CLAIMS

1. A field-assembled satellite communications terminal (101), comprising:
    a. a plurality of discrete, modular aperture blocks (103), each aperture block comprising:
        i. an electrically steered antenna aperture (105);
        ii. a plurality of interconnection ports (107) for power and data communications between the plurality of aperture blocks, said plurality of interconnection ports (107) being removably connectable; and
    b. a signal processing system (325) configured to receive, process and generate signals to and from the antenna apertures (105),
    c. wherein the aperture blocks (103) are removably connectable to each other;

    characterised by:

    the aperture blocks (103) are arranged to self-configure to form a combined electrically-steered antenna, and

    a controller (339) within each of the plurality of aperture blocks (103) configured to automatically measure a relative distance and orientation between each block and each of its adjacent connected blocks to calibrate the combined electrically-steered antenna.
2. The terminal of claim 1, wherein said plurality of aperture blocks (103) are assembled to form a block assembly having a combined aperture formed by the plurality of antenna apertures (105).
3. The terminal of claim 2, wherein the combined aperture of the assembled terminal has higher gain, performance, and throughput than the antenna aperture of each aperture block (103).
4. The terminal of any of claims 1-3, wherein each of said plurality of aperture blocks comprises an integrated battery and power control circuitry.
5. The terminal of any of claims 1-4, further comprising an external battery (433) that is configured to provide power through an interconnection interface.

6. The terminal of any of claims 1-5, wherein each aperture block comprises a computing device (311) for communications and control between modules.
7. The terminal of any of claims 1-6, wherein one of said plurality of aperture blocks is selected during configuration to act as a primary block.
8. The terminal of claim 2, wherein the block assembly is configured to act as an integrated terminal, with modem and antenna control unit instantiated as part of the processing capability (329), and position and orientation sensors (343, 345) provided by the plurality of aperture blocks.
9. The terminal of claim 2 or 8, wherein the block assembly is configured to act as an integrated terminal, with modem, battery, antenna control unit, and position and orientation sensors provided by an external block.
10. The terminal of any of claims 1-9, further comprising a reconfigurable processing device or FPGA included in each of said plurality of aperture blocks.
11. The terminal of any of claims 1-10, wherein the aperture blocks are environmentally sealed within a housing.
12. The terminal of any of claims 1-11, further comprising an inductive power coupling (205) providing wireless power transfer between the plurality of aperture blocks (103).
13. The terminal of any of claims 1-11, wherein the interconnection ports (107) have electrical contacts (283) for power transfer, and further comprising a removable cover to protect said electrical contacts.
14. The terminal of any of claims 1-13, wherein the interconnection ports are configured to use short-range high-frequency wireless communications for data transfer.
15. The terminal of any of claims 1-13, wherein the interconnection ports are configured to use optical data couplers for data transfer.
16. The terminal of any of claims 1-15, further comprising one or more external data transfer and power accessories connected to one or more of said plurality of interconnection ports for one or more of said plurality of aperture blocks.
17. The terminal of any of claims 1-16, wherein the electrically-steered antenna aperture is a digital phased array.
18. The terminal of any of claims 1-16, wherein the electrically-steered antenna aperture is an analog phased array.

19. The terminal of any of claims 1-16, wherein the electrically-steered antenna aperture is a lens antenna array.
20. The terminal of any of claims 1-16, wherein the electrically-steered antenna aperture is a liquid crystal-based antenna.
21. The terminal of any of claims 1-20, wherein each of the plurality of aperture blocks have a triangular shape.
22. The terminal of claim 21, wherein the triangular shape has rounded corners.
23. The terminal of any of claims 1-22, wherein the combined antenna aperture self-calibrates from transmitted RF signals.
24. The terminal of any of claims 1-23, wherein relative position and orientation of the plurality of aperture blocks are determined for calibration by measuring optical path length differences by phase comparisons for a high-frequency optically modulated signal from a transmitter within one of the aperture blocks and a receiver within at least three other aperture blocks.
25. The terminal of any of claims 1-24, wherein the terminal is configured to act as a VSAT satellite communications terminal.
26. The terminal of any of claims 1-24, wherein the terminal is configured to operate in commercial and military Ka-band satcom frequencies.
27. The terminal of any of claims 1-24, wherein the terminal is configured to operate in Ku-band satcom frequencies.
28. The terminal of any of claims 1-24, wherein the terminal is configured to operate in X-band satcom frequencies.
29. The terminal of any of claims 1-24, wherein the terminal is configured to operate across multiple bands.