex AM-10 6-in, 2-out portable mixers with meter panels

Recorders

- 1 Ampex AG-440B-2 2-channel, $\frac{1}{4}$ inch, in console, with remote control
1 Ampex AG-440C-2 2-channel, $\frac{1}{4}$ inch, in console, with remote control
1 Ampex AG-440C-4 4-channel, $\frac{1}{2}$ inch, in console, with remote control (may also be used as 2-channel, $\frac{1}{4}$ inch)
AG-440C's are equipped with servo capstan motors and Dolby A-Type noise reduction systems.
1 Crown CX-824 $\frac{1}{4}$ -track stereo, with remote control
2 Revox A77 $\frac{1}{4}$ -track stereo
1 Revox A77 $\frac{1}{2}$ -track stereo
Also available: Scully 282-4 4-channel, $\frac{1}{2}$ inch, in console; 3 Sony TC-770 $\frac{1}{4}$ -track stereo portable recorders; TEAC 450 and Sony TC-131SD cassette recorders with Dolby B noise reduction.

1 CROWN SX-724 $\frac{1}{4}$ -TRACK STEREO

Noise Reduction Systems

- 6 Dolby 361 A-Type (professional), used in conjunction with Ampex AG-440C recorders.
1 Advent 100A Dolby B-Type, 2 channel

Equalizers

- 8 input channels of Langevin AM4A mixing system
4 Soundcraftsmen RP10-12 octave-band, graphic
Also available: B&K 125 one-third octave-band, graphic

Limiting Amplifiers

- 4 UREI 1176LN limiter/compressor amplifiers

Reverberation

- 1 EMT 140TS stereo reverberation unit (adaptable for 4-channel use)

Phonograph Equipment

- Thorens TD 125 turntable with SME 3009 arm and Shure V-15 cartridge (33 $\frac{1}{3}$ and 45 rpm; other equipment available for 78 rpm use).
Marantz 7T preamplifier

Special Equipment

- 2 Countryman 968 voltage-controlled phase shifters
1 Lang LMC-1 remote control
1 Martin Varispeed III variable-speed capstan drive amplifier
Television cameras and monitors; Shibaden $\frac{1}{2}$ " video tape recorder

Monitoring

- 2 McIntosh MC2505 stereo power amplifiers
4 JBL 4310 monitor loudspeakers
2 JBL 4320 monitor loudspeakers
Also available: AR-3a, Altec A-7, and Klipsch loudspeakers (2 or more each)

Test Equipment

- Telequipment and Hewlett-Packard oscilloscopes; Tektronix, Wavetek, Krohn-Hite, and Hewlett-Packard function generators; Tektronix and Hewlett-Packard oscillators; Hewlett-Packard and GR distortion analyzers; Simpson, Triplet, and Hewlett-Packard meters; H-P and Kepco power supplies; H-P 45 calculator, etc.

Studios and Halls interconnected with Recording Studio Control Room

- Hancher Auditorium: 2,600 seating capacity, orchestra enclosure, 16 program lines, talkback and video lines; reverberation time 1.6 seconds.
- Clapp Recital Hall: 700 seating capacity, 16 program lines, talkback and video lines; 53-stop, 74-rank, 3-manual Casavant tracker-action organ; reverberation time 2.0 seconds. Motorized microphone boom with 1 Neumann SM-69FET and 2 Neumann KM-84 microphones permanently installed. The air handling equipment for either Hancher Auditorium or Clapp Recital Hall may be turned off independently for recording sessions.
- Harper Hall: 200 seating capacity, 8 program lines talkback lines, direct visual monitoring. Neumann SM-69FET stereo microphone or Neumann U-87 microphones suspendable from ceiling.
- Choral Rehearsal Hall: 100 seating capacity, 8 program lines, talkback lines, direct visual monitoring.
- Instrumental Rehearsal Hall: accomodates full symphony orchestra with 200 voice chorus, 8 program lines, talkback and video lines.
- Electronic Music Studios (2): Moog, ARP, and EMS Synthi synthesizers, special electronic generating and processing equipment; 16 program lines, talkback and video lines.
- Center for New Music Rehearsal Room: 8 program lines, talkback and video lines.
- Organ Studios (2): Schlicker and Moeller organs, 3 program lines each, talkback and video lines.
- Small Ensemble Room (2050 MB): 6 program lines, talkback and video lines.

Recording Studio
2057 Music Building
The University of Iowa
Iowa City, Iowa 52242
(319) 353-5976 / 353-5977

September 1976

December 9, 1976

Discussion of electronics equipment, maintenance, budget and policy

Present: C. Montano, T. Nee, P. Oliveros, P. Olson, G. Ritscher.

Letter to Department Chairman (November 30, 1976) from Electronics Committee was discussed. The present available balance in Groups II and III funds is \$12,891. The operating budget presented to the faculty showed a lower figure since a commitment had been made to purchase a celeste.

It was agreed that there is approximately \$8,115 remaining for purchase of electronic equipment since expenditures to date have been under the estimate agreed upon last year. At issue is whether \$4,000 or \$5,000 may be available in the "Faculty Playback Systems" category. Although \$5,000 is the amount requested, and \$4,000 is the amount later approved in faculty discussion, in fact it may be possible to pick up this \$1,000 through savings in other items (e.g., if a celeste is purchased with money from the Academic Senate Research Committee).

In future budgets, the Electronics Committee will be advised of all funds available for their disposition. Archive allocation will be included as part of Curriculum and not Research.

Priorities for the balance of II and III monies were discussed. It was agreed that purchase of microphones for B-206 would be postponed until late in the year when we might know what specifics were required by the new electronics/recording person. Interwiring of classroom areas would also be postponed until the last possible moment in order to channel all available funds into a purchase order at the close of the fiscal year. Deletion of these two items brings these requests within the available funds. (total \$7,950)

It was agreed that the policy recommended in the letter be adopted. T. Nee and P. Oliveros would prepare a letter to all faculty outlining the procedures to be followed (e.g., all requests must be initialed by G. Ritscher).

The Performance Committee is to handle requests to purchase instruments in a similar manner, i.e., all requests are to be reviewed by the committee or committee designee. Efforts will be made to have instruments purchased by the Academic Senate Research Committee.

The Chairman will investigate campus allocation of equipment replacement money. The committee will assist in preparing a full list of equipment and adequate justification for future requests. T. Nee and P. Oliveros will present equipment needs directly to McElroy and ask for use of discretionary funds. As a general policy, P. Oliveros urged that records of the activities of each committee be kept up to date, and that all committees present minutes and working papers for these files.

CM

Balance 8,115
Perhaps 9,115

November 30, 1976

To: Thomas Nee, Chairman
From: Pauline Oliveros, Chairman
Electronics Committee

Subject: Priorities Groups II and III equipment purchases, recommendations and questions concerning budgetary statement issued to the faculty and staff dated October 27, 1976.

Left out Celeste \$3,000 for SC Francis

Actual Balance \$12,890.99

According to the Operating Budget issued October 1976 the Group II and III "Available Balance" was \$10,727. On Monday November 22, 1976 upon inquiring of Pat Olson, the available balance was \$14,936.18. The Committee would like clarification of this discrepancy.

According to our figures the following amounts of money remain as our allocation in the following areas:

(Figures approximate within \$5.00)

B108 Grad Electronic Studio	\$2230.00
B104 Faculty tape Composition	\$1410.00
Performance Electronics	\$475.00
Faculty Playback Systems	\$5000.00

They say 4000

Of the \$2,000, Equipment and Facilities (-4), Ritscher was "allocated" \$1200. The committee would like to remind the chairman that former technician, Lew Prince was promised \$2000 per year, Equipment (-4), in order to replace classroom equipment. Where is the other \$800? And why is the category now called equipment and facilities? *This is administrative category* ←

Furthermore, due to inflation and in order to maintain the status quo, the committee sees a necessary increase of this fund to at least \$4000. For instance, one complete playback system costs at least \$2000 at today's prices.

On the next page the following statement should be corrected "equipment and mo ies (-4) are for the purchase of inventoriable items over \$200 in value". Please insert the word "electronics" between inventoriable and items. *ok*

Under the title Technical Support, the following corrections: Electronics (Ritscher): tools, parts, supplies, Moog and Buchla items, test equipment, replacement items-audio equipment UNDER \$200. (Audio equipment items over \$200 belong to Equipment -4)

Under the title Faculty Research : Archive Tape and supplies \$1,200 belongs under INSTRUCTION not research.

- continued -

Thomas Nee
November 30, 1976
Page two

Priorities for 1976-77 by space and original Electronics Committee Allocation:

B108	two little dipper filters	\$1100.00
	two uher 4200 portable recorders	\$1350.00
	(the \$200 overage here will be snatched from another pot)	

Faculty Playback Systems

Oliveros office	\$2000.00
Portable Roll Around Multipurpose System Including Cassette	\$3000.00

Replacement Audio Equipment (Equipment -4)

System for technician room	\$500.00
----------------------------	----------

Interconnection of classrooms B104, B108, B150, B152, courtyard and three practice rooms, B202, B206 B210 and Mandeville lighting booth	\$3000
---	--------

(NOTE: this has not been completed. We recommend that the job be completed by Pacific Recorders and not by amateurs. Also the money should come from some other fund, which should have been budgeted for the completion of the building, not groups II and III)

B206	Microphones for high quality recording	\$750
------	--	-------

Recommendations

write policy for faculty

- I All purchases of electronics over \$10.00 must go through the Electronics Committee for the following reasons:
 - a. Discounts are available. A lot of money has been wasted by individuals who do not know how and where to buy.
 - b. The technician should be consulted on the practicability of maintenance.
 - c. The committee wishes to maintain consistency for the overall program since equipment is used communally.
- II An instrument Committee, aside from the Performance Committee should be appointed to coordinate purchases
- III According to Harold Cohen, Visual Arts Department, \$250,000 in equipment replacement money came down from Berkeley. The committee for dispersal of these funds was headed by Rotenberg. Our Department and Visual Arts each received 1% of this money. According to Cohen, Rotenberg said that neither Department asked for such funds. That is why we received so little.

Thomas Nee
November 30, 1976
Page three

The committee wishes the chairman to investigate this matter. The committee urges immediate action on these matters so that second quarter may begin with items purchased and installed.

Your copy

September 30, 1975

To: Thomas Nee, Chairman

From: Pauline Oliveros
Chairman, Electronics Committee

Subject: Priorities Groups II and III equipment purchases and other recommendations

1. B-104/Faculty Tape Composition Studio. This studio must be cleared of all that does not belong there as immediately as possible. It should become operational with what equipment is already available as first installation priority.

The following is essential this year:

One 8-track, 8-channel tape recorder	\$13,500	
Rebuild one 2-channel tape recorder	1,000	
Move one 4-channel tape recorder from recording studio to B-104	-0-	
One 8-channel out mixing desk	17,000	
Four JBL loud speakers	2,544	
Four amplifiers	1,000	
Two 1/3 octave filters	6,000	
Interconnection/installation materials	<u>3,500</u>	
	44,544	... \$44,544
Future needs: 4 DBX noise reduction systems	...	3,200
2. B-108/Electronic Music Studio	...	16,000
* Buchla System package		
Noise reduction		
Mixing console		
* Under investigation		

Recommend: remove old equipment for possible sale, trade or incorporation into undergraduate studio.

3.	Faculty playback systems (5 at \$2,000)	\$10,000	
	Who is to receive these? How determined? (Either a piano, or a system.)		
4.	Microphones and microphone stands.		1,240
5.	Portable system		
	4-channel, 1/4-inch tape recorder	\$1,900	
	Two amplifiers, Two loud speakers	1,700	
	Microphones, microphone stands	2,000	
		<u>6,840</u>	\$ 6,840
6.	B-151/Undergraduate Studio.		
	Recommend: a new space be found for the studio to accomodate teaching. Use B-151 for storage of equipment.		
	Buchla System		\$ 3,000
7.	Music I		
	Recommend: Investigation of grants for funding.		
8.	Question: Who will use scalatron and who owns? (See item 10, memo July 29, from J. Campbell to Pauline Oliveros.)		
			<hr/>
		TOTAL	\$75,824

The committee recommends that our two studios B-104 and B-108 must receive first consideration. Also that no equipment be purchased in the future without due consideration for time and cost of installation, and that old equipment be phased out in the best possible way after due consideration. Anything may be rebuilt, but it ultimately may cost more in parts and labor than a new system or item. We recommend that Ritcher and Julian be sent to Berkeley as soon as possible to investigate and price new Buchla systems.

P. Oliveros
G. Ritscher
R. Reynolds
J. Julian

230.18
14,406.00

14,175.82

What was spent

October 27, 1976

TO THE FACULTY AND STAFF:

Attached is a statement of funds available to the Department for the current year, July 1, 1976 to June 30, 1977. Total state funding to the department (19900 funds) is \$522,825. This is augmented by funding for TA's and monies from the Academic Senate, La Jolla Civic Association, and building finishing funds (Groups II and III) for a total funding of \$565,174.

The operating budget for this year is also attached. This covers expenditures of the \$41,903 available in the Supplies and Expense category for general expenditures.

This year I would like to reinforce the Chairman's prerogative in approving all guest lecturers, faculty travel, and music purchases. Attached is a form for your requests. Additional forms will be available at the front desk.

Please be reminded of the following: Funds are available from the Academic Senate Research Committee to support faculty research. The departmental allocation for faculty research is limited, since other sources of funds (such as the Academic Senate) are available. Also, the allocation for SONOR is primarily seed money. It is anticipated that expenses will be offset by income from performance fees for off-campus appearances. It is also projected that a portion of travel for that group may be considered as graduate student recruitment.

The allocation to the Concert Committee is to be seed money; overall production expenses should be offset by concert income.

The basic format of the budget has been changed to show in greater relief our heavy investment in support of the curriculum. Last year, the Program Review Committee raised questions on the level of our concert activity. This year's budget is designed to show that these activities are an integral part of our curriculum, and not an extravagance which decorates our course offerings.

All requests for goods and services are to be made through Pat Olson. Last minute requests for audio-visual services have a late penalty assessed. This year's federal subsidy has also been cut back, so we will have to make very careful use of these funds.

Comments you have regarding these guidelines will be appreciated.

THOMAS NEE

October 1976

Department of Music

OPERATING BUDGET
1976-1977

APPROPRIATION

Academic Salaries (-0)	17.5 FTE	366,815
TA Allocation (-0)	4.5 FTE	46,143
Staff Salaries (-1)	5.5 FTE	75,194
General Assistance (-2)		15,808
Supplies and Expense (-3)		41,903
<i>what kind?</i> <u>Equipment</u> and <u>Facilities</u> (-4)		2,000
Academic Senate Awards: Recording Tape/Duplicating . .		1,750
Intercampus Travel		700
Groups II & III: Available Balance		<u>10,727</u>
La Jolla Civic Association: Donation		2,000
Scholarship Fund:		2,134
Total Available Funds		<u>\$565,174</u>

what kind?

what does this mean?

*#1200 for george
where's the \$800?*

*what is this
discrepancy*

NOTES

Academic Salaries includes 1.0 pool FTE for this year only. The 0.5 represents the split in Campbell's appointment between staff and academic funding. Actual permanent funding of FTE is 17.0.

The FTE in staff salaries will be increased by 1.0 with the creation of the secretary-receptionist position. General Assistance monies include a \$5,000 increase for this year only on a trial basis to fund accompanists. It also includes \$2,120 which will be transferred to staff salaries to cover the receptionist position, a permanent increase effective this year.

The Supplies and Expense budget includes a temporary increase of \$2,500 to fund a temporary appointment (Ungar). This should be added permanently when a permanent appointment is made.

These figures do not include the allocations and FTE for CME which are actually listed on our official budget.

ELECTRONICS

Equipment monies (-4) are for the purchase of inventoriable items over \$200 in value.

Academic Senate funds to the department reflect an overall decrease of \$1,000 from last year's allocation, due to cutback of funds to the campus for Research Committee awards. Last year, however, we were able to reapply, and successfully requested an increase of \$1,100 over the initial allocation since we could show an active need for additional funds.

In addition to this departmental allocation, faculty are able to request individual awards for travel, preparation of material for publication, and research projects from the Academic Senate. Please coordinate your requests with Pat Olson.

Groups II and III monies for equipping the Mandeville Center show an available balance of \$10,727. This is primarily due to outstanding negotiation with vendors for several items voted on last year (celeste, harpsichord, etc.).

La Jolla Civic Association, as mentioned in an earlier memo, has made a donation to defray the costs for secretarial/clerical assistance.

The Scholarship Funds showed an initial balance of \$2,134 at the start of this year (July 1, 1976). Awards made for the current year have reduced the available balance at this point to \$908.

Students in the Department have received various financial awards. A list is attached of current awards. Last year, Student Affairs allocated \$300 to the Student Tape Club. This year, we have requests pending for support of the Atomic Cafe and certain activities of the Civic Chorus.

In addition to these funds, we project a limited amount of production income which will be used to offset expenses for the Wednesday Evening Series, Scholarship Series, and special appearances by the Gospel Choir and Civic Chorus.

(These figures do not include the allocations and FTE for CME which are actually listed on our official budget.)

There should be \$3,000 available to the Department through the Academic Senate due to the exchange of ownership of a synthesizer which Keith Humble took to Australia. Pauline Oliveros is preparing a request for the purchase of a new synthesizer. (We were required to replace this equipment in kind.)

For your general information, the Budget and Planning offices are always quick to point out that the Mandeville Center Facility and its operating budget (\$40,000) are seen as an additional resource to the Department. Although this is not a direct allocation to us, it is always taken into account that it is a direct resource to us since we always have first preference on use. Similarly, although the CME is separate from the Department, it is always pointed out that the space, facilities and funding represent a direct source of support to Music Faculty and graduate students.

GRADUATE STUDENT AWARDS 1976-77

Research Assistantships:

Tom Nunn received a Fellow-Research Assistantship to work on research related to his degree; 10 months @ \$375 and fees (\$678) \$4,428.00

Although not directly allocated to the department, there are allocations for 2 RA's at CME for 9 months @ 50%.

Fee Scholarships from OGSR:

Chafe, Christopher - Fall Quarter	226.00
Grusin, Martin - Fall, Winter and Spring Quarters . .	678.00
Heins, Victoria - Fall and Winter Quarters	452.00
Kelleher, John - Fall and Winter Quarters	452.00
Kotani, Jeraldine - Winter and Spring Quarters . . .	452.00
Russo, Vincent - Fall, Winter and Spring Quarters . .	678.00
	<u>\$2,938.00</u>

Non-Resident Tuition Scholarship:

Batschelet, Bernhard - Fall, Winter and Spring Quarters \$1,875.00

San Diego Fellowship:

Hollis Gentry received a fellowship for 12 months @ \$375 and fees (\$678)	\$5,178.00
Omar Ramirez received a fellowship for 12 months @ \$375 and fees (\$678)	<u>\$5,178.00</u>
	\$10,356.00

TOTAL AWARDS \$19, 597.00

Awards Declined:

John Celona declined to accept a dissertation fellowship in order to accept a position as Associate in Music.
Rodney Rogers withdrew and thus forfeited a Regent's Fellowship for 9 months @ \$375 and fees (\$678).
James Marshall withdrew and forfeited a Fee Scholarship (\$678).

DEPARTMENT OF MUSIC

OPERATING BUDGET 1976-77

I. CURRICULUM

Course Support

Music 130 (Large) Chamber Singers.	100
Music 135 (Nee) Civic Orchestra.	600
Music 137 (Large) Opera Studio	1,000
Music 140 (Chase) Civic Chorus	300
Music 141 (Brooks/Nee/Brooks) Concert Choir. . .	300
Music 143 (Nee/Turetzky/Francois) Seminar	900
Music 144 (Lytle) Gospel Choir	500
Music 145 (Lytle) Jazz Ensemble.	500
Music 201 (Rands/Francois/Nee).	1,000

All other expenses:

Guest lecturers, audio visual subsidy, film rental, class materials, duplicating, texts, reference materials, moving, garage, etc. 2,000

Subtotal. 7,200. 7,200

Technical Support

Electronics (Ritscher): tools, parts, supplies, replacement audio equipment, microphones Moog & Buchla items, test equipment, etc. 5,800

Instruments: piano tuning, harpsichord tuning, harp regulation, other tunings and repair 3,000

Subtotal. 8,800. 8,800

Production Support (Solomon)

Graphics (posters, flyers, programs, releases, publicity, etc.) for all performances 3,000

Cartage, film, art supplies, mileage, postage, all other expenses. 1,800

Subtotal. 4,800. 4,800

CURRICULUM SUPPORT. 20,800

Repair and upkeep but not new items.

II. FACULTY RESEARCH

SONOR.	500		
<i>not research</i> * Archive Tape and Supplies	1,200	<i>not research</i>	
All other expenses (tape, supplies, fees, travel).	<u>800</u>	<i>but instructional</i>	
FACULTY RESEARCH SUPPORT	2,500.		2,500

III. ADMINISTRATION

Affirmative action/faculty recruitment	1,500		
Graduate student recruitment/brochure.	1,500		
Telephone instrument charges/tolls	5,300		
Mail delivery/postage.	1,500		
Graphics/duplicating	1,000		
Storehouse supplies	1,800		
Facilities maintenance/repairs/keys/security	1,500		
Staff training/travel/mileage.	500		
Memberships/periodicals/reference materials.	500		
Rental of equipment	200		
Maintenance of office equipment/repair	350		
Contingency.	<u>1,753</u>		
ADMINISTRATIVE SUPPORT	17,403.		17,403

IV. PUBLIC SERVICE/CURRICULUM ENRICHMENT

Concert Committee (Lytle): Wednesday Evening Series, Scholarship series, Atomic Cafe, non-class activities, small equipment, fees, related expenses)	<u>1,200</u>		
PUBLIC SERVICE/ENRICHMENT.	1,200.		<u>1,200</u>

Department Operating Budget for Supplies and Expenses \$41,903

Request for Guest Lecturer/Guest Artist

Name: _____ Course: _____

Address: _____ Proposed Date: _____

_____ Honorarium: _____

Social Security: _____ Special Information: _____

Signed: _____ Date: _____

REQUEST FOR MUSIC PURCHASE

Title: _____ Course: _____

Composer: _____ Date Needed: _____

Suggested Vendor: _____

(address) (phone)

Number of copies requested/special ordering information: _____

Signed: _____ Date: _____

REQUEST FOR LEAVE

Name: _____ Inclusive Dates: _____

Purpose for Leave: _____

How your classes will be handled: _____

All leaves of more than one week must be approved in advance by the Vice Chancellor
Submit your request on an official "Special Leave" form.

Signed: _____ Date: _____

Instrument
Committee
should be
formed

Electronics Folder - Delegate authority to committee-chairman
do not ok purchases unless they have gone through
the committee - anything over \$100 or \$10 -
no more purchases on unilateral basis Electronics
Committee waste - inefficient
with consulting tech maintenance.

Cohen said
250K for
equip replace
we didn't ask

\$2000 was promised for equipment renewal how called
Equipment & Facilities 1200 to George what
has happened to \$800 Why titled?

General Assistance ?

(same thing
with space)

Group II + III why discrepancy between Pat Olson
as of Nov. 22, 1976 and budget Oct 1976
10,722 as opposed 14,936.18

\$4100 still
available
in B104
B108

Archive Tape & Supplies
not research but instructional.

+ Ref Elec.
not including
\$5000 set aside
for faculty
Play back.
\$9100
left.

Course Support for Composers

" To the extent that equipment belongs to instrument
the professor can buy it -

A musical instrument especially when electronically enhanced
includes everything up to

Electronics in
Performance
needs course
support -

Wiring should have been in original cost of building
not equipment and components -
A+E funds

Accounting of the total amount of money spent for
electronics in the groups II and III area
since Sept. 1975

Then
Consisting of the source - Supplier
Shipping - Tax
Total cost
what actually is the
who pays what?

How to categorize the charges

Wher seems best for service and price -
Grads want one top quality machine Stereo Reel to reel -

Dept. needs cassette machine \$500

Filters a pair of little diffusers 2 to 4 \$545

office system Pauline \$2000

Wher \$1200

Other faculty systems

Spare audio components (Class room setup
Speakers Amp Preamp -)

Portable playback system with record capability \$2500

Lab fees \$5 to \$10

Go see Standish

Xerox fee may might get us sued for copyright laws.

Per student \$5 - Per course ?

More information from staff - Electronics Committee
is willing to support idea - What does Performance
think?

What can the library do
" " " Media Center do.

Transcription turntable

Omnidirectional mics ~~###~~ - \$750

I Finish wiring \$3000

J Medium quality Speaker \$500 for technician

May 15, 1973

TO: The Music Faculty

FROM: The Committee on Electronics in the Mandeville Center

SUBJECT: A request for input on a basic position. PLEASE READ AND COMMENT BY MAY 25 (TO THE MUSIC OFFICE).

The Committee attempted to develop an overall picture of the ideal needs that the Department might foresee in the area of electronics.

We drew five general categories:

- I. Equipment for faculty offices/studios.
- II. Equipment for general classroom use.
- III. Equipment supporting undergraduate service courses.
- IV. Equipment serving undergraduate majors and graduate students [this to include specialized facilities in which faculty has priority].
- V. Equipment for faculty research.

At this point, we suggest the following:

- 1) tape machine and monitor system for each faculty office/studio
- 2) tape and record playback appropriate to space with option to record with mikes and cables signed out
- 3) continue and up-grade present Music 1 and Music 10 laboratory facilities
- 4) and 5) these together may be seen in the accompanying chart. We suggest five general categories each of which may have a research (or guided, one-to-one instruction) and/or instructional aspect.

attach.

SOUND
RECORDING

SYNTHESIS

ANALYSIS

VISUAL
RECORDING

MAINTENANCE
&
FABRICATION

V. <u>RESEARCH</u> (individual instruction)	Facility for Documentation & Research	Controlled-** access analog studio	**	Video documentation facility	Technician lab & check-out of equipment.
VI. <u>INSTRUCTION</u> (class)	Teaching facility	Analog studio for student use & instruction.*	Instructional station including scope, computer terminal to Center's machine, etc.	Instructional use of sound for video or film.	Student shop for fabrication and instruction.

*basic preparatory electronic work should be done in "practice rooms" at a Music 2C or related level.

**It is assumed that the highest level of faculty research in these areas will be accommodated by the Center's facilities.

June 11, 1973

To: John Silber

From: Peter Farrell

Concerning: recommendations of the library committee

The committee recommends the establishment of a Fine Arts Library facility in the new building. The facility would house the departmental collections of the Music, Visual Arts, and Drama Departments and provide audio and visual equipment for listening and viewing.

Music holdings would include choral library, orchestral library, teaching materials, periodicals, reference books, catalogs, instruments, departmental tape archives. Chamber music would be housed in the Central Library. Playback equipment for tape, disk, and video materials.

Visual Arts and Drama holdings would include slides and slide projectors, and periodicals and reference works, and scripts.

Inventory control and security of the materials would be maintained by one FFB staff member plus extra help as needed, perhaps work-study.

The cost of the staff would be shared by the departments on a pro rata basis. The cost of departmental materials, storage facility and retrieval equipment is the responsibility of the individual departments.

June 11, 1973

To: John Silber

From: Peter Farrell

Concerning: Duties of a Fine Arts Librarian

- 1 Catalog and label materials
- 2 Organize library space
- 3 Store and retrieve materials
- 4 Control inventory. Check materials out and in.
Send overdue notices
- 5 Order materials
- 6 Supervise extra personnel
- 7 Help library users. Answer telephone inquiries.
- 8 Coordinate services with Central University Library
- 9 Maintain equipment and supplies
- 10 Keep files. Keep statistics on use of materials
- 11 maintain security of materials. Lock and unlock.
Arrange for substitute librarian

This position may be filled by a library assistant or by someone trained in Fine Arts who could be trained in his new library duties by the staff of the Central Library.

June 11, 1975

To: John Silber

From: Peter Farrell

Concerning: Music Department Collections

The current needs of the Music Department in a Fine Arts Library are estimated as follows:

I. STORAGE

Shelves. Choral	250 ft	
Orchestral	250 ft	
Teaching material	125 ft	
Periodicals display and storage cabinet		
Reference display and storage cabinet		
Catalogs	35 ft	
Miscellaneous. Card catalog case		
Circulation charge files		
Chart case for large scores.		\$4,000
Special cabinets. 3 for instrument storage		
6 for tape storage		
3 for video tape storage		\$3,000

II. FURNISHINGS

Charging and reference desk		
Staff desk, chairs, and file cabinets		
Readers tables and chairs		
Book truck.		
Typewriter		
Labeling equipment		\$3,000

III. ELECTRONIC EQUIPMENT

4 tape play listening stations		
1 disk play listening station		
Tape dubbing station		
Video playback and monitor		\$8,500

IV. EXPANSION

Shelves		
Cabinets.		
1 new tape cabinet needed each year		\$6,000

\$24,500

April 25, 1973

Program Review Board:

Subject: Request for minor film/video editing lab funds.

The music department is very interested in initiating a minor film making/video/editing studio. As you know there is much about the art of music which cannot be expressed in written form. There are those movements, that peripheral data, gestures and collective events which avail themselves only to immediate visual/sonic documentation. Additionally much can be accomplished in creating instructional documentaries produced as art works, to make them timeless artistic products rather than just informational sources. We anticipate in the near future a great need for such documn ^{musical arts and} pedagogy. We are despararately in need of a modest amount of equipment to establish such an exploratory research unit.

Our needs are:

<u>Material</u>	<u>Estimated Cost</u>
Editing Table complete with Lightwell, Rack and Drawer	\$178.00
Trim Bins TB-3	55.00
TB-3 Extra arms 18" with 12 hooks	9.00
Micarta Flange 400'	12.50
Micarta Flange 1000'	20.00
Split Reels (6) 400'	7.50
Split Reels (2) 800'	9.75
Split Reels (6) 1200'	15.00
Split Reels (2) 1600'	18.50
2 Search Head Kits (Manual)	60.00
Amplifier - Speaker Units URS Optical or Magnetic (4" speaker)	72.00
2 Rewinders WA-35 WA-16 Accomodates 1 reel	28.00
2 Rewinders WDUS-35 WDUS-16 Accomodates 4 reels	53.00

<u>Material</u>	<u>Estimated Cost</u>
Synchronizers For 16mm SZD	\$200.00
Editing Chairs Without casters	46.00
Hot Splicers Maier Hancock 8-16	264.00
Tape Splicers Guillotine 16mm Straight Cut	155.00
Tape Splicers Guillotine 16mm Straight and Diagonal Cut	170.00
Moviscop Viewer - 16mm without base or rewinds	180.00
Moviscop Viewer bulbs (6)	3.00
Tape Dispensers - C-22 Double roll, heavy duty	8.25
Gloves (White Cotton) 6 Large (medium wt.)	2.80 (per dz.)

I should add that the music department is not without prior experience in film production. We have produced two films for NET as well as a local series of video documentaries on new music. We also possess a sony 1/2" video camera and recorder and access to an excellent 16mm film camera.

Sincerely,

John J. Silber
Department Chairman

JS/nb

TO: DR. SILBER

FROM: LEW PRINCE

SUBJECT: EQUIPMENT TO BE INCLUDED IN NEW BUDGET.

I have compiled this list of most urgently needed items to be used in renovation and repair of department electronic equipment, so that you might incorporate these requests in your 1972-73 budgetary request. They are all a necessity as of right now, others may occur during the time interval involved, but I cannot anticipate those needs.

	Head assembly for ampex AG-440-2	\$ 325.00
	Head assembly for ampex AG-350-2	395.00
2 sets	Replacement heads for Revox HS-77 machines (record + play only)	36.00/set
2	Electro-sound pinch roller tire assembly	8.50 ea.
2 sets	Heads for Sony 777 (approx. figure dependent on model)	100.00 ea.
	Conversion of ampex AG-440-2 in Q315 (moog studio) to 4 channel:	
	Head assembly	\$ 615.00
	Electronics assembly	1280.00
	Cables	60.00
	Head connector assembly	150.00
		<u>\$2105.00</u> + tax
	Flutter meter	595.00
	Distortion measuring equipment	200.00
	Capacitor tester	75.00
	Spare parts stock (additional to \$100 already allotted)	400.00
14	Calibration Kits for Ampex tape recorders (1 per channel)	20.00 ea.
	Replacement potentiometers for Buchla & moog	300.00
	Wire and cable	150.00
	Connectors, plugs, etc.	250.00

	Equipment cabinets for classroom set-ups (you add quantity)	\$ 200.00/unit
	Loudspeaker systems (6-8)	3000.00
6	Sony 800 portable tape recorders	1400.00
	New Styli for turntables	100.00
	Replacement of Scully 280	3000.00
	-trade-in	<u>1000.00</u>
	for ampex 440	2000.00
10	Permanent mix-down facilities consisting of 2 playback-only decks and 1 recorder each	5000.00
	New motor for tapesonic	200.00

I am sure there is other "stuff" needed, but I wished to get this much on paper A.S.A.P.

CLASSROOM SOUND EQUIPMENT SYSTEM

1	<u>Sony TC 650 Tape Recorder (1/2 track stereo)</u>	\$600.00
	[must buy 1/4 track plus 1/2 track head assembly to convert machine; 1/2 track not available by direct purchase]	
2	<u>Altec-Lansing A7-500 Speaker Systems</u>	1,000.00
1,1	<u>Dynaco PAS-3X Preamplifier and Stereo-70 Amplifier - one each</u>	300.00
1	<u>Rack cabinet to hold above equipment</u>	250.00
		<hr/>
		\$2,150.00
		<u>Tax</u> 108.00
	(Est) <u>Shipping</u>	42.00
		<hr/>
		<u>\$2,300.00*</u>

*add 10% inflation if items to be purchased
after 7-1-73 = \$2,500

LP/ba

5-18-73

Projected life of equipment with and without maintenance -

Hard use = Round the clock

When to replace - When is it as \$ to maintain as to replace -

Constant struggle - deterioration

Archive - Mills set-up

Computer programs
for cross reference
and updating

Floating Equipment

for performance + concerts etc

flexible, durable, portable

Easy access storage (Tall shelving)

Security measures?

Fabrication + maintenance

Space for students to do work (design build) (I+L)

Recording Studio
 Studio for classes
 Fabrication Maintenance
 Storage
 Archive
 Buchla
 Moog
 Theremin
 Film Studio
 Dubbing
 Office

Staff

David Behrman
 Bill Farley Film Instructor
 Maggi Payne Audio Eng
 Bob Sheff " "
 designs eng Paul De Marinis
 Technician Nicholas Bertoni
 Administrator Robin Kirk

Pagenmill Rd
 West

Pass 280

Bridge
 Across traders
 Turn right
 Building on hill
 on the right

#01 - Oregon Expressway

Behrman

" Experimental music centers should have an open door to artists traffic."

" Give artists a chance to play with current expensive equipment." Rather than old artist
 in residence "idea" tremendous influence
 for a few days.

Roger leaves 10th Jan.

Allen Strange 4 Euclid Los Gatos

South 280 Highway 17 South
Los Gatos Highway 9

go to first light take left on University
next light left on main st
Cross back over or look for El Gato
Penthouse on right College to right
up hill take right on Jones next
is Euclid

Documentation + Check

1 Colloquium - Procedure What constitutes proper research?
Grad Proposal - Signed by advisors Research Proposal + report

2 CME Publications

- a. Why aren't the papers
- b. news letter

what's appropriate? opportunities

How to be handled

3 Technical Studio

- a. Usage Guidelines
- b. Time involvement with students.
- c. Lightening -

How to make reciprocal arrangements

Donorman
Norman Crowell

4. Grantsmanship

ie. Al does 201 then Hawkins or Francois
works in center with release time -

"Can you state your need?"

Call Ezra

5 Conference for next fall -

wingspread
Johnson Foundation
Grant for conference

"Human +
professional
economy" / 6
planning

Baldwin Piano 7 foot not 9 foot -

to plan computer
conference -

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

To: Pauline Oliveros & George Richter
From: John Celone
Date: 11-10-76

This is to certify that Alberto Galos has received sufficient instruction in the use of the moog studio including the care and operation of the tape machines. I have told him to see George regarding issuance of a key.

I will be assigning him projects as sort of an unofficial 105 or 103 I think it should be a mandatory requirement for him to be currently enrolled in 105 or 103 in order to maintain his key status and this privelege.

Thanks

Lab fees
for courses

Friday Agenda

Oct. 29

1) Performance Electronics John Silber
where are they?

Campbell letter

Priorities for spending

2nd Technician

Stroboconn

Portable Whers for grads

can't use
electronic fund
for other things

Technical support - for maintenance/parts necessary tool & supplies
category

Sub II new items should go into this category.

where does leader/splining etc for the studios come from.

Listing of Qualifications of technicians

Little differ
sound effects filter
Grad studio

who pays for parts?
who pays for replacement.

who pays for what
under what circumstances?

George investigate

Purchase maintain replace/
part/labor

Sound systems for faculty should not
come from this budget (current) what happened to original \$1200 for each office.

B²⁰⁶

List items for room take 10% of total cost for installation
\$3500 was too high according to Joe Klein. Recommended \$900

Mixing desk was purchased complete with wiring

B104 \$50,000 total - requested \$900

B210 1 customized cabinet with accessories \$108

\$350,000 total requested
given \$250,000 (approximately)

Initial \$3,000

2nd 99,628

Allocation

How Berkeley Allocated funds

Based on square footage (Campbell has largest room)

Change space requirement to hard science for better allocation -

Laboratory Space for experimental work -
would give us more work - Compare to
other UC campuses to show how different we
are.

Berkeley is used as Economic model -

our allocation based on that -

19 Faculty offices

15 B100

4 Main level

(no sound control
or isolation)

15 Stereo systems were requested

16 Pianos

TO: Pauline Oliveros
FROM: James L. Campbell
DATE: October 21, 1976
page 2

In addition, Pacific Recorders is to finish the wiring of the communications link between B-206 and the Auditorium/Recital Hall Recording Studio as well as the link between the Music Court-yard/B-150/B-152 complex and B-206. When all of this is finished the wiring of the total music department will be finished.

Last year a report was submitted to the Chairman of the Department concerning items to be purchased for the Archive. Among those items were two omnidirectional condenser microphones to round out the microphone compliment of the Archive and eight compatible headsets for use in multi-track recording techniques being used and requested for use by the student composers in the Department. As of yet no word has been received as to whether the items will be purchased. In the meantime the particular recordings described can not be accomplished due to the lack of those items. I would appreciate your aid on behalf of the Archive in requesting that the purchase of those items be initiated as soon as possible.

Barbara Alvarez collected requests from faculty on what was wanted where are those?

Must get oriented towards ^{original} orientation -
Talk to George Mandler - Psychology -

Bob Thomas Business Manager for Univ -
Pushed for extra allocations -
Get him to push for 3rd allocation -

How much did equipment actually cost?
How to follow up on my letter of Sept 30, 1975

Look through with George -
Does equipment purchased match the request,
Are funds left?

Law got \$2000 per year allocated for new equipment.
Where is that in the budget?

In addition, the use of both performance studios in multi-varying functions at the same time with a common and compatible result in mind not only is possible but has been demonstrated on several occasions by the students in the recording class. It is to be understood that this function will become more paramount in the needs of the composers of the department as word gets around.

The necessary wiring from each of the large performance studios is finished into B-206 and needs to be connected so that the Electronic Processing Studio (B-108) can be directly connected to its companion performance studio (B-210) and the Faculty Tape Processing/Composition Studio (B-104) can be connected to its companion studio (B-202). This last phase of wiring is to be accomplished by Pacific Recorders on a contract already agreed to by them but by now out of date as far as necessary funding is concerned.

UNIVERSITY OF CALIFORNIA, SAN DIEGO

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SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF MUSIC

POST OFFICE BOX 109
LA JOLLA, CALIFORNIA 92037

October 21, 1976

TO: Pauline Oliveros, Chairman
Electronics Committee

FROM: James L. Campbell, Lecturer
Sound Recording Techniques

SUBJECT: Progress Report on Wiring of Studio Complex

The wiring of the studio complex: B-104/B-202/B-206/B-210/B-108, begun during the summer of 1975 is now two-thirds completed. The remainder of the wiring must wait for funds from the Department budget of 1976-77 which has yet to be approved from higher up.

At the moment the two large performance studios are wired complete to the mixing desk in B-206 such that simultaneous foldback/recording techniques can be employed. This will allow the necessary functions pertinent to multi-track recording to take place. The sending of signals to the performers (while in the process of performing) can be accomplished in the following ways:

1. via headsets;
2. via the two-channel stereophonic system indigenous to each of the two performance studios;
3. via both 1. and 2. above.

In addition, the use of both performance studios in multi-varying functions at the same time with a common and compatible result in mind not only is possible but has been demonstrated on several occasions by the students in the recording class. It is to be understood that this function will become more paramount in the needs of the composers of the department as word gets around.

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Present: Nee, Oliveros (Chairman/Electronics Committee),
Silber (Chairman/Performance Committee); Georgalis

Overall priorities for purchase of equipment were discussed, using the priorities given by the Performance and Electronic Committees.

The following list emerged:

B-104/Faculty Tape Composition Studio	44,544
B-108/Electronic Music Studio	16,000
Playback systems for faculty	5,000
Performance electronics ^a	6,000
Percussion: vibraphone (Musser "Century")	1,776
Percussion: celeste	3,000 ^b
Harpsichord (1/3 cost)	3,000
Electric piano (Finder Roads)	<u>1,250</u>
	80,570

NOTE: Performance faculty felt the first priority should be handling classroom needs -- playback systems for HL and instruments for Music I. Use of Groups II and III monies is not possible, however, since these courses are in HL. Departmental funds may be available for these purchases; report follows. We may be able to get significant values by trading in obsolete and unused equipment when we make large orders, freeing monies for electronic equipment.

a It was suggested that this need may be met by audio visual; rather than our building up an inventory of portable electronics, we may better be served by renting equipment as needed from audio visual. Further, they are subsidized, so the charge would be small.

b It was hoped that a good celeste for less than \$3,000 could be found.

12/5/75

PERFORMANCE ELECTRONICS

Quantity	Item	Unit Price	Total Price
10	Small audio <u>transducers</u> (speaker minus coil) to drive resonators (Encinitas)	25 est.	250
4	Base portable "instrument" <u>speakers</u>	700 (2)	1,400
2	Crown D-150 Stero <u>Amps</u>	300	600
1	Portable <u>mixer</u> , 8 in, 4 out (Shure)	,500	1,500
3	Morley boost <u>Pedal</u> (WaWa+)	119	357
1	Tel Ray <u>Echo Unit</u> (list 195)	79	79
4	Contact <u>Mikes-piano</u>	135 (60% +)	640
6	Contact <u>Mikes-winds</u>	40 (60% +)	240
6	Contact <u>Mikes-strings</u>	40 (60% +)	240
4	<u>Pre Amps</u>	42 (60% +)	168
MISC.	<u>Cable box and cable</u> (instrument pickups to amps and speakers)		400
12	Tuned <u>filters</u> (electronic), <u>mikes</u> and <u>pre-amps</u>	125	1,500
12	Helmholtz <u>resonators</u> , <u>limiter</u> , and <u>amps</u>	80 est.	1,000
10	Assorted reed mouthpieces plus ligatures (acoustic accessories)	12	120
10	Adaptor bits for mouthpieces (acoustic accessories)	5	50

PERFORMANCE ELECTRONICS, cont'd.

Quantity	Item	Unit Price	Total Price
2	Four channel mixer <u>pre-amp</u> for instrument pick-ups	125 (60% +)	250
2	Four in, one out (Shure) <u>Mixer</u>	200	400
5 or 6	Air <u>mikes</u> (high quality) and <u>stands</u>	200 30	1,240
	Fabrication of triggering access system from instruments (4) to computer and/or synthesizer (electronic and mechanical)		CME development or present system Buchla?
TOTAL			10,440

TO: Pauline Oliveros
acting Chairperson 29 July 1975

FROM: James L. Campbell
Coordinator, Space and Facilities

SUBJECT: Insertion into the Grps II & III Equipment List:
Phase II of recommendations by ad-hoc committee
on planning the Faculty Tape Composition Studio

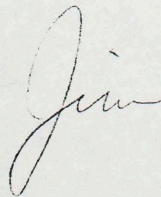
Enclosed is the original list modified by the insertions recommended by the committee comprised of Robert Erickson, Roger Reynolds, George Ritscher, yourself and myself. Those items marked with an asterisk are the insertions. Included in the list of June is the additional item labeled "Old-time instruments" which is not included in the revised list as recommended by the committee for obvious reasons. That item listed:

contra-bassoon
piccolo
bass flute
alto flute
vibraphone
electric piano
Baldwin electric harpsichord
viola
double-bass
soprano saxophone
baritone saxophone

The revised list totals (with 6% tax) \$140,931.00. Grps II & III funds for the year 1975 are approximately \$96,000.00. There is approximately \$7,000.00 left over from Grps II & III funds for 1974 (although this has not been varified by the accountant.

One question raised by Roger pertains to the involvement of the Office of Graduate Research in the funding of new equipment. I have been advised that OGR is in no way involved; requesting and procuring equipment for new buildings is entirely a department matter insofar as the department subscribes to the "code" as set forth by the Office of the President of the University.

Sincerely,



cc Tom Nee
Chairperson

Grps II & III Equipment List: Phase II

1. Chamber music pianos

- a) Baldwin SD-10, 7-foot (for B210) \$ ~~9,410.00~~ 7,000.00
- b) Baldwin model L, 6'3" (for B150 or B146) 4,995.00

12,714 spent

2. Pro-seminar piano - 5'8" 6,000.00

3. Harpsichord - Hubbard kit - \$1,500.00 + \$1,000.00 2,500.00

4. Faculty pianos ?

* 5. B108 - (2) 10,000.00 + 6,000

beef up with good, voltage-controlled source generators, good, voltage-controlled filters, good, voltage-controlled mixers; sacrifice noise reduction systems if necessary.

Buchla Package

6. New duplicator (one-half of purchase price from V.A.) ?

(6) * 7. B151 - Under grad notes 3,000.00

retain as a two-channel, beginning studio where emphasis is on discovering good tape techniques rather than sacrificing the time in using four-channel equipment.

8. Tape cabinets for Archive 1,200.00

9. Furniture for office re-alignment and addition of new faculty/staff ?

(8) 10. Adaptations for Scalatron who can use (2,700.00) no

(4) 11. Microphones and microphone stands 1,240.00

12. Blackboards 350.00 3/pair

13. Celeste and harmonium ?

(3) 14. Faculty playback systems (5 at \$2,000.00 each) (10,000.00) who?

(5) 15. Portable System (s) - original estimate (4,800.00) is too low.

4-channel, 1/4-inch tape machine \$1,900.00
 2 amplifiers and 2 loudspeakers 1,700.00
 microphones, microphone stands, etc. 2,000.00
 \$5,600.00

5,600.00

Grps II & III Equipment List: Phase II
page 2

① Top priority
no trimming

* ①⑥. B104 -

1 8-track, 8-channel tape recorder	\$13,500.00	
1 4-track, 4-channel tape recorder with 2-track head unit as well	5,225.00	X
1 2-track tape recorder	3,685.00	X
4 dBx noise reduction systems	3,200.00	X
1 8-channel (out) mixing desk	23,000.00	- \$6,000
4 JBL 4320 loudspeakers	2,544.00	
4 amplifiers	1,000.00	
2 one-third octave filters	<u>6,000.00</u>	

sub-total \$58,154.00

interconnection material, cabinets
movable standards, etc. 10% 5,815.00 - 2,000

sub-total \$63,969.00 \$63,969.00

17. Piano re-building (5) 7,100.00 *paid*

18. Music manuscript storage cabinets (27) 2,740.00

* 19. Faculty typewriter 600.00

① ②⑦. Music I - 1 4-track, 4-channel, 1/4-inch
tape recorder (431 H&L building) ? 1,900.00 ?
what are intentions?

sub-total \$132,954.00

6% tax 7,977.00

Total \$140,931.00
- 2,410 -

* Additions to the list as comprised in June, 1975. \$138,521.00

October 29, 1976

TO: Electronics Committee
P. Oliveros, R. Erickson, Wm. Brooks, J. Campbell, G. Ritscher,
J. McColm, D. Jones

There will be a meeting of this committee on Friday, November 5
at noon in the conference room.

note to Jim —

ok — we will buy 8 compatible head sets

for mult-track recording

no — omni directional mikes -

no — wiring, wait

Jr. Elec. Technician:

60 tape recorders
30 H-L, 5 KTCME

pl. Sci. Equip.

Requests for 76-77 FY Budget - Electronics
(Ritscher)

- 1. Small tools, and power tools - \$1000
Have. need B-104 eqpt.
- 2. Supplies (parts, office supplies, misc. expendable items) - \$2000
digital counter new eqpt. diff. sizes
- 3. Equipment ⁷⁷⁶ *all classrooms now w/d*
 - a. Microphones for classrooms and checkout - \$1000 *cut to 450*
 - b. Replacement audio equipment (to equip B-104, spares for classrooms, replacement & new items for Moog & Buchla Studios) - \$3000
Spring block / patch cords B-104. 760
 - c. Test Equipment
 - (1) Logic Testers - \$350
 - (2) Variable Transformer - \$45
 - (3) Power Supplies (2) - \$450

Test sub-total \$845

7/13 Auth. up to \$1,000 until further notice

Total - \$7845

Other items (different budgets?)

- 1. Interconnection wiring of all classrooms and studios
supplies and labor - (eg Pacific Recorders) - \$2000
- 2. Audio systems for faculty offices - \$5000
- 3. Mikes for concert recording (Campbell) - \$4000
- 4. Replacement of Stolen Eqpt.

75-76 FY Budget History

Requested - \$10,170

Revd. - \$6300 plus ⁷⁰⁶⁶ \$2300 Groups 2+3
 9366 Total revd. - \$8600
 350
 9916

order of preference (\$450,000?)

\$96,000 + 7400
1977

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

\$83,000 last year
\$96,000 this year

on basis of square footage

Summer Purchase = (Budget not approved by Governor yet!)

(1) Pianos - (new) 2 - 7' chamber grand - \$13,000

(2) PIANO (1-5'8 1/2" grand

(3) Harpsichord = Hurlbard kit \$1500. plus on [to go in Pro-Seminar room]

? (4) ~~(*)~~ 1 uprights - For Faculty. [buy Harris assembly] \$?

(5) Electronic inats -
electronic music studio B108
1. Noise reduction \$3,200. ???
2. mixer - 3,000. (needs patch panel)
3. Misc. - 2,000.
\$3,000

DBX 600

(6) new duplicating machine with art dept. ?

X (7) (?) 4-channel machine, For 151 This is ^{beginners} ~~faculty~~ only studio
2 Amps.
\$3000 (Amps are there new)
[2-2 chml tape machines if ^{Viking} don't work.]

(8) 2 - tape cabinets for archives

9a. Furniture For offices

? (9) envelope generator (organ) \$1200

(10) 4-MIKES, Mike stands \$840.

(11) blackboards..

Old Pianos (Fix) - \$4,000.

Emergency Funds?

(12) Faculty playback system 4800.

X (13) 1 - 2 channel deck [For B#104] \$4,000.
2 - spkrs - \$1,000
2 - amps - \$400.

This is faculty studio \$21,000

4 mixers - \$600
stands -

MCI \$15,000

- (16) - 4-chann. - #104 \$6,000. (?)
- 4-noise reduc - \$3,200.
- 4-Amps \$800.
- 4-speaks - 2,000.
- mixer - \$3,000.
- filters - 6,000.
- \$21,000

(17.) Instruments

- Celesta -
- harmonium -
- piccolo - ?
- Contrabassoon -
- bas - Flute -
- Alto Flute -
- tripes -
- electric piano -
- (Strings)
- Sax / Sops.
- baritone
- Horn (alt.)

more perc.? List from Jc 7.?

make lists proper to teaching and research send to library -
what music do we have to buy.

Library won't buy multiple parts

we need examples of electronic music from our faculty.

How much do we know we get \$96,000

How does Berkeley assign our square footage? Bob Thomas

Who works for who? (Chain of command)

Is no money given for support of graduate study?

* Lab space instead of classroom space. (more \$ for lab space)
no letters have been sent to Berkeley to argue for lab space.

We might argue for more \$ but not necessarily get it.

\$73,000 allocated

(Media Study Council Roger Marchand)

When do funds come? for what? new building
bring funding to be spent by when?

- Tape Composition Studio
- 1 eight track
 - 1 four track with 2 track harness
 - 1 2 track

UNIVERSITY OF CALIFORNIA, SAN DIEGO

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ



DEPARTMENT OF MUSIC

POST OFFICE BOX 109
LA JOLLA, CALIFORNIA 92037

23 July 1975

Dear Pauline:

Two problems have arisen which you may have to help with in your position of acting chairperson:

1. In talking with Bob Erickson about outfitting the Tape Composition Studio he became quite agitated at the equipment list worked out by Tom and I according to the specifications set up by the group of persons (one of which, I believe, was you). If you remember, on that list was the request for an eight-channel tape machine, as well as other track formats. In going through the Groups II & III allocation and listing in priority the new equipment we felt that an eight-track would be out of the question in view of the great expense for the instrument as well as the perifial equipment. We therefore decided to forego in eight-channel and request a four-channel and a two-channel of a design that would enable the two instruments to move tape in sync with each other; later we would expand (with the help of grants and/or gifts) by adding an eight-track instrument. Bob objects and wishes a meeting with those individuals who would be using the Studio (incidentally, a faculty-only studio). Thus, if I may suggest, a meeting should be called and the individuals involved so far would be Bob, Joe, yourself, and myself (from the group last year). In addition, Roger, Will (who has recently expressed interest, believe it or not), and George Ritcher (the technician) should, perhaps, be involved. I might add that I have had increasing requests from John Large, Peter Farrell, Bert, Rafael, and John Silber for such a facility to be available as a research studio. So there you are.

2. Cheryl is having a problem hiring the three students for the FTE of general flunky the department managed to get this year. One of the student is Tony Shepard who will be taking another job in two weeks. In order for me to get all of the studios ready as well as the classrooms I will need Tony to begin work this coming Monday or we will not be able to open for instruction on the first day of classes. Perhaps you could check with Cheryl and make the necessary telephone calls to expedite matters for us. I would appreciate it very much.

Sincerely,

A handwritten signature in cursive script, appearing to read "John".

FACULTY MEETING

Friday, October 31, 1975

3:00 p.m.

A G E N D A

1. FTE (Roger Reynolds/John Silber)
2. Curriculum Discussion (Pauline Oliveros) *
3. Center for World Music (Tom Nee)
4. Budget (Cheryl Georgalis)
5. New Business
6. Committee Reports
 - Groups II and III Recommendations for purchase
(Electronics Committee and Performance Committee)
 - Other Committee Reports

* Please submit written suggestions to Oliveros/Nee/Erickson

September 30, 1975

To: Thomas Nee, Chairman

From: Pauline Oliveros
Chairman, Electronics Committee

Subject: Priorities Groups II and III equipment purchases and other recommendations

1. B-104/Faculty Tape Composition Studio. This studio must be cleared of all that does not belong there as immediately as possible. It should become operational with what equipment is already available as first installation priority.

The following is essential this year:

One 8-track, 8-channel tape recorder	\$13,500	
Rebuild one 2-channel tape recorder	1,000	
Move one 4-channel tape recorder from recording studio to B-104	-0-	
One 8-channel out mixing desk	17,000	
Four JBL loud speakers	2,544	
Four amplifiers	1,000	
Two 1/3 octave filters	6,000	
Interconnection/installation materials	<u>3,500</u>	
	44,544	... \$44,544
Future needs: 4 DBX noise reduction systems		3,200
2. B-108/Electronic Music Studio		16,000
* Buchla System package		
Noise reduction		
Mixing console		
* Under investigation		

Recommend: remove old equipment for possible sale, trade or incorporation into undergraduate studio.

- 3. Faculty playback systems (5 at \$2,000) \$10,000
 Who is to receive these? How determined?
 (Either a piano, or a system.)
- 4. Microphones and microphone stands. 1,240
- 5. Portable system *for the recording cabinet*
 - 4-channel, 1/4-inch tape recorder \$1,900
 - Two amplifiers, Two loud speakers 1,700
 - Microphones, microphone stands 2,000
 - 6,840 \$ 6,840
- 6. B-151/Undergraduate Studio.
 Recommend: a new space be found for the studio to
 accomodate teaching. Use B-151 for
 storage of equipment.
 Buchla System \$ 3,000
- 7. Music 1
 Recommend: Investigation of grants for funding.
- 8. Question: Who will use scalation and who owns? (See
 item 10, memo July 29, from J. Campbell to
 Pauline Oliveros.)

TOTAL \$75,824

The committee recommends that our two studios B-104 and B-108 must receive first consideration. Also that no equipment be purchased in the future without due consideration for time and cost of installation, and that old equipment be phased out in the best possible way after due consideration. Anything may be rebuilt, but it ultimately may cost more in parts and labor than a new system or item. We recommend that Ritcher and Julian be sent to Berkeley as soon as possible to investigate and price new Buchla systems.

- P. Oliveros
- G. Ritscher
- R. Reynolds
- J. Julian

Recommendations of Committee on Performance Instrument needs:

Item No.	Instrument	Est. Cost
1.	Performance organ for Mandeville Auditorium	Gift
2.	Electronic organ for practice (adapt scalatron w/pedals)	\$2700.00
<i>w.A. Johnson</i> 2.	<i>Chamber Musicians (6 1/4") Steidmayer/Stuttgart</i>	<i>6,200.00 (1/2)</i>
3.	Concert Harpsichord (perhaps MDV Ctr Budget?)	\$9000.00
4.	Set, virginal (for keyboard pro- ^{Seminar} seminar)	\$1000.00
5.	Clavichord (for keyboard pro- ^{Seminar} seminar)	\$1000.00
6.	Pianos for faculty offices (X number of Kawai) each.	\$1000.00
7.	Pipe organ, sized for practice room-new	\$25000.00
	or purchase and re-build one available from Military Academy	\$10000.00
8.	Makimba (Slingerland)	\$2600.00
9.	Vibraphone (Musser "Century")	\$1776.00
10.	Xylophone (Slingerland "Concert")	\$1600.00
11.	Glockenspiel	\$1200.00
12.	Symphony Chimes (Slingerland)	\$2300.00
13.	Celeste	\$3000.00
14.	Tympani Calfheads, 5	\$500.00
15.	Snare Drum	\$200.00
16.	Snare Drum, peccolo	\$185.00
17.	Tom Toms:	
	8X12	\$100.00
	14X14	\$135.00
	16X18	\$170.00
18.	Tam Tam - 38"	\$1320.00
19.	Gougs, 3	\$500.00
20.	Timbales, one pair	\$200.00

<u>Item No.</u>	<u>Instrument</u>	<u>Est. Cost</u>
21.	Hand cymbals, 2	\$200.00
22.	Suspended cymbals:	
	10"	\$35.00
	20"	\$100.00
	24"	\$180.00
23.	Cowbells, lowest octave	\$1000.00
24.	Ampli-Pick-up for Manimba	\$480.00
25.	Slapsticks, 4	\$30.00
26.	Stands for suspended cymbals, 3	\$100.00
27.	Bells	\$3000.00
28.	Basset Horns, 2	
29.	Trumpet, B ^b	\$500.00
30.	Cornet, B ^b	\$500.00
31.	Flugelhorn, B ^b	\$500.00
32.	Trumpet C	\$500.00
33.	Trumpet, F-G combination	\$500.00
34.	Tympani, 1 set, excellent quality	
35.	Performance electronics, portable use	\$6000.00
36.	Instruments to up-date Music I collection	\$2000.00

Other instruments recommended for purchase as per the CIPME listing of 1972

Room Number	Item	Cost
B-202	Projection screen	\$ 900.00
B-210	Projection screen	900.00
B-206	Magnetic tape cabinets; 5 needed @ \$240.00	1,200.00
	Microphone; stereophonic, condenser (FET); 2	2,432.00
	Microphone; quadraphonic, condenser (FET); 2	2,836.00
	Microphone; omni-directional, condenser (FET); 4	1,204.00
	Microphone; 3-pattern switchable; cond. (FET); 4	2,000.00
	Power supply for FET microphones; 1	174.00
	Audio frequency test set; Ferrograph	1,800.00
B-108	Mixing desk; 8-in/4-out	3,255.00
	Audio frequency test set; Ferrograph	1,800.00
	Audio disc turntable w/pre-amplifier	774.00
Faculty offices	Two-channel sound recording/reproduction instruments with provision to use loudspeakers or headsets	1,200.00 ea.
	Studio pianos; uprights	995.00 ea.
B-143, B-144, B-145, B-146	Two-channel recording/reproduction equipment with omni-directional microphones	2,400.00 ea.
B-151	3 two-channel tape recorder/reproducers	9,450.00
	microphone; dynamic; omni-directional; 4	700.00
	Microphone; dynamic; cardioid; 4	700.00
	Audio disc turntable w/pre-amplifier	774.00
B-160	Portable, battery-operated magnetic tape recorder(M)	2,000.00
	Portable, battery-operated magnetic tape recorder(S)	3,150.00
	Sound pressure Level meters (2)	5,000.00
	Portable sound synthesizer; Synthi VCS-3	1,575.00
	1/3rd Octave Equalizer/band pass filter (2)	3,066.00
	1/3rd Octave Graphic Equalizer (2)	1,240.00
	Acoustical Audio system analyzer	1,103.00
	Microphone; dynamic; cardioid; 4	700.00
	Microphone; dynamic; "line" type (shotgun) 2	600.00
	Microphone; ribbon; pattern switchable 2	368.00
	Microphone; condenser; cardioid (for Nagra) 2	602.00
	Audio frequency test set	1,800.00
	Variable speed motor drive amplifier 2	1,460.00
	Pre-amplifier; monaural 4	600.00
	Pre-amplifier power supply 2	300.00
	Amplifier, power; for loudspeaker 4	520.00
	Loudspeaker; wide-band; acoustical test 2	2,760.00
	Loudspeaker; portable; performance 2	1,260.00
	Loudspeaker; portable; extended performance 4	1,000.00
	Microphone; dynamic; omnidirectional 4	700.00

Other instruments recommended for purchase as per CIPME listing of 1972

112/113	Automatic Spirit Duplicating Machine	700.00
114	Two-channel recording/reproducing system with loudspeakers	1,400.00
	Upright piano	995.00
n/d	Small electronic organ	3,000.00
	Master electronic organ w/15 keyboards	5,000.00
	Piano accordion	900.00
	Improvisational instrument collection/selection	6,500.00
	Harp	7,000.00
	Bandoneon	900.00
	Dutch Baroque Organ/Flintrop	4,000.00
	Gamelang Javanese Collection	13,500.00
	Opaque projector 4	2,800.00
	Overhead projector 4	1,200.00
	Slide projector w/remote switching	1,000.00
	Audio-visual carts 8	600.00
	Super 8 cameras w/sound 6	4,200.00
	Projectors 2	400.00
	Light box	400.00
	Cameras (slide producing) 3	1,050.00
	Fold-out projection screens 4	2,000.00
	Slide projectors 6	1,200.00
	Music Typewriter	950.00
	Two-channel recorder/reproducer system with headsets and sel-sync with one microphone and one enclosed carrell 9	14,980.00
Additional equipment not listed on CIPME but needed		
B-202	Black-out blinds over two upper-story windows	300.00
B-210	Black-out blinds over two upper-storey windows	300.00
B-206	Draw drapes for view windows between B-206 and B-202; and B-206 and B-210	200.00
B-104	Draw drapes for view window into B-202	100.00
B-108	Draw drapes for view window into B-210	100.00
B-151	Draw drapes for view windows into B-150 and B-152	200.00
	Miscellaneous:	
	Cable, connectors, patch panels, terminal blocks, starter kits; etc.	3,000.00
	<i>Electricians</i>	1500.00
Analysis instruments		

Other instruments recommended for purchase

n/D

Analysis instruments for Faculty research studio

Spectral/Dynamics full capability analysis without computer	\$20,000.00
with computer	40,000.00
Kay sonagraph w/amplitude display & sectioner	5,000.00
Pneumotachographic system	
Electromyographic system	
Laryngeal photographic system	
Hardware for inverse filtering system	
Melograph analysis instrument	15,000.00
<i>Spectrograph</i>	<i>5,000.00</i>
Interfacing instruments and hardware	5,000.00

Mills
Dec 11.
Most interesting applicants for electronics/recording technology position.

ANTHONY GNAZZO

Bachelor of Music - Hartt (theory and composition)
B.A. - University of Hartford (Mathematics)
M.F.B. - Brandeis (theory and composition)

Additional:

M.I.T., University of Connecticut, University of Toronto, U.S. Navy Officer in technology, data processing, electronics, 305 hours in computer technology, programming, etc.

Design consultant in electronic music and computer systems: 23 colleges listed

Many positions listed such as RA at Toronto, technical director of Brandeis electronic studio. U.C. Davis teaching undergraduate/graduate courses in electronic music, circuit design, music theory courses at U.C. Berkeley, now a technician at Hayward State (not teaching).

CHARLES THOMPSON

B.M. Peabody, post graduate courses in radio and T.V. at Peabody, Baltimore College. Graduate student at Buffalo State in Instructional media.

Was in charge of recording at Peabody for five years, other recording positions listed, director of Tonmeister program at Fredonia SUNY. Lists competencies in recording, electronic music composition and production, COBOL programming.

Several composition listed. Present audio engineering manager for DAK Industries, Hollywood.

THOMAS MINTNER

Presently audio specialist and performing fellow at Iowa University. Teaches electronic Music I and tutors students with Lowell Crossin Art and Technology .

XBM Northeastern (clarinet)

Lists performing, recording, composition and engineering many video media works done. Lists his work at Iowa very specifically, has experience with over five computer languages, design and construction of many audio, video and electronic systems.

Sample Ad

The department of Music, University of California, San Diego, announces an opening at the level of Assistant Professor for a musician qualified to teach Electronic music and recording technology at both undergraduate and graduate level. Applicants should also state their other areas of musical experience and expertise.

Search Committee Department of Music (B-026 U.C.S.D. La Jolla, California

Phase 100



The MXR Phase 100 represents the current state-of-the-art in phase shifting, and is without peer in the industry.

Its deceptively simple design and operation provide for the widest range of phase-shifted effects currently available in the industry, and allow the musician a freedom of choice in phasing parameters until now available only in the most sophisticated recording studio effects boards.

The Phase 100 is the first self-contained phasing unit to offer *programmable phase-shifting*, through two independently adjustable controls, Speed and Intensity. The Intensity control allows for adjustment of sweep width and notch depth, two important parameters relevant to phase shifting, both contained within a convenient four (4) position switch. You are invited to hear the possibilities for yourself.

Application possibilities, too, are immense. The *Phase 100's* low noise and high overload point allow you to use it with musical instruments, and most studio and PA systems *without distortion*. All of which means you can create the precise phase shift effect you want, and have it whenever you want it.

The unit is ruggedly built, and compactly housed in a die-cast aluminum case with switches and knobs that defy destruction. All of this combines with an extremely long battery life (6 months in normal usage) to make the Phase 100 the ultimate in portable, programmable phase-shifting.

\$149.95

SPECIFICATIONS

Maximum Input Level	+5dBv
Input Impedance	500Kohm
Output Impedance	<4Kohm
Frequency Response	20Hz/20KHz
Dynamic Range	100dB
Number of Filters	10
Power Consumption	<14mW

MXR Innovations, Inc.

Musical Products Development Group
P.O. Box 722/Rochester, N.Y. 14603

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

October 27, 1976

TO: Electronics Committee
P. Oliveros, Wm. Brooks, J. Campbell, R. Erickson, M. Grusin,
J. McColm, G. Ritscher

There will be a meeting of this committee on Friday, October 29
at noon in the Music Department conference room.

2nd
Tech } Madvolle
 } Vis Art
 } Music
 } Music Library
 } OLR

Specialist
→ { 202
 } Erickson
 } Turitsky
 } Reynolds
 } new HE

Pitsher Supervise

Archivist ?

Archives

National Tape Archive

West Coast Archive

KPFA
KPFR
Kills

October 20, 1976

To: Gossel
Fraley

In order to gain access to the Graduate Electronic Studio, you must have thorough studio orientation as part of your course work in Music 103 A/B with John Celona. Mr. Celona must decide whether it is appropriate to his course to begin the orientation. Until then use the Buchla Studio.

Pauline Oliveros

cc: John Celona
George Ritsher

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

Pauline's copy
TO: Martin Grusin
FROM: Pauline Oliveros
Chairman of Electronics Committee

Martin:

In accordance with a long standing policy, I must deny you the use of the hagra recording equipment. The hagra equipment is reserved for faculty use. The policy is in consideration of the delicacy of the equipment and the necessity for special instruction in its use. Also because the faculty has need of high quality recording extensively.

If you will see me, I will try to help you consider alternatives. My office hours of Monday/Friday - 11:00 - 12:00 at CME, call Joan Tayman for an appointment. Or Wednesday 1:00 - 3:00 in room 122 Mandeville.

cc: R. Erickson
W. Brooks
G. Ritscher

vi. Noise reduction system (state number of channels)

Dolby
DBX
Burwen

vii. Mixing consoles: Number of channels Number of groups

viii. Equipment for "live electronics" (Please specify briefly)

ix. Other major equipment (Please specify briefly)

11. How many members of staff are engaged in teaching courses to do with EM?

Full-time:
Part-time:

12. Do you offer an undergraduate course in EM?

13. About how many hours work a week is expected of students on the undergraduate EM course? About what proportion of his study time is this?

14. What is the course's duration?

15. How much time per week is spent in group sessions?

16. How much individual studio time can a student have?

17. Is a member of staff available to assist individual students?

18. What proportion of your students are primarily composers?

19. Do you expect your students to have any particular experience or formal qualification before embarking on an EM course?
If so, what?

20. How many undergraduate students does your studio cope with during a typical week?

21. Briefly, what does your undergraduate study programme aim to achieve?

22. Do you offer a postgraduate course?

Full-time study:
Part-time study:

23. To what qualification does it lead?

24. What is the duration of the postgraduate course?

25. How does it relate to the undergraduate course (if any) and what does it aim to achieve (briefly)?

26. How many postgraduates do you cater for?

27. How much time is spent each week in group sessions for postgraduates?

Dear Jim,

Jan. 27, 1976

Can you provide the
electronics committee with a
description of the wiring between
the studios and the time
required to complete any current
wiring projects?
What remains to be done?

Yrs,

Pauline

Profile

The Electro-acoustic connection of studios B-104/B-202-B-206-B-210/B-108 and the Recital Hall-Recording Studio-Auditorium.

1. As originally designed, studio B-104 was designated the Electronics Lab/ Service room and its attendant sound production studio was B-202; studio B-108 was designated the Tape Composition room and its attendant sound production studio was B-210. During the preliminary planning for the use of space in Mandeville Center for music production in anticipation of moving instruments from Matthews Campus to Mandeville Center it soon became apparent that B-104 would be better suited for Tape Composition due to the attendant studio, B-202, being reserved primarily for percussion performance. Therefore, the two studios, B-104 and B-108, were "flipped" as to their functions.
2. The original design allowed for the future use of the two studios in question to become, if necessary, focal points for the transmission of aural/ visual material for the intended use of those courses emphasizing film music, video-tape music, computer music, and the like. Thus, the arrangement of conduit in the walls (for the purpose of carrying transmission cable) was purposely routed through B-206 so that all five studios could be interconnected at any future date. This arrangement would allow the use of B-206 to serve as a junction point for all studios but would in no way jeopardize the use of B-104 and B-108 with their attendant studios to serve as specialized studios.
3. Also during the initial designing of the five studios, a view of the future was necessary in order to avoid those problems associated with instant change in programs and program content without in any way jeopardizing the intended use for the present. For example, the size of B-206, necessary for the positioning of the five spaces, also allows for the alteration of that space into three: one for the intended function of B-206, one for the housing of a time-sharing computer, and one for the housing of the video processing instruments which will be needed for future music program expansion.
4. All wiring designs are accomplished with the first three points in mind.
5. Each studio is to be wired so that
 - A. the studio, with its attendant sound production studio, can be used on a self-serving basis;
 - B. the studio, with its attendant sound production studio, can be used as attendant sound processing spaces for other sets of studios;
 - C.= A + B.
 - D. the positive portion of the voltage wave equals the compression portion of the sound wave;
 - E. the positive portion of the voltage wave equals the positive portion of the voltage wave in all studios unless otherwise intended;
 - F. all grounds are at the same potential.

The Electro-acoustic connection of studios B-104/B-202-B-206-B-210/B-108
and the Recital Hall-Recording Studio-Auditorium.

page 2

6. The actual wiring is dependent on
 - A. the design parameters of the instruments to be installed in the studios;
 - B. the availability of the individual (s) to do the wiring;
 - C. the understanding of basic wiring techniques by the individual (s) doing the actual wiring (in industry all wiring of interconnection points is done by the same individual in so far as possible to avoid any problems leading to complications of points 5.D, E, and F);
 - D. the availability of the material.
7. Until the 15th of December, studio B-104 was not well defined as to its design parameters. Although a basic wiring scheme had been designed (and accomplished) it was not known how much of what kind of wire and necessary connection devices had to be ordered to finish wiring to that space.
8. Anticipated finish dates for wiring five studios
 - A. B-206: all wiring necessary to make B-206 self-serving will be accomplished by the 6th of February. At that time B-206 will be internally wired for the present function so that the mixing desk will be connected to all peripheral instruments and to the south sides of B-202 and B-210. This will complete Phase I, Step 1 of the wiring for B-206. Phase I, Step 2 will be to wire between B-206 and the Recording Studio for the Recital Hall and the Auditorium. George Ritscher has the order for the necessary material for that step and as soon as the order is delivered the necessary time for pulling in the wire and connecting it will take about one week.
 - B. B-206, Phase I, Step 3: interconnecting B104/B-202 through B-206. This step should take two to three weeks to accomplish once it is started. It is thought that by that time the design parameters for instruments in B-108 will be finalized and B-108/B-210 can be wired.
 - C. B-206, Phase II, Step 1: all wiring at this level will be associated with aural/visual instruments and functions. It is not anticipated for the near future.
9. The original design called for B-151 to be wired so that any aural/visual function could occur between the three spaces in the complex B-150/B-151/B-152 could be easily accomplished without in any way jeopardizing the self-serving use of each space. We have no way of knowing whether to proceed on the design of B-151 wiring since the use of that space is so ill-defined at the moment. In addition, wiring from the concert shell area to B-206 can not be accomplished, again because of the nature of the use of B-151.

The Electro-acoustic connection of studios B-104/B-202-B-206-B-210/B-108
and the Recital Hall-Recording Studio-Auditorium.

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10. There are times when the question as to the necessity of expending funds now for future use are wise. It has been our experience that the installation of cable should, insofar as possible, be done as soon as the facility is available and should all be done within the same time framework and by the same personnel. Only then can all of the parameters of point 5. above be ascertained. In addition, the inflation spiral of cost of material continues to plague us and no change appears on the horizon. We, therefore, recommend that, so long as funds hold out, all wiring be done this year as determined by point 6. above.

Dear Pauline,

1/27/76

I haven't yet had a chance to set up any sort of a regular maintenance schedule for the classrooms, as I'm still trying to get to the various problems there as they crop up, which so far has been pretty often. At some point when these problems abate I plan to try a regular maintenance schedule. At the moment, it's still mostly chaotic maintenance - going from one problem to the next.

Prent is now supposed to be cleaning B-104, B-108 and B-151 on a weekly basis, although I'm not sure if he'll be able to get them every week. I come into B-108 about once a month to check calibrations, as needed into the other two.

I hope this gives you satisfactory answers for now.

George

Pauline Oliveros

UCSD ELECTRONIC MUSIC STUDIOS ADMISSION REQUEST

Name: _____ Student No.: _____

If not registered as a graduate student in music at UCSD, please state your affiliation (i.e. other dept., private study with faculty member, etc.):

_____.

Briefly state what the studio will be used for:

Which studio do you want access to? _____

For what period of time? _____ (not to exceed one academic quarter)

Your signature: _____

Faculty sponsor: _____ Date: _____

Dept. Tech'n: _____

Pauline O. _____

FOR YOUR INFORMATION!

We spent about 1/2 an hour looking for the old forms from the by gone era. We put this one together to take its place. I'll collect them as I give out keys, then give them to you, if you want them.

— Tony AS

Pauline

BUCHLA STUDIO
B151

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8:30					
9:00					
10:00					
11:00					
NOON					
1:00					
2:00					
3:00					
4:00					

N.B. At the present time we do not have any keys to the outside (B150-B152) door. This means that you cannot get into B151 before about 8:30 a.m. during the week days and not at all on Saturday and Sunday.

Also, there is a very limited number of keys for B151 (like one or maybe two) so you will have to check out a key at 8:30 (in B160) in order to use the studio anytime before 10:30 etc. YOU MUST RETURN THE KEY AT THE FIRST SET OF B160 HOURS AFTER YOU CHECKED IT OUT. (i.e. If you check out the key at 2:30 Monday - so that you can use the studio at say 4:00, YOU MUST RETURN IT BETWEEN 8:00 and 8:30 A.M. Tuesday.) FAILURE TO RETURN KEY AT FIRST SET OF HOURS FOLLOWING CHECK OUT TIME WILL MEAN THE LOSS OF PRIVILEGES FOR B151.

FOR YOUR INFORMATION & APPROVAL.

Tony
RS

October 14, 1975

APPLICANT: James J. Owen - graduate Music major.

REQUEST: I would like access to the Eltro Rate Changer and its peripheral accessories (tape decks and a turntable).

REASON:

Access to the above equipment should greatly facilitate my efforts to notate various pieces of ethnic music (Indonesian, East Indian, etc), for which scores are not currently available by any other means. This accumulation of scores is very important to me as a means of:

1. Obtaining examples to support my projected Master's thesis on certain facets of musical analysis;
2. furthering my own personal knowledge of different compositional styles;
3. providing new idiomatic material for me to play on the guitar (my main musical instrument); and
4. providing me with an interesting, educational and practical exercise in ear training.

I have been transcribing unnotated music for several years now and, due to the large amount of scores needed, am looking for a more efficient way of obtaining this material. Since there are no courses currently offered which afford access to the rate changer, I am making this application under the sponsorship of Dr. Ogdon, who is my faculty advisor and professor for Music 203 A (Composition).
Estimated cost to the department of Music: NONE.

*Approved
Will Ogdon*

Pauline -

I have been checked out by on the equipment by George & am being sponsored by Ogdon, but I need your permission to use the ^{B108} room since it will soon be (if it isn't already) off-limits to students. Would it be possible (in order of preference) to:

- 1) transfer the rate-changer to the Moog room,
- 2) give me permission to use B108 with the understanding that I don't touch any other equipment, or
- 3) give me permission to use the changer until the new equipment arrives?

Could you please:

- 1) make a decision on this matter &
- 2) leave a note for me in my mailbox?

Thank you,

Jim Owen

Operating Budget 6,000 - 7,000 per yr.

Maintenance
Purchase of Equipment

more fact
for good buy -

Test equip. purchases \$3,170

Tools

Supplies

Replacement audio components

- Basic maintenance -

Function Generators - measuring systems
Professional level test -

Time efficiency = good equipment

xxx

troubleshooting
Back up systems
must be paid for

Lew Prince

SAN DIEGO: DEPARTMENT OF MUSIC
LA JOLLA, CALIFORNIA

UCSD ELECTRONIC MUSIC STUDIOS

TO: Faculty
Students
Staff

FROM: Pauline Oliveros
Chairman of the Electronics Committee

DATE: 22 September 1972

Interim Users Policy:

- I. All users must have a faculty sponsor. The Potential user must write a brief statement of purpose* which will be signed by the faculty sponsor and given to Lew Prince, the Department technician. This must be done for every quarter.
- II. All users must demonstrate a working knowledge of Tape recorders as per installation, pre-amplifiers, power amplifiers, patching facilities and any associated equipment. The test shall be administered by the Department technician.
- III. The technician will demonstrate the proper approach to the use of the facilities. If the potential user is deficient, the technician must advise the faculty sponsor and submit recommendations for ways to remedy the deficiency.
- IV. The technician shall post a list of qualified users with the Electronics Committee and the Music office every quarter.
- V. The technician will post a time schedule on the door of the respective Electronic Music Studio users may sign up on a weekly first come, first serve, basis. The number of hours available to each user will depend on the number of qualified users. Students enrolled in courses involving the use of certain equipment will have priority over personal research if necessary. All users are responsible for time reservations. If the reserved time is unused the user must make an effort to alert a stand by user. Abuse of reservations will result in loss of the use of the studios. After 15 minutes an unused reservation belongs to a stand by user.
- VI. Users are responsible for maintaining the security of the studios. After compliance with items I and II above keys and combinations to locks may be obtained from the Music office. The user must not loan or copy keys nor reveal combinations to any unqualified user.
- VII. Users must always help maintain an order by studio. This means clean up after a working period and report all malfunctions of equipment in writing to the technician.

VIII. No equipment is to be removed from the studios. Special cases will be considered by the Electronics Committee. Report any missing items in writing, with time and date directly to the technicians.

*The statement of purpose is intended to aid the Electronics Committee in determining needs and future direction of the studios. What kind of projects are you doing? What equipment do you expect to use? What do you need that we don't have? Is your project course work? or research?

10/3/1975

Ms. Paulin Oliveros and the other Members of the Committee:

This letter constitutes a request to use the Mooge facilities.

I need the mooge to complete the tape portion of a composition started in the spring of 1975 on the Buchla system. The composition, entitled "Color and Texture in Sound", is a tape piece to be accompanied by accoustic instrumentation. "C.T.S." is a study of static textures and color possibilities in electronic medium.

The portions of tape that are lacking completion are a small, but vital, sequential section (that needs the Synthesizer), two sections for a harmonic generator, and a minimal amount of filtering to various other portions. Except for the sequential section the rest could be done on the Buchla, but it is not operable at the time.

I have taken: PRIN/ELECTROACOUST IO4A &B, ELECTRONICS/MUSIC A, B and have put in many hours on the Buchla on my own. I am willing to exchange the time in the studio that I need (10 hours) for my time in re-assembling the Buchla laboratory.

Sincerely: *Robert Owens*

D^{ar} Pauline

this is regarding electronics committee
and policy for use of B-104 and the
Rate Changer. Over the summer i have been
using the rate changer, but it is my
understanding that B-104 is soon to be made
~~inaccessable~~ inaccessible to all but
faculty. Currently i am working on two
pieces which employ use of the rate
changer, and should an off limits policy
regarding this equipment be implemented,
my current compositional projects would
be curtailed. So, my interest ~~in~~ is that
during this quarter (and possibly winter)
i be allowed access to the rate changer.
I would also be interested in building
a table so that it could be used in B-108
~~where the~~ where the ~~equipment~~ equipment is
cleaner. thank you muchly, dave poyourow

available. Best time to buy November 4-18

1/2 Price Dis-

THE SAN DIEGO OPERA

proudly presents
the Incomparable

**JOAN
SUTHERLAND**
as



LUCIA

"LUCIA
DI LAMMERMOOR"

Donizetti's moving
romantic tragedy,
filled with
thrilling melodies

Dec. 4, 6, & 8

CIVIC THEATRE

Half-price seats available through
Student Activity Center only.

Tickets: \$15.50,
\$14, \$12.50, \$11,
\$9.50, \$7.50, \$5.75
Standing Room: \$3.50

count for Students! Extremely limited num-

ber of seats

Pre-opera lecture - Dec. 2nd. Call 232-7636 for information.

Electronics Committee
Sept 29

Agenda Items

Job description for Jim & George

Purchases

Faculty Studio

\$84,000

\$1200

in technical support
left in Retoche

UNIVERSITY OF CALIFORNIA

Date.....

TO Pauline FROM.....

Subject.....

For initial signature approval comments discussion information

Please file return draft reply route to.....

Message..... We have 84, 000

in groups 2/3 and the
Faculty room is to take
half of that ? ? Sense
of proportion seems off, to me

Escalation is ours! fought 1974 T-