Women's study to continue

By Lee Giniea

The Urban Vehicle Design Competition is growing faster than the problems created by the increasing use of automobiles within American cities.

It started last February with fewer than 200 engineers and architects examining the more focused version of the 1970 Clean Air Car Race. The competition now involves more than 1000 students; they compete teams from 80 US and Canadian universities. About 70 teams are expected in the final competition, which will be held at the GM Proving Grounds in Milford, Mich. In contrast, only 43 teams tested their vehicles in an MIT-Cal Tech race during August 1970.

This year's competition will be less spectacular than a transcontinental race but more significant. It will tackle one problem intensively: that of designing and building transit systems that are more "civilized" in the urban traffic environment that present automobiles.

The purposes of this conference, as stated in the proposal submitted by the committee, are: 1) to provide MIT Black students with the opportunity to examine their skills, strengths and weaknesses; to make them better aware of how their proficiencies and knowledge how may be useful in responding to some of the technical needs and considerations of our urban communities; and to offer the opportunity for them to further develop their problem solving skills, and 2) to engender a new consciousness of the contribution of our community to Black communities and pursuits in these areas. According to coordinators, these topics were chosen because of their current technical urgency and major impact on the Black communities of America. They hope that the weekend session will give participants the unique opportunity of defining problems, strategies, and possible solutions to some of the needs of rapidly changing urban communities.

In an effort to encourage the involvement of all Black faculty, administrators, Community and Sloan Fellows, and students interested in the topic, these sessions were sent to all members of the MIT community. Some invitations have also been extended to members of other campus communities and to several residents of the greater Boston area. Since that time, responses to the invitations have been overwhelmingly favorable. The only problem that really faces coordinators now is that some people may have to be turned away because the conference was planned on the assumption of 180 participants.

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LINAC passes the 20 MEV milestone:

By Steven Kaufmann

The MIT Linear Accelerator (LINAC) of electrons, which is under construction at Middle-
ton, has passed with flying col-
ors its series of tests at 20
million electron volts (MEV) and
should be ready in March for its
first operational run at 100
MEV.

Costing in excess of seven
million dollars, LINAC has been
jointly financed by MIT, 20 per-
cent, and the Atomic Energy
Commission, the remaining 80
percent. Therefore, it will be
essentially a national facility
serving physicists from all over
the country.

Operations and research are
to be largely funded under AEC
contract, and priorities will be
assigned by the lab director as
advised by a program review
committee with representatives
from prestigious institutions
such as MIT, Los Alamos, Stan-
ford, Yale, and the Bureau of
Standards. To further promote
the efficient utilization of the
installation, a national policy
board of scientists from other
accelerators has been formed.
Nearby schools have already
been invited to investigate the
opportunities that LINAC offers.

Professor of Physics Peter
Demos, the Director of the Lab
for Nuclear Science, said of
LINAC, has said that the accel-

ator is on schedule and should
have the capability of generating
its maximum power of 430 MEV
by December of this year. How-
ever, research projects, which
will begin in earnest in early
1973, will likely work with only
half the energy for a time.
LINAC could have been com-
pleted this year, but it was
not built on the level necessary
to balance inflation.

A Linear for MIT

Plans for an MIT accelerator
date back to 1960 when a
small, on-campus facility was
being considered. A possible site
was on Bridge Field, but engi-
neers rejected that location on
the contention that the high
towers on campus would make it
impossible to keep the buildings
underground. Rather, the
Linac was authorized in 1966 but
construction did not begin until
two years later.

Some of the inevitable prob-
lems have caused delays. Due to
its location on a small hill, the
underground vault which con-

tains the beam guide tube minor
amounts of ground water. Dur-

ing construction, forms for the
huge concrete walls of the experi-
mental area were blown down,
the electronics was operational.

Another important feature is
the ability to deliver the pulsed
energy in the form of mass.

Mad River Glen is Like a Happy Hour

No wonder Ski Magazine's na-
tional survey revealed skiers con-
sider this area the "Most Loveable in the U.S.A." It's now being inseparable, as
mercenariled, not overcrowded, just
great sport, great exercise, a
perfect place for skiing. Great
skiing for all abilities, The best
time to visit is late Dec., early
Jan.

Ski Birdland, our unique Mini-
Area within the area enjoys ski trails and four lift seats on mid-moun-
tains. Enthusiastically approved by
skiers wanting to get out and LINAC's
given out after a mere ten hours of
service but, fortunately, they
are guaranteed for five hundred
hours. Fortunately, though LINAC bought them at
a cost of $3,000 each, they now cost $23,000 and the
installation requires a total of twenty. All are not yet needed so the
only result delay was the time for replacement and test-
ing.

Changing a tube in an acceler-
ator is not nearly as easy as it
may sound. These installations
must be run "heavy electron-
ics," an engineer's way of saying
that a crane is required to lift the
equipment.

Unique LINAC

LINAC is in a class by itself for
a number of reasons. It does not
have the great beam energy of
Stanford or the National Ac-
celerator Lab as it has been
designed to study the shape and
structure of the nucleus as a
whole as well as at a sum of its
subnuclear particles. It has been
planned very carefully with this
in mind and much of the credit
for the electronics goes to Prof.
of Physics John O. White, the
accelerator for the Dr. Jacob
Halimson of the Lab for Nuclear
Science.

One of the exceptional abili-
yes of LINAC is its beam intra-

face. The electron beam has been
receiving a positive feedback
for its tenacity in tests at 20 MEV
that should be able to run for up to
a week with only minor supervi-
sion. If funds become available in
the future and research oppor-
tunities look promising, the ac-
celerator's power to nearly a billion
will be more than adequate for the
addition of another "transmitter."

LINAC layout

A visitor enters LINAC through the reception and office areas which lead into the control
room. The control room is not
yet in use, but upon completion it
will house all remote control
instruments and a com-
puter.

The other area that is above
ground is the RF (Radio
Frequency) Gallery which is
the power boosting and heavy
electronic equipment is housed.

Beginning nearby five hundred
feet in length and twenty-five in
width it will contain five large
transmitter assemblies plus gen-
erators, cooling and heating
units, and other equipment nec-

essary for servicing. Presently,
everything is somewhere in the
gallery but is now undergoing
the electronics is operational.

The last area of the gallery is a
ceiling to the injector room
where the electron gun, buncher,
chopper, and the energy
changer. An area of mainline wave guide can be found where the beam originates.

The electrons then travel through their nearly three hundred
feet of guide in the vault. To
prevent radiation exposure, the
vault is constructed with heavy
cement walls and has had fit-
covers for access and radi-

shilding. This is the section that is
secluded during operation.

All the way down the length of the beam tube is the beam switch section of the experi-
mental room which will house
various detection devices. Out-
side the room and beyond it
there is a dump that will "catch"
the beam and prevent it from
doing harm once that particular
generation is over. The switch
yard and experimental room are
now largely empty and the dump
has not yet been built.

The entire facility is sur-
roundd by a fence posted
with special "Aux-Area" signs and
in occupied in the middle of a larger
section owned by MIT.

The electron beam

The first stage of LINAC is
an extremely high voltage, oil-
filled transformer which is the
current with a potential of about
500,000 volts. This is channeled
to the injector which contains
the electron gun. Using the high
electrical power, the gun emits
pulses of electrons in a manner
similar to the one in a television
but at a multi-logarithmic rate
and more accurately.

The electrons enter the buncher where they are acceler-
ated to nearly the speed of light.
It is in this area that the length of
guide, less than ten feet, that the
electrons reach this velocity.
From there on, they are only gaining momentum and
reach their maximum speed.

The chopper is a selective
device that cuts the electrons into neat, spaced packets with, as much as possible, the same velocity. This velocity and the uniform packet size is important to effec-
tiveness of the accelerating principle. This is the reason the presently active 20 MEV sec-
tion.

The beam comes through a series of twelves and then twenty-
foot guide wads which guides it further energy. These guides contain "resonant cavity" where the microwave

power from the transmitters kicks the electrons along in rapid succession. These guide sections are connecting tubes that maintain the integrity of the vacuum within and which may contain various monitoring and filtering devices. The waveguides are cooled by a constant flow of water; rather, in most cases, they will be heated as the object is to maintain a constant temperature and warming is the water pumps.

At the end of its accelerating section, the beam enters the switch yard. Here quadrupole and hexapole magnets are used to focus and deflect the beam to the proper spot in the experimental area. Presently, the only experimental device actually provided for a 110-ton spectrometer, however, there are hopes that funds will be made available for another experimental hall and when the switch yard will have greater steering duties.

The spectrometer is a project in itself and it is another of LINAC's features. Filling up most of the research area, the first part of the building, it takes the beam and sends it through a right angle to the beam leaving the device at the bottom of a twenty-three foot pit. This spectrometer will be completed in a few months. With a resolution of more than the number of part in one thousand, it will be capable of studying models with very low visible cross sections.

The beam will travel down a tunnel and into the dump which will safely contain it's radioactive decay. This dump will contain a great mass of iron and the beam will, in time, be "hot" and have to be disposed of in special radioactivity landfills. A residual benefit will result from this cleanup. A dump such as this is capable of safely containing such a microwave, and it will be capable of dumping it through a right angle to the beam and into the switch yard, and is separate from the transformer tank. Here, the switch yard uses a high-speed control de-
ces to either drain current through themselves or send it through the rest of the trans-
mitter.

The final stage of the trans-
mitter is two, separately control-
ble, main klystrons. It is these

klystrons that actually turn out the microwave power that is sent below to accelerate the beam. The microwaves are carried to the vault through water-heated, evacuated, copper microwave guides. Each of the first four sections serves four sections of beam tube, two per main klystron, while the last two powers serve two sections. The first main klystron has been used to energize the beam, but the last two have been tested and are awaiting the 100 MEV run.

With great foresight, the de-
signers of LINAC realized that the chance of all transmitters being operational at the same time is virtually nil, so they allowed for several, even the middle ones, to be deacelarated without loss of performance of the others. This is accomplished by constructing the main beam guide so that it could be changed to prevent deterioration of the beam as it travels through non-
operational sections.

Safety features galore
LINAC's safety precautions are elaborate. With the exception of dump, switch yard mag-

ets, and spectrometer, all of the radioactivity generated will be shielded. The vault is kept sealed at all times after operation to allow radio-
active gases to decay.

Anyone remaining in the vault during operations would quickly receive a lethal dose of radiation, therefore a careful

The used beam will travel to a detector section to be measured and compared with determined before the beam can be activated. Analyses are provided with sensors that monitor every section of the vent operation unless they are closed and remain so. Within the vault there are emergency point sys-
tems that shut off the equipment in the unlikely case someone is missed in the search; the lights are flashed and a deffusing horn sounded as additional warning. Three bolt hails provide emer-
gency "no superfluity" mazes and steep led-
es to the surface. Announcements are made throughout the facility to tell all that the vault must be cleared, that high vol-
tage is coming on at a specific time, and a set of the vault is in progress, that the beam has terminated.

All personnel wear false badges to keep track of their total exposure to radiation. Only chief medical officer Frank Maese, other than Director Denos, has final say over activation. His department monitors the enormous detection devices scattered throughout the facility to be sure that no one re-

Wednesday, February 9, 1972
8:15 pm, Lecture Hall 9-150
The Technology of Social Observation
Dr. Robert Coles
Research Psychiatrist
at Harvard University
7:00 - 9:00 pm: Respondents and Discussion
Respondents:
Leon Eisenberg, Psychiatrist-in-Chief, Massachusetts General Hospital
Herald R. Issacs, Political Scientist, MIT

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A guide to better education?

By Lee Gigert

Large scale swimmers, or "The 1972 MIT Course Evaluation Guide" are helping students to make the best out of their courses. In one case, a student believes it impossible to consider their objective validity without concluding as equally biased, broiling the pool. But there are some biases that can be overcome by considering the Guide's aim, its success, in carrying out what it aims on its own terms, the amount of useful information that is "appears" because it is nearly impossible to find what is useful, the accessibility of its contents, and the extent to which the user can determine for himself just what the replies mean.

The course was the cooperative effort of the 1972 MIT Survey Team and TCA, "analytically student-initiated and student-run." The questionnaires were distributed directly to instructors and the survey team, forming, in the distribution of the questionnaires, sought, but with little success - the CEP enforced course evaluations in general and commended the project but refused any practical assistance on the grounds that such a "consumer research" study is "perfectly proper" to them.

The course evaluation questionnaire was composed of three parts: "The Course Experience," "The Course" and "The Instructor." The former is for comments. "The Course" questions, all requiring a response on a five to five scale, are either based on the student's overall rating of the course, the depth, expectations with the course, the demands and its organization, and its utility. A rating of "teaching," and questions on the time estimation, and answers call for answering as well as completion. The third section, content, also was filled in.

Aims and their execution

According to its authors, the Guide is "a compilation of information about those who taught five courses that volunteered to us at the end of the past term" and is intended "as an aid in course selection" for next year. Forth, they state that "this is our intention," they did, and to identify his year and major.

Letters to The Tech

To the Editor,

Perhaps innocently, Professor Pinson displays some facts in his recent letter to The Tech about the dismissal of Miss. Valda Maoz from the ROTCH Library. There have been long-standing problems with the slide collection in Rotch such as: a) it is disorganized and b) the staff are not aware of the proper location for certain slides. For the past two years, I have been trying to contact the slide collection in Rotch, both with no success.

Far from being a secret accusation, I have discovered that the slide collection is not well organized. The librarian, Miss. Maoz, who is our library representative, is aware of this secret dossier to the problem. She has been, repeatedly, actively, only to transmit my comments, and has no responsibility for their accuracy. Most of the problems are ignored, we never hear of whole series of experiences by various users would make the collection more efficient.

I feel no ill will.

Professor Pinson is convinced that the dismissal has a political motive. I have seen no evidence of that, in any inquiry I have made. I, at least, was completely unaware of Miss. Pinson's political opinions. At the end of the semester, my professor's description of them, they seem perfectly proper to me. The dismissal was based on professional considerations, i.e. for librarianship, and considerations of collection for teaching, and I concurred in the dismissal. I hope that a similar policy will be followed in the future, and the students at least by the end of the semester. The dismissal was based on a "confidential dossier"

I agree with Pinson in one thing: the whole affair makes clear the need for regular, proven, well-staffed, and perhaps for union organization of such a nature that in the future, and the students at least by the end of the semester. The dismissal was based on a "confidential dossier"

Kevin Lynch

Professor, Department of Urban Studies and Planning

To the Editor

Professor William Pinson (in his letter of January 26th) has intentionally chosen to present a distorted picture of my role in the dismissal of Mrs. Valda Maoz.

There is absolutely no basis in fact for his allegation that Mrs. Maoz's firing was in any way politically motivated.

Lawrence Suskind

Associate Professor of Urban Studies and Planning

(MIT has issued to the press the following statement concerning the dismissal of Valda Maoz - Editor)

Conclusions

The 1972 MIT Course Evaluation Guide is certainly a useful document, a good effort to assess students' selecting their courses. It still has many limitations; however. A large number of second term courses are not included since they were not offered first term. In addition, the authors of the Guide do not consider transferring students to use it in planning their term, and by next year, copies of the Guide are likely to have been lost.

Yet the data does point out the direction in which future course evaluations should be aimed if they are to serve as consumer guides. Combined with the catalogues and face-to-face discussions with instructors, the data should help a student who wants to do more than just "get the job done" or "a top grade." Should the Guide be continued on a term-by-term basis, students might have a good idea of what type of professors make an ideal of a well-rounded education without having to travel blind.

The President and Chancellor, upon consideration of the review, support and concur with the review's conclusions.
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LINAC passes tests; trial run set for March

(Continued from page 3) core's more than the permissible annual dose. For a young man, the maximum is five rems per year; an older man with no radiation experience may receive more, though Dr. Manne hopes to hold exposure to below half that. This is the bottom limit at which the chance of genetic mutation is doubled; no danger to the individual's health occurs at this level.

When in full operation, not only the RF Gallery but also the Control Room will receive small amounts of radiation to all areas and workers are monitored. Several areas that are now open to permit access by heavy equipment will be blocked off with shielding to further cut down radiation. The level at the fence which surrounds the entire complex must conform to AEC standards, which have been varying greatly lately as the AEC sways public opinion and misinformation fears of radiation. Only personnel and guests are allowed in.

High voltage can be as deadly as radiation exposure so all areas and persons must conform to AEC standards, which have been varying greatly lately as the AEC sways public opinion and misinformation fears of radiation. Only personnel and guests are allowed in.

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rocoo classic, seems to be at 
a turning point in its popular 
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Enrollment cost is $25.00 and you can start today on either the day or the evening course. Day classes start at 9:30 am and end at 5:00 pm with lunch and coffee breaks. Evening classes start at 6:00 pm and go to 10:00 pm with a break for coffee. We accept enrollment any day of the week, depending upon the student’s schedule.

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L. Ron Hubbard
Founder of Dianetics
and Scientology

To enroll simply come into the Church of Scientology of Boston, 714 Beacon Street, Boston, Massachusetts (Kenmore Square) and speak with a registrar who will schedule you immediately. For those living further away, contact Pam Ellis, our Letter Registrar, who will gladly help you arrange your schedule and answer any questions you may have. Phone: 262-4914.
**Ful ler to speak Thursday**

By Larry Wilson

- Buckminster Fuller asks himself fundamental questions, answers them in terms of his own experiences, and proceeds to reduce his problem-solutions to practice for the benefit of mankind. He radiates a personal warmth and humility, and a sense of urgency concerning the state of mankind. His philosophy is utterly simple and selfless; in his book entitled, *Utopia or Oblivion*, he says, "I go along with the 5000-year-old philosophy of the Bhagavad-Gita which says: Action is the product of the qualities inherent in nature. It is only the ignorant man who, misled by personal egotism, says: 'I am the doer.'"

Dr. Fuller was born in 1895, grew up in Milton, Mass., and spent his summers on Deer Island, off the coast of Maine. He spent one unhappy term at Harvard, and in 1917 enrolled in the U.S. Naval Academy. In the same year he married Anne Hewlett, daughter of a prominent New York architect.

At the Naval Academy, Fuller was educated as a comprehen-
sive scientist. The training which he received in ballistics, logistics, navigation, and, gaming techniques greatly inspired his thinking. Fuller would agree with Albert Einstein that "if a man were to be launched into the universe, and then were to come back and report what he saw, he would not say it was the universe, but it would be something like the Navy Yard."

Fuller is also acutely aware of the limitations of science and technology. He was deeply influenced by Thoreau and by his famous great-aunt, Margaret Fuller. Life is metaphysical; points try to describe what life is, while science discovers what life isn't. He would agree with the statement of Vannevar Bush that science only heightens the mysteries of life. Technology, says Fuller, cannot produce a healthy society, but it can permit, or allow life to regenerate, much in the same way that the superhuman technology of our digestive, circulatory, and nervous systems allow us to grow and regenerate. The purpose of technology is to eliminate resistance to life. As we progressively do more with less, our technology will become more and more invisible, automated, and unobtrusive.

Dr. Fuller's books are on sale in The Coop. He is the subject of an excellent interview in the January '72 issue of Playboy, and is also featured in this month's issue of Architectural Forum.

He will be available to meet with some students on the after-
rnoon of Thursday, Feb. 10, before his evening address in Knege. For more information, call 354-4540.
IAP office begins analysis

By Storm Knaeflin

In the early analysis, the Institute's second Independent Activities Period was a great success. Generally, the events were oversubscribed and some had to be canceled due to the popularity of certain activities. However, the process of organizing and coordinating these events was challenging, and the staff worked hard to ensure that all students had an opportunity to participate.

The only apparent negative aspect of the 1972 IAP was the limited participation of the students. Although the number of students who attended events was impressive, it was not as widespread as in previous years. However, this may be attributed to the increased pressure from regular courses and the resulting lack of time for extracurricular activities.

The students were urged to participate in the upcoming events and to continue their involvement in the IAP. The success of the 1972 IAP shows the importance of offering a variety of activities to cater to the diverse interests of the student body.
Cynics might claim that the success of IAP this year was the result of a lack of skiing weather, but both the number of participants and the increase in activities offered indicate that the popularity of the January institution is definitely on the rise.

Photos by Sheldon Lowenthal
Grapplers win three; WPI, BC slaughtered

By Mike Nielsen
MIT's basketball varsity has compiled a record of five wins against two losses during IAP, since returning from their Flori-
da trip. Two of the games were won into overtime, with MIT winning one of them. Highlighting the basketball action was co-captain Harold Brown '72, who moved into second place on the all-time career scoring ladder. Brown has now totaled 1236 points, mov-
ing ahead of Alex Wilson's (1944-47) 1224 mark. Next move for Harold is to top all-time
leader Dave Jansson's high.

WPI's ursa-co-captain, up for a jumper, his favorite
man's ride, dropping a close
match. Dynamic Loren Dunmante worked to a 1-1 tie
against his foe, and undefeated
Paul Mitchell ran through the matter of course, but MIT's
team lead was cut to 7-3 as
the period ended. The seven minutes of overtime, was thus
for Harold is to top all-
time leader Dave Jansson's high
score. His shooting consisted fifty percent on dis-


This year's Indoor trackcrushed Bowdoin last Saturday, 88-56. Amazingly, 200 yd. run, to bring the track
team's record to 5-2. Co-captain Al Lathem '72, about to
the long jump, high jump, and the 46 yd. HH. Photo by Dave Tenenbaum.

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