MICROCOMPUTER SYSTEMS

MIB

MARKETING INFORMATION BULLETIN

OLIVETTI

500 PARK AVENUE
NEW YORK
N.Y. 10022

MARKETING DIVISION

SUBJECT

STRUCTURAL ENGINEERING SYSTEM

by Ross H. Bryan, Inc.
Consulting Engineers

Order #78122

DATE: July 12, 1972

BULLETIN NO.: #79

PAGE 1 OF 2 PAGES

COPIES TO

All Computing Systems Sales Representatives
All Systems Sales Managers
All Agency Systems Coordinators
All P602 Sales Agents

Mr. C. Alhadeff
Mr. W. Bader
Mr. M. Samaja
All Area Managers
All Branch Managers
All Regional Managers

The Structural Engineering field is a natural market for microcomputers of the P602 size and capacity, but one which requires professional, comprehensive software in order to reach it. Because of the wide range of problems encountered on a daily basis, the Structural engineer who wants to use a microcomputer must be able to select many specific programs from a very large library. A few of even the most used programs probably would not justify the machine; A comprehensive collection of programs definitely will.

Ross H. Bryan, Inc. of Nashville, Tennessee has produced the beginnings of such a library and are providing it to Olivetti customers for a modest fee which is certainly small for the many benefits obtained from their system. As you will notice, from the attached material, their support for their system is full and energetic. The program documentations are professionally rendered, Ross Bryan personnel are reachable for questions and problems which may arise, they will provide errata if it is required, they will custom program at a standard rate. What is most important is that this firm has wide experience in the use of computing equipment from desk calculators to full scale main-frames. They employ a full time Systems Analyst and are familiar with our competition, both hardware and software, and consider the P602/MLU far more capable and desireable from an Engineer's standpoint than any comprable system on the market. Of particular interest are their comments on its advantage over time-sharing (TS) systems. Tell the prospect to keep his Time-sharing terminal, but use it only for the more complex jobs such as large story frame analysis. The P602/MLU can probably do the other routine jobs at far less expense and with a great deal more convenience and flexibility. It is also true that considerable introduction, orientation and study is needed to use time-shared systems effectively. The only thing the engineer needs to do to use the Olivetti system that Ross-Bryan has developed is insert a card (or enter a program # if the complete system is recorded on a cartridge). No involved dialogue with the TS system - which may be an engrossing pleasure to computer buffs, but time-wasting for the average engineer who has his own work to concentrate on.

There are five attachments to this bulletin for your use in being successful in this specialized market area. The first attachment is for your introduction to structural engineering:

1. SELLING THE P602 FOR STRUCTURAL ENGINEERING . . . 21 pages

   I Preface

   II The Market

   III Introduction to Structural Engineering

   IV Glossary

   V Computer System Comparisons

   VI Demonstration Programs
   (Please realize, that the program code listings, in this section, are given to you to key in on cards for demonstration purposes only. These programs are proprietery and the program listings should not be shown or given to the customer.)

   VII Market Approach

The remaining attachments are mainly material for the prospect, with two examples of programs the customer will receive from Ross Bryan:

2. SYNOPSIS/ILLUSTRATED PROGRAM DATA . . . . . 15 pages

   Package A

   Package B

3. SAMPLE PROGRAM: "Composite Beam Design". . . . . 13 pages
   For P602
   Program No. 27

4. SAMPLE PROGRAM: "Spread Footing Design". . . . . 18 pages
   For P602/MLU
   Program No. 59

5. CHART FOR SYSTEM PLACED ON MLU TAPE CARTRIDGE . 2 pages

For the most part this is a new vertical market for our computing products. Less than 2% of P101's were sold in this area due mainly to the limiting size of the equipment which required problems to be broken down into too many parts. Now, with the the P602 (5% so far), or better yet with the P602/MLU, we can do problems formerly done on large scale equipment or else not automated at all. This field should also be rich in needs for peripherals: LN20, PN20.

At present we have a great assist, with the Ross Bryan package, to enter into this new field. While many more sophisticated programs are presently being developed, this should give us an excellent start in the right direction.

SELLING THE P 602 and P 602/MLU

For STRUCTURAL ENGINEERING

This material was prepared for the benefit of Olivetti Corporation of America customers. Before using, the material should be verified by qualified technicians since Olivetti Corporation of America disclaims any responsibility for any inaccuracies that may be involved.

I. PREFACE

This illustrated data has been prepared by Ross H. Bryan, Inc., Consulting Structural Engineers, Third National Bank Building, Nashville, Tennessee, to acquaint firms in the structural consulting field - who are considering purchase of an Olivetti P602 - with a number of structural programs developed for this machine. These programs are written specifically for the structural design field and contain practical, everyday analytical solutions to design problems. A list is included of currently available programs.

The programs are furnished on magnetic cards and may be transferred to the MLU tape unit of the Olivetti P602. The magnetic cards may also be inserted into the computer itself, if the tape unit is not purchased.

Several useful features are contained in these programs which are not often found in programs for small computers. One such item is a preprinted analysis sheet which matches up with the tape output. The tape output may be reproduced with the explanatory sheet to supply a complete, understandable record-set of calculations. The complicated programs have a written commentary, furnished as a part of the program package, to help the user in selecting certain data items involved in completing the design of the structural problem.

Included in the package are programs which allow the user to produce column interaction diagrams based on ultimate analysis for any rectangular or square reinforced concrete column; to design prestress members; to design footings for combined axial and applied moment; and to design individual composite steel members.

Considerable time and expense would be required of an individual firm to develop in-house information comparable to that contained in the structural package. This suggested program package gives the purchaser of an Olivetti P602 access to one of the most comprehensive sets of structural programs developed to date for this particular piece of equipment.

Ross H. Bryan Inc. offers a total of 20 suggested programs from the Index Explanatory Data for $495.00 or the complete list of 68 programs for $950.00. The staff of this engineering firm includes a full-time systems analyst engineer who has written all programs in the package and is available for specific program writing for those firms who wish to expand beyond the present listings.

II THE MARKET

Of the 45,000 consulting engineering firms in the United States, approximately 20,000 engage in structural engineering. The firms range in size from one engineer to several hundred. Many of the larger firms have time sharing or "in house" computer facilities. Extensive calculation work is required to prepare information presented on the construction documents. Small offices are particularly sensitive to work load pressures and would benefit from time saving aids.

Governmental and military agencies have large engineering staffs in various areas of the country. The Corp of Engineers, State Highway Departments and Municipal Governments are involved in structural work. Authorization for equipment expenditure would generally be more involved with these agencies.

There are several hundred firms which specialize in the production of precast prestressed concrete products. Extensive structural design work is done by the engineering staffs of these companies. The repetitious nature of these designs lends itself to microcomputer work. Several have tried time sharing without success, because of difficulty in using the equipment and the program writing required in their specialty. The Olivetti software package is superior to any other competitor in this special design field.

Architectural offices and Architect-Engineer firms should be contacted to determine those performing their own structural work "in house." The firms with structural staffs would be good prospects for demonstration of the P602 and software package.

III INTRODUCTION TO STRUCTURAL ENGINEERING

One of the key members of a design team preparing plans and specifications for construction projects is the structural engineer. Many are in private practice as consulting engineer; others are in architectural firms as an "in-house" structural staff. Concrete and steel fabricators have engineering departments. Governmental agencies, both federal and municipal, have structural staffs and produce or review designs for structures.

The structural engineer designs commercial buildings, ranging in size from the 100-story Sears Roebuck office building under construction in Chicago (which will be the tallest in the world) to one-story shopping centers scattered throughout the country. Churches, school buildings, industrial facilities, and even residential construction, require structural design of members which make up and support the weight and service loads of the buildings.

Governmental agencies design many of the large dam and powerhouse facilities for generating electric power and providing flood control. The interstate highway system has bridges and other structures designed by State Highway Departments of every State in the Union.

Fundamentals:

The structural engineer carries the heaviest burden of analytical work of the design group. Numerous calculations for structural members must be made to determine the most efficient member to support the weight of the structure, and loads incurred from occupancy. The microcomputer relieves the engineer of tedious checks for numerical accuracy and allows more time to quickly investigate alternate solutions.

The materials of construction utilized by the designer include structural steel, concrete (prestressed and reinforced), wood, aluminum and masonry. Each structure includes a combination of these materials meeting the requirements of architect and structural engineer. The general structural programs available in this package may be used to compute the design properties of any of the construction materials. Specific programs have been written for structural steel, reinforced and prestressed concrete.

The structures the engineer must analyze receive loadings from self weight, furnishings and equipment, people, snow, wind, earthquake and vibration. City or State Building Codes require the structure to be reviewed for various combinations of these loads, and specify the magnitude for each geographical area and type structure.

The structural analysis performed on a building member, either by slide rule calculation or by use of structural design programs (as for the P602), consists of reviewing internal stresses created by the external loading. It is the structural engineer's equivalent to a medical doctor's X-ray. The internal stresses calculated are compared with a maximum allowable stress established for the material by applicable code. Common stresses which must be reviewed include shear, bending, tensile, compression and bearing.

IV GLOSSARY

BEAMS

Are generally thought of as structures or machine components to which the loads are applied perpendicular to its axis. They are usually much longer than their width or thickness. Their loads usually tend to bend them. Several kinds of beams are:

Simple Beam: which has a reaction at each end.

Continuous Beam: which has one or more reactions interposed between the two at either end.

Supported Beam: is like a 2 x 4 plank resting on a saw-horse under each end.

Fixed Beam: is like a Supported Beam except plank is firmly nailed to each saw horse.

Cantilever Beam: is like a Supported Beam except plank is firmly nailed to one saw-horse and the other saw-horse removed.

Some beams are fixed at one end and supported at the other.

BEAM COLUMN

Is a structure with loads of a compressive nature applied to its ends at the same time bending loads are applied perpendicular to its length.

BUCKLING

Is a type of failure related to the size and shape of a particular member rather than the strength of the material of which it is made. For example this is what happens to a sheet of notebook paper when its ends are pushed together.

CAISSON FOUNDATION

Circular type pier in the ground.

COLUMN

Is a structure to which the loads are applied in a compressive manner at its ends. (see STRUCTURES - columns).

DEFLECTION

In the case of a beam, the deflection is the displacement of the structure or machine component at some particular point along its length, when loaded, from the point's previous location when the beam was not loaded - - the amount it sags under load.

When a structure such as a pole fixed at one end has a torsional moment applied to any point between its free and fixed ends it will twist. The amount of twist, expressed in radians or degrees is called its torsional deflection.

END FIXITY

Is a phrase used to describe the degree to which the end of a beam or column is fixed. A flag pole is considered to be "fixed" at its base. An engine connecting rod is considered to be "pinned" at its ends. Columns and beams are strengthened by the degree to which their adjoining structures approach a "fixed" condition which in turn depends on the relative stiffness of the adjoining structures.

FRAME

Is a structure comprised of upright and horizontal members.

JOINT

Is the intersection of two or more structural members.

JOINT MOMENT

Is a bending moment present at a reaction or support on a continuous beam or frame.

LOADS

Are the forces applied to the structure or machine component by its use. Loads may be:

Concentrated: in which the forces are applied at single points on the structure.

Uniform: in which the force is applied equally over a portion or all of the length of the structure or machine component.

LOADS (contd.)

Concentrated and Uniform: loads may be superimposed on a structure or machine component.

Axial Load: causes tensile or compressive stress in a member.

KIPS = 1000 lbs.

KSF = KIPS/sq. ft.

KSI = KIPS/sq. in.

K/ft. = KIPS per lineal ft.

KLF = KIPS per lineal ft.

MODULAR RATIO

Modulas of elasticity of steel and compared to concrete.

MOMENT

Is the arithmetical product of a force times a distance and is expressed as inch-pounds, etc. The force required to open a door, applied at its knob, times the distance from the knob to the hinges is the moment about the hinges.

Bending Moment: if the aforementioned door hinges are welded so as to prevent rotation, then the force applied to the knob would produce a bending moment in the door and hinges.

Torsional Moment: is a twisting force induced in a structure or machine component. A torsional moment exists in the body of a screw when its head is rotated with a wrench. (See Deflection)

PROPERTIES OF SECTIONS

In this instance the word "Section" is used to refer to the shape of the elements making up the beam such as: angle section, channel section, H-section, I-beam section, or beams designed to have special sections.

The section properties are mathematical expressions used to determine how a specific shape will behave under load. They are:

Moment of Inertia: used to compute deflection.

Section Modulus: used to compute bending stress.

Cross Sectional Area: used to compute tensile or compressive stress.

PROPERTIES OF SECTIONS (contd.)

Radius of Gyration: used to compute stability of columns.

Weight per Foot: used to compute weight and cost of structure.

REACTIONS

Are the forces applied to the structure or machine component to counteract its tendency to move because of the loads applied in its use, such as the legs of a table.

SPAN

Is that portion of a beam between its reactions. Simple beams have only one span. Continuous beams may have any number of spans.

STRESS

Is the reaction to a strain induced in a structure or machine component by a load acting on it. It is usually expressed in pounds per square inch (psi). Stresses are of several kinds as follows:

Tensile Stress: is that produced by a load tending to elongate the member.

Compressive Stress: is that produced by a load tending to shorten the member.

Shear Stress: is that produced by a load tending to cut through the member.

Bending Stress: is that produced by a load acting perpendicular to the member.

Punching Stress: is related to Shear Stress acting on the perimeter of the footing.

Flexural Stress: same as Bending Stress.

Bearing Stress: is that produced by a concentrated load in a small area.

STRUCTURE

Is a general name given a load bearing member made of metal, wood, concrete, etc.

STRUCTURE (contd.)

Each structure consists of a structural skeleton made up of the most common structural components. The terms used for these include:

Columns: Members carrying direct axial loads which cause compressive stresses of such magnitude as to control the design of the member.

Truss: Denotes a jointed frame designed to sustain inclined, vertical or horizontal loads occurring at or between its points of support, such as a crane boom.

Footing or Foundation: The total of the structural parts of the substructure that serves as the medium through which the weight of the superstructure and the forces due to loads upon it are transmitted to the supporting soil or rock.

Composite Steel Beam: Structural steel beam member rigidly connected by shear studs to the concrete slab system supported upon it; whereby the two materials act together as one integral member in resisting loads imposed upon the system after hardening of the concrete.

Reinforced Concrete Beam: Concrete member in which reinforcing steel is placed to resist the tensile and shearing stresses resulting from beam action. Concrete as a material has high compressive strength relative to its tensile and shearing strength.

Prestressed Concrete Beam: Concrete members in which compressive stresses are introduced by the use of high strength steel bars and/or strand to prevent development of tensile stresses in the member from loading.

V COMPUTER SYSTEM COMPARISONS

The Olivetti P602 System and Structural Software Package have several advantages over competitive equipment in the structural field, which can be stressed as follows:

1. The entire program format may be entered and stored in the MLU unit for immediate recall by entering a four digit number, obtained from a geographic chart located over the unit.*

   By comparison, the Wang system requires the selection of a tape cassette (for the correct program) from a storage unit, insertion of the cassette in the calculator, and a five key operation to enter the program. Some difficulty is being encountered in loading cassettes into the calculator. The simpler program and data entry makes it easier for everyone in a firm to use the Olivetti system.

2. The preprinted Reference Sheet supplies all information required to understand the tape output, and is spaced to match with the tape to allow a reproduction copy of tape strip and reference sheet. The microcomputer concentrates on numeric data rather than typing out reference data with the output, as occurs in a time-sharing terminal or Wang system. This additional output identification requires time and expense.

   The use of the matched reference sheet makes it easier for management to understand the information obtained, and a text book set of design notes is produced. EACH ENGINEER IN THE FIRM PRODUCES THE SAME QUALITY OF LEGIBLE DESIGN NOTES.

   The design notes produced by the Olivetti P602 Structural System are useful where substantiating data must be submitted to another engineering review staff. They also serve as permanent records of the design analysis.

3. Time Sharing Systems: With the advent of the LN20 paper tape reader for use with the P602, many firms who have time sharing should also consider purchasing the Olivetti System. With the larger computer, indeterminate multi-story frames may be analyzed and moments, shears, axial loads punched on a paper tape - for transfer through the LN20 into the P602 for individual member design. The high cost of time-sharing "on line" computing may be reserved for the most sophisticated analysis. It is easily conceivable that firms doing all analysis on time-sharing could pay for the P602 in reduced billings, by transferring individual member analysis to the small computer which has NO OPERATING COSTS AFTER PURCHASE.

   A structural software program has been written to do the above, with further developments still in progress.

   Time sharing systems have the disadvantages of waiting time, telephone line difficulties, and the reluctance of engineers to use the teletype equipment - as compared with the ready-to-do format of the microcomputer.

* See Chart in Attachment 5.

4. Program Commentary: The program commentary, developed for each program which requires sophisticated input data, is invaluable in acquainting the designer with scope and limitations of the program being used. Considerable guidance is given as to selection of input data to meet applicable building code design practice. At the same time, a versatility is built into the program, allowing each design firm to use it as a tool to impose their own design philosophy into the solution. The data is most useful in assisting the young designer to stay 'on track' in performing design assignments.

   Reference equations are given as back-up data.

5. Present P101 Users: Objections may be raised by owners of P101 equipment as to the necessity of updating their current equipment to P602 with MLU.

   There are certain basic structural programs, such as the composite beam design, which are executable on P101 and P602. When using the P101, the engineer must find up to four cards before execution can begin. One card is entered and some calculations are performed with output, another card is entered and followed by this same sequence until solution is complete. On the other hand, with the P602 and MLU, the user simply turns the machine on and selects the composite beam program from MLU tape cartridge. The increased capacity of P602 permits the entire program to be stored in the memory. The MLU tape unit is not used after the initial transfer of this program.

   Other problems, such as the spread footing design, could be solved on the P101. The solution would require a multi-card operation with numerous input terms entered more than once. Also, engineering judgement would be required to determine the sequence of cards to follow for a particular soil pressure diagram. The entire operation could take 30 minutes. The P602 with MLU runs the complete footing solution, without engineering decisions, in less than one minute. The program actually computes the type soil pressure diagram a footing has and transfers control automatically to the MLU Block, which has the correct equations for that soil pressure diagram.

   The random tape access and tape storage features of the MLU permit programmer to solve the more difficult structural problems too large for the P101. An example is C. P. 127, "Continuous Beam Analysis." This program solves up to a 10-span indeterminate structure. Variable inertia and span lengths are inputs, along with uniform load and any number of point loads. Many more such programs are currently under development.

VI DEMONSTRATION PROGRAMS

SAMPLE PROGRAM FOR P602 WITH MLU UNIT

C. P. 59 is a design program based on trial sizing to review a concrete spread footing subjected to combined axial load and moment for allowable soil pressure and overturning resistance. Areas of reinforcing required are calculated and shear stresses compared with allowable by Code.

The designer selects a trial size, applies the loads, and selects a reinforcing design constant for the grade steel specified. The program calculates a moment capacity for the allowable soil pressure and overturning resistance which are comparable to actual moment printed out. If either are insufficient or oversized, a new trial size is selected. When moment capacity and shear stresses are less than allowable, a reinforcing pattern is selected equalling the area required and the design is completed. The output data is copied by superimposing over the proper preprinted reference sheet as shown.*

This program permits design which is unavailable from any standard reference, such as the CRSI Design Handbook which only handles axial load. The program may be verified (or the CRSI data verified) by entering any of the standard spread footing designs shown in the CRSI where no moment is applied. Should adjustments be required in a standard footing, such as increased depth, the program provides a rapid method of obtaining permissible reinforcement adjustments.

This program is one frequently encountered in structural offices and requires individual calculations involving considerable design time. The comparable Wang program will only handle direct axial load (no combined moment) and does not permit individual selectivity of dimensions, because it applies only to square footings. Consequently, these could be selected from the CRSI tables and would require no designer calculations. The demonstrator may also request customers to submit trial data, if he has confidence in his ability to run the program.

SAMPLE PROGRAM FOR P602 WITHOUT MLU UNIT

C. P. 27 is a design program using trial sizing to analyze simple supported composite steel beams in accordance with 1969 AISC Specifications. Loadings consist of uniform dead and live loads. Concentrated loads, if required, must be represented by an equivalent uniform load. The designer enters the span, slab thickness, uniform loads, allowable steel stress, member weight, modular ratio, composite and bare section properties (from Pages 152-195 of AISC Manual or by calculation from a section property program) effective width of slab, flange thickness of steel section, and stud coefficients from table on reference sheet.*

The program computes the number of studs required and maximum size allowed. Moments are printed out. The required bare section and composite section properties for either shored or unshored construction are given (see instruction and commentary sheet for shored condition). The designer compares the required values with input values and reselects a new section, if over or undersized. Concrete and steel stresses are printed out. Deflection values are given and compared to maximum tolerable values selected by the user as an office standard.

Where a cover plated section is employed the program (as a part of the continuous printout) computes cutoff distance, weld spacing and length.

*See attachments 3 and 4 and sample runs in this section.

The tape printout is spaced to be superimposed on the reference sheet, and then placed in a copier to produce a complete explanatory set of design notes. Space is provided on the reference sheet to record a summary of the design information obtained.

A comparable program is available on the Wang system which produces the same information. However, there is more automation built into the Wang program and therefore allows the designer less selectivity in investigating alternate member solutions.

olivetti P 602

Code [C. P. 27]	Date	Page 1/2

SAMPLE RUN : Cut along dotted lines and fix to pre-printed run sheets as illsutrated on pages 9 and 10 of the program documentation supplied by Ross Byran, Inc.

```
                V
            5   S
           31   S
          1.5   S
           24   S
       1.2489   S
         10.7   S
          177   S
          537   S
          118   S
         7.73   S
        17.58   S
           85   S
        0.499   S
           51   S
        0.461   S
        0.111   S

      23.5110   F0
      47.1750   F0
      48.0000   A0
       1.2475   A0
       2.7489   A0
     150.0241   F0
     180.1875   F0
     330.2116   A0
     165.1058   A0
      75.0120   A0
     208.8954   A0

       0.6896   A0
       1.2010   A0
       0.3296   A0

      15.2566   A0
      12.2161   A0
      27.4727   A0

       0.9878   A0
       0.3478   A0
```

```
       0.335   S
       17.86   S
        0.57   S
        0.21   S
        4.64   S
           6   S
         1.5   S

     86.1566   D0
     42.6079   A0
     17.6700   A0
      6.6650   A0
    222.9257   A0
     46.8143   A0
      5.5000   A0
     12.0000   A0

     24.2865   A0
      0.4250   A0

     32.7529   A0
     11.9760   A0
```

THIS PROGRAM LISTING IS FOR DEMONSTRATION PURPOSES ONLY

DO NOT RELEASE TO ANYONE OTHER THAN OLIVETTI PERSONNEL

olivetti P 602 | Code [C. P. 27] | Date | Page 2/2

Side .....

P1	P2	P3	P4	RF	RE
S	↓	d ↑	A ◊	E ↕	r ◊
d ↑	S	X	A ↑	A ◊	r ◊
S	X	A ◊	R ▬	d ↕	r ◊
b ↑	f ↕	b ↓	R ↕	f X	r ◊
S	d ↓	b X	d S	D ↕	S
B ↑	A S	A ↑	↓	A ◊	D ↑
S	C X	d ◊	f X	d ◆	D ↓
c ↑	S	↕	F ↕	A ◊	S
S	X	F ↕	A ↑	r ◊	X
C ↑	F ↕	C ↓	R ▬	F ↓	c X
S	r ◊	F X	R ↕	b X	A ↑
A S	r ◊	F ↕	d ↓	b X	R X
d ↑	f ◊	B X	◆	E ↕	d S
S	F ◊	f ↕	E X	A S	X
D ↑	f ↓	B ↓	A ◊	B ↕	D ↕
S	F ▬	C ◆	r ◊	F ↕	S
e ↑	A S	A ◊	f ↓	A ↑	A S
S	A W	F ◊	F ◆	D S	B ↑
E ↑	f ↓	f ◊	d X	R X	S
S	F ↕	A ↑	A S	r ↓	e ↑
A S	e W	D ↑	d ↕	d ↑	S
B ↑	F ↓	r ↓	e ↕	F ↓	c ↑
S	A ↑	d ↑	A ◊	d ↕	B ↓
A S	d ↓	f ↓	f ↓	A ◊	C ◆
c ↑	/ ↕	F ◆	F ↕	f ↓	C ↕
S	◆	A ◊	A ◊	b X	S
A S	A ◆	d X	D ↓	b X	B ↑
C ↑	A ◊	c ↕	e ↕	d ↕	S
S	A S	A ◊	A ◊	D ↕	F ↑
A S	b ↓	F ↓	r ◊	A S	r ◊
b ↑	A ↑	d X	F ↓	c ↕	r ◊
S	R ▬	c ↕	d X	A ◊	r ◊

Side .....

RD	RC	F	E	D	C
D ◊	↕				
A ↑	A ◊				
d ↑	B ↓				
E ↑	E X				
C ↓	A ◊				
b X	b ↓				
E ↕	r ◊				
A ◊	E ↕				
b ↓	f ▬				
A S	C X				
B X	A ◊				
A ◊	e X				
A ↕	A ↑				
b ◆	D ↑				
E ↕	r ↓				
A ◊	↕				
f ↕	A ◊				
b ↓	r ◊				
f ▬	F ↕				
f X	E X				
C X	c X				
E ↕	F ↕				
A ◊	A ◊				
e X	A ↑				
A ◊	D ◆				
c ↕	r ↑				
A ↑	↓				
d ↓	A S				
/ ↕	b X				
◆	A ◊				
A ↑	V				
d ↑					

STORAGE PLANNING

	Ab	b	AB	8
0	Ac 1	c 2	AC 3	C
4	Ad 5	d 6	AD 7	D
8	Ae 9	e 10	AE 11	E
12	Af 13	f 14	AF 15	F
16	Bc 17	Rc 18	BC 19	RC
20	Bd 21	Rd 22	BD 23	RD
24	Be 25	Re 26	BE 27	RE
28	Bf 29	Rf 30	BF 31	RF

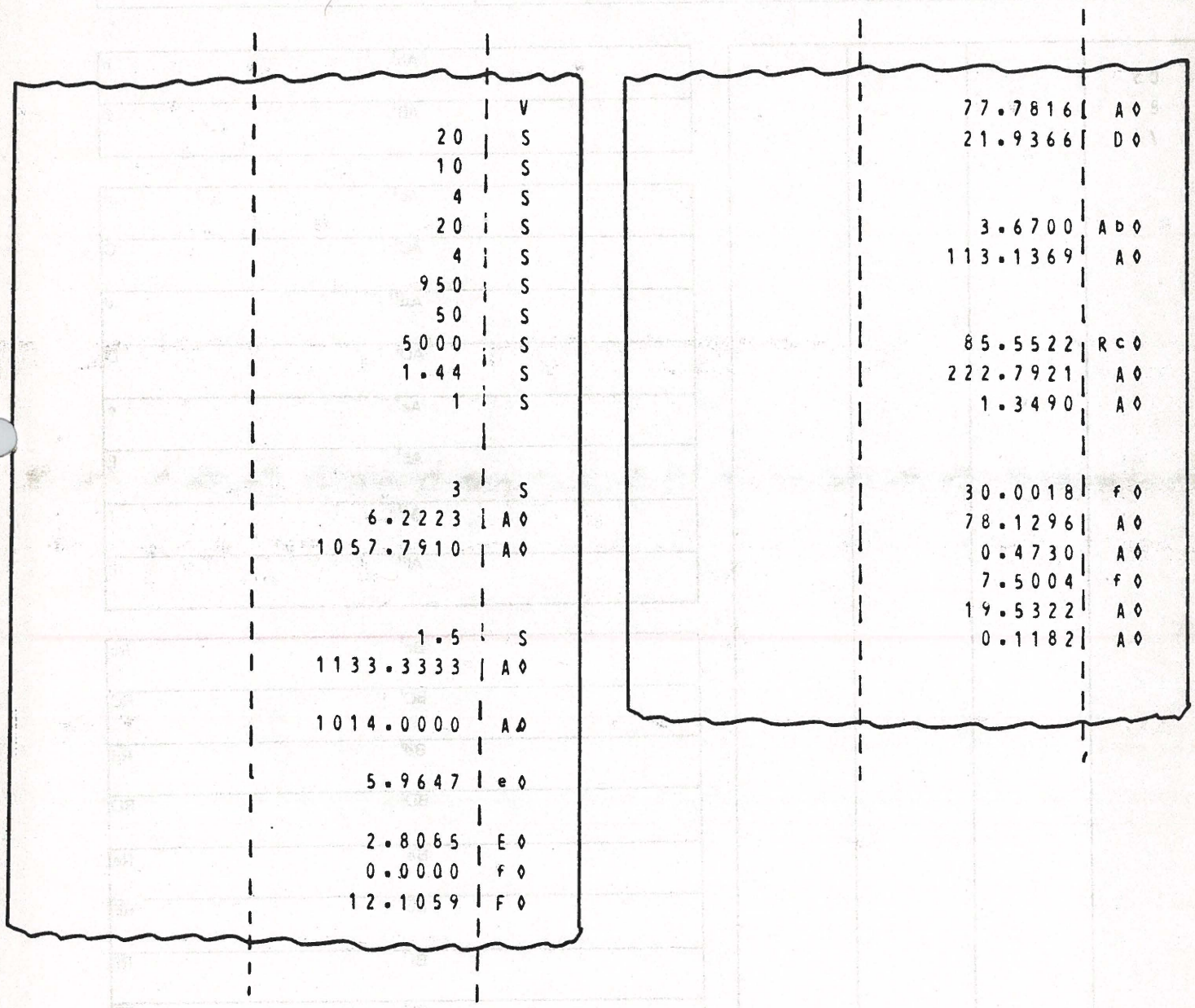
2nd section

1st section

olivetti P 602

Code [C. P. 59]	Date	Page 1/6

SAMPLE RUN : Cut along dotted lines and fix to pre-printed run sheets as illustrated on pages 9 - 12 of the program documentation supplied by Ross H. Byran, Inc.



olivetti P 602 | Code [C. P. 59] | Date | Page 2/6

Block Number	From	To	Zone 3	Zone 2	Zone 1	Routine Description
Start Card		59				Spread Footing Design Start Card

C S
B
1

Ab'	b
AB'	B

Ac'	c
AC'	C
Ad'	d
AD'	D
Ae'	e
AE'	E
Af'	f
AF'	F

Bc'	Rc
BC'	RC
Bd'	Rd
BD'	RD
Be'	Re
BE'	RE
Bf'	Rf
BF'	RF

Block Number	From	To	Zone 3	Zone 2	Zone 1	Routine Description
59	Start Card					Spread Footing Design -Side A-

S	r◊	F S	E ↕
b ↑	r◊	b ◆	f -
S	b ↓	↕	f ↕
B ↑	A ↑	C ◆	b ↓
S	d ↑	A ◊	A ↑
c ↑	↕	D ↕	d ↑
S	b ↕	e ↕	X
↓	D ↓	b ↓	F ↕
S	A ↑	A ↑	Y
X	B -	f ↕	aW
S	f ↓	↕	A ↑
◆	↕	e ◆	d S
C ↕	B ↕	A S	f ↑
b ↓	S	AW	b ↓
B X	↕	D ↓	e -
c X	b ◆	B ↕	F ↕
A ↑	A ◊	b ↕	F ↓
R -	D X	A ↑	B X
R ↓	A ◊	d ↑	A ↑
d S	r◊	↕	R -
X	r◊	E ↕	d ↓
S	D ↓	C ↓	X
◆	b X	A ↑	E ↕
D ↕	S	R -	F ↓
S	↕	d ↓	F ◆
d ↑	A ◊	X	F ◆
S	r◊	B ↕	F ↕
A S	c ↓	b ↕	D ↓
c ↑	c X	b ↕	E ↕
S	c X	f ↕	E ↕
A S	B X	E ↓	/Y
B ↑	A ↑	f ◆	/ ↓

Ab'	b
AB'	B
Ac'	c
AC'	C
Ad'	d
AD'	D
Ae'	e
AE'	E
Af'	f
AF'	F

Bc'	Rc
BC'	RC
Bd'	Rd
BD'	RD
Be'	Re
BE'	RE
Bf'	Rf
BF'	RF

Store Sides A , B, C, on MLU blocks 59, 60, 61, and 62, respectively.

Block Number	From	To	Zone 3	Zone 2	Zone 1	Routine Description
60	59	61				Spread Footing Design -Side B-

r◊	B↕	RS	b↓
e◊	f S	c↕	A S
r◊	◆	A S	B◆
E◊	A S	b↓	A S
f◊	b↕	A↑	b◆
F◊	A S	d↑	D↕
d↓	b↓	↑	E↓
Af	A↑	A S	f▬
d↕	f↑	B◆	b↑
f↓	↑	RS	A↑
R S	b◆	c X	d↑
AZ	A S	D◆	↑
Y	B▬	D↕	D X
aZ	D↕	A S	f◆
C S	E↓	B↓	E◆
D↕	f◆	A S	A S
Z	B X	B◆	b↕
/Y	D X	A S	D↕
d↓	D↕	b◆	b↓
A↑	B↓	A↑	A S
d↑	A S	R X	B▬
X	B▬	R↕	A S
r◊	A S	R▬	b▬
A◊	B▬	d S	D X
d↓	A S	X	A↑
A↑	b▬	A S	R▪
d↕	R S	b X	R↑
X	c↕	D↕	d S
A◊	f↓	D↕	↑
c↓	E◆	A◊	D↕
A↑	R S	r◊	/Z
B↕	c X	r◊	/↓

Ab'	b
AB'	B

Ac'	c
AC'	C
Ad'	d
AD'	D
Ae'	e
AE'	E
Af'	f
AF'	F

Bc'	Rc
BC'	RC
Bd'	Rd
BD'	RD
Be'	Re
BE'	RE
Bf'	Rf
BF'	RF

olivetti P 602

Code [C.P. 59]	Date	Page 5/6

Block Number	From	To	Zone 3	Zone 2	Zone 1	Routine Description
61	60	62				Spread Footing Design -Side C-

f ↓	Z	R S	D ↕
R S	●W	C ↕	F ↓
A W	A ↑	F ↓	A ↑
b ↓	B ↕	b ▬	f ↕
A S	B ↕	A S	↑
B ◆	f S	B ◆	b ◆
R S	↓	E X	A S
c ↕	c ◆	F ↑	B ▬
E ↓	A S	E ◆	E X
f ▬	b ↕	E ◆	F X
b ↑	b ↓	A ↑	A ↑
A ↑	A S	d X	d ↑
d ↑	B ▬	↑	↑
↑	A S	R S	R S
R S	b ▬	d ↕	c ↕
c X	R S	b ↓	F ▬
f ◆	c ↕	A S	A S
E ◆	F ↓	B ▬	A Z
E ◆	R S	A X	R S
A ↑	c ▬	R S	C ↓
d X	E X	d X	D ↕
↑	F ↑	R S	R S
R S	E ◆	d ↕	d ↓
c ↕	A ↑	F ↓	R S
b ↓	R ■	E X	c ↕
A S	R ↑	A S	C ↓
B ▬	d S	b ↑	C ↓
A X	↑	A ↑	C ↓
R S	A S	R ■	●Z
c X	b ↑	R ↑	/Z
R S	R S	d S	/ ↓
c ↕	c X	↑	

Ab'	b
AB'	B

Ac'	c
AC'	C
Ad'	d
AD'	D
Ae'	e
AE'	E
Af'	f
AF'	F

Bc'	Rc
BC'	RC
Bd'	Rd
BD'	RD
Be'	Re
BE'	RE
Bf'	Rf
BF'	RF

olivetti P 602

Code [C. P. 59]	Date	Page 6/6

Block Number	From	To	Zone 3	Zone 2	Zone 1	Routine Description
62	61					Spread Footing Design -Side D-

C S	c ↕	E ↕	r ◊
B ↕	c ↕	f ↕	/ ↓
A ↑	A ◊	f ◊	
R ↓	A ↑	f ↓	
d ↓	D ↑	F ↕	
↓	r ↓	c ↕	
d X	↓	c ↕	
A ◊	A S	A ◊	
D ◊	c X	f ↓	
r ◊	A S	R S	
r ◊	b X	c ↕	
A S	R S	A ◊	
b ◊	c ↕	B ↓	
A ↑	R S	B X	
R X	c ↕	c X	
d ↓	A ◊	E ↕	
↓	r ◊	f ↕	
d X	r ◊	f ◊	
A ◊	A ↑	f ↓	
r ◊	R ↕	F ↕	
r ◊	R ↕	c ↕	
R S	D ↕	c ↕	
c ◊	r ▪	A ◊	
R S	E ↑	f ↓	
c ↓	b ↓	R S	
A ↑	A ↑	c ↕	
R ▪	d ↑	A ◊	
R ↑	X	r ◊	
R S	b ↕	r ◊	
d S	b ↓	r ◊	
F ↑	b X	r ◊	
F ↕	c X	r ◊	

Ab'	b
AB'	B

Ac'	c
AC'	C
Ad'	d
AD'	D
Ae'	e
AE'	E
Af'	f
AF'	F

Bc'	Rc
BC'	RC
Bd'	Rd
BD'	RD
Be'	Re
BE'	RE
Bf'	Rf
BF'	RF

VII MARKET APPROACH

A. REVIEW THE SYSTEM

1. Glossary
2. Sample Programs

B. PREPARE PRESENTATION BINDER

C. REVIEW THE MARKET

1. Prepare Vertical Market List
   a. P101 Users
   b. Yellow Pages
   c. Associations
   d. Referrals

D. FIND KEY CUSTOMER

1. Someone you know in the Business - or a P101 User
   a. Demonstration
   b. Benefits
   c. In his estimate, whom should you call on?
   d. Whom do you sell first?

E. ORGANIZE APPOINTMENT

1. Telephone, Cold-Canvass

F. SELL