OPERATIONAL ARMATURES

Georgia Institute of Technology
FALL 2016
Atlanta, GA
School of Architecture
ARCH 6071 | Design + Research Studio
CRN 91918

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OPERATIONAL ARMATURES is a working regimen set up as an architectural think-tank and experimental studio format. It provides an opportunity to critically imagine and develop new cultural potentials tied to architectural triggers (and especially vice-versa) through a mode of practice that utilizes design motivation and spatial exploration at every step along the way. Studio participants can expect to unleash a wide array of digital and physical production tools, working both rapidly and precisely with a strong bias towards producing physical evidence through advanced means.

At the most immediately tangible level, participants in this studio will set out to design OPERATIONAL ARMATURES: buildings meticulously configured to invite and support experiments in advanced fabrication, interactive installation, atmospheric production, material interfaces and other spatial engagements through precisely curated volumetric signatures, structural systems and utility arrays. For example, imagine a building as an electrified, high-strength pegboard, turned somewhat inside-out. Add a loading dock and a gantry crane. Now, what can be done with such a place?

Ultimately, the point of this studio is not to “solve problems” in a traditional sense, but rather identify, invent, incubate, refine, develop and deliver versions of architectural imaginaries and cultural engagements to the city, in the myriad ways that only such an exploratory format can. This studio will collectively navigate a vast cloud of questions and ideas yet to be formulated, culminating in a diverse array of individually projected examples of built invitations for experimental productions in Atlanta. In this sense, the city itself can be conceived of as an armature poised to be recalibrated with custom architectural settings that may enable new occupations and encounters yet to be imagined.

We will initiate this overall endeavor by immediately jumping into action on several simultaneous and intertwined fronts for the first four weeks of the semester:

OPERATIONAL ENVELOPES: MEGA-MATRIX
(DESIGN - RESEARCH: Weeks 1-4)

Given the overall attitude and ambition outlined above, how many ways might we rapidly imagine spatial actions within a standardized, generic working envelope of space? With the intention of working at a semi-frenzied pace on what amounts to a collective brainstorm phase, individual participants will be tasked to rapidly and iteratively design and depict scores of potential scenarios within each of the following categories: ARMATURES (structural strategies, building typologies, utility arrays, operable systems, etc.), INSTALLATIONS (ideas, ambitions, “what-if” questions, etc.) and SPATIAL SIGNATURES (i.e., potential flows, manifolds, volumetric conflicts, events and encounters, etc.). Of course, any scenario from one category can produce other ideas in a different category, sparking yet other starting points and divergent approaches on yet a different track…and so on.

Speed and agility will be the crucial assets in developing a large collection of singular ideas for how notions of OPERATIONAL ARMATURES might eventually be approached. As such, working template .3dm and .ai files will be provided which will include our working volumetric envelope, saved views and drawing standards, thus enabling rapid and cohesive production of ideas by all involved. Further, this will facilitate opportunities for direct exchange within the studio, fostering an open-source approach to this massive collective burst of ideas. The net result of this phase will be a printed (monochromatic, low-res / hi-fi, vector-based) MEGA-MATRIX of ideas, scenarios, ambitions and questions – a comprehensive and collective document to be utilized as a working resource through the rest of the semester.
OPERATIONS REFERENCE CATALOG
(RESEARCH - DESIGN: Weeks 1-4)

Another key resource that will be developed during the first four weeks of the semester will be a formatted compilation of references that will help set the tone for specific qualities that may be ultimately embedded within an OPERATIONAL ARMATURE. Small teams will be assigned to research the following categories: VENUES (including progressive galleries, black-box theaters, design labs, material testing facilities, museums and other places that have served as an armature of sorts), INSTALLATIONS (examples of advanced installations at multiple scales, artists’ / designers’ / architecture schools’ work, for example), CONNECTION ARRAYS & HARDWARE (ranging in scale from the interior of a cargo airplane to an individual threaded insert-nut), and INDUSTRIAL FRAMES (i.e., salt-sheds, quarry buildings, hangars, etc.).

Brief and formatted synopses will ultimately be bound in a printed reference “catalog” (template to be developed / provided), with the content ranging from one-page outlines (for project / installation / building examples) to sourced / referenced catalog pages from suppliers for hardware components. A primary goal for this catalog is that it should serve as an actual reference from which studio participants can specify all hardware and components for their projects from its content, meaning that if something doesn’t appear in the OPERATIONS REFERENCE CATALOG, it can’t be used in a future project. Further, the development of this in parallel with the OPERATIONAL ENVELOPES described above is intended to provide sparks of ideas that can positively infect the ongoing development of the MEGA-MATRIX…and vice-versa.

ATLANTA RECONNAISSANCE: OPERATIONAL TERRITORY
(SCAN: Weeks 1-4)

At a consistent rate but a much slower burn than the two initial phases of work listed above, we will discuss approaches to perform urban recon, with the idea that we’re not seeking out “sites” as much as we are scanning for territories, situations and quirks unique to Atlanta’s fabric. This will be an ongoing discussion through the first weeks of the semester, and the directions it may take us are both exciting and yet to be determined. The primary goal is that we develop attitudes about how projects may take the leap from the generic volumetric envelope utilized in the OPERATIONAL ENVELOPE: MEGA-MATRIX to a situation with rich external pressures and opportunities from an urban fabric.

MID-REVIEW ARMATURE PUSH
(REFINE: Weeks 4-7)

With the vast array of ideas, strategies, potentials and questions developed during the first four weeks in our arsenal, the push towards mid-review involves two fundamental shifts in production. First, studio participants will be tasked to immediately zoom in on the deployment of a design model (most likely a combination of features) from the MEGA-MATRIX into conditions offered by insights gained through the ATLANTA RECONNAISSANCE: OPERATIONAL TERRITORY phase.

This translation from the “generic” to “deployed” will then be explored and developed with the second (simultaneous) shift: the refined production of a large, sturdily constructed physical construct of the OPERATIONAL ARMATURE at hand. These spatial constructs are meant to be developed as both a model and a tool – an actual armature that can be used to design, play and work with. While the specific sizes of each MID-REVIEW ARMATURE is yet to be determined, the approximate dimensions should currently be thought of in the range of 2’ x 3’ x 4’. Materials to be utilized for these (low-res / hi-fi) constructs must be burly, meaning ¼” airplane plywood, steel, aluminum, plexi / polycarb sheets and 3d-printed components are highly prioritized over chipboard and foam-core. The other implication that this approach provides is that the production of all MID-REVIEW ARMATURES will require focused and diligent use of the Digital Fabrication Lab and other digital fabrication resources over these 3 weeks (and beyond).

ARMATURE EXCHANGE: OPERATE
(REBOOT: Weeks 7-11)
While the content and required deliverables for the mid-review will include all of the work and resources developed in the first four weeks of the semester, the MID-REVIEW ARMATURES along with associated documentation of its production and the projects’ responses to urban situations (drawings, maps, schedules, etc.), the mid-review itself will be geared much more like a working session towards a fundamental shift in the studio’s operations which will drive the second half of the semester. Through an exchange protocol yet to be determined (lottery, “market”, back-room deals?), studio participants will hand off their MID-REVIEW ARMATURES to someone else, and acquire somebody else’s. Each studio participant is then required to design an installation within their newly acquired armature.

As all MID-REVIEW ARMATURES will have been sturdily built and augmented with analog details / hardware that replicate the ambitions of the “actual” design, the initial work of this phase will be primarily rapid physical production using materials such as string, copper-coated welding rods, chipboard, latex sheets, wire, balloons, etc. Upon developing trajectories for these invitational spatial responses, we will then focus on translating the analog work into digital models, operate accordingly, and the production of highly refined versions of such schemes. Output tools and techniques for this phase will, again, require students to exploit the Digital Fabrication Lab facilities and other digital fabrication resources (laser-cutters, 3d-printers, etc.). We will go through at least one ARMATURE EXCHANGE cycle, with the option to work through two or more cycles preliminarily on the table as the work develops (to be determined).

FINAL APPROACH
(REFINE & PROJECT: Weeks 11-14)

While one can imagine that it is excitingly difficult to predict the vast array of diverse work that will have been developed by Week 11, final approaches towards the end of the semester will be customized and dialed-in per project at this time. However, several things can be anticipated as common approaches for each project at hand. A low-res atlas of spatial ideas in the city is to be developed with standardized drawing requirements, meaning that the speculative urban impacts and opportunities developed through the work is to be further pushed and documented. Potential cultural encounters / regimens / activities / protocols sparked by aspects of the work are to be explored and broadcasted through various forms of propaganda. Additional physical models ranging from small-scale to detailed moments will also be prioritized and developed during this last rapid-fire phase, along with numerous drawings and diagrams. Ultimately, the question for this final approach is very similar to our starting point:

What can be done with the OPERATIONAL ARMATURES at hand?

DIGITAL / PHYSICAL TOOLS*

Studio participants will flex all of the digital, physical, CNC, parametric, visualization, analytical, and low-tech tools currently in their arsenal, with Rhino and Grasshopper set as our common platforms. It is anticipated that hundreds of digital and physical constructs will be produced in this studio, in conjunction with a multitude of drawings, models, diagrams, maps, schedules, catalogs, images and other propaganda. Of course, all forms of exploration and communication are expected to be executed at the appropriate levels of resolution for any particular task or goal at hand.

* OPERATIONAL ARMATURE studio participants are highly encouraged to also enroll in OPERATION: 512 (ARCH 4833 / 8833 M / W 10:05am - 11:25am, Keith Kaseman, Instructor). While this elective course is designed to be a free-standing exploration of customized digital and physical fabrication workflows and techniques, it is specifically geared to augment many of the themes and trajectories embedded within the ambitions of the studio. Further, and perhaps most importantly for studio participants, OPERATION:512 provides an opportunity to expand and sharpen a critical set of digital tools with pointed tutorials of techniques within Rhino and Grasshopper in relation to custom fabrication workflows and physical production strategies. Plus, it should prove to be an enjoyable ride in and of itself!

WORKING SCHEDULE (TBD)