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CUMULATIVE Index to NASA Tech Briefs

1963–1966

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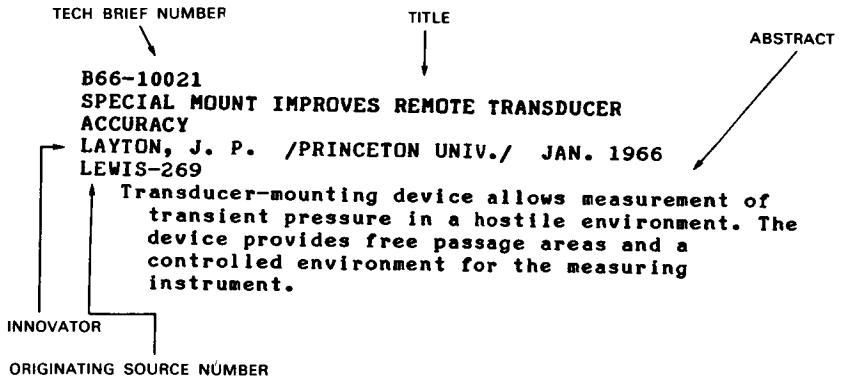
National Aeronautics and Space Administration

Introduction

This *Cumulative Index to NASA Tech Briefs* lists the technological innovations published in this form during the period from 1963 through 1966. The main section is arranged in five categories: Electrical (including Electronic); Physical Sciences (Energy Sources); Materials (including Chemistry); Life Sciences; and Mechanical. A typical entry has these elements:



To help users locate information of value, three indexes are provided. The first is a subject index, arranged alphabetically:

Note that in this index several routes are opened for obtaining further information. If the title seems promising, the Tech Brief number and category may be used to locate the abstract, which will be found in the main section arranged sequentially by Tech Brief number

within each category. Further, the Tech Brief number can of course be used for obtaining a copy of the original Tech Brief.

The second index relates all items by the originating source and number to the Tech Brief number and category.

The third index relates all items by the Tech Brief number and category to the originating source and number.

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This *Cumulative Index* replaces all previous issues of the *Index to NASA Tech Briefs* (NASA SP-5021) and supplements.

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B63-10006
SETTING OF ANGLES ON MACHINE TOOLS SPEEDED BY MAGNETIC PROTRACTOR
VALE, L. B. MAY 1964
ARC-5
An adjustable protractor facilitates transference of angles to remote machine tools. It has a magnetic base incorporating a beam which can be adjusted until its shadow coincides with an image on the screen of a projector.

B63-10024
SOLENOID PERMITS REMOTE CONTROL OF STOP WATCH AND ASSURES RESTARTING
KODAI, C. JUN. 1964
FRC-17
A stop watch which may be remotely controlled by the use of a solenoid mechanism is described. When the solenoid is energized the coil spring pulls the lever arm and starts the balance wheel. When it is not energized, the spring pulls the lever and stops the watch.

B63-10027
INCREASED PERFORMANCE RELIABILITY OBTAINED WITH DUAL /REDUNDANT/ OSCILLATOR SYSTEM
NOLIS, W. M. /IBM/ MAR. 1964
GSFC-36
Two crystal-controlled oscillators, each with an associated buffer stage, provide an output at a common point. The circuit design gives high reliability control of output frequency and amplitude.

B63-10033
INDIUM FOIL WITH BERYLLIA WASHER IMPROVES TRANSISTOR HEAT DISSIPATION
HILLIARD, J. JOHN, J. E. A. APR. 1964 /SEE NASA-TN-D-1753/
GSFC-42
Indium foil, used as an interface material in transistor mountings, greatly reduces the thermal resistance of beryllia washers. This method improves the heat dissipation of power transistors in a vacuum environment.

B63-10091
MODIFIED FILTER PREVENTS CONDUCTION OF MICROWAVE SIGNALS ALONG HIGH-VOLTAGE POWER SUPPLY LEADS
MATHISON, R. P. MAY 1964
JPL-63
Very lossy powdered iron material, in the lining of a polyester resin, replaces the dielectric material in the short coaxial transmission line of a simple filter. The lossy material absorbs microwave signals along high voltage power supply leads.

B63-10118
STEPPING SWITCH WITH SIMPLE ACTUATOR PROVIDES MANY CONTACTS IN SMALL SPACE
MILLER, J. V. MAY 1964
JPL-122
To reduce the space required for a stepping switch with many contacts, a simple electromechanical actuator with a maximum number of wipers has been incorporated into a compact assembly. This small sized unit is inexpensive to fabricate.

B63-10174
MODULAR CHASSIS SIMPLIFIES PACKAGING AND INTERCONNECTING OF CIRCUIT BOARDS
ARENS, W. E. BOLINE, K. G. MAY 1964
JPL-236A
A system of modular chassis structures has simplified the design for mounting a number of printed circuit boards. This design is structurally adaptable to computer and industrial control system applications.

B63-10193
REMOVABLE PREHEATER ELEMENTS IMPROVE OXIDE INDUCTION FURNACE
LEIPOLD, M. H. JAN. 1964
JPL-288
Heat and corrosion resistant preheater elements are used in oxide induction furnaces to raise the temperature to the level for conducting electricity. These preheater elements are then removed and the induction coil energized.

B63-10227
ELECTROMECHANICALLY OPERATED CAMERA SHUTTER PROVIDES UNIFORM EXPOSURE
FORD, A. G. MAR. 1964
JPL-357
A unidirectional camera shutter employing a solenoid and mechanical linkages permits uniform exposure and minimizes distortion of the image formed in the camera.

B63-10229
FLANGE ON MICROWAVE ANTENNA SUBREFLECTOR CUTS GROUND NOISE
POTTER, P. D. MAY 1964
JPL-362
The subreflector of a microwave antenna has been redesigned so that its outer edge has a conical flange. This reduces noise by causing ground energy radiation to cancel out before entering the antenna.

B63-10238
SHAPED SUPERCONDUCTOR CYLINDER RETAINS INTENSE MAGNETIC FIELD
HILDEBRANDT, A. F. WAHLQUIST, H. MAY 1964
JPL-381
The curve of the inner walls of a superconducting cylinder is plotted from the flux lines of the magnetic field to be contained. This shaping reduces maximum flux densities and permits a stronger and more uniform magnetic field.

B63-10250
LEVEL OF SUPER-COLD LIQUIDS AUTOMATICALLY MAINTAINED BY LEVELOMETER
TENER, W. M. MAR. 1964
JPL-397
A levelometer system, in which the level of cryogenic liquid to be controlled affects the level of an electrolyte, automatically switches a pump on and off. A pressure- sensitive diaphragm can also throw a microswitch to start or stop the pump.

B63-10255
TRANSFLUXOR CIRCUIT AMPLIFIES SENSING CURRENT FOR COMPUTER MEMORIES
MILLIGAN, G. C. MAR. 1964
JPL-406
To transfer data from the magnetic memory core to an independent core, a reliable sensing amplifier has been developed. Later the data in the independent core is transferred to the arithmetical section of the computer.

B63-10258
DOUBLE-THROW MICROWAVE DEVICE SWITCHES TWO LINES QUICKLY
CLAUSS, R. STELZRIED, C. T. FEB. 1964
JPL-410
By combining a single-throw microwave switch with a microwave circulator in a circuit, two input lines can be switched quickly. There is only a brief transition time when both /or neither/ of the two lines are connected to an output line.

B63-10262
IGNITING SYSTEM FOR MERCURY VAPOR LAMPS PROTECTS TRANSISTORIZED SUSTAINING SUPPLY
GUISINGER, J. E. JUL. 1964
JPL-421
A current from a sustaining power supply flows through the mercury vapor lamp and, as there are no resistors in series with this supply, the power is efficiently used. This high voltage igniting device protects the transistorized high current, low voltage power supply.

B63-10264
NOVEL HORN ANTENNA REDUCES SIDE LOBES, IMPROVES RADIATION PATTERN
POTTER, P. D. APR. 1964
JPL-425
A horn antenna, combining two propagation modes at selected power ratios, reduces side lobes, and improves the radiation characteristics. Noise and unwanted signals are considerably suppressed.

B63-10280
METER ACCURATELY MEASURES FLOW OF LOW-CONDUCTIVITY FLUIDS
LOVE, E. G. MAY 1964
JPL-0021
An electromagnetic flowmeter has been adjusted to minimize the errors inherent in measuring the flow of low conductivity fluids. This is done through use of a direct-coupled, differential cathode-follower, whose grid potential is adjustable with respect to ground levels.

B63-10284
SMALL DIGITAL RECORDING HEAD HAS PARALLEL BIT CHANNELS, MINIMIZES CROSS TALK
ELLER, E. E. LAUE, E. G. MAY 1964
JPL-0029
A small digital recording head consists of closely spaced parallel wires, imbedded in a ferrite block to concentrate the magnetic flux. Parallel-recorded information bits are converted into serial bits on moving magnetic tape and cross talk is suppressed.

B63-10321
IMPROVED VARIABLE-RELUCTANCE TRANSDUCER MEASURES TRANSIENT PRESSURES
MORTON, R. W. PATTERSON, J. L. MAY 1964
LANGLEY-10
A flush-diaphragm pickup and a feedback-stabilized carrier amplifier are among the features incorporated into an improved variable-reluctance transducer. This low-impedance device responds to steady-state as well as transient pressures.

B63-10338
OPTICS USED TO MEASURE TORQUE AT HIGH ROTATIONAL SPEEDS
KRSEK, A., JR. TIEFERMAN, M. DEC. 1964
LEWIS-13
In measuring torque transmitted by a high speed rotation shaft, an apparatus has been devised which includes a shaft, an optical system and readout servomechanism. This highly accurate method uses only optical contact with moving part and is statically calibrated.

B63-10342
RADIANT HEATER FOR VACUUM FURNACES OFFERS HIGH STRUCTURAL RIGIDITY, LOW HEAT LOSS
VARY, A. MAY 1964
LEWIS-39
Some problems associated with high temperature heaters for vacuum furnaces have been eliminated by the use of shaped filaments of refractory metal. These filaments, supported in cylindrical array by ceramic spacers, operate with high voltage, low current power.

B63-10440
NEW APPARATUS INCREASES ION BEAM POWER DENSITY
BALDWIN, L. V. SANDBORN, V. A. JUN. 1964
LEWIS-73
To increase ion engine or rocket power, an ion source and emitter, an ion beam focusing electrode, and an ion accelerator are incorporated into the system. In operation the space charge surrounding the ion emitter decreases, the ion beam density accelerates, and engine power increases.

B63-10443
IMPROVED SENSOR COUNTS MICROMETEOROID PENETRATIONS
DAVISON, E. H. MAY 1964
LEWIS-76
A sensor, consisting of a thin dual-capacitor assembly with an outer film of thermal-control material, is used to detect micrometeoroid particles. A coincidence counting circuit is used to count the penetrations.

B63-10493
TWO-STAGE EMITTER FOLLOWER IS TEMPERATURE STABILIZED
SCHMIDT, M. H. /MCDONNELL AIRCRAFT CORP./ MAY 1964
MSC-20
Two-stage temperature stabilized circuit using two transistors is described. Increase in temperature causes the base-to-emitter voltage of n-p-n transistor to become less positive whereas the base-to-emitter voltage of p-n-p transistor becomes less negative, so the temperature-induced variation in V sub 1 and V sub 2 cancel out.

B63-10508
CIRCUIT SWITCHES LATCHING RELAY IN RESPONSE TO SIGNALS OF DIFFERENT POLARITY
SMITH, L. S. /ELECTRO-OPTICAL SYSTEMS, INC./ MAY 1964
WOO-055
A circuit using one power supply and two storage capacitors, which may be separately discharged in opposite directions through a relay in response to change in polarity of a signal, is described.

B63-10511
FREQUENCY-SHIFT-KEYER CIRCUIT IMPROVES PCM CONVERSION FOR RADIO TRANSMISSION
MIKSZAN, D. P. /WESTINGHOUSE ELEC. CORP./ JUN. 1964
GSFC-80
A data logic circuit employing a fixed frequency, square-wave oscillator and flip-flop gates allows for the shifting from one frequency to the other at the end of a whole number of cycles of one shift frequency and at the beginning of a cycle of the second shift frequency.

B63-10512
LOW-COST TAPE SYSTEM MEASURES VELOCITY OF ACCELERATION
HARTENSTEIN, R. JUN. 1964
GSFC-85
By affixing perforated magnetic recording tape to the falling end of a body, acceleration and velocity were measured. The measurement was made by allowing the tape to pass between a light source and a photoelectric sensor. Data was obtained from a readout device.

B63-10514
COMPUTER CIRCUIT WILL FIT ON SINGLE SILICON CHIP
SMITH, C. JUN. 1964
JPL-513
A simplified computer logic circuit of two NAND/NOR gates and three additional inputs to accomplish the count and shift function is described. The circuit has capacity for parallel read-in, counting, serial shiftout, complement input and set and reset.

B63-10529
CONNECTOR FOR THERMOCOUPLE LEADS SAVES COSTLY WIRE, MAKES RELIABLE CONNECTORS
MILLER, H. B. APR. 1964
LANGLEY-26
A connector for use in the thermocouple circuits which is silver-brazed to the metal thermocouple sheath on one end and crimped over the insulation of the flexible lead on the other, assures protection against breakage and abrasion. A moisture-proof insulating material is used to

encapsulate the wire junctions.

B63-10536
HOT-AIR SOLDERING TECHNIQUE PREVENTS OVERHEATING OF ELECTRICAL COMPONENTS
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ FEB. 1964
GSFC-91
By using a hot-air gun with a small orifice, heat may be localized to the soldering area of the chassis. The solder is placed around the capacitor which is inserted in the mounting hole so the ring is in contact with the chassis.

B63-10537
SIMPLE CIRCUIT PROVIDES ADJUSTABLE VOLTAGE WITH LINEAR TEMPERATURE VARIATION
MOEDE, L. W. /DATAMETRICS CORP./ MAR. 1964
JPL-WOO-029
A bridge circuit giving an adjustable output voltage that varies linearly with temperature is formed with temperature compensating diodes in one leg. A resistor voltage divider adjusts to temperature range across the bridge. The circuit is satisfactory over the temperature range of -20 degrees centigrade to +80 degrees centigrade.

B63-10551
UNMANNED SEISMOMETER LEVELS SELF, CORRECTS DRIFT ERRORS
SUTTON, G. /COLUMBIA U./ MAY 1964
GSFC-100
An unmanned, self-leveling seismometer is developed which contains three subsystems- a mechanical, an electronic pickoff and feedback, and a leveling and vertical centering subsystem. Earth motions are detected by means of a seismic mass coupled to a coil-magnet assembly and a differential capacitor plate assembly.

B63-10553
TRANSISTORIZED TRIGGER CIRCUIT IS FREQUENCY-CONTROLLABLE
MOORE, E. T. /DUKE U./ JUN. 1964
GSFC-111
A trigger circuit employing two unijunction transistor oscillators, whose frequency is varied by changing the base-to-base voltage, provides variable electrical control of the frequency.

B63-10554
HIGHLY EFFICIENT SQUARE-WAVE OSCILLATOR OPERATOR AT HIGH POWER LEVELS
HALL, J. E., JR. /DUKE U./ JUN. 1964
GSFC-112
A square-wave oscillator circuit containing only simple resistor-capacitor combinations and transistors operates with high efficiency at relatively high power levels.

B63-10555
COMPUTER DETERMINES HIGH-FREQUENCY PHASE STABILITY
NICHOLS, G. B. JUL. 1964
GSFC-113
Determination of phase stability of a high frequency signal using a computer is accomplished by a circuit using two auxiliary oscillators, multipliers and low-pass filters in cross correlation with the oscillator producing the signal of interest.

B63-10561
TINY SENSOR-TRANSMITTER CAN WITHSTAND EXTREME ACCELERATION, GIVES DIGITAL OUTPUT
MOSSINO, R. L. ROBINSON, G. NOV. 1964
ARC-22
A self-pulsing oscillator transmits a pulsed signal. The time between pulses and the frequency are controlled by two networks. Variations in the component values in each of the two networks, due to environmental changes, appear as changes in frequency and time between pulses in the transmitted signal. Such a sensor is used to measure physical magnitudes.

B63-10567
SIMPLE CIRCUIT CONTINUOUSLY MONITORS THERMOCOUPLE SENSOR
GREENWOOD, T. L. AUG. 1964
M-FS-61
A series circuit was developed to check the continuity in thermocouple sensors. This method may be used in monitoring continuity in any dc voltage-operated control circuit.

B63-10572
DEVICE CALIBRATES VIBRATION TRANSDUCERS AT AMPLITUDES UP TO 20G.
GREENWOOD, T. L. AUG. 1964
M-FS-86
A piezoelectric transducer provides accurate calibration of vibration amplitudes to 20 G. The calibration system uses an electromagnetically driven resonant beam to generate mechanical vibrations at a fixed frequency.

B63-10579
SMALL FOAMED POLYSTYRENE SHIELD PROTECTS LOW-FREQUENCY MICROPHONES FROM WIND NOISE
TEDRICK, R. N. MAY 1964
M-FS-123
A foamed polystyrene noise shield for microphones has been designed in teardrop shape to minimize air turbulence. The shield slips on and off the microphone head easily and is very effective in low-frequency sound intensity measurements.

B63-10596
FRONT AND BACK PRINTED CIRCUIT LAYOUTS PRESENTED ON SINGLE SHEET
PERRY, J. OCT. 1964
GSFC-93
A diazo photographic process of clear plastic masters is used in reproducing front and back printed circuit layouts of differing intensity on a single sheet.

B63-10597
PRECISION GAGE MEASURES ULTRAHIGH VACUUM LEVELS
HUDSON, J. B. SEARS, G. W. /GEN. DYN. CORP./ JUN. 1964
GSFC-114
An ionization gauge in which internally generated X-rays are minimized is described. This gauge permits the measurement of gas pressures in ultrahigh systems of micro-pico torr /10 -18/.

B63-10599
LIQUID SWITCH IS REMOTELY OPERATED BY LOW DC VOLTAGE
MOORE, E. T. /DUKE U./ MAY 1964
GSFC-119
A liquid switch which does not depend on any mechanical, gravitational, or inertial actuation is developed for use in space environments. It may be remotely operated on low dc voltage.

B63-10600
CIRCUIT CONTROLS TRANSIENTS IN SCR INVERTERS
MOORE, E. T. WILSON, T. G. /DUKE U./ JUN. 1964
GSFC-120
The elimination of starting difficulties in SCR inverters is accomplished by the addition of two taps of the output winding of the inverter. On starting or under transient loads the two additional taps deliver power through diodes without requiring quenching of SCR currents in excess of normal starting load.

B63-10603
MONOSTABLE CIRCUIT WITH TUNNEL DIODE HAS FAST RECOVERY
HEFFNER, P. MAY 1964
GSFC-132
A monostable multivibrator circuit using a tunnel diode makes it possible for the MSMV to exceed the performance of present multivibrators in two respects. The rise time of the output voltage is faster and the duty cycle is raised to approximately 95 percent.

B63-10606
NEW SINTERING PROCESS ADJUSTS MAGNETIC VALUE OF FERRITE CORES
VINAL, A. W. /IBM/ MAY 1964
GSFC-129

A two-phase sintering technique based on time and temperature permits reversible control of the coercive threshold of sintered ferrite cores. Threshold coercivity may be controlled over a substantial range of values by selective control of the cooling rate.

B63-10609
TEMPERATURE-SENSITIVE NETWORK DRIVES ASTABLE MULTIVIBRATOR
INNOVATOR NOT GIVEN /RCA/ OCT. 1964
GSFC-137
The development of a simple circuit using two zener diodes and five resistors, which provides a temperature-sensitive voltage to drive the astable multivibrator, is described.

B63-10613
CRYOGENIC WAVEGUIDE WINDOW IS SEALED WITH PLASTIC FOAM
CLAUSS, R. STELZRIED, C. T. JUN. 1964
JPL-559
Waveguide windows made with polystyrene preformed plastic and sealed with foamed-in-place plastic are useful in any microwave waveguide system using cryogenic cooling.

B64-10002
CIRCUIT RELIABILITY BOOSTED BY SOLDERING PINS OF DISCONNECT PLUGS TO SOCKETS
PIERCE, W. B. MAR. 1964
JPL-447
Where disconnect pins must be used for wiring and testing a circuit, improved system reliability is obtained by making a permanent joint between pins and sockets of the disconnect plug. After the circuit has been tested, contact points may be fused through soldering, brazing, or welding.

B64-10004
ULTRA-SENSITIVE TRANSDUCER ADVANCES MICRO-MEASUREMENT RANGE
ROGALLO, V. L. MAY 1964
ARC-26
An ultrasensitive piezoelectric transducer, that converts minute mechanical forces into electrical impulses, measures the impact of micrometeoroids against space vehicles. It has uniform sensitivity over the entire target area and a high degree of stability.

B64-10007
LOW-POWER TRANSISTORIZED CIRCUIT PROVIDES STAIRCASE WAVEFORM
BREEN, G. D. JUL. 1964
GSFC-48
A low input power transistorized circuit is used to generate a staircase waveform of high step uniformity. Other characteristics are low step droop, fast transition time, and no feedback.

B64-10010
MODIFIED RF COAXIAL CONNECTOR ENDS VACUUM CHAMBER WIRING PROBLEM
WEINER, D. MAY 1964
GSFC-150
A standard radio frequency coaxial connector is modified so that a plastic insulating sleeve can be mounted in the wall of a vacuum chamber. This eliminates ground loops and interference from cable connections.

B64-10016
COMPACT COAXIAL CONNECTOR FOR PRINTED CIRCUIT ADDS RELIABILITY
RADECKE, T. F. MAY 1964
MSC-57
Soldering and welding techniques are used to connect a coaxial cable to a printed circuit board. This device aids reliability control of equipment as standard connectors are bulky and heavy.

B64-10017
BLOCKING OSCILLATOR USES LOW TRIGGERING VOLTAGE
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ DEC. 1964
MSC-58
To prevent premature triggering of a blocking oscillator, a smaller magnetic core is added to the conventional oscillator circuit. This serves as a second blocking oscillator and has a lower triggering threshold.

B64-10019
NEW METHOD USED TO FABRICATE GALLIUM ARSENIDE PHOTOVOLTAIC DEVICE
ELLIS, S. G. /RCA/ JUN. 1964
WOO-062
A new method for fabricating photocells, or solar cells, substitutes copper iodide for zinc diffusion. This produces a p-type surface layer and a photovoltaic junction.

B64-10024
EFFICIENT CIRCUIT TRIGGERS HIGH-CURRENT, HIGH-VOLTAGE PULSES
GREEN, E. D. /WESTINGHOUSE ELEC. CORP./ JUN. 1964
MSC-14
A modified circuit uses diodes to effectively disconnect the charging resistors from the circuit during the discharge cycle. Result is an efficient parallel charging, high voltage pulse modulator with low voltage rating of components.

B64-10042
OHMMETER SENSES DEPLETION OF LUBRICANT IN JOURNAL BEARINGS
ROSS, A. O. DEC. 1964
LEWIS-37
An ohmmeter is used as a sensor to determine when the lubricating oil in a high speed journal bearing becomes depleted.

B64-10064
DIGITAL LOGIC ELEMENTS PROVIDE ADDITIONAL FUNCTIONS FROM ANALOG INPUT
MATTY, T. C. /MCDONNELL AIRCRAFT CORP./ JUN. 1964
MSC-64
A dc analog input can be used to produce an integrator with high dynamic range or a position servo with inherent stability. This is done by a switching system using digital-to-analog converters and an electronic switch to obtain the desired outputs.

B64-10065
CONTINUITY TESTER SCREENS OUT FAULTY SOCKET CONNECTIONS
GOLDING, G. MAY 1964
JPL-596
A device, used before and after assembly, tests the continuity of an electrical circuit through each pin and socket of multiple connector sockets. Electrically insulated except at the contact area, a test probe is dimensioned to make contact only in properly formed sockets.

B64-10080
IMPROVED INSERTION-LOSS TESTER
FINNIE, C. J. SCHUSTER, D. JUN. 1964
JPL-358
An improved test method accurately measures the insertion loss of RF components while avoiding amplifier drift. Currents are balanced across a bridge transformer with shorted probes and then with each component to be tested. Differences in adjustments indicate the loss.

B64-10109
ANALOG DEVICE SIMULATES PHYSIOLOGICAL WAVEFORMS
HICKMAN, D. M. NOV. 1964
MSC-51
An analog physiological simulator generates representative waveforms for a wide range of physiological conditions. Direct comparison of these waveforms with those from telemetric inputs permits quick detection of signal parameter degradation.

B64-10114
AUXILIARY SILVER ELECTRODE ELIMINATES TWO-STEP VOLTAGE DISCHARGE CHARACTERISTIC OF SILVER-ZINC CELLS

CHREITZBERG, A. M. /ELEC. STORAGE BATTERY CO./
JUN. 1964
GSFC-169
In silver-zinc cells, an auxiliary silver electrode is electrically connected to the positive terminal only during discharge. This eliminates the two-step discharge characteristic of such cells.

B64-10118
USE OF PHOTOGRAPHS SPEEDS INSPECTION OF PRINTED-CIRCUIT BOARDS
STARK, E. /IBM/ JUL. 1964
MSC-72
The projected images of a printed circuit board and the engineering drawing are superimposed on a screen for visual comparison. This technique speeds inspection, reduces the incidence of error.

B64-10122
SIMPLE TRANSDUCER MEASURES LOW HEAT-TRANSFER RATES
LAUMANN, E. A. OCT. 1964
JPL-466
A simple transducer is used to measure low rates of convective and conductive heat transfer from a fluid to a cooled surface under steady-state conditions. Temperature drop is measured by two thermocouples imbedded in a rod of low thermal conductivity.

B64-10143
FIELD-EFFECT TRANSISTOR IMPROVES ELECTROMETER AMPLIFIER
MUNOZ, R. NOV. 1964
ARC-36
An electrometer amplifier uses a field effect transistor to measure currents of low amperage. The circuit, developed as an ac amplifier, is used with an external filter which limits bandwidth to achieve optimum noise performance.

B64-10144
RING COUNTER MAY BE ADVANCED OR RETARDED BY COMMAND SIGNAL
LIBBY, J. N. MOORE, H. D. JUL. 1964
GSFC-101
A power logic circuit, with bidirectional capability, is used to drive small loads in planned sequence. This is designed in the form of a shift register, with a reversible ring counter.

B64-10150
NOVEL CIRCUIT COMBINES PULSE STRETCHER WITH NOR GATE
CLIFF, R. A. OCT. 1964
GSFC-187
A pulse-stretching circuit added to a conventional NOR gate circuit detects a preselected state and produces a pulse that the pulse stretcher maintains for a long enough period to reset all counter stages.

B64-10158
EMISSION TESTER FOR HIGH-POWER VACUUM TUBES
LUNDY, C. OCT. 1964
JPL-628
A simple emission-testing circuit for high power vacuum tubes to check their output stability is described. With modification it may be useful in testing mercury-arc rectifiers.

B64-10163
FIELD EFFECT TRANSISTORS USED AS VOLTAGE-CONTROLLED RESISTORS
INNOVATOR NOT GIVEN NOV. 1964
M-FS-174
Two new methods of incorporating field effect transistors into circuit designs have resulted in linear response of this type transistor over a wide range of controlled voltage levels. This increases its usefulness as a voltage-controlled resistor.

B64-10171
SUBMINIATURE BIOTELEMETRY UNIT PERMITS REMOTE PHYSIOLOGICAL INVESTIGATIONS
INNOVATOR NOT GIVEN OCT. 1964
ARC-39
A subminiature biotelemetry transmitter permits the measurement of biopotential response in humans or animals to controlled environmental stimuli without discomfort while engaged in normal activities.

B64-10173
HIGH-PASS RF COAXIAL FILTER REJECTS DC AND LOW FREQUENCY SIGNALS
BAILEY, J. W. MC AFEE, D. F. OCT. 1964
GSFC-73
A low-loss RF filter element for coaxial transmission provides dc isolation and eliminates low frequency signals. The characteristic impedance of the transmission line is not affected, as the design permits direct connection of the filter to the line.

B64-10200
BINARY SYSTEM GENERATES SIDEREAL RATE FROM STANDARD SOLAR RATE
GRANATA, R. MC CAUL, P. OCT. 1964
GSFC-190
A sidereal rate output from mean solar rate input is derived from a sidereal generator that uses digital division and multiplication techniques.

B64-10209
RASTER LINEARITY OF VIDEO CAMERAS CALIBRATED WITH PRECISION TESTER
INNOVATOR NOT GIVEN /RCA/ DEC. 1964
GSFC-200
The time between transitions in a camera*s video output is measured when registered at reticle marks on the vidicon faceplate. This device permits precision calibration of raster linearity of television camera tubes.

B64-10222
COMPACT CARTRIDGE DRIVES CODED TAPE AT CONSTANT READOUT SPEED
AUSTIN, D. C. OCT. 1964
JPL-472
To facilitate storage and repetitive reading of short-program coded tape, a cartridge case, containing mechanical drive and readout assemblies, has been fabricated. The drive transports the tape past a conventional pickup device during the reading function.

B64-10226
TEMPERATURE-COMPENSATION CIRCUIT STABILIZES PERFORMANCE OF VIDICONS
INNOVATOR NOT GIVEN NOV. 1964
JPL-486
A simple transistor circuit uses a thermistor to change the vidicon target potential in relation to temperature differences.

B64-10237
APPARATUS MEASURES CONCENTRATION OF SUSPENDED DROPLETS IN GAS STREAMS
BOOTH, F. W. DEC. 1964
LANGLEY-31
An apparatus, operating on the principle of wet- and dry-bulb thermometry, permits intermittent or continuous measurement of the concentration of droplets dispersed in a gas stream over a wide range of gas pressure.

B64-10255
ELECTRONIC DEVICE SIMULATES RESPIRATION RATE AND DEPTH
THOMAS, J. A. NOV. 1964
MSC-89
An oscillator circuit and a thermistor, in close proximity to a light bulb, periodically alter the heat output of the bulb by varying the voltage across its filament. Use of this simulator permits checkout tests on pneumographs.

B64-10258
DIGITAL CARDIOMETER COMPUTES AND DISPLAYS HEARTBEAT RATE
MITCHELL, V. M. NOV. 1964
MSC-93
To compute the heartbeat rate from the waveform output of an electrocardiogram, a digital cardiometer with solid state circuit elements has

been developed. This computes the beat every 15 seconds and visually presents the data on numerical display tubes.

B64-10259
PNEUMOTACHOMETER COUNTS RESPIRATION RATE OF HUMAN SUBJECT
GRAHAM, O. NOV. 1964
MSC-92
To monitor breaths per minute, two rate-to- analog converters are alternately used to read and count the respiratory rate from an impedance pneumograph over fixed intervals. The converter outputs are sequentially displayed numerically on electroluminescent matrices.

B64-10271
IMPROVED TECHNIQUE FOR LOCALIZING ELECTRO-POLISHING FEATURES NOVEL NOZZLES
INNOVATOR NOT GIVEN /GEN. DYN./ASTRONAUTICS/ NOV. 1964
WOO-101
Impingement electropolishing is accomplished by use of an electrolyte film, which is evenly distributed by an insulated nozzle designed to match the contour of the workpiece to be treated. The workpiece is connected to the positive terminal of a generator and the nozzle to the negative terminal.

B64-10280
SERVO SYSTEM FACILITATES PHOTOELASTIC STRAIN MEASUREMENTS ON RESINS
OTTS, J. W. NOV. 1964
JPL-504
To facilitate photoelastic measurements of the strains developed by stresses applied to birefringent resins, a servomechanism is employed.

B64-10281
PTC THERMISTOR PROTECTS MULTILOADED POWER SUPPLIES
LEVERONE, H. MANDELL, N. NOV. 1964
GSFC-236
A PTC /positive-temperature-coefficient/ thermistor placed in series with each branch load of a multiload circuit prevents power loss in parallel branches. This thermistor may be used in any circuit requiring current limiting or intended overload resetting.

B64-10283
MOUNTING FOR DIODES PROVIDES EFFICIENT HEAT SINK
INNOVATOR NOT GIVEN /RCA/ NOV. 1964
M-FS-197
Efficient heat sink is provided by soldering diodes to metal support bars which are brazed to a ceramic base. Electrical connections between diodes on adjacent bars are made flexible by metal strips which aid in heat dissipation.

B64-10299
RADIATION DETECTOR-OPTICAL HANGING DEVICE IS OF SIMPLIFIED CONSTRUCTION
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ JAN. 1965
GSFC-251
A simplified radiation detector was designed which employs an activated continuous front surface consisting of either the diffused or barrier type of semiconducting material with a grid structure on the nonactivated side of the detector. Its form may be either a rectangular coordinate or a polar coordinate system.

B64-10305
TRANSISTORIZED CONVERTER PROVIDES NONDISSIPATIVE REGULATION
INNOVATOR NOT GIVEN /DUKE U./ DEC. 1964
GSFC-238
A transistorized regulator converter efficiently converts fluctuating input voltages to a constant output voltage, avoiding the use of saturable reactors. It is nondissipative in operation and functions in an open loop through variable duty cycles.

B64-10309
WELDING PROCEDURE IMPROVES QUALITY OF WELDS, OFFERS OTHER ADVANTAGES
INNOVATOR NOT GIVEN DEC. 1964
M-FS-32
An improved procedure for arc spot welding uses the SIGMA /submerged inert gas metallic arc/ method. This has resulted in welds of higher quality than are obtainable by conventional means.

B64-10320
VOLTAGE GENERATOR SWEEPS OSCILLATOR FREQUENCY LINEARLY WITH TIME
INNOVATOR NOT GIVEN /MELPAR, INC./ JAN. 1965
M-FS-219
A voltage-tuned oscillator circuit is described which sweeps the output signal frequency linearly exponentially varying with time.

B64-10330
ECONOMICAL FABRICATION PROCESS PRODUCES HIGH-QUALITY JUNCTION TRANSISTORS
INNOVATOR NOT GIVEN /IBM/ DEC. 1964
JPL-SC-065
A convenient, three-step fabrication process, with a p-type layer of gallium arsenide vapor-deposited on a starting wafer of germanium, is used to produce heterojunction-homojunction p-n-p transistors. These are of high quality with good injection efficiency and low capacitance.

B64-10349
BANDWIDTH SWITCHING IS TRANSIENT-FREE, AVOIDS LOSS OF LOOP LOCK
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS./ DEC. 1964
WOO-054
A circuit, in a wide bandwidth mode, overcomes transient-producing capacitance switching by maintaining an equivalent voltage at all times. Bandwidth switching may be done at any time, and integrity of the loop lock is maintained.

B65-10001
CIRCUIT CONVERTS AM SIGNALS TO FM FOR MAGNETIC RECORDING
INNOVATOR NOT GIVEN /RCA/ JAN. 1965
GSFC-227
Convert AM signals to FM for magnetic recording by relaxation-type voltage-controlled oscillator /VCO/. This circuit may be used in radar, telemetry, and test equipment.

B65-10002
TUNNEL-DIODE CIRCUIT FEATURES ZERO-LEVEL CLIPPING
BUSH, E. G. JAN. 1965
GSFC-241
Tunnel-diode circuit starts clipping action as input voltage crosses zero axis. This clipper circuit is effective as limiter in FM receiver.

B65-10005
COMPUTER MODIFICATION REDUCES TIME OF PERFORMING ITERATIVE DIVISION
INNOVATOR NOT GIVEN /IBM/ FEB. 1965
M-FS-166
Time reduction in performing iterative division results from using a serial-by-parallel divider employing a look-ahead feature that predetermines the sign relationships of several iterations before the computer cycle begins. This method can be employed in any data handling system performing high-speed division.

B65-10006
MODIFICATION INCREASES LIGHT OUTPUT OF INJECTION-LUMINESCENT DIODES
INNOVATOR NOT GIVEN /RCA/ JAN. 1965 SEE ALSO B64-10283
M-FS-192
Removing a section of the electrode area from the N-face of injection-luminescent diodes for pumping lasers substantially increases light output. Light is emitted from the N-face as well as from the four edges of the diode.

B65-10010
INEXPENSIVE, STABLE CIRCUIT MEASURES HEART

RATE
VICK, H. A. JAN. 1965
MSC-95
Inexpensive transistorized circuit provides reliable analog indications of heart rate in response to preamplified electrocardiograph signal applied to its input.

B65-10011
CIRCUIT IMPROVEMENT PRODUCES MONOSTABLE MULTIVIBRATOR WITH LOAD-CARRYING CAPABILITY
GOLDMAN, N. E. SCHAFFERT, J. C. JAN. 1965
GSFC-34A
Improved circuit provides greater reliability and load-carrying capabilities for monostable multivibrator.

B65-10012
HELICAL COAXIAL-RESONATOR MAKES EXCELLENT RF FILTER
INNOVATOR NOT GIVEN /RCA/ JAN. 1965 1965
GSFC-243
Isolation of closely spaced transmitting and receiving frequencies of an antenna without insertion loss by filtering the receiver input is accomplished by an inner conductor with two winding helices and an outer conductor of aluminum. A tuning slug is at either end of the inner conductor form.

B65-10013
ZENER DIODE FUNCTION GENERATOR REQUIRES NO EXTERNAL REFERENCE VOLTAGE
BOLTE, G. BURNS, R. JAN. 1965
JPL-33
Function generator utilizing parallel impedance networks with zener diodes produces functions which are discontinuous in slope. The function generated appears at the output of the parallel network in the form of a voltage varying in time.

B65-10018
CARBON ARC IGNITION IMPROVED BY SIMPLE AUXILIARY CIRCUIT
INNOVATOR NOT GIVEN /RCA/ JAN. 1965
MSC-103
High voltage, low current pulse in series with arc power supply efficiently ignites a carbon arc. The easily and economically produced circuit is useful with arc burners and searchlights and with plasma jets.

B65-10023
MINIATURE STRESS TRANSDUCER HAS DIRECTIONAL CAPABILITY
SAN MIGUEL, A. SILVER, R. H. JAN. 1965
JPL-591
Miniature stress transducer uses a semi-conductive piezoresistive element to detect stress only on specific axes. Measurement of internal mass stress is based on the compressive deformation of the transducer. The device is applicable to constant stress monitoring in building and dam structural parts.

B65-10025
LOGIC REDUNDANCY IMPROVES DIGITAL SYSTEM RELIABILITY
INNOVATOR NOT GIVEN /STANFORD RES. INST./ FEB. 1965
JPL-SC-069
Redundant-channel system automatically corrects any single error in a set of three binary signal channels. This system is especially applicable to digital computers where data is transmitted in parallel channels.

B65-10026
STEPPING MOTOR DRIVE CIRCUIT DESIGNED FOR LOW POWER DRAIN
INNOVATOR NOT GIVEN /HARVARD COLL./ FEB. 1965
GSFC-198
High power drain is eliminated by a circuit consisting of a divide-by-two stage, two identical inputs, a wiggle amplifier, driver, and power output stages to drive the step motor.

B65-10028
TRANSISTOR VOLTAGE COMPARATOR PERFORMS OWN SENSING
CLIFF, R. A. FEB. 1965
GSFC-228
Detection of the highest voltage input among a group of varying voltage inputs is accomplished by a transistorized voltage comparison circuit. The collector circuits of the transistors perform the sensing function. Input voltage levels are governed by the transistors.

B65-10030
LIBRARY OF DOCUMENTS COMPRESSED INTO LAP-HELD DISPLAY KIT
INNOVATOR NOT GIVEN /NATL. CASH REGISTER CO./
FEB. 1965
MSC-125
A lightweight Apollo flight kit containing microfilmed data is packaged in a hinged box with a viewing screen cover, and a writing surface. It is secured to the users lap.

B65-10033
PHOTOELECTRIC SEMICONDUCTOR SWITCH OPERATES WITH LOW LEVEL INPUTS
INNOVATOR NOT GIVEN /IBM/ FEB. 1965
JPL-SC-068
Photoelectric semiconductor switch with a buried emitter region avoids high-leakage currents across the emitter. It exhibits high emitter-to-collector transport efficiency beta at low signal levels.

B65-10041
PULSE HEIGHT ANALYZER OPERATES AT HIGH REPETITION RATES, LOW POWER
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS., INC./
FEB. 1965
WOO-046
Simple multistage transistor gating circuit provides a pulse height analyzer that operates at high repetition rates and low power. The circuit compares the input pulse heights to discrete reference voltages.

B65-10045
THERMISTOR CONNECTOR ASSEMBLY INCREASES ACCURACY OF MEASUREMENTS
INNOVATOR NOT GIVEN /ATLANTIC RES. CORP./ FEB. 1965
LANGLEY-62
Isolation of the thermistor from spurious heat transfer for accurately measuring ambient air temperatures is accomplished by a mounting consisting of a transparent plastic film bonded to a U-shaped phenolic board with depositions of aluminum on each face and upper edge, and a variable capacitor for fine tuning.

B65-10047
CIRCUIT DETECTS ERRORS IN ADDRESS CURRENTS FOR MAGNETIC CORE ARRAYS
INNOVATOR NOT GIVEN /IBM/ FEB. 1965
M-FS-234
Address current error detector generates a signal whenever any error producing conditions arise in magnetic core arrays. Can be used with test equipment and memory storage units.

B65-10048
MICROPARTICLE IMPACT SENSOR MEASURES ENERGY DIRECTLY
ALEXANDER, W. M. BERG, O. E. FEB. 1965
GSFC-252
Construction of a capacitor sensor consisting of a dielectric layer between two conductive surface layers and connected across a potential source through a sensing resistor permits measurement of energy of impinging particles without degradation of sensitivity. A measurable response is produced without penetration of the dielectric layer.

B65-10050
NULLING PYROMETER USES KERR CELL SHUTTER FOR FAST RESPONSE
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./
FEB. 1965
NU-0010
Conventional pyrometer, in which Kerr cell replaces mechanical shutter and polarizers are

added to filters, yields rapid shutter response.

B65-10051
METAL SHEATH IMPROVES THERMOCOUPLE USING GRAPHITE IN ONE LEG
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./
FEB. 1965
NU-0011
Thermocouple using graphite in one leg is sealed in a moistureproof metal sheath which permits high EMF output and good mechanical strength.

B65-10052
ZENER DIODE IS STARTER FOR TRANSISTOR-REGULATED POWER SUPPLY
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./
FEB. 1965
NU-0015
Zener diode in parallel with a silicon transistor supplies the starting current for a transistor-regulated power supply.

B65-10054
PULSE GENERATOR PERMITS NONDESTRUCTIVE TESTING OF COMPONENT BREAKDOWN VOLTAGE
INNOVATOR NOT GIVEN /HONEYWELL/ MAR. 1965
MSC-122
Nondestructive testing of the breakdown voltage of transistors and other electronic components is achieved by a simple relay circuit. The circuit operates by applying low-energy, high-voltage microsecond pulses to the components under test.

B65-10055
FM OSCILLATOR USES TETRODE TRANSISTOR
BOENSEL, D. W. MAR. 1965
JPL-82
Tetrode-driven crystal oscillator achieves large frequency variations for a given input signal. Frequency control is obtained by variation of the second base current of the tetrode.

B65-10056
VIBRATING-MEMBRANE ELECTROMETER HAS HIGH CONVERSION GAIN
COON, G. W. DIMEFF, J. APR. 1965
ARC-38
Vibrating-membrane transducer in a circuit can measure current below 10 to-the-minus 17 ampere. This electrometer has a high conversion gain and a minimum internal power consumption.

B65-10057
FEED-THROUGH HAS POLYTERMINAL FEATURE
SANDERS, L. H. MAR. 1965
M-FS-25
Feed-through connector with individual solder pots in the polyterminal side provides good connections with small amounts of solder and permits visual inspection of bonds. Polyterminal also provides a friction mechanical bond to position conductors prior to soldering.

B65-10059
METAL DIAPHRAGM USED TO CALIBRATE MINIATURE TRANSDUCERS
INNOVATOR NOT GIVEN /ASTRO-SPACE LABS./ MAR. 1965
M-FS-207
Dynamic comparative calibration system measures response of miniature pressure transducers. The system is composed of an electromechanically driven metal diaphragm, a calibrated and an uncalibrated transducer and an oscillator.

B65-10061
SIMPLE CONTROL DEVICE SENSES SOLAR POSITION
LONBORG, J. O. RANDALL, J. C. MAR. 1965
JPL-638
The amount of solar radiation incident on a specially prepared bimetallic strip is simply and reliably controlled by a light valve. This device is valuable for systems requiring temperature regulation.

B65-10062
PULSED PLASMA ACCELERATOR OPERATES REPETITIVELY WITHOUT COMPLEX CONTROLS
SABOL, A. P. MAR. 1965
LANGLEY-48
Self-repeating pulsed plasma accelerator operates with a wide variety of gases over a large range of pressures without complex control equipment. The accelerator combines a circular channel with a tangential channel at the entrance way of a high-velocity gas.

B65-10066
FUEL CELL SERVES AS OXYGEN LEVEL DETECTOR
INNOVATOR NOT GIVEN /GE/ MAR. 1965
JPL-SC-072
Monitoring the oxygen level in the air is accomplished by a fuel cell detector whose voltage output is proportional to the partial pressure of oxygen in the sampled gas. The relationship between output voltage and partial pressure of oxygen can be calibrated.

B65-10067
SENSITIVE LEVEL SENSOR MADE WITH SPIRIT LEVEL, GIVES ELECTRICAL OUTPUT
BRYANT, E. L. MAR. 1965
LANGLEY-49
Sensor incorporating a circular spirit level, electrical lamp and two pairs of photocells, provides an electrical indication of flat surface level deviation.

B65-10068
AUTOMATIC THERMAL SWITCH ACCELERATES COOLING-DOWN OF CRYOGENIC SYSTEM
WIEBE, E. R. MAR. 1965
JPL-655
Automatic switch uses short stainless steel tube with copper heat sinks to accelerate helium gas cooling and provides good thermal conductivity and good thermal insulation.

B65-10069
FEEDBACK OSCILLATOR FUNCTIONS AS LOW-LEVEL PULSE STRETCHER
INNOVATOR NOT GIVEN /SPERRY RAND CORP./ MAR. 1965
GSFC-261
Low trigger pulses of the pulse stretcher circuit are obtained by forward biasing the transistor oscillator. The loop gain is kept below unity and prevents free-running oscillation. Two parallel feedback loops improve the stretching capabilities.

B65-10072
SYNCHRONIZED PULSE GENERATOR NEEDS NO EXTERNAL POWER
CANCRO, C. A. JANNICHE, P. J., JR. MAR. 1965
GSFC-274
Simple circuit with high input and low output impedance generates a fast rise-time pulse synchronized with an input pulse of slower rise and fall times. Circuit requires no external power.

B65-10073
SYSTEM MEASURES ANGULAR DISPLACEMENT WITHOUT CONTACT
DAVIS, W. T. MAR. 1965
LANGLEY-46
Optic system coupled to an electronic detection and measuring system converts angular movement of reflected light to a direct readout, without any direct contact with the object.

B65-10076
LIGHT-SENSITIVE POTENTIOMETER MEASURES PRODUCT OF TWO VARIABLES
HAERTSCH, O. C. MAR. 1965
GSFC-240
The output voltage from a photoconductive potentiometer circuit using a galvanometer mirror reflecting the light beam is directly proportional to the product of the input voltage.

B65-10079
PHOTOELECTRIC SENSOR OUTPUT CONTROLLED BY EYEBALL MOVEMENTS
INNOVATOR NOT GIVEN /SPACO/ MAR. 1965
M-FS-274
The difference between the infrared absorption of the iris and infrared reflectivity of the eyeball controls the operation of a device consisting of

an infrared source and amplifier, a cadmium selenide infrared sensor, and an infrared filter.

B65-10080
PHASE DETECTOR CIRCUIT SYNTHESIZES OWN REFERENCE SIGNAL
INNOVATOR NOT GIVEN /FAIRCHILD STRATOS CORP./
MAR. 1965
M-FS-247
Circuit with isolation amplifier connected to a frequency multiplier and synchronous phase detector synthesizes the phase reference signal from the phase modulated input signal.

B65-10085
TRANSDUCER SENSES DISPLACEMENTS OF PANELS SUBJECTED TO VIBRATION
PEA, R. O. MAR. 1965
ARC-37
Inductive vibration sensor measures the surface displacement of nonferrous metal panels subjected to vibration or flutter. This transducer does not make any physical contact with the test panel when measuring.

B65-10086
SYSTEM SELECTS FRAMING RATE FOR SPECTROGRAPH CAMERA
INNOVATOR NOT GIVEN /AM. OPT. CO./ MAR. 1965
LANGLEY-55
Circuit using zero-order light is reflected to a photomultiplier in the spectrograph monitors incoming radiation to provide an error signal which controls the advancing and driving rate of the film through the camera.

B65-10087
APPARATUS MEASURES SWELLING OF MEMBRANES IN ELECTROCHEMICAL CELLS
HENNIGAN, T. J. APR. 1965
GSFC-280
Apparatus consisting of a pressure plate unit, four springs of known spring constant and a micrometer measures the swelling and force exerted by the polymer membranes of alkaline electrochemical cells.

B65-10089
TRANSDUCER MEASURES TEMPERATURE DIFFERENTIALS IN PRESENCE OF STRONG ELECTROMAGNETIC FIELDS
INNOVATOR NOT GIVEN APR. 1965
ARC-27
Measurement of temperature rise of cooling water under pressure and in strong electromagnetic fields is accomplished by a transducer using a magnetically shielded thermocouple arrangement. The thermocouple junctions are immersed in oil to isolate them from electric currents in the water.

B65-10091
SIMULATOR PRODUCES PHYSIOLOGICAL WAVEFORMS
EKEROOT, S. MAR. 1965
MSC-94
Physiological waveform simulator capable of producing signals to simulate an axiliary and a sternal electrocardiogram, blood pressure, respiratory rate and body temperature. This may be used to check out bioinstrumentation.

B65-10093
COMPUTER PROGRAMS SIMPLIFY OPTICAL SYSTEM ANALYSIS
INNOVATOR NOT GIVEN /HONEYWELL/ APR. 1965
GSFC-306
The optical ray-trace computer program performs geometrical ray tracing. The energy-trace program calculates the relative monochromatic flux density on a specific target area. This program uses the ray-trace program as a subroutine to generate a representation of the optical system.

B65-10096
DIGITAL SYSTEM ACCURATELY CONTROLS VELOCITY OF ELECTROMECHANICAL DRIVE
NICHOLS, G. B. APR. 1965
GSFC-287
Digital circuit accurately regulates electromechanical drive mechanism velocity. The gain and phase characteristics of digital circuits are relatively unimportant. Control accuracy depends only on the stability of the input signal frequency.

B65-10097
VARIABLE VOLTAGE SUPPLY USES ZENER DIODE AS REFERENCE
KLEINBERG, L. L. LAVIGNE, R. C. APR. 1965
GSFC-262
Using a zener diode as the reference element, a simple transistorized circuit provides a stable variable reference voltage.

B65-10102
SIMPLE CIRCUIT FUNCTIONS AS FREQUENCY DISCRIMINATOR FOR PFM SIGNALS
BILLINGSLEY, J. APR. 1965
GSFC-267
Simple circuit monitors the frequency of PFM /pulse frequency modulated/ telemetry signals. This discriminator can be used as a constant current integrator in such circuits as linear sweep and time delay.

B65-10103
IMPROVED MAGNETOMETER USES TOROIDAL GATING COIL
INNOVATOR NOT GIVEN /CORNELL UNIV./ APR. 1965
GSFC-249
Improved magnetometer employs a cylindrical, high permeability magnetic core with a toroidal gating coil and a solenoid pickup coil. Flux interaction can be reduced by electrostatically shielding the pickup coil from the gating coil. The magnetometer principle can be applied to navigation devices.

B65-10105
VARIABLE LOAD AUTOMATICALLY TESTS DC POWER SUPPLIES
BURKE, H. C., JR. SULLIVAN, R. M. APR. 1965
GSFC-291
Continuously variable load automatically tests dc power supplies over an extended current range. External meters monitor current and voltage, and multipliers at the outputs facilitate plotting the power curve of the unit.

B65-10108
MAGNETIC FIELD CONTROLS CARBON ARC TAIL FLAME
INNOVATOR NOT GIVEN /RCA/ APR. 1965
MSC-139
Polarity of two electromagnets placed near the exhaust flue cancels out a high carbon-arc field. The arc tail flame is correctly drawn to the exhaust flue and contamination is diverted. This device should reduce maintenance cycles on any arc-powered illuminator.

B65-10112
UNIJUNCTION FREQUENCY DIVIDER IS FREE OF BACKWARD LOADING
FAIRBANKS, A. F. APR. 1965
JPL-WOO-010
Simple frequency divider composed of relaxation oscillators uses unijunction transistors to reduce backward loading to a minimum. This circuit design is applicable in timing devices and sync generators for television systems.

B65-10118
TRANSISTORIZED CIRCUIT CLAMPS VOLTAGE WITH 0.1 PERCENT ERROR
INNOVATOR NOT GIVEN /RCA/ APR. 1965
GSFC-196
Transistorized clamping circuit clamps either of two voltage levels to input of digital-to-analog resistive matrix with 0.1 percent error. Clamping circuit technique has analog, digital, and hybrid circuit applications.

B65-10119
VARIABLE FREQUENCY TRANSISTER INVERTERS USE MULTIPLE CORE TRANSFORMERS
INNOVATOR NOT GIVEN /DUKE UNIV./ APR. 1965
GSFC-183
Magnetic-coupled multivibrators containing two or more square-loop cores with multiple windings in a single transformer package, provide indirect

frequency control and improved operational characteristics. This multivibrator can be used for power oscillators, nonlinear magnetic circuitry and telemetry circuits.

B65-10120
MULTIPLE TEST TUBES STIRRED MECHANICALLY
LEON, H. J. STRONG, I. J. APR. 1965
ARC-42
Mechanical device simultaneously stirs multiple test tubes under controlled laboratory conditions. The invention provides a variable stirring rate, minimal amount of contamination of tube contents, unattended and simple operation, and easy maintenance and cleaning.

B65-10123
EFFICIENT THIN FILM HEATING ELEMENT TAKES MINIMUM SPACE
BUSCH, A. H. APR. 1965
GSFC-289
Light, thin-film heating element is formed by vacuum deposition of metal onto a nonconductive surface to be heated. This small-sized heater has a very fast response time.

B65-10124
VARIABLE FREQUENCY MAGNETIC MULTIVIBRATOR GENERATES STABLE SQUARE-WAVE OUTPUT
PAULL, S. MAY 1965
GSFC-AE-21
Variable frequency magnetic multivibrator operates in a full wave fashion to provide a stable square wave output over wide variations in temperature and power supply potential. This invention is applicable in clocks and control devices.

B65-10125
SIMPLIFIED ELECTROMETER HAS EXCELLENT OPERATING CHARACTERISTICS
BRANTNER, R. E. MAY 1965
JPL-413
Simplified and improved electrometer circuit provides high-input impedance, stability of gain and operating point, linear response, and low power requirements.

B65-10127
TRAVELING-WAVE TUBE CIRCUIT SIMPLIFIES MICROWAVE RELAY
ALLEN, W. K. IPPOLITO, L. J. NACE, D. A. MAY 1965
GSFC-299
Circuit with a sawtooth-modulated traveling-wave tube, which acts as a frequency converter and as an amplifier, simplifies microwave transmission. Lower power losses and reduced size and weight are also realized in this circuit.

B65-10128
PIEZORESISTIVE GAGE TESTS PIN-CONNECTOR SOCKETS
BOND, W. W. MAY 1965
JPL-675
Connector pin consisting of a piezoresistive crystal, retainer spring and a bridge circuit with voltmeter is used to test connector sockets and may be adapted for multiple socket testing.

B65-10137
INSTRUMENT CALIBRATES LOW GAS-RATE FLOWMETERS
COPELAND, A. C. FULTON, W. C. SMITHER, M. A. MAY 1965
MSC-134
Electronically measuring the transit time of a soap bubble carried by the gas stream between two fixed points in a burette calibrates flowmeters used for measuring low gas-flow rates.

B65-10138
HIGH-GAIN AMPLIFIER HAS EXCELLENT STABILITY AND LOW POWER CONSUMPTION
KLEINBERG, L. L. MAY 1965
GSFC-272
Transistorized amplifier, in which an external reference voltage controls gain, combines high gain with stability and low power consumption. This circuit is useful in electronic servo and portable audio equipment.

B65-10139
SPHERICAL ELECTRODE ELIMINATES HIGH-VOLTAGE BREAKDOWN
FINKE, R. C. VETRONE, R. H. MAY 1965
LEWIS-155
Spherical electrodes surrounding electrode-dielectric junctions eliminate high-voltage breakdown. The gap between the spherical electrode and the dielectric must be of an optimum size for proper operation. Modified, this electrode should be suitable as a high-voltage feedthrough between various liquid and gaseous media.

B65-10142
AUXILIARY CIRCUIT ENABLES AUTOMATIC MONITORING OF EKG*S
INNOVATOR NOT GIVEN /TEX. INST. FOR REHABILITATION AND RES./ MAY 1965 SEE ALSO B65-10143 AND B65-10010
MSC-106
Auxiliary circuits allow direct, automatic monitoring of electrocardiograms by digital computers. One noiseless square-wave output signal for each trigger pulse from an electrocardiogram preamplifier is produced. The circuit also permits automatic processing of cardiovascular data from analog tapes.

B65-10143
DIGITAL-OUTPUT CARDIOTACHOMETER MEASURES RAPID CHANGES IN HEARTBEAT RATE
VICK, H. MAY 1965 SEE ALSO B65-10010 AND B65-10142
MSC-133
Cardiotachometer circuits produce an output voltage proportional to the heartbeat rate on a beat-by-beat basis. This is less complex and less costly than the digital cardiotachometers.

B65-10145
LOGARITHMIC AMPLIFIER USES FIELD EFFECT TRANSISTORS
STEWART, J. L. MAY 1965
JPL-509
Solid-state amplifier utilizes field effect transistors and planar junction diodes to provide a logarithmic response to a wide range of input signals.

B65-10146
FREQUENCY OFFSET IN LINEAR FM/CW TRANSPONDER ELIMINATES CLUTTER
INNOVATOR NOT GIVEN /MELPAR/ MAY 1965
M-FS-249
Clutter is eliminated by offsetting the frequency of a transponder signal with respect to an interrogation signal. This improves the tracking of aircraft and spacecraft by FM/CW transponders.

B65-10151
ROTOR POSITION SENSOR SWITCHES CURRENTS IN BRUSHLESS DC MOTORS
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ MAY 1965
GSFC-315
Reluctance switch incorporated in an induction motor is used for sensing rotor position and switching armature circuits in a brushless dc motor. This device drives the solar array system of an unmanned space satellite.

B65-10152
CIRCUIT REDUCES DISTORTION OF FM MODULATOR
INNOVATOR NOT GIVEN /RCA/ MAY 1965
GSFC-257
Correction circuit improves the linearity of a voltage-variable capacitor used to modulate a free-running oscillator. This improvement only applies to audio frequency modulation and will not correct for slowly varying dc input in some telemetry systems

B65-10158
LASER BEAM TRANSMITS ELECTRIC POWER
INNOVATOR NOT GIVEN /RCA/ JUN. 1965
GSFC-293
Semiconductor laser beam supplies sustained level of electrical power to remote location not served

by conventional conductors. This system would be useful where transmission of energy is critical, such as in nuclear reactors, or other hazardous environments.

B65-10159
SOLID-STATE SWITCHING USED TO SPEED UP CAPACITIVE INTEGRATOR
NEWCOMB, A. L., JR. JUN. 1965
LANGLEY-104
Capacitive integrator circuit using silicon controlled switches /SCS/ insures output voltage linearly proportional to input pulse width. This circuit provides high input impedance and relatively low output impedance.

B65-10161
INTERFEROMETER COMBINES LASER LIGHT SOURCE AND DIGITAL COUNTING SYSTEM
INNOVATOR NOT GIVEN /MIT/ JUN. 1965
MSC-151
Measurement of small linear displacements in digital readouts with extreme accuracy and sensitivity is achieved by an interferometer. instrument combines a digital electro-optical fringe-counting system and a laser light source.

B65-10165
SUPERCONDUCTOR MAGNETS USED FOR STAGGER-TUNING TRAVELING-WAVE MASER
INNOVATOR NOT GIVEN /RCA/ JUN. 1965
GSFC-292
Superconducting materials reduce size and weight of magnets used for stagger-tuning individual traveling-wave maser crystals. The invention is useful in microwave communication systems requiring a high information rate.

B65-10169
PHASE SHIFT FREQUENCY SYNTHESIZER IS EFFICIENT, SMALL IN SIZE
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS./ JUN. 1965
M-FS-250
Phase shift frequency synthesizer produces suppressed-carrier signals at the sum and difference frequencies. All unwanted frequencies are suppressed by this small-sized synthesizer.

B65-10178
INNOVATOR NOT GIVEN /DUKE UNIV./ JUN. 1965
GSFC-130
Self-oscillating dc to ac converter with transistor switching to produce a square wave output is used for low and high voltage power sources. The converter has a high efficiency throughout a wide range of loads.

B65-10182
FORCE CONTROLLED SOLENOID DRIVES MICROWELD TESTER
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965
WOO-125
Solenoid-driven device tests the integrity of a microweld joint between an electronic component lead wire and a wire ribbon by applying tension stress to the joint. Variable measured force is provided when either destructive or nondestructive testing is performed.

B65-10183
MODIFIED INTERELEMENT SPACING IMPROVES YAGI ANTENNA ARRAY
BECK, F. B. JUN. 1965
LANGLEY-130
Symmetrical antenna array is designed by adjusting the Yagi disk interelement spacing so that the grating lobe of the array factor coincides with the first sidelobe of the element pattern.

B65-10184
PRESSURE SENSOR RESPONDS ONLY TO SHOCK WAVE
INNOVATOR NOT GIVEN /BOEING CO./ JUN. 1965
M-FS-238
Pressure sensor responds only to high pressure crest of a shock wave, and will not respond to conditions of overpressure. The sensor uses plates of a battery to produce voltage output used to actuate an alarm signal or crew escape system.

B65-10187
CRYSTAL MEASURES-SHORT TERM, LARGE-MAGNITUDE FORCES
PFEIFFER, C. G. JUN. 1965
JPL-77
By using the magnitude of piezoelectric crystal response to distortion and compression, this device measures transient accelerations and their rate of change. The invention could be used in a servo control system by supplementing the accelerometer and taking over its function when its range was exceeded.

B65-10193
LOGIC CIRCUIT EXHIBITS OPTIMUM PERFORMANCE
HUSSON, C. JUN. 1965
LANGLEY-129
Performance of circuits are compared to determine the optimum circuit configuration for implementation into microelectronic functions. Comparison is made in terms of power drain, propagation time, and component variations with temperature and load.

B65-10194
ANALOG-TO-DIGITAL CONVERTER HAS INCREASED RELIABILITY AND REDUCED POWER CONSUMPTION
THORNWALL, J. C. JUN. 1965
GSFC-246
Eight-bit analog-to-digital converter decreases average power consumption and increases component reliability. The converter uses solid-state components in pulse operation and magnetic core components for minimizing power consumption. The magnetic core components also increase reliability.

B65-10195
DEVICE MEASURES FLUID DRAG ON TEST VEHICLES
FREEMAN, R. JUDD, J. H. LEISS, A. JUN. 1965
LANGLEY-34
Electromechanical drag balance device measures the aerodynamic drag force acting on a vehicle as it moves through the atmosphere and telemeters the data to a remote receiving station. This device is also used for testing the hydrodynamic drag characteristics of underwater vehicles.

B65-10196
INEXPENSIVE ELECTRICAL CONNECTOR IS MOISTURE AND CORROSIONPROOF
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965
1965
MSC-164
Compression-sealed electrical connector made principally of plastic components is used in a corrosive atmosphere. This inexpensive and moistureproof connector can be modified to provide a multiple-pin connector.

B65-10197
IMPROVED SOLDERLESS CONNECTOR IS EASILY DISCONNECTED
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ JUN. 1965
JPL-SC-060
Compression type solderless connector is easily disconnected and reassembled and resists vibration. The connector, which uses a tapered, split sleeve that is tightened by a nut into a mating bug, is used in place of standard solder lugs and to connect unsolderable wire.

B65-10199
MODULAR THERMOELECTRIC CELL IS EASILY PACKAGED IN VARIOUS ARRAYS
EPSTEIN, J. JUN. 1965
GSFC-339
Modular thermoelectric cells are easily packaged in various arrays to form power supplies have desirable voltage and current output characteristics. The cells employ two pairs of thermoelectric elements, each pair being connected in parallel between two sets of aluminum plates. They can be used as solar energy conversion devices.

B65-10200
DENSITY TRACE MADE WITH COMPUTER PRINTOUT

WILSON, M. JUN. 1965
GSFC-322
Special drum for a computer-controlled printer improves density trace of scientific data. The drum provides uniformly shaped characters and evenly spaced variations of print density that precisely reflect data magnitude. This device plots temperature profiles, geographic contours, pressure gradients, electric potential gradients, and magnetic field configurations.

B65-10202
QUICK-DISCONNECT COUPLING SAFE TRANSFER OF HAZARDOUS FLUIDS
DEWITT, R. L. SCHMIDT, H. W. JUN. 1965
LEWIS-125
Quick-disconnect coupling is used for uncoupling of plumbing during ground-to-vehicle transfer of cryogenic and hazardous fluids. The coupling allows remote positive control of liquid pressure and flow during the transfer operation, remote connection and separation capabilities, and negligible liquid spillage upon disconnection.

B65-10203
TINY BIOMEDICAL AMPLIFIER COMBINES HIGH PERFORMANCE, LOW POWER DRAIN
DEBOO, G. J. JUL. 1965
ARC-41
Transistorized, portable, high performance amplifier with low power drain facilitates biomedical studies on mobile subjects. This device, which utilizes a differential input to obtain a common-mode rejection, is used for amplifying electrocardiogram and electromyogram signals.

B65-10204
VOLTAGE VARIABLE OSCILLATOR HAS HIGH PHASE STABILITY
HEARN, C. P. JUL. 1965
LANGLEY-123
Two or more series RLC circuits are used with a negative feedback amplifier to make a voltage variable oscillator. This combination results in high phase stability and optimum frequency modulation.

B65-10206
SENSITIVE ELECTROMETER FEATURES DIGITAL OUTPUT
DOONG, H. JUL. 1965
GSFC-288
Four-stage transistorized electrometer eliminates the need for a logarithmic compression network. It measures very low currents and produces a digital output directly indicative of the input current magnitude.

B65-10208
HYBRID COMPUTER TECHNIQUE YIELDS RANDOM SIGNAL PROBABILITY DISTRIBUTIONS
CAMERON, W. D. JUL. 1965
ARC-34
Hybrid computer determines the probability distributions of instantaneous and peak amplitudes of random signals. This combined digital and analog computer system reduces the errors and delays of manual data analysis.

B65-10209
OSCILLATOR CIRCUIT MEASURES LIQUID LEVEL IN TANKS
INNOVATOR NOT GIVEN /IBM/ JUL. 1965
M-FS-245
Oscillator circuits automatically measure the liquid level in tanks. The circuit employs a twin transmission line as a liquid level probe.

B65-10212
DETECTOR CIRCUIT COMPENSATES FOR VIDICON BEAM CURRENT VARIATIONS
INNOVATOR NOT GIVEN /RCA/ JUL. 1965
GSFC-310
Signal detector circuit compensates for black level shifts in vidicons by dark current cancellation. It clamps the video signal to the dark current component of the signal. The device also compensates for background noise variation or transducer bias fluctuations in other repetitive pulse systems.

B65-10213
MULTIAXIAL ANALYZER DETECTS LOW-ENERGY ELECTRONS
LIND, D. L. OGILVIE, K. W. WILKERSON, T. D.
JUL. 1965
GSFC-329
Three curved plate energy analyzers coupled with three electron multiplier tubes detect and measure low energy electron flux in several directions simultaneously.

B65-10215
ELECTRICAL PROBE ENSURES RELIABLE CONTACT IN SOCKET
INNOVATOR NOT GIVEN /IBM/ JUL. 1965
M-FS-315
Spring-loaded probe makes a reliable electrical contact by producing a circular wiping motion at the tip when inserted into a mating socket.

B65-10218
GRAPHITE ELEMENT SERVES AS RADIANT HEAT SOURCE
JUL. 1965
M-FS-105
Radiators using a graphite heating element as a radiant heat source have high heat flux and long operational lives. They are used to test the thermal resistance of materials.

B65-10221
INSTRUMENT ACCURATELY MEASURES EXTREMELY LOW AIR DENSITIES
INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS/
AUG. 1965
M-FS-193
Gauge accurately measures low air densities in high-vacuum systems. It relies on the detection of near-visible light radiated from nitrogen molecules present in the system.

B65-10223
VOLTAGE CONTROLLED OSCILLATOR IS EASILY ALIGNED, HAS LOW PHASE NOISE
SYDNOR, R. L. AUG. 1965
JPL-510
Voltage controlled oscillator /VCO/, represented by an equivalent rf circuit, is easily adjusted for optimum performance by varying the circuit parameter. It contains a crystal drive level which is also easily adjusted to obtain minimum phase noise.

B65-10225
SIMPLE BCD CIRCUIT ACCURATELY COUNTS TO 24
SPAFFORD, M. L. AUG. 1965
GSFC-317
Ripple-through counter with divide-by-24 output pulse is used in digital control clocks to register hours and give a daily output signal. It uses commercially available digital modules that incorporate and-gates with flip-flops.

B65-10226
MAGNETIC-SHIFT-REGISTER CIRCUIT CONTROLS STEP MOTOR OPERATIONS
VEILLETTE, L. J. AUG. 1965
GSFC-340
Magnetic-shift-register circuit controls bidirectional operations of a phase-pulsed step motor. The circuit draws no power in standby, is nonregenerative, and is insensitive to switching transients.

B65-10228
SIMPLE CIRCUIT PRODUCES HIGH-SPEED, FIXED DURATION PULSES
GARRAHAN, N. M. AUG. 1965
GSFC-285
Circuit generates an output pulse of fixed width from a variable width input pulse. The circuit consists of a tunnel diode in parallel with an inductance driven by a constant current generator. It is used for pulsed communication equipment design.

B65-10232
FIELD EFFECT TRANSISTOR PRESENTS HIGH INPUT IMPEDANCE IN AC AMPLIFIER
MARSHALL, J. H. AUG. 1965
JPL-500
Four-stage transistorized ac amplifier provides high input impedance and operates at low intrinsic noise levels. It is suited to carrier or narrow band sine wave applications.

B65-10233
HIGH-SPEED SQUARE-WAVE CURRENT LIMITER OPERATES EFFICIENTLY
INNOVATOR NOT GIVEN /LABKO SCI./ AUG. 1965
JPL-SC-073
Transistorized high speed circuit limits currents from a square-wave ac power supply. The current limiter resets after each half cycle of the square wave and thus minimizes power losses.

B65-10234
SIMPLE CIRCUIT REDUCES TRANSISTOR SWITCHING TIME
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ AUG. 1965
GSFC-314
Silicon-controlled rectifier /SCR/, gated by a voltage divider, controls the potentiometer in transistorized switching circuits. The SCR acts as a gate to trigger the switching transistor only when the input signal reaches an amplitude that will switch the transistor rapidly.

B65-10237
BRUSHLESS DC MOTOR USES ELECTRON BEAM SWITCHING TUBE AS COMMUTATOR
STUDER, P. AUG. 1965
GSFC-345
Electron beam switching tube eliminates physical contact between rotor and stator in brushless dc motor. The tube and associated circuitry control the output of a dc source to sequentially energize the motor stator windings.

B65-10238
SOLID-STATE LASER TRANSMITTER IS AMPLITUDE MODULATED
BILDERBACK, R. AUG. 1965
MSC-121
Amplitude modulated laser transmitter affords radio frequencies unlimited bandwidth. The system, which is solid state and compact, uses a gallium arsenide diode that emits in the near infrared.

B65-10242
ELECTROMETER HAS AUTOMATIC ZERO BIAS CONTROL
INNOVATOR NOT GIVEN /APPLIED PHYSICS CORP./ AUG. 1965
GSFC-350
Zero biasing circuit in a vibrating reed type electrometer counterbalances residual potential. It charges a capacitor to the residual potential and connects that capacitor in series with the vibrating reed so that the voltages cancel. This enables the electrometer to read zero output potential in the absence of an input current.

B65-10243
NOVEL PROBE SIMPLIFIES ELECTRONIC COMPONENT TESTING
SYNER, W. F.
GSFC-342
Test probe, in conjunction with standard equipment, tests axial-lead electronic components in their original packages. The probe can be modified to test any electronic component with automatic or nonautomatic equipment.

B65-10244
LIGHTWEIGHT COAXIAL CABLE CONNECTOR REDUCES SIGNAL LOSS
BREJCHA, A. G., JR. AUG. 1965
JPL-720
Connectors with milled interface surfaces for perfect electrical contact eliminate secondary-emission discharge and low signal loss in rf coaxial cables. The connectors which contain alignment and centering components for proper joint concentricity are used in communications systems designs.

B65-10247
SERVO CALORIMETER MEASURES MATERIAL HEATING RATE
GILMOUR, G. WILSON, J. H. /WESTINGHOUSE ELEC. CORP./ AUG. 1965
NU-0024
Servo calorimeter accurately measures the heating rate of a material exposed to nuclear radiation independently of the specific heat thermal conductivity of the material. The electrical power used is a direct measure of the nuclear heating rate.

B65-10249
MANUAL-FEED ADAPTER PERMITS MICROFILMING OF CONTINUOUS OSCILLOGRAPH OUTPUT
BENNETT, J. /WESTINGHOUSE ELEC. CORP./ AUG. 1965
NU-0029
A manual-feed adapter used with a microfilm recording unit permits continuous filming and reduces oscillograph output to manageable dimensions.

B65-10255
BORON TRIFLUORIDE NUCLEAR DETECTOR PREAMPLIFIER USES SINGLE-CABLE CONNECTION
HECKELMAN, J. D. SHUMAKER, R. E. AUG. 1965
LEWIS-178
Preamplifier for a nuclear particle detector operates with a single interconnecting cable. Isolating and bypass networks permit this single cable operation.

B65-10257
INDUCTOR FLYBACK CHARACTERISTIC GIVES VOLTAGE REGULATOR FAST RESPONSE
SMITH, G. D. AUG. 1965
GSFC-361
Voltage regulator alternately connects an inductor in parallel and in series with the input voltage source. This flyback voltage regulator provides a regulated dc voltage to varying loads from a varying dc supply and gives fast response to load and supply changes.

B65-10258
GAPPED TOROID PROVIDES INFINITE RESOLUTION OF DELAY-LINE PICKUP
ROBINSON, G. B. AUG. 1965
GSFC-370
Gapped toroid magnetically coupled to a delay line provides continuous adjustment of the time delay line signal retrieval. A rotating screw moves the toroid pickup parallel to the delay line. This device can be used in signal detection devices and instrumentation equipment.

B65-10259
INCREASED JUNCTION LEAD INDUCTANCE BALLASTS HIGH-FREQUENCY TRANSISTORS
GILBERT, G. J. /RCA/ SEP. 1965
GSFC-387
Segmentation of transistor bonding stripes and the inherent inductance of individual leads provides ballast for even current distribution across the junction of a high-frequency transistor.

B65-10260
SIMPLE PULSE COUNTING CIRCUIT COMPUTES SUM OF SQUARES
SCHAEFER, D. H. SEP. 1965
GSFC-391
Pulse counting circuit with an extra chain of flip-flops, delay lines, and AND/GATES computes the sum of the squares of the pulse sequences. A pulse train and the sum of the squares of the pulses are simultaneously completed.

B65-10263
INDEXING DEVICE ENSURES PROPER MATING OF ELECTRICAL CONNECTORS
JENKINS, L. M. JENKINS, S. M. SIMMONS, W. H.
SEP. 1965
MSC-155
Indexing splines with modified standard male and female connectors eliminates the possibility of

incorrect mating. Large stock quantities of differently indexed connectors are unnecessary since connectors from a single stock can be indexed as desired at installation time.

B65-10264
PLASTIC BAGS IN EVACUATED CHAMBER MAKE LIGHTWEIGHT GAS SAMPLING SYSTEM
SHAFFERNOCKER, W. M. /GE/ SEP. 1965
FRC-31
Portable, lightweight system collects the exhaust gas of an aircraft during flight for use in analyzing combustion efficiency. The system uses an evacuated chamber and plastic bags.

B65-10265
WELD LEAKS RAPIDLY AND SAFELY DETECTED
INNOVATOR NOT GIVEN /BOEING CO./ SEP. 1965
M-FS-362
Test method detects leaks that occur during hydrostatic pressure testing of welded joints in metal tanks. A strip of aluminum foil and a strip of water-soluble paper are placed over the weld. A voltage applied between the tank wall and the foil strip is monitored to detect a decrease in ohmic resistance caused by water leakage into the paper layer.

B65-10267
ELECTROMETER PREAMPLIFIER HAS DRIFT CORRECTION FEEDBACK
LABARTHE, L. C. /LABKO SCI./ SEP. 1965
JPL-SC-074
Negative feedback circuit corrects output drift in an electrometer. The negative feedback is used in the no signal state to maintain the output level at zero reference. Drift voltage storage in the signal on state is also used to provide a drift-free readout.

B65-10268
MULTIPLE TEST CHAMBER EXPOSES MATERIALS TO VARIOUS ENVIRONMENTS
JOHNSTON, R. L. SEP. 1965
MSC-179
Multiple compartment test chamber exposes several material specimens to various environmental conditions for prolonged periods. The specimens are individually mounted in chamber compartments, rotated to various positions, and measured through optical windows to determine progressive changes in the material properties.

B65-10269
SIMPLE DEVICE PRODUCES ACCELEROMETER CALIBRATION PULSE
INNOVATOR NOT GIVEN /LOCKHEED MISSILES AND SPACE CO./ SEP. 1965
M-FS-363
Shock-impulse exciter produces a remote checkout of the amplitude calibration and frequency response of a piezoelectric vibration accelerometer. The exciter employs a bimetal spring to apply a mechanical acceleration pulse of a known amplitude and frequency to the accelerometer.

B65-10271
COMPOSITE SEAL REDUCES ALKALINE BATTERY LEAKAGE
CLATTERBUCK, C. H. PLITT, K. F. SEP. 1965
GSFC-337
Composite seal consisting of rubber or plastic washers and a metal washer reduces alkaline battery leakage. Adhesive is applied to each washer interface, and the washers are held together mechanically.

B65-10273
ELECTROMECHANICAL FLOWMETER ACCURATELY MONITORS FLUID FLOW
GRANT, D. J. SEP. 1965
GSFC-357
Electromechanical flowmeter remotely and accurately monitors the flow rate and total volume of a transparent liquid discharged from a dispensing system. A dual dispensing tube system provides a relative reference level which permits compensation for temperature variations.

B65-10274
ELECTRONIC OHMMETER PROVIDES DIRECT DIGITAL OUTPUT
SEMYAN, J. SEP. 1965
GSFC-363
Self-balancing wheatstone bridge acts as all-electronic digital readout ohmmeter.

B65-10275
IMPROVED CIRCUIT MINIMIZES GENERATION OF PSEUDONOISE CHECK BITS
ANDERSON, T. O. LUSBAUGH, W. A. SEP. 1965
JPL-698
Computer switching network consists of parallel and series combinations of mod 2 adders using the minimum number of gating levels. This network minimizes the propagation time in which a sequence of pseudonoise check bits are generated.

B65-10276
ADDED DIODES INCREASE OUTPUT OF BALANCED MIXER CIRCUIT
ROBINSON, G. B. SEP. 1965
GSFC-354
Two diodes added to a conventional balanced mixer circuit increase the output signal level. The resulting half-wave carrier switch balanced modulator is used in radio equipment.

B65-10277
NONLINEAR FEEDBACK REDUCES ANALOG-TO-DIGITAL CONVERTER ERROR
MUNOZ, R. M. SEP. 1965
ARC-46
Nonlinear analog-to-digital converter measures the analog input level and continuously adjusts the digital readout scale sensitivity to effectively increase the accuracy. It is able to acquire more accurate low-level data.

B65-10278
MODIFIED DEVELOPER INCREASES LINE RESOLUTION IN PHOTOSENSITIVE RESIST
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ SEP. 1965
GSFC-386
Standard developer solution is mixed with dipropyl carbonate. This reduces swelling in the photosensitive resist and permits application of relatively thick films with minimal pinhole formation and increased line resolution.

B65-10279
INFLATABLE BLADDER PROVIDES ACCURATE CALIBRATION OF PRESSURE SWITCH
SMITH, N. J. /BOEING CO./ SEP. 1965
M-FS-367
Calibration of a pressure switch is accurately checked by a thin-walled circular bladder. It is placed in the pressure switch and applies force to the switch diaphragm when expanded by an external pressure source. The disturbance to the normal operation of the switch is minimal.

B65-10281
CIRCUIT MAINTAINS DIGITAL DECISION THRESHOLD AT PRESET LEVEL
INNOVATOR NOT GIVEN /AVCO CORP./ SEP. 1965
M-FS-331
Optimum decision-level circuit maintains the decision threshold at any preselected percentage of the input-signal amplitude. Communications equipment involving recognition of transmitted digital information can benefit from this circuit.

B65-10282
CONSTANT-CURRENT REGULATOR IMPROVES TUNNEL DIODE THRESHOLD-DETECTOR PERFORMANCE
CANCRO, C. A. SEP. 1965
GSFC-239
Grounded-base transistor is placed in a tunnel diode threshold detector circuit, and a bias voltage is applied to the tunnel diode. This provides the threshold detector with maximum voltage output and overload protection.

B65-10284
FIELD-EFFECT TRANSISTOR REPLACES BULKY TRANSFORMER IN ANALOG-GATE CIRCUIT

INNOVATOR NOT GIVEN /RADIATION, INC./ SEP. 1965
GSFC-351
Metal-oxide semiconductor field-effect transistor /MOSFET/ analog-gate circuit adapts well to integrated circuits. It provides better system isolation than a transformer, while size and weight are appreciably reduced.

B65-10286
UPPERCASE AND LOWERCASE COMPUTER PRINTOUT INCREASES READABILITY
HAND, W. W. /DOC., INC./ JONSBERG, M. B SEP. 1965
HQ-12
Print chain of 120 characters facilitates production of computer printout in both uppercase and lowercase characters. Although the output speed is reduced, the use of the print chain increases the computer printout readability.

B65-10287
PHOTORESISTANCE ANALOG MULTIPLIER HAS WIDE RANGE
HARTENSTEIN, R. G. SEP. 1965
GSFC-360
Photoactivated bridge facilitates equal performance of analog multipliers over a wide frequency range. The multiplier operates from direct current to an upper frequency limited by either the light source or the closed-loop amplifier.

B65-10289
BORON NITRIDE HOUSING COOLS TRANSISTORS
INNOVATOR NOT GIVEN /SPACE TECHNOL. LABS./ SEP. 1965 SEE ALSO B63-10033 AND B65-10186
WOO-079
Boron nitride ceramic heat sink cools transistors in rf transmitter and receiver circuits. Heat dissipated by the transistor is conducted by the boron nitride housing to the metal chassis on which it is mounted.

B65-10290
FM/CW SYSTEM MEASURES AIRCRAFT ATTITUDE
INNOVATOR NOT GIVEN /MELPAR/ SEP. 1965
M-FS-276
FM/CW radar system measures attitude of an approaching aircraft relative to a ground station. The FM/CW transmitter on board the aircraft transmits through two antennas to a ground-based receiver.

B65-10293
ELECTROSTATICALLY DRIVEN DYNAMIC CAPACITOR EMPLOYS CAPACITIVE FEEDBACK
LONBORG, J. O. OCT. 1965
JPL-771
Three-part signal electrode provides capacitive feedback to an oscillator driven dynamic capacitor in an electrometer circuit.

B65-10298
TITANIUM DIAPHRAGM MAKES EXCELLENT AMPLITRON CATHODE SUPPORT
TEICH, W. W. /RAYTHEON CO./ OCT. 1965
GSFC-394
Cathode support structure designed around a titanium diaphragm prevents radial misalignment between the cathode and anode in amplitrons. The titanium exhibits low thermal conductivity, tolerates lateral thermal expansion of the cathode, and is a poor primary and secondary emission medium.

B65-10299
ELECTROPNEUMATIC RHEOSTAT REGULATES HIGH CURRENT
HAACKER, J. F. JEDLICKA, J. R. WAGONER, C. B. OCT. 1965
ARC-44
Electropneumatic rheostat maintains a constant direct current in each of several high-power parallel loads, of variable resistance, across a single source. It provides current regulation at any preset value by dissipating the proper amount of energy thermally, and uses a column of mercury to vary the effective length of a resistance element.

B65-10300
IMPURITY DIFFUSION PROCESS FOR SILICON SEMICONDUCTORS IS FAST AND PRECISE
MC LOUSKI, R. M. SKOUSON, G. W. /WESTINGHOUSE ELEC. CORP./ OCT. 1965
GSFC-397
Impurity diffusion process produces precision silicon semiconductor junctions economically and fast. Oxide is deposited on a silicon wafer and a controlled concentration of impurity atoms in gaseous form is simultaneously introduced into the reaction.

B65-10301
REMOTE RAPIDLY VARYING PRESSURES ACCURATELY MEASURED
INNOVATOR NOT GIVEN /GE/ OCT. 1965
FRC-28
Transmitting-damping tube with one end closed, the other open to a pressure source, has a pressure sensor connected to a port close to the pressure source. This accurately measures transient or rapidly varying fluid pressures.

B65-10304
IMPROVED STRAIN-WIRE FLOWMETER HAS FAST RESPONSE TIME
DILLON, R. C. DUNBAR, W. R. OCT. 1965
LEWIS-241
Strain-sensitive resistance wires in a wheatstone bridge arrangement from the sensing element of a flowmeter. The change in resistance of the wires is measured as a function of stream velocity. Thus the electrical output is a measure of both rapidly varying and steady fluid-flow rates.

B65-10305
THIN-FILM RESISTORS USED IN FUNCTIONAL ELECTRONIC BLOCKS
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ OCT. 1965
GSFC-380
Vapor-deposited thin-film resistors replace diffused resistors in R-C tank circuits in a solid state electronic block. This allows an optimum parallel capacitance to be obtained for circuit applications requiring a high resistance and a low capacitance.

B65-10306
OPAQUE MICROFICHE MASTHEAD PERMITS EASY READING
LOWE, E. M. /DOC., INC./ OCT. 1965
HQ-7
White-pigmented backing applied to the reverse side of microfiche mastheads makes the area opaque and easily readable. This technique is of value for organizations involved in large volume information storage and retrieval.

B65-10307
FREQUENCY CORRECTION DEVICE USES DIGITAL CIRCUITRY
SCHAEFER, D. OCT. 1965
GSFC-268
Signal acquisition and tracking system covering a wide range of frequencies uses a digital circuit to sample the frequency of an incoming signal and provide correction pulses to the voltage-controlled oscillator. The circuit can also sense the presence of a signal on any one of the input lines.

B65-10308
ELECTRONIC AMPERE-HOUR INTEGRATOR IS ACCURATE TO ONE PERCENT
PAULKOVICH, J. OCT. 1965
GSFC-203
Electronic ampere-hour integrator is based on current-to-frequency conversion. It operates on low power and is accurate to one percent. This device can measure the ampere-hour capacity of batteries and can be adapted for other functions.

B65-10309
THERMOELECTRIC ELEMENTS DIFFUSION-BONDED TO TUNGSTEN ELECTRODES
INNOVATOR NOT GIVEN /TYCO LABS./ OCT. 1965 SEE ALSO B65-10220

GSFC-346
Solid-state diffusion process bonds lead telluride and lead telluride-tin telluride thermoelectric elements to tungsten electrodes. The resulting bond is nonmagnetic and has high strength and low electrical and thermal resistance. This method is also used with tantalum electrodes.

B65-10310
THRESHOLD DETECTOR PRODUCES NARROW PULSES AT HIGH REPETITION RATES
GARRAHAN, N. M. OCT. 1965
GSFC-383
Solid state device generates fixed width output pulses from variable width input pulses in the nanosecond range. The circuit produces pulse repetition rates in the megacycle range and exhibits low power drain.

B65-10311
PCM MAGNETIC TAPE SYSTEM EFFICIENTLY RECORDS AND REPRODUCES DATA
COLE, P. T. OCT. 1965
GSFC-375
Split-phase PCM technique consists of data and clock signal recording and reproduction systems. This PCM magnetic tape system achieves a high packing density on the tape and provides a symmetrical reproduction of the recorded signal.

B65-10313
PLANETARY CAMERA CONTROL IMPROVES MICROFICHE PRODUCTION
CHESTERTON, W. L. LEWIS, E. B. /DOC., INC./ OCT. 1965
HQ-1 HQ-5
Microfiche is prepared using an automatic control system for a planetary camera. The system provides blank end-of-row exposures and signals card completion so the legend of the next card may be photographed.

B65-10314
HYBRID CIRCUIT ACHIEVES PULSE REGENERATION WITH LOW POWER DRAIN
CANCRO, C. A. OCT. 1965
GSFC-382
Hybrid tunnel diode-transistor circuit provides a solid-state, low power drain pulse regenerator, frequency limiter, or gated oscillator. When the feedback voltage exceeds the input voltage, the circuit functions as a pulse normalizer or a frequency limiter. If the circuit is direct coupled, it functions as a gated oscillator.

B65-10315
MAGNETOMETER MEASURES ORTHOGONAL COMPONENTS OF MAGNETIC FIELDS
INNOVATOR NOT GIVEN /SPECTRA PHYS./ OCT. 1965
GSFC-395
Driven magnetometer accurately measures the components of a low strength magnetic field in each of three mutually perpendicular directions. To accomplish this, it employs the principle of magnetic resonance in optically pumped rubidium vapor.

B65-10317
INSTRUMENT PERFORMS NONDESTRUCTIVE CHEMICAL ANALYSIS, DATA CAN BE TELEMETERED
TURKEVICH, A. /CHICAGO UNIV./ OCT. 1965
JPL-SC-078
Instrument automatically performs a nondestructive chemical analysis of surfaces and transmits the data in the form of electronic signals. It employs solid-state nuclear particle detectors with a charged nuclear particle source and an electronic pulse-height analyzer.

B65-10318
REMOTE CONTROL ELECTRICAL SWITCHING SYSTEM HAS 1000-OUTPUT CAPABILITY
INNOVATOR NOT GIVEN /IBM/ OCT. 1965
M-FS-380
Electromechanical remote control system has a capacity of 1000 individual on-off functions yet uses only seven pairs of telephone-type lines for interconnection. Installation and maintenance costs are decreased by using this system.

B65-10320
RUGGED PRESSED DISK ELECTRODE HAS LOW CONTACT POTENTIAL
DAY, J. L. MOSIER, B. /INST. OF RES. AND INSTRUMENTATION/ OCT. 1965 SEE ALSO B64-10025
MSC-158
Pressed-disk electrode with low contact potential monitors physiological processes. It consists of silver and silver chloride combined with bentonitic clay. The clay affords a surface that permits use over extended periods without contact deterioration.

B65-10322
CAM-OPERATED LIMIT SWITCH FEATURES SAFE FUSE REPLACEMENT
WEBER, G. J. /MCDONNELL AIRCRAFT CORP./ OCT. 1965
MSC-218
Two hermetically sealed, short travel, limit switches permit fuse replacement without danger of a spark or arcing. The switches are wired in parallel circuits and actuated by manually operated cams containing the circuit fuses.

B65-10324
SELENIUM BOND DECREASES ON RESISTANCE OF LIGHT-ACTIVATED SWITCH
INNOVATOR NOT GIVEN /IBM/ NOV. 1965
JPL-SC-101
Vitrified amorphous selenium bond decreases the ON resistance of a gallium arsenide-silicon light-activated, low-level switch. The switch is used under a pulse condition to prolong switch life and minimize errors due to heating, devitrification, and overdrawing.

B65-10325
DIRECT FORCE-MEASURING TRANSDUCER USED IN BLOOD PRESSURE RESEARCH
EIGE, J. J. /STANFORD RES. INST./ NEWGARD, P. M. PRESSMAN, G. L. NOV. 1965
ARC-53
Direct force-measuring transducer acts as an arterial tonometer, gives a direct readout to instrumentation, and is unaffected by ambient noise. It uses a semiconductor strain gauge which is deflected by pressure pulses in the artery. The deflection changes the resistance of the gauge and alters the voltage reading on the associated instrumentation.

B65-10328
FEED-THROUGH CONNECTOR WITHSTANDS HIGH TEMPERATURES IN VACUUM ENVIRONMENT
KREISMAN, W. S. /GEOPHYS. CORP. OF AM./ NOV. 1965
GSFC-442
Feed-through connector with sealing action augmented by any temperature increase can be used through the wall of a vacuum device. It retains vacuum integrity through successive cycles of high temperature.

B65-10329
BAKING ENABLES MCLEOD GAUGE TO MEASURE IN ULTRAHIGH VACUUM RANGE
KREISMAN, W. S. /GEOPHYS. CORP. OF AM./ NOV. 1965
GSFC-440
Accurate measurements in the ultrahigh vacuum range by a conventional McLeod gauge requires degassing of the gauge*s glass walls. A closed system, in which mercury is forced into the gauge by gravity alone, and in which the gauge components are baked out for long periods, is used to achieve this degassing.

B65-10333
COMMUNICATION SYSTEM USES MODULATED LASER BEAM
MINOTT, P. O. NOV. 1965
GSFC-377
Electro-optical system is placed on a satellite to effect communications between two remote stations. The system employs an essentially passive, retrodirective, laser beam modulator- reflector.

B65-10334
FREQUENCY DIVIDER IS FREE OF SPURIOUS OUTPUTS

MC DERMOND, D. NOV. 1965
GSFC-308
Frequency divider provides sixteen output states free of spurious pulses from four input circuits. The input is binary coded, and a change of one in the input only changes the number of output states by one.

B65-10340
MINIATURE SERVO ACCELEROMETER IS FORCE-BALANCED
JOHNSTON, A. R. /CALIF. INST. RES. FOUND./ NOV. 1965
JPL-155
Miniature servo accelerometer measures unusually small forces of torques. The pendulous mass of the accelerometer is suspended by fused quartz torsion fibers in an electromagnetically force-balanced environment. It is used in gravity surveys for exploring mineral deposits.

B65-10343
DELAYED RIPPLE COUNTER SIMPLIFIES SQUARE-ROOT COMPUTATION
CLIFF, R. NOV. 1965
GSFC-398
Ripple subtract technique simplifies the logic circuitry required in a binary computing device to derive the square root of a number. Successively higher numbers are subtracted from a register containing the number out of which the square root is to be extracted. The last number subtracted will be the closest integer to the square root of the number.

B65-10345
VARIABLE WORD LENGTH ENCODER REDUCES TV BANDWIDTH REQUIREMENTS
SIVERTSON, W. E., JR. NOV. 1965
LANGLEY-87
Adaptive variable resolution encoding technique provides an adaptive compression pseudo-random noise signal processor for reducing television bandwidth requirements. Complementary processors are required in both the transmitting and receiving systems. The pretransmission processor is analog-to-digital, while the postreception processor is digital-to-analog.

B65-10347
COMPACT SCR TRIGGER CIRCUIT FOR IGNITRON SWITCH OPERATES EFFICIENTLY
FOSTER, L. E. NOV. 1965
M-FS-371
Trigger circuit with two series-connected SCR triggers an ignitron switch used to discharge high-energy capacitor banks. It does not require a warmup period and operates at relatively high efficiency.

B65-10349
FREQUENCY DISCRIMINATOR WITH BINARY OUTPUT ELIMINATES TUNED CIRCUITS
DE VELDE, E. /IBM/ NOV. 1965
M-FS-376
Frequency discriminator has a binary output and permits microminiaturized packaging techniques. It uses a bandpass amplifier and standard logic elements that convert two input frequencies into two discrete logic pulses.

B65-10350
ZENER DIODE CONTROLS SWITCHING OF LARGE DIRECT CURRENTS
INNOVATOR NOT GIVEN /IBM/ NOV. 1965
MSC-188
High-current zener diode is connected in series with the positive input terminal of a dc supply to block the flow of direct current until a high-frequency control signal is applied across the zener diode. This circuit controls the switching of large dc signals.

B65-10352
VIBRATING DIAPHRAGM MEASURES HIGH ELECTROSTATIC FIELD STRENGTHS
INNOVATOR NOT GIVEN /ELECTRO-OPT. SYSTEMS/ NOV. 1965
MSC-189
Meter with flexible conductive diaphragm measures electrostatic charge density on a conducting surface in a vacuum. The diaphragm is supported from an insulated conductive support ring rigidly attached to the conductive surface whose electrostatic charge density is to be measured.

B65-10353
MULTIPHASE CLOCK-PULSE GENERATOR USES SIMPLIFIED CIRCUITRY
INNOVATOR NOT GIVEN /IBM/ NOV. 1965
M-FS-297
Multiphase clock-pulse generator converts a simple pulse train into nonoverlapping clock pulses. The generator employs multistable circuits to minimize the number of electronic components.

B65-10355
SIMPLE CIRCUIT PERFORMS BINARY ADDITION AND SUBTRACTION
CLIFF, R. A. SCHAEFER, D. H. NOV. 1965
GSFC-399
Ripple adder reduces the number of logic circuits required to perform binary addition and subtraction. The adder uses dual input and delayed output flip flops in one register. The contents of this register are summed with those of a standard register through conventional AND gates.

B65-10359
IMPROVED WIRE MEMORY MATRIX USES VERY LITTLE POWER
FEDDE, G. A. /SPERRY RAND CORP./ NOV. 1965
JPL-SC-167
Thin-film, plated-wire memory matrix for computer applications requires little power yet has higher speed and four times greater storage capacity than ferrite-core memories of the same size.

B65-10361
HIGH-INTENSITY FLASHING BEACON POWERED BY MERCURY CELLS
INNOVATOR NOT GIVEN NOV. 1965
LANGLEY-80
Pair of xenon flashlamps powered by mercury batteries in a transistorized circuit provides a flashing beacon with an effective intensity of a second-magnitude star at a distance of ten statute miles. This beacon is lightweight, long lasting and it withstands shock and vibration.

B65-10362
TEMPERATURE TRANSDUCER HAS HIGH OUTPUT, IS TIME STABLE
FOLLETT, W. H. /BALL BROTHERS RES. CORP./ NOV. 1965
GSFC-446
Compact, lightweight temperature transducer requires no amplification of its output signal and is time stable. It uses the temperature-dependent characteristics of a silicon transistor to provide a zero-to-five-volt signal proportional to temperature.

B65-10363
REGENERATIVE FUEL CELL COMBINES HIGH EFFICIENCY WITH LOW COST
DOYLE, H. FRANK, H. STEPHENS, C. W. /ELECTRO-OPT. SYSTEMS/ DEC. 1965
WOO-090
Hydrogen/oxygen regenerative fuel cell stores electrical energy efficiently and inexpensively. The fuel cell has a high energy-to-weight ratio, and is adapted for a large number of cycles with deep discharge.

B65-10369
RESPIRATORY TRANSFER VALVE HAS FAIL-SAFE FEATURE
PUCCINELLI, A. A. SMITH, J. R., JR. DEC. 1965
ARC-1
Quick-acting, remote controlled valve connects either one of two oxygen or air supplies to a breathing tube. The valve, which is fail-safe, incorporates a canned piston arrangement that is driven by a remote controlled reversible rotary solenoid or reversible electric motor.

B65-10376
THREE-POSITION ROCKER SWITCH ACTUATOR HAS POSITIVE CENTERING
BOGLEY, R. L. /N. AM. AVIATION/ DEC. 1965
MSC-261
Three-position rocker switch actuator provides positive center positioning to inhibit possible override. Switch position is visually identified by rocker position, and functions can be shown on tabs and bars.

B65-10377
BINARY COUNTER USES FLUID LOGIC ELEMENTS
INNOVATOR NOT GIVEN /RAND CORP./ DEC. 1965
M-FS-323
Binary counter with two fluid flip-flops in each stage has an output taken from the output of the second flip-flop. The flip-flops each contain three fluid logic elements.

B65-10379
THREE-DIMENSIONAL WIRE-MESH CAPACITOR SYSTEM MEASURES FLUID DENSITY
INNOVATOR NOT GIVEN /GARRETT CORP./ DEC. 1965
WOO-194
Gaging system automatically measures the bulk density of a stored, electrically nonconductive fluid containing varying portions of liquid and vapor. The system employs a three-dimensional wire-mesh capacitor whose capacitance varies with the bulk density of the fluid dielectric medium between the capacitor plates.

B65-10380
DEVICE DETECTS UNBONDED AREAS IN PLASTIC LAMINATES
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ DEC. 1965
WOO-206
Device generates an acoustic signal whose frequency changes disclose the presence of delaminated or unbonded areas in plastic laminates. A microphone makes the frequency change audible.

B65-10381
KEYED PLUGS AND SOCKETS PREVENT IMPROPER CONNECTIONS
BUCKEY, D. L. LANKFORD, H. /MCDONNELL AIRCRAFT CORP./ DEC. 1965
MSC-231
Plugs and sockets individually keyed so that no plug can be mated with other than its proper socket facilitates multiple connection in electrical systems.

B65-10382
PHOTOELECTRIC SYSTEM CONTINUOUSLY MONITORS LIQUID LEVEL
INNOVATOR NOT GIVEN /BOEING CO./ DEC. 1965
M-FS-417
Immersion probe presents a depth-sensitive optical transmission path between a light source and a photoelectric cell to continuously monitor the level of a transparent liquid in a tank. This system operates automatically, without moving parts, and provides output signals to a remote recorder.

B65-10387
SHRINKABLE SLEEVE ELIMINATES SHIELDING GAP IN RF CABLE
INNOVATOR NOT GIVEN /GEN. DYN./CONVAIR/ DEC. 1965
WOO-207
RF shielding gap between an RF cable and a multipin connector is eliminated by a sleeve assembly installed between the connector and the terminated portion of the shielding. The assembly is enclosed in a heat-shrinkable plastic sleeve which completes the continuous RF shield.

B65-10389
INSULATOR-HOLDER PROTECTS TRANSISTORS IN DENSE ELECTRONIC ASSEMBLIES
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ DEC. 1965
MSC-214
Molded insulating spacer with one or more cavities is used as an insulated holder for mounting metal-case transistors in a chassis containing densely packed electronic components. The transistors are mechanically supported on their bases and electrically isolated from each other by the holder.

B65-10392
NONCONTACTING VIBRATION TRANSDUCER HAS CONSTANT SENSITIVITY
FLAGGE, B. DEC. 1965
LANGLEY-99
Noncontacting transducer with constant sensitivity automatically measures the vibration amplitudes along the span of a vibrating structure of irregular contour. A system employing a feedback control positions the transducer at a constant height above the test surfaces. A differential transformer facilitates calibration and extends the amplitude range of the system.

B65-10396
ADHESIVE-BACKED TERMINAL BOARD ELIMINATES MOUNTING SCREWS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965
MSC-173
Low-profile terminal board is used in dense electronic circuits where mounting and working space is limited. The board has a thin layer of pressure-sensitive adhesive backing which eliminates the need for mounting screws.

B65-10399
BINARY COUNTER ACCUMULATES TIME BY COMPLEMENTARY PRESET
MARRINER, G. E. /N. AM. AVIATION/ DEC. 1965
MSC-242
Binary counter reduces the number of logic elements required to furnish electrical control functions. The counter is automatically preset to the complement of the desired time increments in milliseconds. An output pulse is produced each time it reaches its capacity.

B65-10400
ELECTRICALLY HEATED DIAPHRAGM ELIMINATES USE OF PYROTECHNICS
MATHEWSON, R. C. /N. AM. AVIATION/ DEC. 1965
MSC-241
Membrane-type diaphragm is used in systems where fluids are contained under pressure until a certain pressure threshold or point of time has been reached when the fluids are automatically released. The diaphragm is resistance heated until its strength is degraded to the point of rupture, thus releasing the contained fluids.

B66-10002
DUAL-VOLTAGE POWER SUPPLY HAS INCREASED EFFICIENCY
STURMAN, J. C. JAN. 1966
LEWIS-107A
Simple circuit provides two different dc output voltages from an ac source. It employs a full-wave rectifier connected to two passive branches from which the separate dc voltages are taken. The outputs have low ripple and good voltage regulation.

B66-10006
COMPUTER CIRCUIT CALCULATES CARDIAC OUTPUT
MC CULLOUGH, C. E. /KAMAN AIRCRAFT CORP./ JAN. 1966
MSC-274
Electronic circuitry automatically calculates cardiac output. This computer is used for basic research in physiology and as a diagnostic instrument by doctors.

B66-10012
THIN-FILM SEMICONDUCTOR RECTIFIER HAS IMPROVED PROPERTIES
INNOVATOR NOT GIVEN /MELPAR/ JAN. 1966
MSC-207
Cadmium selenide-zinc selenide film is used as a thin film semiconductor rectifier. The film is vapor-deposited in a controlled concentration gradient into a glass substrate to form the required junctions between vapor-deposited gold electrodes.

B66-10013
REACTION HEAT USED IN STATIC WATER REMOVAL FROM FUEL CELLS
PLATNER, J. L. /ALLIS-CHALMERS MFG. CO./ JAN. 1966
M-FS-532
Reaction heat is used for removal of water formed at the hydrogen fuel electrode in a hydrogen-oxygen fuel cell. A portion of the heat inherent in the fuel cell current generation reaction is used to transfer excess water into water vapor and cause it to be exhausted from the cell by a porous vapor transport membrane adjoining a vapor cavity.

B66-10015
ELECTRODELESS DISCHARGE LAMP IS EASILY STARTED, HAS HIGH STABILITY
BELL, W. E. BLOOM, A. L. /VARIAN ASSOCIATES/ JAN. 1966
WOO-030
Electrodeless discharge borosilicate glass lamp is used in various high-resolution optical systems. It is partially charged with krypton, contains small amounts of rubidium, and is enclosed in a hermetically sealed envelope that maintains the lamp at an optimum temperature during discharge. The lamp is quickly started by its excitation coil.

B66-10021
SPECIAL MOUNT IMPROVES REMOTE TRANSDUCER ACCURACY
LAYTON, J. P. /PRINCETON UNIV./ JAN. 1966
LEWIS-269
Transducer-mounting device allows measurement of transient pressure in a hostile environment. The device provides free passage areas and a controlled environment for the measuring instrument.

B66-10025
CUPROUS SELENIDE AND SULFIDE FORM IMPROVED PHOTOVOLTAIC BARRIERS
INNOVATOR NOT GIVEN /RCA/ JAN. 1966
WOO-212
Photovoltaic barriers formed by depositing a layer of polycrystalline cuprous sulfide or cuprous selenide on gallium arsenide are chemically and electrically stable. The stability of these barrier materials is significantly greater than that of cuprous iodide.

B66-10026
IMPROVED CARBON ELECTRODE REDUCES ARC SPUTTERING
INNOVATOR NOT GIVEN /UNION CARBIDE CORP./ JAN. 1966
MSC-219
Carbon rod cores with a smaller proportion of rare earth compounds than in standard cores reduce arc sputtering in optical equipment. This core is produced without additional cost or equipment.

B66-10028
PORTABLE SELF-POWERED DEVICE DETECTS INTERNAL FLAWS IN TUBULAR STRUCTURES
GILMOUR, G. /WESTINGHOUSE ELEC. CORP./ JAN. 1966
NU-0019
Portable probe and eddy-current-sensitive circuitry detects internal flaws or hard spot impurities in an electrically conductive tubular channel by recording the conductivity change at the defect point.

B66-10031
PRESSURE TRANSDUCERS DYNAMICALLY TESTED WITH SINUSOIDAL PRESSURE GENERATOR
JONES, H. B., JR. /PRINCETON UNIV./ JAN. 1966
LEWIS-268
Sinusoidal pressure generator assembly dynamically tests and calibrates pressure transducers by using a chamber whose lowest resonant mode is above the audiofrequency range.

B66-10034
CIRCUIT EXHIBITS POWER EFFICIENCY GREATER THAN 75 PERCENT
MANKOVITZ, R. J. /N. AM. AVIATION/ FEB. 1966
MSC-254
Variable duty cycle pulser increases circuit power efficiency by more than 75 percent when operating solenoid valves. The pulser provides a low-level holding current after a high-level current has actuated the solenoid valves.

B66-10036
FLOWMETER MEASURES LOW GAS-FLOW RATES
WELLS, F. E. FEB. 1966
M-FS-215
Positive-displacement flowmeter measures low gas-flow rates by gauging the time required for a slug of mercury to pass between two reference levels in a tube of known volume.

B66-10038
CIRCUIT OPERATES AS SINE FUNCTION GENERATOR
BOGART, T., JR. /N. AM. AVIATION/ FEB. 1966
MSC-255
Electronic circuit drives sine function generator using square wave and sawtooth sweep generators. The circuit replaces electromechanical driver and increases accuracy.

B66-10039
CONTROL SYSTEM MAINTAINS SELECTED LIQUID LEVEL
BERGESON, R. L. SCHUCK, J. W. /HONEYWELL/ FEB. 1966
M-FS-470
Single-sensor control system maintains liquid hydrogen at a preselected desired level within a tank, regardless of boiloff. It calibrates output in percentage. Thus, when the fuel is at the desired level, the system output will indicate 100 percent regardless of what percent of tank capacity the fuel has reached.

B66-10041
COLD CATHODE IONIZATION GAUGE HAS RIGID METAL HOUSING
HERZOG, R. KREISMAN, W. S. /GEOPHYS. CORP. OF AM./ FEB. 1966
GSFC-445
Cold cathode ionization gauge in a stainless steel housing accurately measures high pressures. The Penning effect is used with a high voltage discharge in the presence of a magnetic field for an ion current proportional to the gas pressure in the gauge.

B66-10042
VIBRATION TESTS ON VIDICONS MADE BY IMPROVED METHOD
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ FEB. 1966
JPL-SC-115
Sensitive method is used for checking the performance of vidicons in mechanical vibration tests. The image of the desired fine-detail test pattern is stored in the photosensitive surface of the vidicon while the system is free of mechanical vibration. Mechanical excitation is then applied, and its effects observed.

B66-10046
LAMP AUTOMATICALLY SWITCHES TO NEW FILAMENT ON BURNOUT
INGLE, W. B. /N. AM. AVIATION/ FEB. 1966
M-FS-498
Lamp with primary and secondary filaments has a means for automatic switching to the secondary filament at primary filament burnout. Lamp failures and resultant expenses during oscillograph printing are appreciably reduced.

B66-10048
NONCONTACTING TRANSDUCER MEASURES SHAFT TORQUE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ FEB. 1966
M-FS-474
Transducer for measuring the output torque of a rotating shaft uses a magnetically permeable sleeve fitted over a section of the shaft which deflects axially in direct proportion to the output torque. A corresponding change in reluctance occurs in pickup coils mounted in close proximity to the sleeve. This change is measured by attached conventional circuitry.

B66-10050
SINGLE CONNECTOR PROVIDES SAFETY FUSES FOR MULTIPLE LINES
WEBER, G. J. /MCDONNELL AIRCRAFT./ FEB. 1966
MSC-199
Fuse-bearing sleeve which is inserted between the male and female members of a multiple-line connector contains a safety fuse for each pin of the connector assembly. The sleeve is easily and quickly opened for fuse replacement.

B66-10051
FERROELECTRIC BOLOMETER MEASURES RF ABSOLUTE POWER AT SUBMILLIMETER WAVELENGTHS
COHN, M. RODGERS, J. D. /ADVANCED TECHNOL. CORP./ FEB. 1966
GSFC-422
Two ferroelectric bolometer sensing elements measure low rf absolute power at millimeter and submillimeter wavelengths. The sensing elements are mounted in sections of waveguide and connected in series in a standard temperature compensating bridge circuit.

B66-10057
MINIATURE BIOELECTRIC DEVICE ACCURATELY MEASURES AND TELEMETERS TEMPERATURE
FRYER, T. B. FEB. 1966 SEE ALSO B64-10171
ARC-52
Miniature micropower solid-state circuit measures and telemeters the body temperature of laboratory animals over periods up to two years. The circuit employs a thermistor as a temperature sensing element and an FM transmitter. It is constructed from conventional discrete components or integrated circuits.

B66-10062
FORTRAN PROGRAM FLOWCHART IS AUTOMATICALLY PRODUCED
CLARK, D. J. WILLIAMS, D. /GE/ FEB. 1966
M-FS-369
Computer under control of the FLO-TRAN program automatically produces and updates flowcharts of Fortran program source decks fed to it. The flowcharts are produced on either 35mm film or paper.

B66-10064
TRANSMISSION SYSTEM ISOLATES PRESSURE TRANSDUCER FROM SEVERE ENVIRONMENT
INNOVATOR NOT GIVEN /SPACE-GEN. CORP./ FEB. 1966
WOO-239
Pressure transmission system measures the pressure of a high temperature, chemically active fluid by isolating the pressure transducer from the process fluid without component disconnections.

B66-10066
ANTENNA CONFIGURATIONS PROVIDE POLARIZATION DIVERSITY
SCHUMACHER, C. N. /CUTLER HAMMER/ FEB. 1966
GSFC-74
Compact back-to-back trapezoidal tooth log-periodic /TTLP/ antenna with frequency-independent characteristics is formed by reducing the angle between the two elements of a basic TTLP to zero. The back-to-back antenna, arranged in various configurations, provides monopulse operations in one or two planes and in various polarizations.

B66-10067
AUXILIARY COIL CONTROLS TEMPERATURE OF RF INDUCTION HEATER
INNOVATOR NOT GIVEN /GEN. DYN./ELECTRON./ FEB. 1966
GSFC-428
Auxiliary coil controls the temperature of an rf induction furnace that is powered by a relatively unstable rf generator. Manual or servoed adjustment of the relative position of the auxiliary coil, which is placed in close proximity to the rf coil, changes the looseness of the rf coil and hence the corresponding heating effect of its rf field.

B66-10068
SENSOR DETECTS HYDROCARBON OIL CONTAMINANTS IN FLUID LINES
ROTH, B. /N. AM. AVIATION/ FEB. 1966 SEE ALSO B63-10311
M-FS-522
Sensor with ultraviolet light monitors and detects hydrocarbon oil contaminants present in fluid lines. The light causes the oil particles to fluoresce. This light emitted by the oil particle is detected by a photocell which is relatively insensitive to ultraviolet radiation.

B66-10082
ROD AND DISH CATHODE IMPROVES PENNING-TYPE VACUUM GAUGE
PEPPIN, G. B. /HUGHES AIRCRAFT CO./ MAR. 1966
GSFC-447
Improved penning-type ionization gauge provides range and sensitivity required to measure gas pressure below .01 torr under high vacuum conditions. The gauge uses a highly conductive cathode composed of two disks of high magnetic permeability separated by a rod of low magnetic permeability.

B66-10084
REFRACTORY COATING PROTECTS INTRICATE GRAPHITE ELEMENTS FROM HIGH-TEMPERATURE HYDROGEN
FERRIS, J. R. PATTERSON, R. L. STEFFEN, R. J. VOGEL, C. E. /WESTINGHOUSE ASTRONUCL. LAB./
MAR. 1966
NU-0027
Refractory coating protects graphite heater elements operating at high temperature in a hydrogen atmosphere. The coating is formed by painting the graphite elements with a composition containing powdered tungsten, and heat-treating it.

B66-10085
SEISMOMETER DESIGNED FOR REMOTE OPERATION IN RANDOM ORIENTATION
LEHNER, F. E. /CALIF. INST. OF TECH./ MAR. 1966
JPL-320
Portable seismometer mounted in a rugged housing can be placed in inaccessible locations and operate efficiently in other than a vertically upright position. The instrument housing contains an amplifier, transmitter, and antenna to relay measurement data to a receiving station.

B66-10088
GELATIN COATED ELECTRODES ALLOW PROLONGED BIOELECTRONIC MEASUREMENTS
INNOVATOR NOT GIVEN /INST. OF RES. AND INSTRUMENTATION/ MAR. 1966 SEE ALSO B64-10025, B65-10015, AND B65-10320
MSC-153
Silver electrodes treated with an anodizing electrolyte containing gelatin are used for long term monitoring of bioelectronic potentials in humans. The electrodes do not interact with perspiration, cause skin irritation, or promote the growth of bacteria.

B66-10089
AUTOMATIC GAIN CONTROL CIRCUIT HANDLES WIDE INPUT RANGE
BLACK, S. H. /SPERRY GYROSCOPE CO./ MAR. 1966
MSC-166
Automatic gain control circuit for a radio receiver handles a wide range of input signal levels without overloading the output stage. The transistorized circuit maintains a relatively constant output by varying attenuation of the input signal.

B66-10091
VAPOR GROWN SILICON DIOXIDE IMPROVES TRANSISTOR BASE-COLLECTOR JUNCTIONS
CARLEY, D. R. /RCA/ DUCLOS, R. A. MAR. 1966
GSFC-389
Vapor grown silicon dioxide layer protects base-collector junction in silicon planar transistors during the emitter diffusion process. This oxide fills in any imperfections that exist in the thermally grown oxide layer and is of greater thickness than that layer. This process is used

to deposit protective silicon dioxide coatings on optical surfaces.

B66-10094
SYSTEM PROPORTIONS FLUID-FLOW IN RESPONSE TO DEMAND SIGNALS
INNOVATOR NOT GIVEN /CURTISS-WRIGHT CORP./
GSFC-457
Control system provides proportioned fluid flow rates in response to demand signals. It compares a digital signal, representing a flow demand, with a reference signal to yield a control voltage to one or more solenoid valves connected to orifices of a predetermined size.

B66-10097
COMPUTER PROGRAM SIMPLIFIES SELECTION OF STRUCTURAL STEEL COLUMNS
VISSING, G. S. MAR. 1966
NU-0044
Computer program rapidly selects appropriate size steel columns and base plates for construction of multistory structures. The program produces a printed record containing the size of a section required at a particular elevation, the stress produced by the loads, and the allowable stresses for that section.

B66-10099
CAPACITIVE SYSTEM DETECTS AND LOCATES FLUID LEAKS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1966
M-FS-478
Electronic monitoring system automatically detects and locates minute leaks in seams of large fluid storage tanks and pipelines covered with thermal insulation. The system uses a capacitive tape-sensing element that is adhesively bonded over seams where fluid leaks are likely to occur.

B66-10101
RING COUNTER CIRCUIT SWITCHES MULTIPHASE MOTOR DIRECTION OF ROTATION
FAIRBANKS, A. F. /SPACE TECH. LABS./ MAR. 1966
JPL-SC-166
Solid state three-phase counter circuit reverses the direction of rotation of a multiphase motor without changing the phase wiring of the supply current source.

B66-10103
MOUNT MAKES LIQUID NITROGEN-COOLED GAMMA RAY DETECTOR PORTABLE
FESSLER, T. E. MAR. 1966
LEWIS-259
Liquid nitrogen-cooled gamma ray detector system is made portable by attaching the detector to a fixture which provides a good thermal conductive path between the detector and the liquid nitrogen in a Dewar flask and a low heat leak path between the detector and the external environment.

B66-10105
ANGULAR ACCELERATION MEASURED BY DEFLECTION IN SENSING RING
RICHARD, R. R. MAR. 1966
MSC-250
Small, lightweight angular accelerometer performs reliably when subjected to harsh temperature and vibration environments. The device uses strain gauges to measure the amount of deflection in a metal ring caused by movement of inertial masses mounted through the ring. Range of the instrument is varied by varying the value of inertial masses.

B66-10106
LOW-POWER RING COUNTER DRIVES HIGH-LEVEL LOADS
INNOVATOR NOT GIVEN /SPERRY RAND/ MAR. 1966
GSFC-431
Ring counter dissipates very low power in standby conditions, yet drives high-current loads on a low duty-factor basis. Complementary transistors are used so that in one selected stage both transistors are conducting while the transistors of the other stage are cut off.

B66-10109
CHARGED PROBES, BOURDON TUBES MAINTAIN CRYOGENIC LIQUID LEVEL
KREJSA, M. J. MAY 1966
LEWIS-261
Automatic liquid nitrogen dispensing system maintains the fluid level in a nitrogen cold trap. The system uses gas-filled probes which drive bourdon tube gauges equipped with microswitches that, through a relay, control a solenoid valve in the liquid nitrogen line.

B66-10112
NEW TELEVISION CAMERA ELIMINATES VIDICON TUBE
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./
MAY 1966
M-FS-472
Small, lightweight camera systems use solid state imaging devices in the form of phototransistor mosaic sensors instead of vidicon tubes for light sensing and image conversion. The digital logic circuits scan the sensor mosaic at 60 frames per second to produce pictures composed of a series of dots rather than lines.

B66-10113
IMPROVED CHOPPER CIRCUIT USES PARALLEL TRANSISTORS
INNOVATOR NOT GIVEN /IBM/ MAR. 1966
M-FS-468
Parallel transistor chopper circuit operates with one transistor in the forward mode and the other in the inverse mode. By using this method, it acts as a single, symmetrical, bidirectional transistor, and reduces and stabilizes the offset voltage.

B66-10126
VARIABLE-CAPACITANCE TACHOMETER ELIMINATES TROUBLESOME MAGNETIC FIELDS
INNOVATOR NOT GIVEN /BENDIX CORP./ MAR. 1966
GSFC-435
Dual variable-capacitance tachometer measures angular speed and sense of rotation without magnetic components. Thus it eliminates magnetic flux interference with associated instrumentation in an electromechanical system.

B66-10127
APPARATUS MEASURES THERMAL CONDUCTIVITY OF HONEYCOMB-CORE PANELS
MAR. 1966
LANGLEY-202
Overall thermal conductivity of honeycomb-core panels at elevated temperatures is measured by an apparatus with a heater assembly and a calibrated heat-rate transducer. The apparatus has space between the heater and transducer for insertion of a test panel and insulation.

B66-10128
OPTICAL GYRO PICKOFF OPERATES AT CRYOGENIC TEMPERATURES
INNOVATOR NOT GIVEN /GE/ MAR. 1966
M-FS-407
Two-axis pickoff for cryogenic gyros uses solid-state light sources and sensors. This compact system operates efficiently at cryogenic temperatures.

B66-10129
DIGITALLY CONTROLLED PULSE-LEVEL DISCRIMINATOR OPERATES OVER WIDE VOLTAGE RANGE
CANCRO, C. A. MAR. 1966
GSFC-324
Low power drain discriminator circuit generates an output pulse when an input pulse exceeds a discrete digitally controlled threshold voltage. The discriminator operates over a wide linear or nonlinear range of threshold levels. It uses several amplifier stages ahead of a fixed-reference threshold detector.

B66-10130
MATERIALS PHYSICALLY TESTED IN VARIABLE-ENVIRONMENT CHAMBER
KNOELL, A. C. MAR. 1966
JPL-789
Controlled environment chamber for physical tests

of crushable materials encloses both the test specimen and the devices for performing the tests. The chamber may be stepped through a range of changing environment.

B66-10133
OMNIDIRECTIONAL ANTENNAS TRANSMIT AND RECEIVE OVER LARGE BANDWIDTH
WOODWARD, O. M., JR. /RCA/ MAR. 1966
GSFC-436
For exchanging wideband signals between two distant ground stations, low-gain antennas with wide angular coverage and circular polarization are mounted on a single mast extending from a satellite. The transmitting antenna has two decoupled ports or inputs for eliminating switching problems when using two transmitters on different frequencies.

B66-10134
HIGH TEMPERATURE THERMOCOUPLE OPERATES IN REDUCTION ATMOSPHERE
HOFF, R. G. /AEROJET-GEN. CORP./ MAR. 1966
NU-0046
Thermocouple continuously measures a flowing gas up to 4500 degrees F in a hazardous environment. The thermocouple combines rhenium and tungsten in the probe, housing, and swaged extension lead. The wires extend continuously from the cold junction to the probe tip to eliminate errors from secondary thermocouple effects.

B66-10141
OPTICALLY DRIVEN SWITCH TURN-OFF TIME REDUCED BY OPAQUE COATINGS
INNOVATOR NOT GIVEN /IBM/ APR. 1966
JPL-SC-107
Turn-off response time of an optically driven switch is reduced by placing an opaque covering over the passivating silicon dioxide members. The coating prevents photon absorption so that carriers are not trapped or stored on the base region, thus shortening turn-off time.

B66-10142
DIFFUSION TECHNIQUE STABILIZES RESISTOR VALUES
GALLAGHER, R. C. GIULIANO, M. N. /WESTINGHOUSE ELEC. CORP./ APR. 1966
MSC-205
Reduction of the contact resistance stabilizes the values, over a broad temperature range, of resistors used in linear integrated circuits. This reduction is accomplished by P-plus diffusion under the alloyed aluminum contacts.

B66-10144
MOUNTING IMPROVES HEAT-SINK CONTACT WITH BERYLLIA WASHER
INNOVATOR NOT GIVEN /COLLINS RADIO CO./ APR. 1966 SEE ALSO B63-10033
MSC-194
To conduct heat away from electrical components that must be electrically insulated from a metal heat sink, a metal washer and a coil spring are placed between one end of the electrical component and the beryllia washer mounted on the heat sink. The thermal paths are formed by the component lead and base, the metal and beryllia washers, and the compressed spring.

B66-10147
POLYMER DEFORMATION GAUGE MEASURES THICKNESS CHANGE IN TENSILE TESTS
BROYLES, H. F. BROYLES, H. H. APR. 1966
JPL-745
Lightweight deformation gauge attached to a polymer specimen determines the thickness changes undergone by the specimen during the testing of its tensile and elongation properties. Mechanical noise from outside sources is dampened when the assembly is hung on a light rubber band.

B66-10148
TESTER PERIODICALLY REGISTERS DC AMPLIFIER CHARACTERISTICS
CREE, D. WENZEL, G. E. APR. 1966
MSC-190
Motor-driven switcher-recorder periodically registers the zero drift and gain drift signals of a dc amplifier subjected to changes in environment. A time coding method is used since several measurements are shared on a single recorder trace.

B66-10158
SWITCHING MECHANISM SENSES ANGULAR ACCELERATION
INNOVATOR NOT GIVEN /BALL BROS. RES. CORP./ APR. 1966
GSFC-462
Switching mechanism actuates an electrical circuit when a predetermined angular acceleration and displacement are reached. A rotor in the mechanism overcomes the restraint of a magnetic detent when the case in which the detent is mounted reaches the predetermined angular acceleration.

B66-10159
IMPROVED SYSTEM MEASURES OUTPUT ENERGY OF PYROTECHNIC DEVICES
SHORTLY, E. M. /N. AM. AVIATION/ APR. 1966
WOO-256
System for measuring the output energy of pyrotechnic devices discharges the reaction products into a test chamber. It measures the radiant heat output from a pinhole aperture as well as internal pressure changes on a common time base.

B66-10160
ELECTROPNEUMATIC TRANSDUCER AUTOMATICALLY LIMITS MOTOR CURRENT
LOVITT, T. F. APR. 1966
LEWIS-253
Pneumatic controller regulates the load on a centrifugal freon compressor in a water cooling system, thus limiting the current input to an electric motor driving it. An electromechanical transducer monitoring the motor input current sends out air signals which indicate changes in the current to the pneumatic controller.

B66-10161
TRANSDUCER MEASURES FORCE IN VACUUM ENVIRONMENT
GLENN, D. C. APR. 1966
LEWIS-218
Transducer assembly measures force in a vacuum environment. The assembly consists of a standard capacitance probe and a torque beam. This transducer can be used in high-pressure as well as in low-pressure environments for static and dynamic force measurements.

B66-10162
FIXTURE AIDS SOLDERING OF ELECTRONIC COMPONENTS ON CIRCUIT BOARD
ROSS, M. H. APR. 1966
ARC-56
Spring clamp fixture holds small electronic components in a desired position while they are being soldered on a circuit board. The spring clamp is clipped on the edge of the circuit board and an adjustable spring-steel boom holds components against the board. The felt pad at the end of the boom is replaced with different attachments for other holding tasks.

B66-10163
TWO-LIGHT CIRCUIT CONTINUOUSLY MONITORS AC GROUND, PHASE, AND NEUTRAL WIRES
MEE, R. W. /N. AM. AVIATION/ APR. 1966
MSC-356
Two-transformer, two-lamp circuit monitors the continuity of ac ground, neutral, and phase wires. The circuit gives different visual indications if any one of the three lines should become open circuited.

B66-10164
FATIGUE TESTER ACHIEVES TRUE AXIAL MOTION THROUGH FLEX PLATES AND BARS
HENGSTENBERG, T. F. /WESTINGHOUSE ASTRONUCLEAR LAB./ KURINKO, C. D. APR. 1966
NU-0021
Lever load-amplifying fatigue testing machine with

a load cycle frequency of 100 to 900 cycles per minute applies the load through true axial motion. Pivot friction and bearing wear are eliminated by replacing these parts with flex plates and bars.

B66-10170
SCANNING PHOTOMETER SYSTEM AUTOMATICALLY DETERMINES ATMOSPHERIC LAYER HEIGHT
WOLFF, M. /MASS. INST. OF TECH./ APR. 1966
MSC-245
Two photometers, placed a given distance apart, determine the height of nonuniform luminous layers in a synchronous manner. Photometer outputs are correlated by a simple analog correlation computer to automatically give the luminous layer height. This system is used to determine visibility ceilings at airports.

B66-10177
BINARY FLUID AMPLIFIER SOLVES STABILITY AND LOAD PROBLEMS
LARKIN, B. D. READER, T. D. /GIANNINI CONTROLS CORP./ MAY 1966
ERC-15
Digital fluid amplifier has load intensity, high stability, and operates at low Reynolds numbers. It contains specially designed nozzles to provide uniform exit-velocity profiles and to ensure jets of low turbulence.

B66-10179
COMPLEMENTARY MONOSTABLE CIRCUITS ACHIEVE LOW POWER DRAIN AND HIGH RELIABILITY
KLEINBERG, L. L. LAVIGNE, R. C. MAY 1966
GSFC-433
Two-transistor multivibrator has minimum power dissipation and maximum reliability. It minimizes the use of components that are subject to enviromental changes or other unpredictable behavior.

B66-10180
THIN-FILM GAGE MEASURES LOW HEAT-TRANSFER RATES
SPITZER, C. R. MAY 1966
LANGLEY 205
Low heat-transfer gauge facilitates determination of the transition between laminar and turbulent conditions, in the boundary layer surrounding slender and moderately slender cones under test in a hypersonic blowdown helium tunnel. The gauge consists of a thin layer of vacuum- evaporated platinum on a heat resistant glass substrate contoured to fit model surfaces.

B66-10182
SUBMINIATURIZED GAS CHROMATOGRAPH GIVES FAST, EFFICIENT ANALYSIS
WILHITE, W. F. MAY 1966
JPL-735 JPL-736 JPL-737 JPL-740
Space oriented, lightweight, subminiaturized gas chromatograph analyzes gas samples in a few seconds with a carrier gas flow of one milliliter per second. In extraterrestrial exploration, the system could be used with a mass spectrometer for detection of life-supporting compounds.

B66-10192
COATING PERMITS USE OF STRAIN GAGE IN WATER AND LIQUID HYDROGEN
BERVEN, B. B. /N. AM. AVIATION/ MAY 1966
M-FS-594
Strain gauge installation covered with a three-layer coating of commercial materials makes measurements in water and liquid hydrogen. It consists of a selected foil strain gauge bonded with a modified commercial heat-curing epoxy cement. The outer protective layer of the gauge installation may develop cracks when immersed in liquid hydrogen.

B66-10193
SOLID STATE THERMOSTAT HAS INTEGRAL PROBE AND CIRCUITRY
INNOVATOR NOT GIVEN /METRO PHYS., INC./ MAY 1966
M-FS-434
Compact, reliable thermostat provides a temperature readout signal and a continuous temperature-control output for temperature monitoring by automatic checkout equipment or telemetry systems. It employs a solid state circuit in a housing rigidly attached to a thermistor probe.

B66-10198
DEVICE WITHOUT ELECTRICAL CONNECTIONS IN TANK MEASURES LIQUID LEVEL
SHENKMAN, J. S. /V. K. C. AEROJET-GEN. CORP./ MAY 1966
WOO-235
Vertical static float in a tank measures the liquid level without the use of electrical connections in the tank. The float transmits the buoyant force of the liquid to an external force transducer. It is insensitive to tank pressure and temperature changes.

B66-10200
APPARATUS PRESENTS VISUAL DISPLAY OF SEMICONDUCTOR SURFACE CHARACTERISTICS
SUMMERS, R. A. MAY 1966
JPL-665
Apparatus provides a representation of the physicochemical condition of the surface layers of a semiconductor. It is based on the principle that the surface layers of a semiconductor will conduct an electric current when exposed to a beam of light.

B66-10203
SOLDERING IRON TEMPERATURE IS AUTOMATICALLY REDUCED
LUM, J. Y. MAY 1966
ARC-57
Hinged cradle-microswitch arrangement maintains a soldering iron at less than peak temperature when not in use. The microswitch introduces a voltage reducing element into the soldering iron power circuit when the iron is placed on the cradle. The iron, when removed from the cradle, returns to operating temperature in 15 to 30 seconds.

B66-10205
WIDE-RANGE INSTRUMENT MONITORS FLOW RATES OF CHEMICALLY ACTIVE FLUIDS
INNOVATOR NOT GIVEN /SPACELABS/ MAY 1966
MSC-186
In-like transducers system measures flow rate of chemically active propellant fluids. The system uses one low-flow transducer and one high-flow transducer. Each consists of separate heater and temperature-sensing elements.

B66-10220
ULTRASONIC RECORDING SCANNER USED FOR NONDESTRUCTIVE WELD INSPECTION
INNOVATOR NOT GIVEN /BOEING CO./ MAY 1966 SEE ALSO B66-10178
M-FS-284
Portable ultrasonic recording scanner is used for nondestructive inspection of welds. It is adaptable to continuous operation in one direction while maintaining oscillatory motion at a right angle to this direction. The scanning speed and oscillation frequency are independently adjustable.

B66-10223
MULTICOLOR STROBOSCOPE PINPOINTS RESONANCES IN VIBRATING COMPONENTS
INNOVATOR NOT GIVEN /CALIF. INST. RES. FOUND./ MAY 1966
JPL-0033
Stroboscopic system, which uses three different colored lights, rapidly scans a multicomponent assembly and provides a visual indication of resonant components. The lights are pulsed at the same flash frequency but at different phases.

B66-10224
FET COMPARATOR DETECTS ANALOG SIGNAL LEVELS WITHOUT LOADING ANALOG DEVICE
WALLACE, H. L. /GE/ MAY 1966
M-FS-503
FET comparator circuit detects discrete analog computer output levels without excessively loading the output amplifier of the computer. An FET common source amplifier is coupled by a

differential amplifier to a bistable transistor flip-flop. This circuit provides a digital output for analog voltages above or below a predetermined level.

B66-10225
SINGLE-CRYSTAL SEMICONDUCTOR FILMS GROWN ON FOREIGN SUBSTRATES
VOHL, P. /RCA/ MAY 1966
WOO-076
Intermediate alloy formed between foreign substrates and semiconductor material enable the growth of single crystal semiconductor films on the alloy layer. The melted film must not ball up on the surface of the substrate and neither chemically react nor alloy with the intermediate alloy formed on the substrate.

B66-10232
ELECTRONIC PHASE-LOCKED-LOOP SPEED CONTROL SYSTEM IS STABLE
STONE, F. A. /RAYMOND ENG. LAB./ JUN. 1966
JPL-SC-084
Phase locked-loop circuit is used for playback motors in digital tape recorders where the reproducer output remains in exact synchronism with an external reference clock over extended periods. It removes the motor dynamics from the control loop so that the loop is stable without damping.

B66-10245
RUGGED MICROELECTRONIC MODULE PACKAGE SUPPORTS CIRCUITRY ON HEAT SINK
JOHNSON, A. L. /MINNEAPOLIS-HONEYWELL REGULATOR CO./ JUN. 1966
MSC-81A
Rugged module package for thin film hybrid microcircuits incorporated a rigid, thermally conductive support structure, which serves as a heat sink, and a lead wire block in which T-shaped electrical connectors are potted. It protects the circuitry from shock and vibration loads, dissipates internal heat, and simplifies electrical connections between adjacent modules.

B66-10251
POLARIZING KEYS PREVENT MISMATCH OF CONNECTOR PLUGS AND RECEPTACLES
CHIAPUZIO, A. /N. AM. AVIATION/ JUN. 1966
MSC-443
Keying prevents mismatching of plugs and receptacles in connector patching of instrumentation involving several thousand leads. Each receptacle and plug contains three polarizing keys that must mate in a complementary mode before the connector pins and sockets will engage.

B66-10260
MULTIPLE TEMPERATURES SAMPLED USING ONLY ONE REFERENCE JUNCTION
COPE, G. W. JUN. 1966
GSFC-485
In a multitemperature sampling system where the reference thermocouples are a distance from the test thermocouples, an intermediate thermal junction block is placed between the sets of thermocouples permitting switching between a single reference and the test thermocouples. This reduces the amount of cabling, reference thermocouples, and cost of the sampling system.

B66-10261
SIMPLIFIED CIRCUIT CORRECTS FAULTS IN PARALLEL BINARY INFORMATION CHANNELS
GOLDBERG, J. /STANFORD RES. INST./ JUN. 1966
SEE ALSO B65-10025
JPL-SC-090
Corrective circuit prevents the appearance of erroneous output signals from the possible failure of any single-channel element interconnected in parallel binary information channels. The circuit is simplified and economical because it does not use redundant channels.

B66-10264
BINARY SEQUENCE DETECTOR USES MINIMUM NUMBER OF DECISION ELEMENTS
PERLMAN, M. JUN. 1966
JPL-673
Detector of an n bit binary sequence code within a serial binary data system assigns states to memory elements of a code sequence detector by employing the same order of states for the sequence detector as that of the sequence generator when the linear recursion relationship employed by the sequence generator is given.

B66-10270
MAGNETICALLY OPERATED LIMIT SWITCH HAS IMPROVED RELIABILITY, MINIMIZES ARCING
STEINER, R. /N. AM. AVIATION/ JUN. 1966
MSC-422
Limit switch for reliable, low-travel, snap action with negligible arcing uses an electrically nonconductive permanent magnet consisting of a ferrimagnetic ceramic and ferromagnetic pole shoes which form a magnetic and electrically conductive circuit with a ferrous-metal armature.

B66-10271
PN ACQUISITION DEMODULATOR ACHIEVES AUTOMATIC SYNCHRONIZATION OF A TELEMETRY CHANNEL
COUVILLON, L. JUN. 1966
JPL-612
Data demodulator for automatic sync acquisition provides an automatic means for obtaining initial word and bit synchronization in a pulse-code-modulated/phase-shift-keyed digital communications system.

B66-10272
EXCLUSIVE-OR LOGIC CIRCUIT HAS USEFUL PROPERTIES
BATTE, W. G. JUN. 1966
LANGLEY-214
Single, simple exclusive-or logic connective eliminates excessive hardware and the number of interconnections between logic modules. This circuit performs the necessary switching for the exclusive-or operation and amplifies, restores, and inverts the signal.

B66-10274
BRAZE ALLOYS USED AS TEMPERATURE INDICATORS
RICE, R. E. /AEROJET-GEN. CORP./ SHURLEY, L. A. JUN. 1966
NU-0063
Patches of braze alloys having known fusion are applied to portions of a metal surface where temperature indicators are required. This method is used to measure temperatures over the range of 175 degrees to 2100 degrees fahrenheit where it is not feasible to employ conventional temperature detectors.

B66-10280
STRAIN GAUGE NETWORK DISTINGUISHES BETWEEN THERMAL AND MECHANICAL DEFORMATIONS
CEPOLLINA, F. J. JUN. 1966
GSFC-478
Strain gauge network measures the thermal coefficient of linear expansion of composite metal structures. The network consists of a test gauge and two dummy gauges arranged to distinguish thermally induced deformation from mechanical strain.

B66-10282
SIMPLE CIRCUIT PROVIDES RELIABLE MULTIPLE SIGNAL AVERAGE AND REJECT CAPABILITY
OPENSHAW, R. L. /AEROJET-GEN. CORP./ JUN. 1966
NU-0069
Summation average and reject circuit based on diode clamping allows detection of individual functional deviations in a multiple signal system without shutting down the entire system.

B66-10286
VACUUM TEST FIXTURE IMPROVES LEAKAGE RATES MEASUREMENTS
MAIER, H. MARX, H. /GRUMMAN AIRCRAFT CORP./ JUN. 1966
MSC-271

Cylindrical chamber, consisting of two matching halves, forms a vacuum test fixture for measuring leakage rates of individual connections, brazed joints, and entrance ports used in closed fluid flow line systems. Once the chamber has been sufficiently evacuated, atmospheric pressure holds the two halves together.

B66-10287
DETECTION SYSTEM ENSURES POSITIVE ALARM ACTIVATION IN DIGITAL MESSAGE LOSS
BOKROS, P. BURSTEIN, A. HEWITT, E. D. /RCA/ JUN. 1966
WOO-208
Lost Word Detection System /LOWDS/ provides special identification for each error detection message transmitted from receiver to transmitter. The message is identified as an original message or an n-times retransmitted message so the receiver can detect where a retransmission request was not fulfilled and activate an alarm.

B66-10291
LARGE CAPACITOR PERFORMS AS A DISTRIBUTED PARAMETER PULSE LINE
GOODING, T. J. /GEN. DYN./ASTRONAUTICS/ JUL. 1966
LEWIS-176
Capacitor of extended foil construction performs as a distributed parameter pulse line in which current, amplitude, and period are readily controlled. The capacitor is used as the energy storage element in a pulsed plasma accelerator.

B66-10292
CIRCUIT PROTECTS REGULATED POWER SUPPLY AGAINST OVERLOAD CURRENT
AIRTH, H. B. /WESTINGHOUSE ELEC. CORP./ JUL. 1966
GSFC-453
Sensing circuit in which a tunnel diode controls a series regulator transistor protects a low voltage transistorized dc regulator from damage by excessive load currents. When a fault occurs, the faulty circuit is limited to a preset percentage of the current when limiting first occurs.

B66-10293
DAMPING TECHNIQUE GIVES ACCELEROMETER FLAT FREQUENCY RESPONSE
WING, T. /GULTON IND./ JUL. 1966
M-FS-471
Piezoelectric accelerometer uses a viscous damping technique to achieve a flat frequency response over a wide frequency range in high acoustic environments. This eliminates the electrical overload on associated electronics and loss of useful data caused by oscillations of the accelerometer.

B66-10295
SUBSTITUTING TRANSISTOR FOR DIODE IMPROVES RECTIFYING MEANS
MULLER, R. M. JUL. 1966
GSFC-474
Unusual transistor connection that substitutes for a silicon diode and allows significantly higher repetition rates without increasing power loss rectifies an alternating current. Operation speed is improved by a factor of 10 or more when a given diode is replaced by this transistor circuit.

B66-10300
COMPUTER PROGRAM DETERMINES GAS FLOW RATES IN PIPING SYSTEMS
FRANKE, R. /BOEING CO./ JUL. 1966
M-FS-443
Computer program calculates the steady state flow characteristics of an ideal compressible gas in a complex piping system. The program calculates the stagnation and total temperature, static and total pressure, loss factor, and forces on each element in the piping system.

B66-10306
INSTRUMENT CALCULATES MOMENTS OF INERTIA OF COMPLEX PLANE FIGURES
MYERS, W. J. /N. AM. AVIATION/ JUL. 1966
MSC-628
Instrument consisting of a narrow field scanner coupled with a simple preprogrammed computer calculates distributive-area properties of complex or irregular plane figures representing cross sections of structural members. The calculator obtains the properties quickly and with a high degree of accuracy.

B66-10308
MICROPHONE MULTIPLEX SYSTEM PROVIDES MULTIPLE OUTLETS FROM SINGLE SOURCE
LAUVER, R. E. AUG. 1966
GSFC-426
Microphone multiplex system accepts an audio signal from a single source and provides any number of low impedance outputs at microphone level with complete isolation between output channels. Any input or output may be converted to high impedance by eliminating the associated transformer.

B66-10309
HIGH-PERFORMANCE RC BANDPASS FILTER IS ADAPTED TO MINIATURIZED CONSTRUCTION
JUL. 1966
ARC-60
Miniaturized bandpass filter with RC networks is suitable for use in integrated circuits. The circuit consists of three stages of amplification with additional resistive and capacitive components to obtain the desired characteristics. The advantages of the active RC filter network are the reduction in size and weight and elimination of magnetic materials.

B66-10315
SYSTEM LOCATES RANDOMLY PLACED REMOTE OBJECTS
LOVELADY, R. W. MC FALL, J. C., JR. JUL. 1966
LANGLEY-209
System to locate objects submerged underwater uses active/passive sonar techniques in which a transmitter is attached to the object to be recovered and a receiver is used for search. The system is rugged, has a long term operating life, and furnishes a precise bearing on the object.

B66-10320
SOLVENT RESIDUE CONTENT MEASURED BY LIGHT SCATTERING TECHNIQUE
SALKOWSKI, M. J. WERLE, D. K. /IIT RES. INST./ JUL. 1966
M-FS-850
Photometric analyzer measures NVR /nonvolatile residue/ in trichloroethylene and other organic solvents. The analyzer converts the liquid solvent to aerosol and passes it between an optically focused light beam and a photodetector that is connected to standard amplifying and readout equipment.

B66-10324
INSTRUMENT TRANSMITS VANISHING POINT TO ILLUSTRATION POINT
ALVAREZ, M. M. /N. AM. AVIATION/ JUL. 1966
MSC-267A
Instrument transmits the vanishing point of an illustration to a point on the illustration on a diminishing scale that also serves as a straightedge.

B66-10331
CIRCUIT PROVIDES ACCURATE FOUR-QUADRANT MULTIPLICATION
MC GOWAN, G. F. /MARTIN-MARIETTA CORP./ JUL. 1966
WOO-272
Solid state circuit provides four-quadrant multiplication at frequencies ranging from dc to 100 cps using pulse-width and -height multiplication techniques. The circuit consumes little power and has an accuracy of approximately one percent.

B66-10341
ULTRASONIC EMISSION METHOD ENABLES TESTING OF ADHESIVE BONDS
FRANK, L. SCHMITZ, G. /GEN. AM. TRANSPORTATION

CORP./ AUG. 1966
M-FS-799
Detection of acoustic energy emitted by adhesive bonds subjected to tensile stresses at frequencies above sixteen kilocycles per second is used as a method for determining bond strength. This method is used in measuring adhesive bond strengths on metal honeycomb core panels.

B66-10344
PHASE INVERTER PROVIDES VARIABLE REFERENCE PUSH-PULL OUTPUT
INNOVATOR NOT GIVEN /RCA/ AUG. 1966
HQ-23
Dual-transistor difference amplifier provides a push-pull output referenced to a dc potential which can be varied without affecting the signal levels. The amplifier is coupled with a feedback circuit which can vary the operating points of the transistors by equal amounts to provide the variable reference potentials.

B66-10347
DUST PARTICLE INJECTOR FOR HYPERVELOCITY ACCELERATORS PROVIDES HIGH CHARGE-TO-MASS RATIO
BERG, O. E. AUG. 1966
GSFC-509
Injector imparts a high charge-to-mass ratio to microparticles and injects them into an electrostatic accelerator so that the particles are accelerated to meteoric speeds. It employs relatively large masses in the anode and cathode structures with a relatively wide separation, thus permitting a large increase in the allowable injection voltages.

B66-10349
ELECTRICALLY CONDUCTIVE FIBERS THERMALLY ISOLATE TEMPERATURE SENSOR
DE WAARD, R. NORTON, B. /BARNES ENG. CO./ AUG. 1966
GSFC-456
Mounting assembly provides thermal isolation and an electrical path for an unbacked thermal sensor. The sensor is suspended in the center of a plastic mounting ring from four plastic fibers, two of which are coated with an electrically conductive material and connected to electrically conductive coatings on the ring.

B66-10350
TRANSISTOR CIRCUIT INCREASES RANGE OF LOGARITHMIC CURRENT AMPLIFIER
GILMOUR, G. /WESTINGHOUSE ASTRONUCL. LAB./ AUG. 1966
NU-0018
Circuit increases the range of a logarithmic current amplifier by combining a commercially available amplifier with a silicon epitaxial transistor. A temperature compensating network is provided for the transistor.

B66-10351
FUNCTION GENERATOR ELIMINATES NECESSITY OF SERIES SUMMATION
CALLAN, J. D. MC CALL, A. J. MEAD, D. /HUGHES AIRCRAFT CO./ AUG. 1966
GSFC-214
Diode generator using four building-block circuits produces complex waveforms without the necessity of series summation. This highly specialized method of producing complex waveforms requires less power than present methods and uses simpler circuitry.

B66-10353
ACCELERATION-COMPENSATED PRESSURE TRANSDUCER HAS FAST RESPONSE
INNOVATOR NOT GIVEN /CORNELL AERON. LAB./ AUG. 1966
LANGLEY-113
Flush-diaphragm transducer accurately measures small dynamic pressures when it is subjected to high accelerations and severe temperature environments. The transducer uses piezoelectric crystals for measuring the pressure and balancing out acceleration forces.

B66-10355
BRUSHLESS DC MOTOR HAS HIGH EFFICIENCY, LONG LIFE
STUDER, P. A. AUG. 1966
GSFC-181
Brushless dc motor operates as a commutator in a vacuum environment with high efficiency and long life. Because of its excellent response time, it can be used in the servomechanism field.

B66-10356
SNIFFER USED AS PORTABLE HYDROGEN LEAK DETECTOR
DAYAN, V. H. ROMMEL, M. A. /N. AM. AVIATION/ AUG. 1966
M-FS-846 M-FS-806
Sniffer type portable monitor detects hydrogen in air, oxygen, nitrogen, or helium. It indicates the presence of hydrogen in contact with activated palladium black by a change in color of a thermochromic paint, and indicates the quantity of hydrogen by a sensor probe and continuous readout.

B66-10359
DEVICE SERVES AS HINGE AND ELECTRICAL CONNECTOR FOR CIRCUIT BOARDS
BETHEL, P. G. HARRIS, G. G. /CHRYSLER CORP./ AUG. 1966
M-FS-743
Hinge makes both sides of electrical circuit boards readily accessible for component checkout and servicing. The hinge permits mounting of two circuit boards and incorporates connectors to maintain continuous electrical contact between the components on both boards.

B66-10361
NEW COMPUTER SYSTEM SIMPLIFIES PROGRAMMING OF MATHEMATICAL EQUATIONS
REINFELDS, J. SEITZ, R. N. WOOD, L. H. AUG. 1966
M-FS-441
Automatic Mathematical Translator /AMSTRAN/ permits scientists or engineers to enter mathematical equations in their natural mathematical format and to obtain an immediate graphical display of the solution. This automatic-programming, on-line, multiterminal computer system allows experienced programmers to solve nonroutine problems.

B66-10362
AUTOMATED DRAFTING SYSTEM USES COMPUTER TECHNIQUES
MILLENSON, D. H. /N. AM. AVIATION/ AUG. 1966
M-FS-788
Automated drafting system produces schematic and block diagrams from the design engineers freehand sketches. This system codes conventional drafting symbols and their coordinate locations on standard size drawings for entry on tapes that are used to drive a high speed photocomposition machine.

B66-10363
INFRARED TELEVISION USED TO DETECT HYDROGEN FIRES
PROFFITT, R. T. /N. AM. AVIATION/ AUG. 1966
M-FS-654
Standard, commercially available closed circuit television system detects hydrogen fires in test facilities. It sees in the infrared and displays on a standard cathode ray monitor screen.

B66-10368
HYDROGEN FIRE DETECTION SYSTEM FEATURES SHARP DISCRIMINATION
BRIGHT, C. S. /N. AM. AVIATION/ AUG. 1966
M-FS-643
Hydrogen fire detection system discovers fires by detecting the flickering ultraviolet radiation emitted by the OH molecule, a short-lived intermediate combustion product found in hydrogen-air flames. In a space application, the system discriminates against false signals from sunlight and rocket engine exhaust plume radiation.

B66-10374
PNEUMATIC BINARY ENCODER REPLACES MULTIPLE SOLENOID SYSTEM
INNOVATOR NOT GIVEN /WESTON HYDRAULICS/ AUG. 1966
M-FS-665
Pneumatic binary encoder replaces solenoid system in the pilot stage of a digital actuator. The encoder operates in flip-flop manner to valve gas at either high or low pressures. By rotating the disk in a pinion-to-encoding gear ratio, six to eight adder circuits may be operated from single encoder.

B66-10376
EFFICIENT DC TO DC CONVERTER ELIMINATES LARGE STRAY MAGNETIC FIELDS
TUMS, E. O. /CHICAGO UNIV./ AUG. 1966
GSFC-463
Two-core nonsaturating dc to dc converter provides high switching efficiency without producing large stray magnetic fields. It uses one core to provide positive feedback and the combination of the two cores for the transformer.

B66-10377
SINGLE CHANNEL PULSE-HEIGHT ANALYZER OPERATES IN SUBNANOSECOND RANGE
AUG. 1966 SEE ALSO NASA-TN-D-2673
LEWIS-267
Single-channel pulse-height analyzer measures nuclear state lifetimes shorter than one nanosecond. The customary logic arrangement is reversed to reduce timing errors.

B66-10379
HUMAN TRANSFER FUNCTIONS USED TO PREDICT SYSTEM PERFORMANCE PARAMETERS
AUG. 1966 SEE ALSO NASA-TN-D-1952, NASA-TN-D-2177, NASA-TN-D-2394, AND NASA-TN-D-2569
LANGLEY-203
Automatic, parameter-tracking, model-matching technique compares the responses of a human operator with those of an analog computer model of a human operator to predict and analyze the performance of mechanical or electromechanical systems prior to construction. Transfer functions represent the input-output relation of an operator controlling a closed-loop system.

B66-10382
FEEDBACK LOOP COMPENSATES FOR RECTIFIER NONLINEARITY
INNOVATOR NOT GIVEN /SPERRY GYROSCOPE CO./ AUG. 1966
M-FS-384
Signal processing circuit with two negative feedback loops rectifies two sinusoidal signals which are 180 degrees out of phase and produces a single full-wave rectified output signal. Each feedback loop incorporates a feedback rectifier to compensate for the nonlinearity of the circuit.

B66-10386
PARALLEL LINE RASTER ELIMINATES AMBIGUITIES IN READING TIMING OF PULSES LESS THAN 500 MICROSECONDS APART
HORNE, A. P. SEP. 1966
JPL-805
Parallel horizontal line raster is used for precision timing of events occurring less than 500 microseconds apart for observation of hypervelocity phenomena. The raster uses a staircase vertical deflection and eliminates ambiguities in reading timing of pulses close to the end of each line.

B66-10389
SYSTEM MONITORS DISCRETE COMPUTER INPUTS
BURNS, J. J. /RCA/ AUG. 1966
M-FS-1021
Computer system monitors inputs from checkout devices. The comparing, addressing, and controlling functions are performed in the I/O unit. This leaves the computer main frame free to handle memory, access priority, and interrupt instructions.

B66-10391
JUNCTION CONNECTORS PERMIT STRATEGIC PLACEMENT OF TELEVISION CAMERAS
KEMPSON, A., JR. SEP. 1966
KSC-66-22
Cable run circuit with switching junction connectors at strategic locations enables television cameras to be plugged in with minimum effort wherever needed. Crimp-type contacts for mating connections reduce installation time and require a lesser level of technician skill than do soldered and potted connections.

B66-10392
INDUCTIVE SYSTEM DETECTS LEVEL OF CONDUCTING FLUIDS
ROESKE, P. W. AUG. 1966
LEWIS-322
Inductive system monitors the liquid level of a conductive fluid that is at a high temperature in a fully closed opaque container. The system is useful in any high temperature liquid- metal system. It shows fast response and is relatively insensitive to temperature fluctuations.

B66-10393
COMPOSITE FILTER STEEPENS REJECTION SLOPES IN MICROWAVE APPLICATION
INNOVATOR NOT GIVEN /DORNE AND MARGOLIN/ AUG. 1966
GSFC-480
Composite filter is used to obtain sharp rejection slopes in microwave transmission by filtering techniques, It consists of a bandpass filter to shape the passband and a bandreject filter on each edge of the bandpass filter to steepen the rejection slopes.

B66-10394
HIGH PRESSURE CRYOGENIC LIQUID FLOW SIGHT ASSEMBLY PROVIDES STREAMLINED FLOW FOR EASY OBSERVATION
HOBART, H. E. MINKIN, H. L. AUG. 1966
LEWIS-310
Window assembly facilitates observation of cryogenic liquids flowing through a smooth pipe at pressures up to several hundred pounds per square inch. This high-pressure cryogenic observation assembly which houses a thin wall glass pipe held within a steel retainer can accommodate fluids under a wide range of pressures and temperatures.

B66-10396
SOLID STATE DETECTORS MONITOR RELAY CONTACTS
QUINN, J. D. SEPT. 1966
JPL-785
Hand carried, solid state, 18-channel detector system constantly monitors contact conditions in relays. The system is relatively insensitive to external noise and is powered by standard 110 volt ac.

B66-10397
MINIMUM PERMISSIBLE LEAKAGE RESISTANCE ESTABLISHED FOR INSTRUMENTATION SYSTEMS
PERRIN, J. L. /N. AM. AVIATION/ SEP. 1966
M-FS-848
Mathematical formulas are used to determine if, and to what extent, an instrumentation system that has been exposed to the elements should be dried out to restore minimum permissible leakage resistance to ground. Formulas are also derived and used for an intermediate number of systems that are exposed to moisture penetration.

B66-10401
DIELECTROMETER DESIGN PERMITS MEASUREMENT IN VACUUM UNDER IRRADIATION
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ SEP. 1966
M-FS-359
Dielectrometer permits measurement of dielectric constant and dielectric losses in a vacuum environment exposed to radiation. It is not necessary to remove the sample from the chamber during testing.

B66-10404
NEW COMPUTER PROGRAM SOLVES WIDE VARIETY OF HEAT FLOW PROBLEMS
ALMOND, J. C. /BOEING CO./ SEP. 1966

M-FS-421
Boeing Engineering Thermal Analyzer /BETA/ computer program uses numerical methods to provide accurate heat transfer solutions to a wide variety of heat flow problems. The program solves steady-state and transient problems in almost any situation that can be represented by a resistance-capacitance network.

B66-10407
DIRECTION INDICATOR SYSTEM DOES NOT REQUIRE COMPLICATED OPTICS
MILDICE, J. W. /GEN. DYN./CONVAIR/ SEP. 1966
WOO-305
Direction indicator which aligns a system relative to a light source uses two photocells as light sensors to form a set. Each set indicates one direction. This indicator has no moving parts and provides very fine vernier acquisition.

B66-10409
MODULAR POROUS PLATE SUBLIMATOR /MPPS/ REQUIRES ONLY WATER SUPPLY FOR COOLANT
RATHBUN, R. J. /IBM/ SEP. 1966
M-FS-1374
Modular porous plate sublimators, provided for each location where heat must be dissipated, conserve the battery power of a space vehicle by eliminating the coolant pump. The sublimator requires only a water supply for coolant.

B66-10412
LEAK LOCATOR FOR VACUUM JACKETED PIPELINES ELIMINATES NEED FOR REMOVAL OF OUTER JACKET
WELLS, G. H. /N. AM. AVIATION/ SEP. 1966
M-FS-888
Device for locating leaks in a vacuum-jacketed liquid-hydrogen transfer line consists of two Mylar discs, a source of nitrogen and helium gas, and a mass spectrometer. The outer jacket of the pipeline does not need to be removed for the locator to be used.

B66-10413
ANALOG SOLAR SYSTEM MODEL RELATES CELESTIAL BODIES SPATIALLY
BAERG, H. R. SEP. 1966
JPL-195
Portable analog planetarium indicates the relative time and space angular locations of the Sun and planets. Distance measuring scales, angular direction indicators, and typical probe trajectories are included.

B66-10414
ELECTRICALLY CONTROLLED OPTICAL LATCH AND SWITCH REQUIRES LESS CURRENT
PIECZONKA, W. A. ROY, M. M. YEH, T. H. /IBM/
SEP. 1966
JPL-SC-111 JPL-SC-112
Electrically controlled optical latch consists of a sensitive phototransistor and a solid-state light source. This design requires less current to activate an optically activated switch than in prior art.

B66-10419
METAL OXIDE SILICON /MOS/ TRANSISTORS PROTECTED FROM DESTRUCTIVE DAMAGE BY WIRE DEVICE
DEBOO, G. J. DEVINE, E. J. SEP. 1966
ARC-65
Loop of flexible, small diameter, nickel wire protects metal oxide silicon /MOS/ transistors from a damaging electrostatic potential. The wire is attached to a music-wire spring, slipped over the MOS transistor case, and released so the spring tensions the wire loop around all the transistor leads, shorting them together. This allows handling without danger of damage.

B66-10420
ELECTRONIC BIDIRECTIONAL VALVE CIRCUIT PREVENTS CROSSOVER DISTORTION AND THRESHOLD EFFECT
KERNICK, A. /WESTINGHOUSE ELEC. CORP./ SEP. 1966
MSC-193
Four-terminal network forms a bidirectional valve which will switch or alternate an ac signal without crossover distortion or threshold effect. In this network, an isolated control signal is sufficient for circuit turn-on.

B66-10423
AN INVESTIGATION OF PHASE-LOCK LOOP SWEPT-FREQUENCY SYNCHRONIZATION
DYE, R. A. /LOCKHEED MISSILES AND SPACE CO./
SEP. 1966
M-FS-656
Rapid synchronization of phase-locked oscillators is best achieved by the swept-frequency acquisition technique, wherein the Voltage-Controlled Oscillator /VCO/ is linearly swept through the uncertainty band. The theoretically predicted sweep rates of this technique and the observed experimental results differ by less than seven percent.

B66-10426
COMPUTER SIMULATION PROGRAM IS ADAPTABLE TO INDUSTRIAL PROCESSES
SCHULTZ, F. E. /GE/ OCT. 1966
LEWIS-240
The Reaction Kinetics Ablation Program /REKAP/, developed to simulate ablation of various materials, provides mathematical formulations for computer programs which can simulate certain industrial processes. The programs are based on the use of nonsymmetrical difference equations that are employed to solve complex partial differential equation systems.

B66-10427
ELECTRICAL CABLING WITHSTANDS SEVERE ENVIRONMENTAL CONDITIONS
HATHAWAY, J. D. /N. AM. AVIATION/ SEP. 1966
M-FS-1585
Multiconductor electrical cables retain their circuit integrity and remain flexible and abrasion resistant in severe invironmental conditions of heat, vibration, and water.

B66-10429
VIDEO SIGNAL PROCESSING SYSTEM USES GATED CURRENT MODE SWITCHES TO PERFORM HIGH SPEED MULTIPLICATION AND DIGITAL-TO-ANALOG CONVERSION
GILLILAND, M. G. ROUGELOT, R. S. SCHUMAKER, R. A. /GE/ OCT. 1966
MSC-781
Video signal processor uses special-purpose integrated circuits with nonsaturating current mode switching to accept texture and color information from a digital computer in a visual spaceflight simulator and to combine these, for display on color CRT with analog information concerning fading.

B66-10430
SOLID-STATE SWITCH INCREASES SWITCHING SPEED
MC GOWAN, G. F. /MARTIN CO./ OCT. 1966
WOO-298
Solid state switch for commutating capacitors in an RC commutated network increases switching speed and extends the filtering or commutating frequency spectrum well into the kilocycle region. The switch is equivalent to the standard Double-Pole Double-Throw /DPDT/ relay and is driven from digital micrologic circuits.

B66-10431
CONTROL CIRCUIT MAINTAINS UNITY POWER FACTOR OF REACTIVE LOAD
KRAMER, M. MARTINAGE, L. H. /IBM/ OCT. 1966
MSC-192
Circuit including feedback control elements automatically corrects the power factor of a reactive load. It maintains power supply efficiency where negative load reactance changes and varies by providing corrective error signals to the control windings of a power supply transformer.

B66-10432
REMOTE PREAMPLIFIER CIRCUIT MAINTAINS STABILITY STABILITY OVER WIDE TEMPERATURE RANGE

MAC NAUGHTON, R. G. /VARIAN ASSOCIATES/ OCT. 1966
W00-278
Circuit remains stable over a wide temperature range while preamplifying light signals falling on a photocell and transmitting them through a transmission line to a remote amplifier. The circuits preamplifier consists of a grounded emitter npn stage followed by a pnp emitter.

B66-10433
LINEAR SIGNAL NOISE SUMMER ACCURATELY DETERMINES AND CONTROLS S/N RATIO
SUNDRY, J. L. /WESTINGHOUSE ELEC. CORP./ OCT. 1966
JPL-SC-152
Linear signal noise summer precisely controls the relative power levels of signal and noise, and mixes them linearly in accurately known ratios. The S/N ratio accuracy and stability are greatly improved by this technique and are attained simultaneously.

B66-10436
SHAFT ENCODER PRESENTS DIGITAL OUTPUT
HILLIS, D. A. /HUGHES AIRCRAFT CO./ OCT. 1966
JPL-SC-191
Circuits that include compensation circuitry time a capacitance relative to a reference voltage so that a digital presentation occurs that is representative of the positional condition of the mechanical shaft being monitored. This circuitry may be employed in multiples to furnish binary encoding of a number of rotating devices simultaneously.

B66-10437
SINGLE-SIDEBAND MODULATOR ACCURATELY REPRODUCES PHASE INFORMATION IN 2-MC SIGNALS
STRENGLEIN, H. F. /SPERRY MICROWAVE ELECTRON. CO./ OCT. 1966
M-FS-664
Phase-locked oscillator system employing solid state components acts as a single-sideband modulator to accurately reproduce phase information in 2-mc signals. This system is useful in telemetry, aircraft communications and position-finding stations, and VHF test circuitry.

B66-10438
DENSITOMETER SYSTEM FOR LIQUID HYDROGEN HAS HIGH ACCURACY, FAST RESPONSE
INNOVATOR NOT GIVEN /FRANKLIN GNO CORP./ OCT. 1966
M-FS-909
Developmental densitometer system for cryogenic liquids uses two balanced ionization chambers containing xenon gas, with X-rays as the radiation source. The X-rays are heavily filtered with a lead shield to make the energy spectrum much less dependent on the voltage applied to the X-ray tube.

B66-10439
ION CHAMBERS SIMPLIFY ABSOLUTE INTENSITY MEASUREMENTS IN THE VACUUM ULTRAVIOLET
SAMPSON, J. A. R. /GEOPHYS. CORP. OF AM./ OCT. 1966
ERC-10
Single or double ion chamber technique measures absolute radiation intensities in the extreme vacuum ultraviolet region of the spectrum. The ion chambers use rare gases as the ion carrier. Photon absorbed by the gas creates one ion pair so a measure of these is a measure of the number of incident photons.

B66-10440
PHOTOELECTRIC SCANNER MAKES DETAILED WORK FUNCTION MAPS OF METAL SURFACE
RASOR, N. S. /THERMO ELECTRON ENG. CORP./ OCT. 1966
JPL-SC-176
Photoelectric scanning device maps the work function of a metal surface by scanning it with a light spot and measuring the resulting photocurrent. The device is capable of use over a range of surface temperatures.

B66-10441
STANDARD ARC WELDERS PROVIDE HIGH AMPERAGE DIRECT CURRENT SOURCE
BEASLEY, W. D. BROOKS, J. D. OCT. 1966
LANGLEY-267 LANGLEY-268
Standard arc welders or power supplies are hooked up in parallel or series connections to obtain an adequate supply of current or voltage for various purposes. This method provides maximum flexibility in a wide range of voltages and currents.

B66-10442
AN IMPROVED METHOD FOR TESTING PERFORMANCE OF VIDICONS DURING VIBRATION
CORSON, B. R. /HUGHES AIRCRAFT CO./ OCT. 1966
JPL-SC-113
Vidicon electron beam modulation is used for checking the performance of vidicons in mechanical vibration tests. The vidicon electron beam is modulated with an external signal during the **write** period thereby storing the image on the vidicon face.

B66-10444
THERMIONIC SCANNER PINPOINTS WORK FUNCTION OF EMITTER SURFACES
RASOR, N. S. /THERMO ELECTRON ENG. CORP./ OCT. 1966
JPL-SC-177
In the electron tube testing, a thermionic scanner makes accurate spatial resolution measurements of the metallic surface work functions of emitters. The scanner determines the emitter function and its local departures from the mean value on a point-by-point basis for display on an oscilloscope.

B66-10447
SEMICONDUCTORS CAN BE TESTED WITHOUT REMOVING THEM FROM CIRCUITRY
ALLEN, B. C. /N. AM. AVIATION/ NOV. 1966
M-FS-1163
Oscilloscope, with specially developed test circuitry, quickly checks semiconductors without removing them from the circuitry. For transistors, approximate gain and linearity, as well as pnp or npn determinations are made. When testing diodes, open or short circuits, and reverse polarity show up plainly.

B66-10449
BASIC SUPPRESSION TECHNIQUES ARE EVALUATED
DAWIRS, H. N. /RECON, INC./ OCT. 1966
M-FS-867
Investigation of standard suppression methods facilitates switching of inductively loaded circuits which causes interference in adjacent electronic equipment. The data are reduced to tabular form and rapid selection of components by the designer can be made without lengthy calculations or trial and error manipulations.

B66-10452
RECTILINEAR ACCELEROMETER POSSESSES SELF-CALIBRATION FEATURE
HENDERSON, R. B. /SAUNDERS ASSOC., INC./ OCT. 1966
M-FS-1480
Rectilinear accelerometer operates from an ac source with a phase-sensitive ac voltage output proportional to the applied accelerations. The unit includes an independent circuit for self-test which provides a sensor output simulating an acceleration applied to the sensitive axis of the accelerometer.

B66-10456
PULSE GENERATOR USING TRANSISTORS AND SILICON CONTROLLED RECTIFIERS PRODUCES HIGH CURRENT PULSES WITH FAST RISE AND FALL TIMES
WOOLFSON, M. G. /WESTINGHOUSE ELEC. CORP./ OCT. 1966
MSC-405
Electrical pulse generator uses power transistors and silicon controlled rectifiers for producing a high current pulse having fast rise and fall times. At quiescent conditions, the standby power consumption of the circuit is equal to zero.

B66-10461
MODIFIED THERMOCOUPLE IS EFFECTIVE FROM MINUS 250 DEG TO 5000 DEG F
MOEN, W. K. /N. AM. AVIATION/ NOV. 1966
MSC-420
Modified, commercially available thermocouple which measures the temperature of a spacecraft heat shield, is capable of continuous measurement in the range of minus 250 deg to 5000 deg F. The modified thermocouples may be used inside metal treating furnaces in high temperature technology, and in certain corrosive environments.

B66-10462
INSTRUMENT AUTOMATICALLY SELECTS PEAK ACCELERATION SIGNAL FROM SEVERAL ACCELEROMETERS
CHAPMAN, C. P. OCT. 1966
JPL-816
Solid state circuit selects the highest of several ac accelerometer signals and gates this signal to an output amplifier, preserving all the frequency information in the peak signal. If the amplitudes of the accelerometer signals change with time, the circuit will continually switch to the highest signal, rejecting the smaller signals.

B66-10465
SOLID STATE CIRCUIT SWITCHES AC LOAD
CHAPMAN, C. P. RUPNIK, D. R. OCT. 1966
JPL-798
Differential amplifier circuit switches ac signals with peak amplitudes greater than 5 volts. This solid state circuit biases a switching transistor on and off by a 0.1 to 5.0 dc control voltage.

B66-10466
STUDY COMPARES METHODS FOR THE NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS
INNOVATOR NOT GIVEN /GEORGIA INST. OF TECHNOL./
OCT. 1966 SEE ALSO NASA-CR-61060
M-FS-830
Study compares the use of five different methods for the computer solution of the restricted three-body problem. It describes the implementation of each method on a Burroughs B-5000 computer and in terms of speed and accuracy.

B66-10469
BIPOLAR CURRENT DRIVER FOR MEMORY CIRCUITS
CHONG, C. F. NELSON, C. A. /SPERRY RAND CORP./
NOV. 1966
GSFC-213
Circuit which logically determines the state of a flip-flop and amplifies the current from a clock pulse provides a bipolar driving current to a memory circuit, the polarity of which is determined by the state of a flip-flop. This principle may be applied to various memory driving circuits where power dissipation must be minimized.

B66-10476
DEVICE TO COLOR MODULATE A STATIONARY LIGHT BEAM GIVES HIGH INTENSITY
GANTZ, W. A. /CALIF. UNIV./ DEC. 1966
HQ-44
Signal controlled system color modulates a beam of light while also providing high intensity and a stationary beam, either collimated or focused. The color modulation acquired by the presented system can be compatible with any color film by employing color filters formed to provide a color wedge having a color distribution compatible with the film*s color sensitivity.

B66-10478
PLUG-IN CONNECTOR SOCKET ACCEPTS COAXIAL CABLE END
MITCHELL, D. VAN LOON, J. NOV. 1966
ARG-9
Connector which includes a spring-loaded contact to receive a protruding center conductor and an internal collet to clamp against a collar attached to a woven outer conductor, is used as a receptacle for the end of a coaxial cable. This plug-in connector socket is used successfully with remote manipulators.

B66-10480
SIMPLE, ONE TRANSISTOR CIRCUIT BOOSTS PULSE AMPLITUDE
KEON, T. MATCHETT, M. W. /CUTLER HAMMER/ OCT. 1966
GSFC-501
Simple circuit that uses a single transistor to accomplish capacitor storage followed by common-base switching supplies a pulse voltage, higher than that normally available from emitter-follower circuits, to drive a 100-watt transmitter.

B66-10481
MODIFIED MCLEOD PRESSURE GAGE ELIMINATES MEASUREMENT ERRORS
KELLS, M. C. NOV. 1966
ARC-62
Modification of a McLeod gauge eliminates errors in measuring absolute pressure of gases in the vacuum range. A valve which is internal to the gauge and is magnetically actuated is positioned between the mercury reservoir and the sample gas chamber.

B66-10482
AUTOMATIC CRYOGENIC LIQUID LEVEL CONTROLLER IS SAFE FOR USE NEAR COMBUSTIBLE SUBSTANCES
KREJSA, M. OCT. 1966
LEWIS-195
Automatic mechanical liquid level controller that is independent of any external power sources is used with safety in the presence of combustibles. A gas filled capillary tube which leads from a pressurized chamber, is inserted into the cryogenic liquid reservoir and becomes a liquid level sensing element or probe.

B66-10486
SOLID STATE CIRCUIT CONTROLS DIRECTION, SPEED, AND BRAKING OF DC MOTOR
HANNA, M. F. OCT. 1966
JPL-757
Full-wave bridge rectifier circuit controls the direction, speed, and braking of a dc motor. Gating in the circuit of Silicon Controlled Rectifiers /SCR*s/ controls output polarity and braking is provided by an SCR that is gated to short circuit the reverse voltage generated by reversal of motor rotation.

B66-10488
SPIRAL SPRING/STRAIN GAGE COMBINATION ACCURATELY MEASURES SHOCK INDUCED DEFLECTION
BERVEN, B. R. WALKER, R. R. /N. AM. AVIATION/
OCT. 1966
MSC-789
Spiral springs equipped with strain gauges which are hard-wired to readout instrumentation, measure deflection between two relatively inaccessible surface in a drop test that causes them to close to near flatness. This technique has been successfully used on Apollo drop tests to measure deflection between aft bulkhead and heatshield.

B66-10490
SOLENOID MAGNETIC FIELDS CALCULATED FROM SUPERPOSED SEMI-INFINITE SOLENOIDS
BROWN, G. V. FLAX, L. NOV. 1966 SEE ALSO NASA-TN-D-2494
LEWIS-184
Calculation of a thick solenoid coil*s magnetic field components is made by a superposition of the fields produced by four solenoids of infinite length and zero inner radius. The field produced by this semi-infinite solenoid is dependent on only two variables, the radial and axial field point coordinates.

B66-10491
MINIATURE CAPACITIVE ACCELEROMETER IS ESPECIALLY APPLICABLE TO TELEMETRY
COON, G. W. HARRISON, D. R. NOV. 1966 SEE ALSO B63-10429
ARC-72
Capacitive accelerometer design enables the construction of highly miniaturized instruments having full-scale ranges from 1 g to several hundred g. This accelerometer is applicable to

telemetry and can be tailored to cover any of a large number of acceleration ranges and frequency responses.

B66-10492
CIRCUIT PREVENTS OVERCHARGING OF SECONDARY CELL BATTERIES
HENNIGAN, T. J. POTTER, N. H. SIZEMORE, K. O.
NOV. 1966
GSFC-454
Circuit prevents battery cell overcharging by detecting and reducing the charging voltage to the open-circuit voltage of the battery when this current falls to a predetermined value. The voltage control depends on the fact that the charging current falls significantly when the battery nears its fully charged state.

B66-10493
STUDY SHOWS EFFECT OF SURFACE PREPARATIONS ON IMPROVING THERMIONIC EMISSION
VAN SOMEREN, L. /THERMO ELECTRON ENG. CORP./ NOV. 1966
JPL-SC-140
Specimen thermionic emitters were electropolished and electroetched to study the effect of surface preparations on improving thermionic emission. The best technique found was to electropolish the annealed rhenium surface and then electroetch it. The effect of electroetching was to remove other crystal planes faster than basal planes.

B66-10494
OPTICAL MONITOR PANEL PROVIDES FLEXIBLE TEST PANEL CONFIGURATIONS
GRIFFIN, F. D. NOV. 1966
KSC-66-18
Optical monitor panel projects a chosen panel configuration upon a translucent screen by using a master projector and appropriate slide to project panel board nomenclature and a series of smaller individual projectors to superimpose monitor indicators upon the projected panel board.

B66-10496
COMPUTER PROGRAM PERFORMS FLOW ANALYSIS THROUGH TURBINES
KATSANIS, T. NOV. 1966 SEE ALSO NASA-TN-D-2546 AND NASA-TN-D-2809
LEWIS-236
Computer program based on an equation for the velocity gradient along an arbitrary quasi-orthogonal analyzes flow through a turbomachine. The program obtains meridional solutions for a hub-to-shroud analysis and blade-to-blade analysis at the hub, mean, and shroud surfaces in a single computer run.

B66-10497
HIGH VOLTAGE POTENTIAL DIVIDER CALIBRATED BY SIMPLE DEVICE
LEWIS, R. N. NOV. 1966
ARG-83
Resistance bridge device incorporates a potentiometer, switches, and a null detector to calibrate high potential dividers under high voltage operation conditions. Calibration can be performed with this device in less than 1 minute at an accuracy of 0.001 percent.

B66-10500
DIGITAL SYSTEM PROVIDES SUPERREGULATION OF NANOSECOND AMPLIFIER-DISCRIMINATOR CIRCUIT
FORGES, K. G. NOV. 1966
ARG-61
Feedback system employing a digital logic comparator to detect and correct amplifier drift provides stable gain characteristics for nanosecond amplifiers used in counting applications. Additional anticoincidence logic enables application of the regulation circuit to the amplifier and discriminator while they are mounted in an operable circuit.

B66-10501
ELECTRONIC CIRCUIT DELIVERS PULSE OF HIGH INTERVAL STABILITY
FISHER, B. /N. AM. AVIATION/ NOV. 1966
MSC-673
Circuit generates a pulse of high interval stability with a complexity level considerably below systems of comparable stability. This circuit is being used as a linear frequency discriminator in the signal conditioner of the Apollo command module.

B66-10502
POINT-SOURCE LIGHT SENSOR CIRCUIT IS INSENSITIVE TO BACKGROUND LIGHT
DAVIS, E. S. NOV. 1966
JPL-778
Circuit incorporating a bisynchronous demodulator for an electro-optical star-tracking sensor provides a signal proportional to star intensity without interference from background light in the field of view. The system works best on a sharply focused star image and requires a 50 percent duty cycle.

B66-10503
COMPUTER PROGRAM DETERMINES PERFORMANCE EFFICIENCY OF REMOTE MEASURING SYSTEMS
MEREWETHER, E. K. /N. AM. AVIATION/ NOV. 1966
M-FS-1137
Computer programs control and evaluate instrumentation system performance for numerous rocket engine test facilities and prescribe calibration and maintenance techniques to maintain the systems within process specifications. Similar programs can be written for other test equipment in an industry such as the petrochemical industry.

B66-10504
SUBROUTINE ALLOWS EASY COMPUTATION IN EXTENDED PRECISION ARITHMETIC
BERGGREN, R. L. GYSBERS, J. C. /N. AM. AVIATION/
NOV. 1966
M-FS-1136
Subroutine called NPREC allows relatively simple computation of very large numbers or very small fractions with extreme accuracy. This subroutine handles numbers that consist of 35 binary bits /1 word/ for the exponent and 70 bits /2 words/ for the fraction.

B66-10505
SOLID STATE ANNUNCIATOR FACILITATES COMPLEX SYSTEM TROUBLESHOOTING
HOFER, H. P. /N. AM. AVIATION/ NOV. 1966
M-FS-1258
Solid state annunciator monitors up to 60 parameters for a dc voltage change from zero to 28 volts in the testing of complex systems. This annunciator is presently being used for testing of the complex J-2 rocket engine.

B66-10506
COMPUTER PROGRAM DETERMINES INVENTORY SIZE
KASPAR, H. /N. AM. AVIATION/ NOV. 1966
M-FS-1135
Fortran IV computer program calculates optimum size of a small inventory of relatively complex or expensive items. this program can be used in situations where the initial cost of purchase is large or when there is a need for a balanced inventory, on a short production run.

B66-10509
PULSE STRETCHER HAS IMPROVED DYNAMIC RANGE AND LINEARITY
LARSEN, R. N. NOV. 1966
ARG-82
Current-switching pulse stretcher overcomes the diode nonlinearity and capacitive feedthrough of voltage switching diode-capacitor stretchers and lengthens nanosecond pulses so that their amplitude may be determined and extends the dynamic range of the pulse stretcher. The rise time of the output pulse in response to a step function is approximately 5 nanoseconds.

B66-10510
LOW LEVEL ACCELEROMETER TEST METHODS ARE INVESTIGATED
NELSON, R. H., JR. PLOURDE, H. S. /DYN. RES. CORP./ NOV. 1966
M-FS-908

Problems associated with testing accelerometers to an accuracy where the standard error is less than .0000001 g are centered around the elimination of uncertainties in the acceleration input to the accelerometer. By placing a test rig in free fall, the uncertainty in the earth*s gravity field can be eliminated.

B66-10511
COMPUTER ROUTINE ADDS PLOTTING CAPABILITIES TO EXISTING PROGRAMS
HARRIS, J. C. LINNEKIN, J. S. /LITTON IND. /
NOV. 1966
GSFC-490
PLOTAN, a generalized plot analysis routine written for the IBM 7094 computer minimizes the difficulties in adding plot capabilities to large existing programs. PLOTAN is used in conjunction with a binary tape writing routine and has the ability to plot any variable on the intermediate binary tape as a function of any other.

B66-10512
NIXIE TUBE DISPLAY UNIT EMPLOYS TIME-SHARED LOGIC
GRAY, J. NOV. 1966
ARG-117
Cathodes of display tubes wired in parallel achieve input switching simplication of a Nixie tube display system. Use of time-shared logic energizes the appropriate anode and inhibits all unecessary cathodes.

B66-10516
DIGITAL SYSTEM DETECTS BINARY CODE PATTERNS CONTAINING ERRORS
MULLER, R. M. THARPE, H. M., JR. NOV. 1966
GSFC-541
System of square loop magnetic cores associated with code input registers react to input code patterns by reference to a group of control cores in such a manner that errors are canceled and patterns containing errors are accepted for amplification and processing. This technique improves reception capabilities in PCM telemetry systems.

B66-10518
ANTENNA SIMULATOR PERMITS PREINSTALLATION SYSTEM CHECKOUT
ELIA, A. D. SCHMIDT, R. F. NOV. 1966
GSFC-522
Antenna simulator provides for evaluation checkout of corporate feeds, monopulse sum-and-difference networks, etc. in a shielded environment prior to system checkout on an antenna pattern range. This technique is useful wherever simulation of monopulse antenna element characteristics is desired for checkout of ancillary equipment in a controlled environment.

B66-10520
PYROMETRY HANDBOOK DESCRIBES PRACTICAL ASPECTS OF SURFACE TEMPERATURE MEASUREMENTS OF OPAQUE MATERIALS
BRANSTETTER, J. R. BUCHELE, D. R. NOV. 1966 SEE ALSO NASA-TN-D-3604
LEWIS-349
Handbook contains extensive reference literature and results from pertinent experiments to provide a collection of applied technology and reference sources for engineers and technicians. Fundamental equations of radiation, off-design corrections, characteristics of pyrometers, and calibration apparatus and techniques are discussed.

B66-10521
FLOWMETER MEASURES FLOW RATES OF HIGH TEMPERATURE FLUIDS
VARY, A. NOV. 1966
LEWIS-328
Flowmeter in which flow rate is determined by measuring the position and thus the displacement of an internal float acted upon by the flowing fluid determines the flow rates of various liquid metals at elevated temperatures. Viscous forces cause the float to move from its mounted position, affording several means for measuring this motion and the flow rate.

B66-10524
STUDY OF VORTEX VALVE FOR MEDIUM TEMPERATURE SOLID PROPELLANTS
HOLT, W. D. RIVARD, J. G. /BENDIX CORP./ DEC. 1966
LANGLEY-204
Fluid state vortex valve secondary injection control system shows considerable promise for future application to solid propellant rocket engine thrust vector control. The single axis injection system tested would be capable of providing secondary injection thrust vector control using 2000 deg F gas.

B66-10525
COMPUTER PROGRAM PERFORMS STATISTICAL ANALYSIS FOR RANDOM PROCESSES
NEWBERRY, M. H. NOV. 1966 SEE ALSO
NASA-TM-X-53359
M-FS-723
Random Vibration Analysis Program /RAVAN/ performs statistical analysis on a number of phenomena associated with flight and captive tests, but can also be used in analyzing data from many other random processes.

B66-10526
IMPROVED DESIGN PROVIDES FASTER RESPONSE TIME IN PHOTOMULTIPLIER
INNOVATOR NOT GIVEN /HALLICRAFTERS CO./ NOV. 1966
GSFC-451
Dynamic crossed-field electron multiplying /DCFEM/ light demodulator avoids the normal response time limitations inherent in static field devices, by using time varying crossed electric and static magnetic fields to eliminate the transit time spread that affects electrons as they proceed along the secondary emission stages of the tube.

B66-10529
COMPUTER PROGRAM SEARCHES CHARACTERISTIC DATA OF DIODES AND TRANSISTORS
INNOVATOR NOT GIVEN /BOOZ-ALLEN APPL. RES. CORP./
NOV. 1966
GSFC-493
Semiconductor information storage and retrieval system provides a comprehensive, accurate, and ready reference to characteristic data of diodes and transistors. The system can be used to supply a complete listing of technical component information necessary for circuit designers, reliability engineers, and quality assurance personnel.

B66-10531
HEAT FLUX SENSOR DESIGN REDUCES EXTRANEOUS SOURCE EFFECTS
CROFTS, E. D. ROBINSON, G. P. /MCDONNELL AIRCRAFT CORP./ NOV. 1966
MSC-400
Heat flux sensor isolates the sensor and its transmitting thermocouple from undesirable heat sources by incorporating a radiator section that forms a radiation shield between mounting cup and sensor. Bonding of the thermocouple cable to the underside of the radiator provides a conductive path to dissipate extraneous heat that might otherwise reach the sensor.

B66-10533
METHOD PERMITS MECHANICAL AND ELECTRICAL CHECKOUT OF PIEZOELECTRIC TRANSDUCERS WHILE INSTALLED IN A SYSTEM
JENKINS, R. S. ROGALLO, V. L. NOV. 1966 SEE ALSO B66-10534
ARC-73
Known dc voltage is applied and then removed suddenly in a method to permit checkout of the mechanical and electrical condition of piezoelectric transducers of the cantilever beam type, while installed in a system.

B66-10534
MINIATURE PIEZOELECTRIC TRIAXIAL ACCELEROMETER MEASURES CRANIAL ACCELERATIONS
DE BOO, G. J. ROGALLO, V. L. NOV. 1966 SEE ALSO

B64-10004 AND B66-10533
ARC-71
Tiny triaxial accelerometer whose sensing elements are piezoelectric ceramic beams measures human cranial accelerations when a subject is exposed to a centrifuge or other simulators of g environments. This device could be considered for application in dental, medical, and automotive safety research.

B66-10536
HELMET SYSTEM BROADCASTS ELECTROENCEPHALOGRAMS OF WEARER
WESTBROOK, R. M. ZUCCARO, J. J. NOV. 1966 SEE ALSO B65-10203
ARC-70
EGG monitoring system consisting of nonirritating sponge-type electrodes, amplifiers, and a battery-powered wireless transmitter, all mounted in the subject*s helmet obtains electroencephalograms /EEG*s/ of pilots and astronauts performing tasks under stress. After a quick initial fitting, the helmet can be removed and replaced without further adjustment.

B66-10539
COMPUTER PROGRAMS PERFORM SPECTRAL ANALYSES OF UP TO SEVEN TIME SERIES
BYARS, B. J. DUBMAN, M. R. /N. AM. AVIATION/ NOV. 1966
M-FS-1133 M-FS-1134
Computer programs perform statistical spectral analysis of up seven time series. These programs should have applicability to a variety of engineering systems in the fields of geophysics, physiology, acoustics, and structural analysis.

B66-10541
COMPUTER USED TO PROGRAM NUMERICALLY CONTROLLED MILLING MACHINE
HARRIS, T. C. /GE/ NOV. 1966
M-FS-1608
Computer program automatically directs a numerically controlled milling machine through a series of cutting and trimming actions. It accepts engineering data points, passes smooth curve segments through the points, breaks the resulting curves into a series of closely spaced points, and transforms these points into the form required by the mechanism.

B66-10542
PREREGULATOR FEEDBACK CIRCUIT UTILIZES LIGHT ACTUATED SWITCH
HAYSER, T. P. /IBM/ NOV. 1966
M-FS-1180
Preregulator feedback circuit employing a Light Actuated Switch /LAS/ provides a simple and efficient feedback device in a power supply preregulator which maintains dc isolation between input and output grounds. The LAS consists of a diode pn junction infrared source close to, but electrically isolated from, a photodetector.

B66-10543
HIGH-RELUCTANCE ROTOR RINGS IMPROVE HOMOPOLAR GENERATOR PERFORMANCE
MUSSET, E. E. NOV. 1966
ARG-104
Nonmagnetic metal rings imbedded in a homopolar generator rotor normal to its axis keep the induction flux entering the rotor in a radial path. Use of the rings permits optimum rotor design for any given set of operating requirements and simplifies the task of predicting the operation characteristics of the generator.

B66-10544
ULTRASONIC QUALITY INSPECTION OF BONDED HONEYCOMB ASSEMBLIES IS AUTOMATED
KAMMERER, C. C. /N. AM. AVIATION/ NOV. 1966
MSC-859
Inspection system for bonded honeycomb assemblies is accurate, fast, and automated. The ultrasonic system consists of inner and outer transducer positioning assemblies with suitable motor controls, a centerless turntable assembly, water squirter assemblies, and an inspection program completely encoded on tape suitable for use on a high speed computer.

B66-10548
SECURITY WARNING SYSTEM MONITORS UP TO FIFTEEN REMOTE AREAS SIMULTANEOUSLY
FUSCO, R. C. /RCA/ NOV. 1966
KSC-66-39
Security warning system consisting of 15 television cameras is capable of monitoring several remote or unoccupied areas simultaneously. The system uses a commutator and decommutator, allowing time-multiplexed video transmission. This security system could be used in industrial and retail establishments.

B66-10549
MINIATURE ELECTROMETER PREAMPLIFIER EFFECTIVELY COMPENSATES FOR INPUT CAPACITANCE
BURROUS, C. N. DE BOO, G. J. NOV. 1966
ARC-69
Negative capacitance preamplifier using a dual MOS /Metal Oxide Silicon/ transistor in conjuction with bipolar transistors is used with intracellular microelectrodes in recording bioelectric potentials. Applications would include use as a pickup plate video amplifier in storage tube tests and for pH and ionization chamber measurements.

B66-10552
NONELECTROLYTIC TANTALUM CAPACITORS DEVELOPED
INNOVATOR NOT GIVEN /CORNELL-DUBILER ELEC. CORP./
NOV. 1966
M-FS-1546
Large area, nonelectrolytic tantalum foil capacitor has capacitance of approximately 1 microfarad and is capable of operating at 125 deg C at 150 volts with an insulation resistance of at least 1 megohm. In tests at a potential of 100 volts, capacitors remained stable through a temperature range from 25 deg to 125 deg C

B66-10553
COMPUTER PROGRAMS CALCULATE POTENTIAL AND CHARGE DISTRIBUTIONS IN A PLASMA
JEFFERIES, N. P. PRINCE, D. C. /GE/ NOV. 1966
M-FS-871
Computer program determines the potential and charge distributions between two electrodes in a plasma. Solutions of the Vlasov equations for plane, cylindrical, and spherical geometries is determined and density distributions are found for each of these configurations over a range of conditions.

B66-10555
A FAST-NEUTRON SPECTROMETER OF ADVANCED DESIGN
MOLER, R. B. PRESTON, C. C. /IIT RES. INST./
NOV. 1966
M-FS-1664
Fast neutron spectrometer combines helium filled proportional counters with solid-state detectors to achieve the properties of high efficiency, good resolution, rapid response, and effective gamma-ray rejection.

B66-10556
SIMPLIFIED FIXTURE PERMITS PRECISION ALIGNMENT OF AN OPTICAL TARGET
MAGURA, P. /IBM/ NOV. 1966
M-FS-1181
Optical target holder is permanently placed for instrument sighting, yet is adjustable and easily aligned.

B66-10557
TRISPHERE SPARK GAP ACTUATES OVERVOLTAGE RELAY
CAMACHO, S. L. DEC. 1966
ARC-68
Trisphere spark gap and high voltage relay provides a positive, fast response, high current capacity device that will sense an overvoltage condition and remove power from the circuit before insulation breakdown. When an overvoltage occurs, the spark gap breaks down and conducts an actuating current to the relay which removes power

from the circuit.

B66-10559
ONE-COUNT MEMORY CIRCUIT PREVENTS MACHINE MODE INTERACTION
DE FOREST, B. DEC. 1966
ARG-90
One-count memory logic circuit used with electromechanical counter-printer machines operates in either count or print mode. The circuit advances the counter when the machine is in the count mode and provides storage for the count pulse when the machine is in the print mode.

B66-10561
PULSE TECHNIQUE PROVIDES MORE ACCURATE CHECKOUT OF EXPLODING BRIDGE WIRE DEVICE
PETRICK, J. R. /GE/ DEC. 1966
HQ-62
Exploding Bridge Wire /EBW/ is treated as a transmission line system and pulse reflection techniques are used for checking the electrical integrity of an EBW cartridge. A step voltage is propagated into the system and the reflected voltage waves are monitored.

B66-10563
COLLECTOR/COLLECTOR GUARD RING BALANCING CIRCUIT ELIMINATES EDGE EFFECTS
LIEB, D. P. /THERMO ELECTRON ENG. CORP./ DEC. 1966
JPL-SC-143
Circuit in which an emitter is maintained opposite a concentric collector and guard structure is achieved by matching the temperature and potential of the guard with that of the collector over the operating range. This control system is capable of handling up to 100 ampers in the guard circuit and 200 ampers in the collectors circuit.

B66-10564
PHOTOCELL SHADOWING TECHNIQUE IMPROVES LIGHT SOURCE DETECTOR
CARPENTER, D. G. HOOPER, G. E. DEC. 1966
JPL-809
Lightweight, compact modular system that includes an acquisition photocell is used as a light source tracking detector that exhibits minimum scale factor change with increased light source angle. Photocells of various types, responsive to other portions of the spectrum, could be used to acquire and track infrared, ultraviolet, and other source fluxes.

B66-10566
COMPUTATIONAL PROCEDURE FOR FINITE DIFFERENCE SOLUTION OF ONE-DIMENSIONAL HEAT CONDUCTION PROBLEMS REDUCES COMPUTER TIME
IIDA, H. T. /N. AM. AVIATION/ NOV. 1966
MSC-1120
Computational procedure reduces the numerical effort whenever the method of finite differences is used to solve ablation problems for which the surface recession is large relative to the initial slab thickness. The number of numerical operations required for a given maximum space mesh size is reduced.

B66-10568
MONITORING CIRCUIT ACCURATELY MEASURES MOVEMENT OF SOLENOID VALVE
GILLETT, J. D. /N. AM. AVIATION/ DEC. 1966
M-FS-1829
Solenoid operated valve in a control system powered by direct current issued to accurately measure the valve travel. This system is currently in operation with a 28-vdc power system used for control of fluids in liquid rocket motor test facilities.

B66-10569
DEVICE ACCURATELY MEASURES AND RECORDS LOW GAS-FLOW RATES
BRANUM, L. W. /N. AM. AVIATION/ DEC. 1966
M-FS-1077
Free-floating piston in a vertical column accurately measures and records low gas-flow rates. The system may be calibrated, using an adjustable flow-rate gas supply, a low pressure gauge, and a sequence recorder. From the calibration rates, a nomograph may be made for easy reduction. Temperature correction may be added for further accuracy.

B66-10574
NONDESTRUCTIVE TEST METHOD ACCURATELY SORTS MIXED BOLTS
DEZEIH, C. J. DEC. 1966
M-FS-1426
Neutron activation analysis method sorts copper plated steel bolts from nickel plated steel bolts. Copper and nickel plated steel bolt specimens of the same configuration are irradiated with thermal neutrons in a test reactor for a short time. After thermal neutron irradiation, the bolts are analyzed using scintillation energy readout equipment.

B66-10576
A CONTINUOUSLY OPERATING SOURCE OF VACUUM ULTRAVIOLET BELOW 500 ANGSTROM
INNOVATOR NOT GIVEN /SPACE SCI. INC./ DEC. 1966
GSFC-545
Duo plasmatron type source of ultraviolet radiation operates in the wavelength region below 500 angstrom. Since the spectra produced are determined almost completely by the gas injected, and because the source operates continuously, this arrangement is beneficial in the development and calibration of filters and detectors within discrete wavelength ranges.

B66-10577
ULTRASONIC WATER COLUMN PROBE SPEEDS UP TESTING OF WELDS
HOOP, J. M. MC DONALD, J. A. /GE/ DEC. 1966
HQ-58
Ultrasonic device consisting of a coaxial rod and transducer enclosed in a cylindrical probe which is filled with deionized or distilled water speeds up the testing of welds. Rubber diaphragm is molded to produce the desired test beam angle.

B66-10579
AN ORTHONORMALIZATION PROCEDURE FOR MULTIVARIABLE FUNCTION APPROXIMATION
INGRAM, H. L. DEC. 1966
M-FS-1313
Where a function of several variables is given numerically in tabular form, an orthonormalization technique allows an approximation of the numerical data to be determined in a convenient functional form. In this technique, the speed and accuracy of coefficient computation are much improved.

B66-10580
RESISTOR MONITORS TRANSFER OF LIQUID HELIUM
HESKETH, W. D. DEC. 1966
LANGLEY-229
Large resistance change of a carbon resistor at the liquid helium temperature distinguishes between the transfer of liquid helium and gaseous helium into a closed dewar. The resistor should be physically as small as possible to reduce the heat load to the helium.

B66-10581
DETECTOR MEASURES POWER IN 50 TO 30,000 GHZ RADIATION BAND
ARAMS, F. R. WANG, M. T. /AIRBORNE INSTR. LAB./ DEC. 1966
ERC-26
Broadband power detector assembly measures electromagnetic radiation in the 50 to 30,000 GHz band. The assembly includes a matched pair of detectors which incorporate thin-film radiation absorbers. The detector is effective with either coherent or incoherent radiation.

B66-10584
OPTICAL SUPERHETERODYNE RECEIVER USES LASER FOR LOCAL OSCILLATOR
LUCY, R. F. /SYLVANIA ELECTRON. SYSTEMS/ DEC. 1966
M-FS-1605
Optical superheterodyne receiver uses a laser coupled to a frequency translator to supply both the incident signal and local oscillator signal

and thus permit reception of amplitude modulated video bandwidth signals through the atmosphere. This receiver is useful in scientific propagation experiments, tracking experiments, and communication experiments.

B66-10590
STUDY MADE OF APPLICATION OF STEREOSCOPIC DISPLAY SYSTEM TO ANALOG COMPUTER SIMULATION
KENNEL, H. F. DEC. 1966 NASA-CR-61116
M-FS-1263
Stereoscopic visual display system provides both a qualitative and measurable presentation for functions of several variables. A primary application of such a display system is in analog computer simulation of sets of differential equations.

B66-10591
ELECTRONIC CIRCUIT PROVIDES ACCURATE SENSING AND CONTROL OF DC VOLTAGE
LOFTUS, W. D. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0089
Electronic circuit used relay coil to sense and control dc voltage. The control relay is driven by a switching transistor that is biased to cutoff for all input up to slightly less than the threshold level.

B66-10592
SENSORS MEASURE SURFACE ABLATION RATE OF REENTRY VEHICLE HEAT SHIELD
RUSSEL, J. M., III DEC. 1966 SEE ALSO NASA-TN-D-3686
LANGLEY-287
Sensors measure surface erosion rate of ablating material in reentry vehicle heat shield. Each sensor, which is placed at precise depths in the heat shield is activated when the ablator surface erodes to the location of a sensing point. Sensor depth and activation time determine ablator surface erosion rate.

B66-10598
DESIGN CONCEPT FOR PRESSURE SWITCH CALIBRATOR
SLINGERLAND, M. G. /GE/ DEC. 1966
HQ-36
Calibrator and switch design enables pressure switches to operate under 150 g shock loads. The design employs a saturated liquid-to-vapor phase transition at constant pressure to produce a known force independent of displacement over a usable range.

B66-10599
PRESSURE PROBE COMPENSATES FOR DIMENSIONAL TOLERANCE VARIATIONS
BIRNER, R. A. /AEROJET-GEN. CORP./ DEC. 1966
LEWIS-302
Flexible, compressible spring-loaded pressure probe measures the static pressure between the rotor stages on an axial-flow fuel pump. This probe is used in installation where a drilled static pressure tap or a rigid impulse tube cannot be used. Its parameters must be specially determined for each installation.

B66-10600
HIGH FREQUENCY WIDE-BAND TRANSFORMER USES COAX TO ACHIEVE HIGH TURN RATIO AND FLAT RESPONSE
DE PARRY, T. DEC. 1966
ARG-107
Center-tap push-pull transformer with toroidal core helically wound with a single coaxial cable creates a high frequency wideband transformer. This transformer has a high-turn ratio, a high coupling coefficient, and a flat broadband response.

B66-10603
MOSFET ANALOG MEMORY CIRCUIT ACHIEVES LONG DURATION SIGNAL STORAGE
INNOVATOR NOT GIVEN /IBM/ DEC. 1966
M-FS-860
Memory circuit maintains the signal voltage at the output of an analog signal amplifier when the input signal is interrupted or removed. The circuit uses MOSFET /Metal Oxide Semiconductor Field Effect Transistor/ devices as voltage-controlled switches, triggered by an external voltage-sensing device.

B66-10605
ELECTRICAL CONTINUITY SCANNER FACILITATES IDENTIFICATION OF WIRES FOR SOLDERING TO CONNECTORS
BOULTON, H. C. DICLEMENTE, R. A. /N. AM. AVIATION/ DEC. 1966
MSC-626
Electrical continuity scanner automatically scans 50 wires in 2 seconds to correlate all wires in a circuit with their respective known ends. Modifications made to the basic plan provide circuitry for scanning up to 250 wires.

B66-10606
A RADIOMETER-PYROMETER
DEC. 1966 NASA-TN-D-2405
LEWIS-284
Radiometer-pyrometer measures the spectral absorption, emission, and temperature of gases. The major problems involved in spectroradiometric measurements are nonuniform spectral sensitivity, nonlinearity, poor absolute accuracy, wide range of intensities, and wide range of wavelengths.

B66-10607
DEVELOPMENTAL INSTRUMENT SUPPLIES ACCURATE ATTITUDE AND ATTITUDE-RATE DATA
INNOVATOR NOT GIVEN /BOLT, BERANEK, AND NEWAN, INC./ DEC. 1966
HQ-57
Three orthogonal-plane projection provides accuracy of readout of both attitude and attitude-rate information in an easily interpreted, uncluttered arrangement where blind navigation of a moving body is involved. The longitudinal length of the projection is constant, and independent of the pitch and roll attitudes of the moving body.

B66-10612
RESISTANCE THERMOMETER HAS LINEAR RESISTANCE-TEMPERATURE COEFFICIENT AT LOW TEMPERATURES
KUZYK, W. /GEN. DYN./ DEC. 1966
WOO-190
Resistance thermometer incorporating a germanium resistance element with a platinum resistance element in a Wheatstone bridge circuit has a linear temperature-resistance coefficient over a range from approximately minus 140 deg C to approximately minus 253 deg C.

B66-10614
STUDY OF THEORY AND APPLICATION OF LONG DURATION HEAT FLUX TRANSDUCERS
HEAMAN, J. P. ROBERTSON, S. J. /HEAT TECHNOL. LAB./ DEC. 1966
M-FS-1265
Theory and application of transducers used to measure heat flux in tests of more than one second duration.

B66-10617
IMPROVED MEMORY WORD LINE CONFIGURATION ALLOWS HIGH STORAGE DENSITY
INNOVATOR NOT GIVEN /UNIVAC/ DEC. 1966
GSFC-559
Plated wire memory word drive line allows high storage density, good plated wire transmission and a simplified memory plane configuration. A half-turn word drive line with a magnetic keeper is used. The ground plane provides the return path for both the word current and the plated wire transmission line.

B66-10619
COMPUTER PROGRAM SIMPLIFIES TRANSIENT AND STEADY-STATE TEMPERATURE PREDICTION FOR COMPLEX BODY SHAPES
GIEBLER, K. N. /N. AM. AVIATION/ DEC. 1966
MSC-989
Computer program evaluates heat transfer modes and calculates either the transient or steady- state

temperature distributions throughout an object of complex shape when heat sources are applied to specified points on the object. It uses an electrothermal model to simulate the conductance, heat capacity, and temperature potential of the object.

B66-10621
CONNECTOR ACTS AS QUICK COUPLING IN COAXIAL CABLE APPLICATION
BREJCHA, A. G., JR. DEC. 1966
JPL-803
Quick-coupling connector whose inner shells are threaded to the cable ends and whose outer shells have tracks that register in channels machined in the inner shells are rotated 45 deg to effect a locking of the coupling. This connector faithfully reproduces excellent electrical characteristics no matter how frequently assembled and disassembled.

B66-10622
POINT-SOURCE DETECTION SYSTEM REJECTS SPATIALLY EXTENDED RADIATION SOURCES
MAXWELL, R. F., JR. /WESTINGHOUSE ELEC. CORP./ DEC. 1966
GSFC-486
System employing digital space correlation to suppress false target signals in a point-target tracking device is a reliable method for discriminating a distant target from false targets in the field of view of an infrared detection system or tracking device.

B66-10623
THERMOCOUPLES ELECTRICALLY CHECKED WHILE CONNECTED TO DATA SYSTEM
INNOVATOR NOT GIVEN /REP. AVIATION CORP./ DEC. 1966
LANGLEY-182
Constant current source is connected across the input of the millivolt measuring system to monitor the electrical continuity and resistance of multiple thermocouple installations without disconnecting them from a data system. This technique monitored gauge thermocouple leads during the assembly and preflight testing of the Project Fire reentry packages.

B66-10624
MINIATURE TELEMETRY SYSTEM ACCURATELY MEASURES PRESSURE
FRYER, T. B. DEC. 1966 SEE ALSO B64-10171 AND B66-10057
ARC-74
Miniature, low power, telemetry system that can be used with commercially available strain gauge pressure transducers accurately measures pressure with a small implantable pressure cell and transmitter. The system has been used to date only with pressure transducers, but the circuit is equally applicable to any measurement using a strain gauge sensor.

B66-10625
COMPACT MICROWAVE MIXER HAS HIGH CONVERSION EFFICIENCY
PENQUE, N. J. ROSEN, H. A. /HUGHES AIRCRAFT CO./ DEC. 1966
GSFC-197
Compact, lightweight microwave mixer has a relatively high conversion efficiency and power output. The mixer employs a pair of back-to-back voltage-variable capacitors in a stripline network.

B66-10629
PRECISION CW LASER AUTOMATIC TRACKING SYSTEM INVESTIGATED
LANG, K. T. LUCY, R. F. MC GANN, E. J. PETERS, C. J. /SYLVANIA ELECTRON. SYSTEMS/ DEC. 1966
M-FS-1606
Precision laser tracker capable of tracking a low acceleration target to an accuracy of about 20 microradians rms is being constructed and tested. This laser tracking has the advantage of discriminating against other optical sources and the capability of simultaneously measuring range.

B66-10632
ACCURATE DEPTH CONTROL PROVIDED FOR THERMOCOUPLE JUNCTION LOCATIONS
RICHARDSON, N. R. DEC. 1966 SEE ALSO NASA-TN-364
LANGLEY-289
Flight reentry experiments define the total heating on a large blunt-nosed body by means of imbedded thermocouples. The thermocouples, installed in a beryllium layered forebody, were designed to provide minimum feasible disturbance of local heat flow with accurate depth control of the thermocouple junction locations.

B66-10636
AUTOMATIC SYSTEM DETERMINES MOMENTS OF INERTIA OF ASYMMETRICAL OBJECTS
INNOVATOR NOT GIVEN /SPACO, INC./ DEC. 1966
M-FS-1769
Automatic system rapidly and accurately determines moments and products of inertia of asymmetrical objects. The system combines a torsional pendulum arrangement and a precision rate table with simplified analog computers to determine the desired quantities directly, without the need for additional calculations.

B66-10637
INSTRUMENT ACCURATELY MEASURES SMALL TEMPERATURE CHANGES ON TEST SURFACE
HARVEY, W. D. MILLER, H. B. DEC. 1966 SEE ALSO NASA-TN-D-2846
LANGLEY-174
Calorimeter apparatus accurately measures very small temperature rises on a test surface subjected to aerodynamic heating. A continuous thin sheet of a sensing material is attached to a base support plate through which a series of holes of known diameter have been drilled for attaching thermocouples to the material.

B66-10640
VOLUME-RATIO CALIBRATION SYSTEM FOR VACUUM GAGES
DEC. 1966 SEE ALSO NASA-TN-D-3100
LEWIS-303
Volume-ratio calibration system consists of a gas source, high pressure gauge, small volume tank, large volume chamber, plus appropriate piping, valves, and vacuum source. This system used in conjunction with commercial vacuum gauges evaluates its ability to accurately produce desired pressures in the .000001 to .01 torr range.

B66-10644
THREE-AXIS ATTITUDE AND DIRECTION REFERENCE INSTRUMENT HAS ONLY ONE MOVING PART
BOSSLER, F. B. /BELL AEROSPACE CORP./ DEC. 1966
M-FS-1819
Lunar vehicle instrument combines the functions of attitude reference, direction reference, and display in a unit having only one moving part. The device, using bubble levels and a calibrated dial, is used as a sextant prior to takeoff, and as a backup navigation system during flight.

B66-10645
CONCEPT FOR USING LASER BEAMS TO MEASURE ELECTRON DENSITY IN PLASMAS
LONGO, S. E. /BOEING CO./ DEC. 1966
M-FS-965
Concept is proposed for using laser beams as a means of measuring electron density at various points in flame or plasma exhausts. Measurement of the electron density is obtained by detecting reflected waves in the plasma that were activated by the laser.

B66-10650
MAGNETORESISTOR MONITORS RELAY PERFORMANCE
KREBS, D. Q. /BOEING CO./ DEC. 1966
M-FS-1754
Magnetoresistor monitors the action of relays without disturbing circuit parameters or degrading relay performance. The magnetoresistor measures the relay magnetic flux produced under transient conditions to establish the characteristic signature of the relay.

B66-10653
THERMOCOUPLES EASILY INSTALLED IN HARD-TO-GET-TO PLACES
GUENTHER, F. G. /N. AM. AVIATION/ DEC. 1966
M-FS-1946
Thermocouple wires attached to charged capacitors are inserted in a drilled hole. An electric charge fuses the thermocouple wires to the host material. This method has shown excellent results in fusing nichrome, chromel, Inconel, and stainless steel wires to nickel, beryllium, iron, steel, Inconel, and stainless steel.

B66-10658
DIGITAL FREQUENCY COUNTER PERMITS READOUT WITHOUT DISTURBING COUNTING PROCESS
WINKELSTEIN, R. DEC. 1966
JPL-906
Digital frequency counter system enables readout accurately at one-second intervals without interrupting or disturbing the counting process. The system incorporates a master counter and a slave counter with novel logic interconnections. The counter can be readily adapted to provide frequency readouts at 0.1 second intervals.

B66-10659
LOGIC CIRCUITRY USED TO AUTOMATICALLY TEST SHIELDED CABLES
DIBB, G. /GE/ DEC. 1966
HQ-60
Automatic cable tester checks multiple shielded conductors assembly cable connections. The tester uses logic circuitry to sequentially test all conductors and their shields to reveal any connection error in a GO-NO GO test.

B66-10661
STUDY OF FAST RESPONSE THERMOCOUPLE MEASUREMENT OF TEMPERATURES IN CRYOGENIC GASES
BIELAWSKI, T. LOWRIE, A. R. ROBINSON, C. C. /BEECH AIRCRAFT CORP./ DEC. 1966
M-FS-1659
Thermocouples fabricated from uninsulated small diameter wire have fast reproducible response times. The thermocouple is thermally isolated from its supports by making the leads of sufficient length so that the heat conduction down the leads is small and assuming that the leads adjacent to the junction are subjected to the same thermal conditions.

B66-10664
PACKAGING OF ELECTRONIC MODULES
KATZIN, L. DEC. 1966
JPL-801
Study of design approaches that are taken toward optimizing the packaging of electronic modules with respect to size, shape, component orientation, interconnections, and structural support. The study does not present a solution to specific packaging problems, but rather the factors to be considered to achieve optimum packaging designs.

B66-10668
PHOTOGRAPHIC METHOD MEASURES PARTICLE SIZE AND VELOCITY IN FLUID STREAM
DICKERSON, R. A. /N. AM. AVIATION/ DEC. 1966
M-FS-1536
Method employing a nonframing motion picture camera, a continuous front light source, and a strobe light determines the size and velocity of small particles in nonturbulent fluid streams. This method is used in the study of the motion of solid and liquid particles in research and industrial fluid flow systems.

B66-10669
GAS LEAK DETECTOR IS SIMPLE AND INEXPENSIVE
MITCHELL, D. K. /BOEING CO./ DEC. 1966
M-FS-1206
Pressure sensor monitors small gas leaks in piping and pressure vessels. A combination of a paper ribbon and adhesive plastic tape is used to cover the area to be monitored and the pressure sensor is placed over a hole in the tape and paper.

B66-10670
COMPUTER PROGRAM DETERMINES CHEMICAL COMPOSITION OF PHYSICAL SYSTEM AT EQUILIBRIUM
KWONG, S. S. /N. AM. AVIATION/ DEC. 1966
MSC-1119
Fortran IV digital computer program calculates equilibrium composition of complex, multiphase chemical systems. This is a free energy minimization method with solution of the problem reduced to mathematical operations, without concern for the chemistry involved. Also certain thermodynamic properties are determined as byproducts of the main calculations.

B66-10671
COMPUTER PROGRAM DETERMINES CHEMICAL EQUILIBRIA IN COMPLEX SYSTEMS
GORDON, S. ZELEZNIK, F. J. DEC. 1966 SEE ALSO NASA-TN-D-1454
LEWIS-281
Computer program numerically solves nonlinear algebraic equations for chemical equilibrium based on iteration equations independent of choice of components. This program calculates theoretical performance for frozen and equilibrium composition during expansion, Chapman-Jouguet flame properties, studies combustion and designs hardware.

B66-10675
GAGE ACCURATELY CONTROLS FORCE FOR PLACING CHIPS ON SUBSTRATES
BENZIE, W. P. /IBM/ DEC. 1966
M-FS-1941
Device is developed to control the force used in manually placing chips on substrates. It controls the compression load between 2 small members at loads as low as 25 grams by means of a force control gauge that is preset by varying the spring deflection.

B66-10679
BLACKBODY CAVITY RADIOMETER HAS RAPID RESPONSE
HALEY, F. C. DEC. 1966
JPL-521
Fast response, spectrally linear standard detector in the form of a blackbody cavity radiometer calibrates rapidly responding photodetectors against a calibrated standard detector. A power amplifier with maximum available gain reduces error signal without stability loss. It may be used as a blackbody radiator by manipulation of the bridge variable arm.

B66-10680
SLIDE RULE-TYPE COLOR CHART PREDICTS REPRODUCED PHOTO TONES
GRIFFIN, J. D. /N. AM. AVIATION/ DEC. 1966
MSC-1227
Slide rule-type color chart determines the final reproduced gray tones in the production of briefing charts that are photographed in black and white. The chart shows both the color by drafting paint manufacturer*s name and mixture number, and the gray tone resulting from black and white photographic reproduction.

B66-10685
PROCESS REDUCES SECONDARY RESONANT EMISSION IN ELECTRONIC COMPONENTS
ERPENBACH, H. DEC. 1966
JPL-934
Process reduces secondary electron emission in coaxial connector and in waveguides in the atmosphere. The assembly is placed in a vacuum chamber and is gradually vented to the atmosphere. It is exposed to high voltage, argon gas, and a hydrocarbon gas during the process.

B66-10687
STUDY OF HOT WIRE TECHNIQUES IN LOW DENSITY FLOWS WITH HIGH TURBULENCE LEVELS
HANSON, A. R. KRAUSE, F. R. LARSON, R. E. DEC. 1966
M-FS-1269
Prediction of heat, mass, species, and momentum fluxes in a space vehicle and aerodynamic noise

production by supersonic jet and rocket exhausts requires a predictability of the associated turbulence fields. The hot wire is a technique that will allow an experimental determination of turbulent properties.

B66-10689
LOW INPUT VOLTAGE CONVERTER/REGULATOR MINIMIZES EXTERNAL DISTURBANCES
INNOVATOR NOT GIVEN /HONEYWELL/ DEC. 1966
GSFC-527
Low-input voltage converter/regulator constructed in a coaxial configuration minimizes external magnetic field disturbance, suppresses radio noise interference, and provides excellent heat transfer from power transistors. It converts the output of fuel and solar cells, thermionic diodes, thermoelectric generators, and electrochemical batteries to a 28 vdc output.

B66-10690
EQUIVALENT CIRCUIT FOR A FIELD EFFECT TRANSISTOR ESTABLISHED FOR COMPUTER SIMULATION
MING, L. J. /IBM/ DEC. 1966
M-FS-1752
Equivalent circuit for the field effect transistor made up of circuit elements can be simulated by existing computer programs.

B66-10691
SOLID-STATE RECOVERABLE FUSE FUNCTIONS AS CIRCUIT BREAKER
THOMAS, E. F., JR. DEC. 1966
GSFC-560
Molded, conductive-epoxy recoverable fuse protects electronic circuits during overload conditions, and then permits them to continue to function immediately after the overload condition is removed. It has low resistance at ambient temperature, and high resistance at an elevated temperature.

B66-10692
HERMETICALLY SEALED CELLS PROTECTED FROM INTERNAL GAS PRESSURE
CARSON, W. N. /GE/ DEC. 1966
GSFC-555
Manufacturing process prevents damage to hermetically sealed nickel-cadmium secondary cells by buildup of gas pressure during overcharging and reversed charging conditions. The cells are manufactured with less charge capacity in the positive electrode than in the negative electrode, and two additional electrodes are added.

B66-10696
LOW RATE FLOW SWITCH CAN BE USED FOR GAS OR LIQUID
BATES, E. T., JR. DEC. 1966
JPL-879
Flow switch operable at low flow rates is used for detecting the flow of a water coolant in a vacuum deposition apparatus. This switch utilizes one or more reed switches which are actuated by a sliding magnet.

B66-10699
MONITORING SYSTEM DETERMINES AMPLITUDE AND TIME OF VIBRATION CHANNEL PEAKS
ANDERSON, T. O. DEC. 1966
JPL-879
Adaptive scheme advocated in this innovation will reduce processing time and is applicable to environmental testing and to space- or aircraft-borne vibration monitoring devices requiring a large number of channels.

B66-10706
LOGARITHMIC CURRENT SIMULATOR GENERATES ELECTRICAL CURRENTS ACCURATELY BETWEEN 10 TO THE MINUS 11 AMPERE TO 10 TO THE MINUS 3 AMPERE
WILSON, J. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0087
Current generator accurately simulates electric currents in the range of .0000000001 ampere to 01. ampere. Compensation networks have been devised to improve the accuracy at the lower current levels.

B66-10709
THERMOCOUPLE-FLEXIBLE CABLE CONNECTOR INSULATOR IS HIGHLY RELIABLE
GRACEY, C. M. /AEROJET-GEN. CORP./ DEC. 1966
NU-0082
Plastic /polycarbonate/ insulator improves thermocouple reliability in test operations. The insulator is molded in half sections, assembled mechanically and eliminates electrical shorting.

02 PHYSICAL SCIENCES (ENERGY SOURCES)

B63-10260
SOLAR-ANGLE SENSOR HAS NO MOVING PARTS
EXNER, D. W., JR. MEISENHOLDER, G. W. SCHMIDT, L. F. MAY 1964
JPL-418
To measure the direction of the sun over a spherical field of view, a cube-shaped solar sensor with a photocell on each side is used. The outputs from the six cells are fed into a computer for determining the position of the sun relative to an orthogonal coordinate system.

B63-10344
COOLING METHOD PROLONGS LIFE OF HOT-WIRE TRANSDUCER
BALDWIN, L. V. SANDBORN, V. A. JUN. 1964
LEWIS-41
To cool a hot-wire transducer, the two ends of the wire are supported on thermally and electrically conductive rods, surrounded by a fluid cooling medium. By keeping the supporting rods at a substantially constant temperature, the probe is prevented from overheating.

B63-10346
NEW METHOD USED TO FABRICATE LIGHT-WEIGHT HEAT EXCHANGER FOR ROCKET MOTOR
BAEHR, E. F. MAR. 1964
LEWIS-43
A grooved capstrip, to straddle the metal edges of regenerative cooling channels, increases the strength and heat transfer characteristics of lightweight motor cases. This capstrip is so designed as to form a firm joint between the channels that form the rocket casing wall.

B63-10421
MIRROR DEVICE ALIGNS MACHINE SURFACE PERPENDICULAR TO SIGHT LINES
KISSLER, H. R. /RCA/ MAY 1964
WOO-5
A sight alignment device is used to align two machines so that an axis of the first machine is parallel to a flat surface on the second. This sighting device depends on the reflection of a light beam from the surface to be aligned.

B65-10036
IONIZATION VACUUM GAGE STARTS QUICKLY, IS UNAFFECTED BY SPURIOUS CURRENTS
GARWOOD, D. C. FEB. 1965
JPL-304
Ionization vacuum gauge with a switch-operated starting device and a microammeter begins functioning quickly in a high vacuum. The microammeter is also protected by its circuit design from spurious currents.

B65-10046
WIDE-APERTURE SOLAR ENERGY COLLECTOR IS LIGHT IN WEIGHT
INNOVATOR NOT GIVEN /BECKMAN INSTRUMENTS/ FEB. 1965
JPL-SC-055
By mounting the Fresnel lens in eight steps above three paraboloidal reflector rings of epoxy resin with aluminized surfaces, a light weight, wide-aperture solar energy collector is devised.

B65-10071
SIMPLE OPTICAL SYSTEM USED TO ALIGN

SPECTROGRAPH
EXTON, R. J. MAR. 1965
LANGLEY-92
Optically fast, portable spectrograph incorporates auxiliary optics in a boresight technique to use the zero order of the grating for visual alignment. This device obtains moderately resolved spectra of a multitude of light sources.

B65-10081
MAGNETIC FIELD TEST COILS ARE TEMPERATURE COMPENSATED
INNOVATOR NOT GIVEN /SPECTRA PHYS./ APR. 1965
GSFC-294
Magnetic field test coils with auxiliary winding wound opposite to main coil winding eliminates changes in field configurations due to temperature changes. The auxiliary coil is made with aluminum wire.

B65-10082
MULTIPLE ELEMENT SOFT X-RAY SOURCE PRODUCES WIDE RANGE OF RADIATION
CARUSO, A. J. NEUPERT, W. M. MAR. 1965
GSFC-286
A rotating mount with target elements positioned independently for direct electron bombardment produces soft X-ray radiation with a wide range of characteristics. The device may be used to study solar radiation from a satellite.

B65-10084
MODIFIED CONTOUR PROJECTOR MAKES EXCELLENT CONTOUR DENSITOMETER
EXTON, R. J. MAR. 1965
LANGLEY-93
Thin glass beam splitter, densitometer head, and densitometer electronics are incorporated in a standard contour projector. The density contour of small areas of photographic film can be read. This instrument can be used as a research tool in process engineering.

B65-10100
ROTATING FILTERS PERMIT WIDE RANGE OF OPTICAL PYROMETRY
EXTON, R. J. SIVITER, J. H., JR. STRASS, H. K.
APR. 1965
LANGLEY-33
Gear-driven dual filter disks of graduated density vary linearly with respect to rotation, allowing a wide range of photographic pyrometry. This technique is applicable in metallurgy, glass, plastics and refractory research, and crystallography.

B65-10122
MICROWAVE TECHNIQUE MEASURES PLASMA CHARACTERISTICS
LEONARD, W. F. APR. 1965
LANGLEY-134
Plasma electron density and temperature distribution is measured by passing a high frequency millimeter wave through plasma. Variations in density and temperature are determined by measuring insertion loss as the plasma travels between the microwave transmitting and receiving antennas

B65-10129
APPARATUS PERMITS FLEXURE TESTING OF SPECIMENS AT CRYOGENIC TEMPERATURES
DENABURG, C. R. REECE, O. Y. MAY 1965
M-FS-257
Cryostat with support structure for test specimen allows flexure fatigue testing of honeycomb composite sandwich structures at cryogenic temperatures. The cryostat consists of a cryogen container enclosing two pairs of yokes which support two rotating end clamps.

B65-10132
SIMPLE CIRCUIT POSITIONS FILM FRAMES IN PROJECTOR
SILVER, R. H. MAY 1965
JPL-508
Individual frames on a photographic film strip in a projector are automatically positioned by a simple circuit. The circuit uses a photodiode that senses frame registry position and a relay that stops the film-advance motor to suspend the film at point of registry.

B65-10133
PROBE MEASURES CHARACTERISTICS OF HOT GAS STREAM
INNOVATOR NOT GIVEN /PLASMADYNE CORP./ MAY 1965
M-FS-240
Shielded, tubular flow calorimeter operated by valve position measures characteristics of a hot gas stream of unknown composition. Measurements of mass flow density and total heat content per unit mass, total heat content per unit mass only, and pitot pressure are made.

B65-10157
INTERNAL COOLING INCREASES RANGE OF IMMERSION-TYPE TEMPERATURE PROBE
LANZO, C. D. JUN. 1965
LEWIS-171
Temperature probe used in a high temperature, high velocity gas stream consists of cooled outer shell and a cooled platinum sensing tube with iron constantan thermocouples.

B65-10171
FRESNEL ZONE PLATE FORMS IMAGES AT WAVELENGTHS BELOW 1000 ANGSTROMS
INNOVATOR NOT GIVEN /SMITHSONIAN INST./ JUN. 1965
GSFC-231
Fresnal zone plate with openings replacing the usual transparent rings produces images in a vacuum ultraviolet. The plate is made by etching and electrodeposition.

B65-10186
ELECTRONIC MODULES EASILY SEPARATED FROM HEAT SINK
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ JUN. 1965 SEE ALSO B63-10033
MSC-142
Metal heat sink and electronic modules bonded to a thermal bridge can be easily cleaved for removal of the modules for replacement or repair. A thin film of grease between a fluorocarbon polymer film on the metal heat sink and an adhesive film on the modules acts as the cleavage plane.

B65-10188
REFRACTORY METAL SHIELDING /INSULATION/ INCREASES OPERATING RANGE OF INDUCTION FURNACE
EBIHARA, B. T. JUN. 1965
LEWIS-202
Thermal radiation shield contains escaping heat from an induction furnace. The shield consists of a sheet of refractory metal foil and a loosely packed mat of refractory metal fibers in a concentric pattern. This shielding technique can be used for high temperature ovens, high temperature fluid lines, and chemical reaction vessels.

B65-10211
LIGHT RAY MODULATION CONTROLS OPTICAL SYSTEM ALIGNMENT
INNOVATOR NOT GIVEN /KOLLSMAN INSTR. CORP./ JUL. 1965
GSFC-171
Light ray modulator maintains focus in optical system subject to severe thermal gradients, vibration and shock. The modulated signals drive a servo system that aligns the system optics.

B65-10224
HEATER DECOMPOSES OIL BACKSTREAMING FROM HIGH-VACUUM PUMPS
SHAPIRO, H. AUG. 1965
GSFC-356
Heater placed between an oil diffusion pump and a vacuum chamber prevents backstreaming of oil molecules into the work area of the chamber. It breaks the oil molecules into basic constituents that can be pumped away.

B65-10239
ION PUMP PROVIDES INCREASED VACUUM PUMPING SPEED
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ AUG.

1965
NEO-13
Multiple-cell ion pumps with increased vacuum pumping speed are used for producing ultrahigh vacuums in vacuum tubes and mass spectrometers. The pump has eight cathode-anode magnetron cells arranged in a cylinder which increase the surface area of the cathode.

B65-10240
INSULATION ACCELERATES RATE OF COOLING WITH CRYOGENIC FLUID
ALLEN, L. D. AUG. 1965
MSC-161
Thermal insulating material increases the rate of heat transfer from the interior of a chamber to a liquid nitrogen-filled metal jacket. A thin film of the material is bonded to the surface of the metal wall facing the liquid nitrogen.

B65-10252
DISTANT OBJECTS DETECTED VISUALLY WITH OPTICAL FILTERS
INNOVATOR NOT GIVEN AUG. 1965
LANGLEY-166
Fluorescent coating aids visual daylight detection and identification of distant objects. An object appears as a blinking light when the area is alternately scanned with transmitting and obscuring filters. This method can be effective in search and rescue operations.

B65-10253
OIL-DAMPED MERCURY POOL MAKES PRECISE OPTICAL ALIGNMENT TOOL
THEKAEKARA, M. P. AUG. 1965
GSFC-353
Mercury pool with a cover layer of high viscosity oil provides a reference reflector for precise alignment of optical instruments. The cover layer effectively damps any ripples in the mercury from support structure vibrations.

B65-10272
INFRARED SHIELD FACILITATES OPTICAL PYROMETER MEASUREMENTS
EICHENBRENNER, F. F. ILLG, W. SEP. 1965
LANGLEY-133
Water-cooled shield facilitates optical pyrometer high temperature measurements of small sheet metal specimens subjected to tensile stress in fatigue tests. The shield excludes direct or reflected radiation from one face of the specimen and permits viewing of the infrared radiation only.

B65-10280
ELECTRON BOMBARDMENT IMPROVES VACUUM CHAMBER EFFICIENCY
PRZYBYSZEWSKI, J. SWIKER, M. A. WATSON, J. SEP. 1965
LEWIS-160
Bombardment of vacuum chamber walls by an electron gun within the chamber achieves greater efficiency with less cost. The ultimate vacuum reached using the gun is greater than the system design level.

B65-10283
ELECTRON-BEAM DEFLECTION CONTROLLED BY DIGITAL SIGNALS
CRESSEY, J. R. SEP. 1965
GSFC-385
Electron-beam deflection in electronic image converters is controlled by a tapped magnetic deflection yoke and a series of current generators. The generators supply equal current to each tap through digitally controlled switches, thereby increasing the inherent accuracy of the system.

B65-10291
SPIRALED CHANNELS IMPROVE HEAT TRANSFER BETWEEN FLUIDS
HIGA, W. WIEBE, E. R. OCT. 1965
JPL-694
Spiral flow channels increase heat transfer between two fluids in a countercurrent heat exchanger of given volume. The heat exchanger is constructed by connecting a spiraled bellows-shaped ducting between two concentric cylindrical tubes.

B65-10292
INTERFEROMETER CONSTRUCTION ASSURES PARALLELISM OF CRITICAL COMPONENTS
CONNES, P. OCT. 1965
JPL-704
Interferometer with rigidly mounted components assures parallelism of critical components. The interferometer is constructed for effective operation even if the total instrument is subjected to mechanical stress.

B65-10295
UNIQUE CONSTRUCTION MAKES INTERFEROMETER INSENSITIVE TO MECHANICAL STRESSES
BEER, R. OCT. 1965
JPL-725
Michelson-type interferometer with a cat-eye reflector operates effectively even in the presence of random mechanical stresses. A cubical beansplitter with dichroic surfaces permits operation in infrared or visible light.

B65-10296
COAXIAL CAPACITOR USED TO DETERMINE FLUID DENSITY
ATKISSON, E. A. OCT. 1965
LEWIS-232
Sensing device measures directly the density of compressible fluid existing simultaneously in both liquid and gaseous phases. The device is comprised of a capacitor connected as one leg of a bridge circuit, a power source, and an indicator calibrated to indicate density as a direct measurement.

B65-10297
SUPERCONDUCTOR SHIELDS TEST CHAMBER FROM AMBIENT MAGNETIC FIELDS
HILDEBRANDT, A. F. OCT. 1965
JPL-627
Shielding a test chamber for magnetic components enables it to maintain a constant, low magnetic field. The chamber is shielded from ambient magnetic fields by a lead foil cylinder maintained in a superconducting state by liquid helium.

B65-10330
WEDGE IMMERSED THERMISTOR BOLOMETER MEASURES INFRARED RADIATION
DREYFUS, M. G. /BARNES ENG. CO/. NOV. 1965
GSFC-443
Wedge immersed-thermistor bolometer measures infrared radiation in the atmosphere. The thermistor flakes are immersed by optical contact on a wedge-shaped germanium lens whose narrow dimension is clamped between two complementary wedge-shaped germanium blocks bonded with a suitable adhesive.

B65-10331
CLOSED FLUID SYSTEM WITHOUT MOVING PARTS CONTROLS TEMPERATURE
STENGER, F. J. NOV. 1965
LEWIS-222
Closed fluid system maintains a constant temperature in an insulated region without the use of any moving parts. Within the system, the energy for thermodynamic cycling of two- phase heat transfer fluid and a hydraulic fluid is entirely supplied by the heat generated in the thermally insulated region.

B65-10356
SEGMENTED ELECTRODE INCREASES OPERATING PRESSURE OF MHD ACCELERATOR
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./
NOV. 1965
LANGLEY-95
Circumferentially segmented-ring electrode replaces the solid-ring electrode in a basic magnetohydrodynamic /MHD/ accelerator. This produces diffuse discharges at pressures as high as 100 atmospheres.

B65-10368
VACUUM CHAMBER PROVIDES IMPROVED INSULATION

AND SUPPORT FOR CRYOSTAT
INNOVATOR NOT GIVEN /GE/ DEC. 1965
M-FS-415
Taut wires in an evacuated cylinder minimize heat transfer through the walls and junctions of a liquid-helium-filled cryostat by suspending the cryostat.

B65-10373
MODIFIED PROCEDURE SPEEDS CAMERA COPY LAYOUT FOR OFFSET PRINTING
SMITH, L. F. DEC. 1965
GSFC-424
Projecting a grid pattern on a steel layout board facilitates the alignment of camera copy for photo-offset reproduction. Small flat bar magnets fasten the copy to the board.

B65-10395
OPTICAL OUTPUT ENHANCES FLOWMETER ACCURACY
WOLPIN, E. G. /N. AM. AVIATION/ DEC. 1965
M-FS-482
Magnetic flowmeter with a direct-coupled optical output increases accuracy and operates independently of other system inputs. The design includes simple external adjustment and signal amplitude control.

B66-10004
COPPER FOIL PROVIDES UNIFORM HEAT SINK PATH
PHILLIPS, I. E., JR. SCHREIHANS, F. A. /N. AM. AVIATION/ JAN. 1966
MSC-262
Thermal path prevents voids and discontinuities which make heat sinks in electronic equipment inefficient. The thermal path combines the high thermal conductivity of copper with the resiliency of silicone rubber.

B66-10008
AUTOMATIC FLUID SEPARATOR SUPPLIES OWN DRIVING POWER
DECKER, M. S. MAJNERI, L. A. SPULGIS, I. S. /MIDLAND-ROSS CORP./ JAN. 1966
WOO-085
Centrifugal separator suspended in the fuel tank of a space vehicle selects and vents gas vapor at zero gravity. Escaping vapor is used to drive an expander turbine that is magnetically coupled to the separator.

B66-10010
OPTICAL PROJECTORS SIMULATE HUMAN EYES TO ESTABLISH OPERATOR*S FIELD OF VIEW
BEAM, R. A. /N. AM. AVIATION/ JAN. 1966
WOO-250
Device projects visual pattern limits of the field of view of an operator as his eyes are directed at a given point on a control panel. The device, which consists of two projectors, provides instant evaluation of visual ability at any point on a panel.

B66-10016
SINGLE PROJECTOR ACCOMMODATES SLIDES OF DIFFERENT SIZE AND FORMAT
GATES, G. M. JAN. 1966
GSFC-439
Projector with two adjustable external units accommodates slides of different size and format. One external unit is the holder for different size slides and includes mounting means for appropriate condensing lens and heat filters. The other unit is a turret lens assembly. The machine is easily adaptable to rear-screen and front-screen projection over various distances.

B66-10017
PTFE-ALUMINUM FILMS SERVE AS NEUTRAL DENSITY FILTERS
BURKS, H. D. JAN. 1966
LANGLEY-189
Polytetrafluoroethylene /PTFE/ films coated with aluminum films act as neutral density filters in the wavelength range 0.3 to 2.1 microns. These filters are effective in the calibration of photometric systems.

B66-10045
COMPLEMENTARY SYSTEM VAPORIZES SUBCOOLED LIQUID, IMPROVES TRANSFORMER EFFICIENCY
KETAILY, E. C. /N. AM. AVIATION/ FEB. 1966
M-FS-550
Complementary system converts subcooled liquid hydrogen or nitrogen to gas. The inherent induction heat losses of an electrical transformer are used in the vaporizing process. Transformer efficiency is improved in the process.

B66-10058
CALORIMETER ACCURATELY MEASURES THERMAL RADIATION ENERGY
ANDERSON, W. W., JR. MILLER, H. B. SWEET, G. E.
FEB. 1966
LANGLEY-173
Calorimeter accurately measures steady-state and transient, low-level thermal radiation energy. The calorimeter uses a compensating shield between the sensor and the calorimeter mount to intercept sensor heat losses and to provide a reference for determining a correction factor.

B66-10060
THIN CARBON FILM SERVES AS UV BANDPASS FILTER
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ FEB. 1966
ERC-8
Thin carbon film deposited on a 70 percent transparent screen provides a filter for narrow-band detectors in the extreme ultraviolet. The filter also suppresses scattered light and light of unwanted orders in vacuum spectrographs.

B66-10072
BEAM SPLITTER USED IN DUAL FILMING TECHNIQUE
ZELDIN, S. /N. AM. AVIATION/ FEB. 1966
M-FS-501
Tubular tee is intersected at its junction by a reflecting/transmitting mirror angled to provide two images of an object for simultaneous photographing from two positions. This method is used when space and focal conditions are limited.

B66-10075
SPECIMEN HOLDER DESIGN IMPROVES ACCURACY OF X-RAY POWDER ANALYSIS
MACK, M. /N. AM. PHILLIPS CORP./ FEB. 1966
JPL-SC-165
Specimen holder for X-ray diffraction analysis presents the specimen to the incident X-rays in a curvature. This permits the use of an X-ray beam having a larger divergence angle, the beam intensity is increased, and the statistical accuracy of analysis is improved.

B66-10079
HIGH-PRESSURE, LOW TEMPERATURE ELECTRICAL CONNECTOR MAKES NO-LEAK SEAL
WEAKLEY, J. F. /N. AM. AVIATION/ MAR. 1966
MSC-276
Flow control of cryogenic liquids is achieved through use of an electrical feed-through connector with a solenoid-type valve. To prevent gas leakage, the connector is designed and structured so that extremely high pressure and low temperatures contribute to its sealing properties.

B66-10086
SCREEN OF CYLINDRICAL LENSES PRODUCES STEREOSCOPIC TELEVISION PICTURES
NORK, C. L. /SPACO, INC./ MAR. 1966
M-FS-273
Stereoscopic television pictures are produced by placing a colorless, transparent screen of adjacent parallel cylindrical lenses before a raster from two synchronized TV cameras. Alternate frames from alternate cameras are displayed. The viewer*s sensory perception fuses the two images into one three-dimensional picture.

B66-10095
ULTRAVIOLET PHOTOGRAPHIC PYROMETER USED IN ROCKET EXHAUST ANALYSIS
LEVIN, B. P. /N. AM. AVIATION/ MAR. 1966
M-FS-499
Ultraviolet photographic pyrometer investigates the role of carbon as a thermal radiator and

determines the geometry, location, and progress of afterburning phenomena in the exhaust plume of rocket engines using liquid oxygen/RP-1 as propellant.

B66-10096
INEXPENSIVE INFRARED SOURCE IMPROVISED FROM FLASHLIGHT
INNOVATOR NOT GIVEN /FAIRCHILD HILLER CORP./ MAR. 1966
M-FS-494
Inexpensive hand-held source of infrared energy is provided by a flashlight bulb coated with a paint which filters out the visible light emitted by the bulb and transmitts only infrared radiation. This device can be used for checking infrared sensors and for experimental purposes.

B66-10098
NEW ENERGY STORAGE CONCEPT USES TAPES
GRUBER, A. KAFESJIAN, R. R. /MONSANTO RES. CORP./ MAR. 1966
LEWIS-239
Energy storage system uses movable permeable tapes with cathode and electrolyte material that is drawn across an anode to produce electric power. The system features long shelf life, high efficiency, and flexible operation.

B66-10108
PLASTIC SCINTILLATOR CONVERTS STANDARD PHOTOMULTIPLIER TO ULTRAVIOLET RANGE
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ MAR. 1966
ERC-9
Commercially available plastic scintillators are attached to the glass windows of standard photomultiplier tubes for detection of ultraviolet radiation.

B66-10114
HIGHLY SENSITIVE SOLIDS MASS SPECTROMETER USES INERT-GAS ION SOURCE
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ MAR. 1966
ERC-11
Mass spectrometer provides a recorded analysis of solid material surfaces and bulk. A beam of high-energy inert-gas ions bombards the surface atoms of a sample and converts a percentage into an ionized vapor. The mass spectrum analyzer separates the vapor ionic constituents by mass-to-charge ratio.

B66-10121
COMPOUND IMPROVES THERMAL INTERFACE BETWEEN THERMOCOUPLE AND SENSED SURFACE
KALLIN, I. N. /WESTINGHOUSE ASTRONUCLEAR LAB/ MAR. 1966
NU-0028
Thermocouples and brittle materials are joined without welding by an epoxy resin cement mixer with a conducting material. This mixture does not form thermal barriers at cryogenic temperatures.

B66-10122
NIOBIUM THIN FILMS ARE SUPERCONDUCTIVE IN STRONG MAGNETIC FIELDS AT LOW TEMPERATURES
CLOUGH, P. J. /NATL. RES. CORP./ FOWLER, P. MAR. 1966
JPL-SC-174
Niobium film superconductor carries high currents in strong magnetic fields. The thin niobium film is formed on an inert substrate through evaporation in a vacuum environment. Control of temperature and vacuum results in rejection of gaseous impurities so that the film is of a very high purity.

B66-10143
SEXTANT MEASURES SPACECRAFT ALTITUDE WITHOUT GRAVITATIONAL REFERENCE
INNOVATOR NOT GIVEN /GEONAUTICS, INC./ APR. 1966
MSC-200
Horizon-sensing sextant measures the altitude of an orbiting spacecraft without gravitational reference by optically measuring the dip angle to the horizon along a line of sight in each of two planes. The sextant scans over a relatively limited field of view.

B66-10153
ARGON PURGE GAS COOLED BY CHILL BOX
SPIRO, L. W. /N. AM. AVIATION/ APR. 1966
M-FS-560
Cooling argon purge gas by routing it through a shop-fabricated chill box reduces charring of tungsten inert gas torch head components. The argon gas is in a cooled state as it enters the torch and prevents buildup of char caused by the high concentrations of heat in the weld area during welding operations.

B66-10156
CIRCULAR, EXPLOSION-PROOF LAMP PROVIDES UNIFORM ILLUMINATION
INNOVATOR NOT GIVEN /N. AM. AVIATION/ APR. 1966
MSC-382
Circular explosion-proof fluorescent lamp is fitted around a TV camera lens to provide shadowless illumination with a low radiant heat flux. The lamp is mounted in a transparent acrylic housing sealed with clear silicone rubber.

B66-10157
CRYOGENIC LIQUID TRANSFER SYSTEM REDUCES RESIDUAL BOILOFF
HEGLAND, D. E. APR. 1966 2 P
LEWIS-274
System for transferring cryogenic liquids to a dewar prevents boiloff of residual liquid by venting the boiloff to the atmosphere during the transfer tube cooling period. The system is most useful with liquids having very small heat vaporization.

B66-10173
OFFSET LENSES AND VERSATILITY TO PHOTOTYPESETTING MACHINE
JAMES, A. M. /DOCUMENTATION, INC./ APR. 1966
HQ-9
Offset lenses facilitate the composition of inputs of other than straight baseline characters on the Photon phototypesetting machine. A number of lenses in the turret are mounted in an offset pattern that causes characters projected through them to fall on the photographic paper in the magazine above and below the baseline.

B66-10178
FATIGUE CRACKS DETECTED AND MEASURED WITHOUT TEST INTERRUPTION
FRECHE, J. C. KLIMA, S. J. LESCO, D. J. MAY 1966
LEWIS-266
Ultrasonic flaw detector records cracks in materials undergoing fatigue tests, without interfering with test progress. The detector contains modified transducers clamped to the specimens, and an oscillograph readout.

B66-10181
ALUMINUM DOPING IMPROVES SILICON SOLAR CELLS
MAY 1966 SEE ALSO NASA-TN-D-2711
LEWIS-206
Aluminum doped silicon solar cells with resistivities in the 10- to 20-ohm centimeter range have broad spectral response, high efficiency and long lifetimes in nuclear radiation environments. Production advantages include low material rejection and increased production yields, and close tolerance control.

B66-10183
INSULATION FOR CRYOGENIC TANKS HAS REDUCED THICKNESS AND WEIGHT
DUMIRE, P. E. MIDDLETON, R. L. SCHELL, J. T. STUCKEY, J. M. MAY 1966 SEE ALSO NASA-SP-5030
M-FS-326
Dual seal insulation, consisting of an inner layer of sealed-cell Mylar honeycomb core and an outer helium purge channel of fiberglass- reinforced phenolic honeycomb core, is used as a thin, lightweight insulation for external surfaces of cryogenic-propellant tanks.

B66-10186
RADIATION USED TO TEMPERATURE COMPENSATE SEMICONDUCTOR STRAIN GAGES
GROSS, C. MAY 1966
LANGLEY-207
Exposure to high energy electron radiation reduces the temperature coefficients of resistance and gauge factor of a range of resistivities of n- and p-type semiconductor silicon strain gauges. After irradiation, the gauges are heated to a high temperature for a 24-hour period to stabilize their temperature coefficients.

B66-10187
RUBBER-COATED BELLOWS IMPROVES VIBRATION DAMPING IN VACUUM LINES
HEGLAND, D. E. SMITH, R. J. MAY 1966
LEWIS-273
Compact vibration damping systems, consisting of rubber-coated metal bellows with a sliding O-ring connector, are used in vacuum lines. The device presents a metallic surface to the vacuum system and combines flexibility with the necessary stiffness. It protects against physical damage, reduces fatigue failure, and provides easy mating of nonparallel lines.

B66-10199
MOUNT ENABLES PRECISION ADJUSTMENT OF OPTICAL-INSTRUMENTATION MIRROR
INNOVATOR NOT GIVEN /MASS. INST. OF TECH./ MAY 1966
MSC-184
Mirror mount assembly allows the plane of a mirror to be adjusted through small angles about two orthogonal axes. The assembly, which has a mirror mount with two independently adjustable flexure joints, allows independent precise adjustment of the mirror mount with respect to each axis.

B66-10231
SOLAR CELL SUBMODULE DESIGN FACILITATES ASSEMBLY OF LIGHTWEIGHT ARRAYS
YASUI, R. K. MAY 1966
JPL-728
Solar cell submodules with bus bars that leave tabs along one end of the submodule and wires with raised portions along the other end are assembled by interlocking the tabs and wires of adjacent submodules. This structural design is lightweight and reliable and requires no metallic substructure.

B66-10257
FREON PROVIDES HEAT TRANSFER FOR SOLID CO2 CALIBRATION STANDARD
INNOVATOR NOT GIVEN /LEEDS AND NORTHRUP CO./ JUN. 1966
M-FS-644
Acetone and Freon as liquid heat transfer mediums bring a dry ice bath to, and keep it at, the temperature required when using solid carbon dioxide as a calibration standard. Although acetone gives better results, Freon TF is preferred since acetone reacts violently in the presence of liquid oxygen.

B66-10263
OPTICAL DEVICE ENABLES SMALL DETECTOR TO SEE LARGE FIELD OF VIEW
ARNDT, J. H. /TRW SPACE TECHNOL. LABS./ JUN. 1966
WOO-253
Optical device images the sun on a mask that transmits it or prevents its transmission to a photodetector behind the mask depending on image position on the mask. The device uses a pinhole as the image former to provide a large field of view and diffraction-limited resolution.

B66-10268
HIGH-SPEED FURNACE USES INFRARED RADIATION FOR CONTROLLED BRAZING
ECKLES, P. N. /AEROJET-GEN. CORP./ JUN. 1966
NU-0047
Furnace produces controlled heat for brazing and heat treating metals over a wide range of temperatures by using a near-infrared heat source positioned at one focus of an ellipsoidal reflector mounted below a cylindrical quartz chamber. This furnace maintains a pure atmosphere, has rapid heatup and cooldown, and permits visual observation.

B66-10289
ULTRASONIC HAND TOOL ALLOWS CONVENIENT SCANNING OF SPOT WELDS
MITCHELL, D. K. /BOEING CO./ JUL. 1966
M-FS-539
Small, portable, electrically powered hand tool, coupled with auxiliary ultrasonic equipment, allows convenient scanning of spot welds for discontinuities.

B66-10290
MODIFIED MCLEOD GAGE RECORDS AUTOMATICALLY
FAETH, P. A. JUL. 1966
LEWIS-290
Modified McLeod gauge records pressure measurements automatically. The measurements can be programmed in advance by means of an automatic timer.

B66-10307
COMMERCIAL FILM PRODUCES POSITIVE X-RAY PHOTO IN TEN SECONDS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUL. 1966
M-FS-521
Type 52 Polaroid Land Film Packet provides a rapid, inexpensive method of producing positive X-ray photographs of various objects.

B66-10316
LEGIBILITY OF ELECTROLUMINESCENT INSTRUMENT PANELS INVESTIGATED
MC LEAN, M. V. MILLER, G. E. /N. AM. AVIATION/ AUG. 1966
MSC-494 MSC-496 MSC-501 MSC-505
Legibility studies of several EL /electroluminescent/ displays correlate reading time and accuracy with number size, stroke/width ratio, indicia size, pointer width, contrast, ambient illumination, and color background and contrast. Human factor criteria established on non-EL displays may not apply to EL displays.

B66-10325
BIMETALLIC DEVICES HELP MAINTAIN CONSTANT SEALING FORCES DOWN TO CRYOGENIC TEMPERATURES
DE BOSKEY, W. R. /MELPAR/ JUL. 1966
M-FS-800
Tantalum washers compensate for different thermal coefficients of expansion between stainless steel and an aluminum O-ring. The washers have sufficient thickness to maintain a vacuum seal from room to cryogenic temperatures.

B66-10348
INEXPENSIVE INSULATION IS EFFECTIVE FOR CRYOGENIC TRANSFER LINES
LINDGREN, A. R. /N. AM. AVIATION/ AUG. 1966
MSC-618
Matting cover thermally insulates cryogenic-liquid transfer pipelines. The matting consists of layers of commercially available fiberglass tape in which the fibers are randomly oriented in parallel planes.

B66-10372
SPECIAL TREATMENT REDUCES HELIUM PERMEATION OF GLASS IN VACUUM SYSTEMS
BRYANT, P. J. GOSSELIN, C. M. /MIDWEST RES. INST./ AUG. 1966
HQ-25
Internal surfaces of the glass component of a vacuum system are exposed to cesium in gaseous form to reduce helium permeation. The cesium gas is derived from decomposition of cesium nitrate through heating. Several minutes of exposure of the internal surfaces of the glass vessel are sufficient to complete the treatment.

B66-10388
AUXILIARY TITANIUM SUBLIMATION PUMP PRODUCES ULTRAHIGH /10 TO THE MINUS 11 TORR/ VACUUM
OUTLAW, R. A. SEP. 1966
LANGLEY-212

Sublimated titanium as a gettering agent in conjunction with a turbine-type pump provides a two-step procedure for obtaining an ultrahigh vacuum of 10 to the minus 11 torr. The pump alone evacuates the chamber to a pressure of 10 to the minus 9 torr. The residual gas is removed by the gettering agent at a pumping speed of 15 liters per second per square inch.

B66-10435
CHEMICAL REGENERATION OF EMITTER SURFACE INCREASES THERMIONIC DIODE LIFE
BREITWIESER, R. OCT. 1966 SEE NASA-TN-D-1877
LEWIS-17

Chemical regeneration of sublimated emitter electrode increases the operating efficiency and life of thermionic diodes. A gas which forms chemical compounds with the sublimated emitter material is introduced into the space between the emitter and the collector. The compounds migrate to the emitter where they decompose and redeposit the emitter material.

B66-10474
GAS PRESSURE FEEDS FILM INTO CAMERA AT HIGH SPEED
KEIGHER, P. J. NOV. 1966
ARG-97

Blast of gas blows a loop of unexposed film as a wave across a vacuum platen to feed film smoothly into a camera so that 2 successive lengths can be exposed within 50 milliseconds. This technique can be readily applied to multiple aperture cameras as well as to various types of films.

B66-10483
UNIFORM REFLECTIVE FILMS DEPOSITED ON LARGE SURFACES
NOV. 1966 SEE ALSO NASA-TN-D-3357
GSFC-507

Specially designed baffle which intercepts varying amounts of the vapor stream from an evaporant source, vacuum deposits films of uniform thickness on large substrates, using a single small area evaporation source. A mirror coated by this method will have a reflectance as high as 82 percent at 1216 angstroms with a variation of only plus/minus 2 percent over the surface.

B66-10499
CRYOGENIC COOLING REDUCES HIGH VOLTAGE ARCING BETWEEN ELECTRODES OPERATING IN A VACUUM
DE GEETER, D. J. NOV. 1966
ARG-109

Cooling to a temperature of approximately liquid nitrogen or lower, reduces arcing, or high voltage breakdown, between two closely spaced electrodes operating in a vacuum. This cooling technique can be applied to electrodes having other than hemispherical shapes.

B66-10507
PANELS ILLUMINATED BY EDGE-LIGHTED LENS TECHNIQUE
HAAG, G. E. HORSFALL, R. B. /N. AM. AVIATION/
NOV. 1966
MSC-871

Electroluminescent lamps used to edge-light a specially ground lens provide nonglare, reduced eye strain panel illumination. There is no noticeable falloff in brightness along the lens edge. Light intensity diminishes toward the lens center. A slight halo, observed along the lens edge, has no detrimental effect.

B66-10508
EXPERIMENTAL INVESTIGATION OF MEGAWATT DC ARC HEATING OF NITROGEN
BOLDMAN, D. R. CAMPBELL, J. P. DEC. 1966
LEWIS-313

Four types of arc heaters, each with the capability of providing arc power levels in excess of 1 megawatt in nitrogen, were tested over a range of power levels and nitrogen flow rates to determine their value as heaters for hypersonic tunnels. The data derived should be useful in the design of high energy heaters for various industrial processes.

B66-10532
LIGHT-INTENSITY MODULATOR WITHSTANDS HIGH HEAT FLUXES
MAPLES, H. G. STRASS, H. K. NOV. 1966
MSC-246

Mechanism modulates and controls the intensity of luminous radiation in light beams associated with high-intensity heat flux. This modulator incorporating two fluid-cooled, externally grooved, contracting metal cylinders which when rotated about their longitudinal axes present a circular aperture of varying size depending on the degree of rotation.

B66-10547
HIGH INTENSITY RADIATION HEAT SOURCE IS CAPABLE OF SUSTAINED OPERATION
GEIDEMAN, W. A. MULLER, K. /TEXRON ELECTRONICS/
NOV. 1966
ARC-61

Water cooled, high intensity radiation source rated at 125 kw, with an efficiency of 31 to 34 percent is used in the evaluation of ablative materials under simulated conditions of high velocity entry into planetary atmospheres. The source operates repeatedly at maximum power for periods of 10 to 20 minutes.

B66-10554
CALCULATION OF INFRARED SPECTRAL TRANSMITTANCES OF INHOMOGENEOUS GASES
HUFFAKER, R. M. DEC. 1966
M-FS-1563

Calculation of spectral transmittance for a particular inhomogeneous gas path is made by combining known data on gases at constant temperature, pressure, and concentration. The spectral transmittances of the inhomogeneous plume gases is needed to calculate the heat radiated from the exhaust plume to the rocket base of a multiple engine rocket.

B66-10560
LASER MEASURING SYSTEM ACCURATELY LOCATES POINT COORDINATES ON PHOTOGRAPH
DOEDE, J. H. LINDENMEYER, C. W. VONDEROHE, R. H.
DEC. 1966
ARG-74

Laser activated ultraprecision ranging apparatus interfaced with a computer determines point coordinates on a photograph. A helium-neon gas CW laser provides collimated light for a null balancing optical system. This system has no mechanical connection between the ranging apparatus and the photograph.

B66-10565
MIXER CONDITIONS TEMPERATURE OF LIQUIFIED GAS STREAMS
TALMOR, E. /N. AM. AVIATION/ DEC. 1966
M-FS-1784

Room temperature gaseous hydrogen mixed with liquified hydrogen in a venturi produces a two-phased liquid hydrogen stream at a stable temperature. This technique is useful in a laboratory testing where presently, temperature control is maintained by a calibrated heat leak that results in considerable expenditure of cryogenic refrigerants.

B66-10583
NEON ISOTOPES CANCEL ERRORS IN GAS LASER
MACEK, W. M. OLTHUIS, R. W. SCHENEIDER, J. R.
/SPERRY GYROSCOPE CO./ DEC. 1966
M-FS-1476

Neon isotopes cancel frequency pushing errors arising from unequal gain in the two contracirculating beams of a helium-neon filled discharge tube used in a ring laser.

B66-10596
OPTICAL AUTOMATIC GAIN CHANNEL
MRUS, G. ZUKOWSKY, W. /PERKIN-ELMER CORP./ DEC. 1966
M-FS-1550

Automatic gain control /AGC/ channel automatically compensates for gain changes in the azimuth error channel due to time varying optical sight degrading effects. This system is useful

in remote television monitors, automatic navigation systems, and surveying and mapping instrumentation.

B66-10602
EXPOSURE VALUE /EV/ SYSTEM EXPANDED TO INCLUDE FILTER FACTORS AND TRANSMITTANCE
LINDSEY, W. F. DEC. 1966
LANGLEY-190
Application of the exposure value system requires that the system be extended to high brightness level, and expanded to include filter factors. A minimum of four photographic factors are involved in the evaluation of an exposure which when determined from tables of 1-stop interval could introduce noticeable error.

B66-10615
FEED-THRU FLANGE IS USEFUL IN VACUUM APPLICATIONS TO CRYOGENIC TEMPERATURES
YAGER, S. P. DEC. 1966
JPL-846
Feed-thru flange seals inner and outer walls of high vacuum test chambers. It is used in vacuum applications at both cryogenic and higher than cryogenic temperatures. A damaged flange can still be used for partial vacuum, noncryogenic applications in conjunction with an appropriate rubber seal.

B66-10630
TECHNIQUE FOR MEASURING ABSORPTANCE AND EMITTANCE BY USING CYCLIC INCIDENT RADIATION
JACK, J. R. DEC. 1966 SEE ALSO NASA-TM-X-52193
LEWIS-321
Cyclic radiation technique has been developed for determining absorptance and emittance of metal surfaces. Using this technique both absorptance and emittance can be determined from one set of data, and variable and controlled temperature levels are possible.

B66-10638
TWIN HELIX SYSTEM PRODUCES FAST SCAN IN INFRARED DETECTOR
VANZETTI, R. /N. AM. AVIATION/ DEC. 1966
M-FS-1598
Two rotating wheels in orthogonal relationship with helicoidal reflecting surfaces mounted on their outer rims achieve a linear speed without normal time loss in their return motion. The pitch of the helicoidal surfaces equals the displacement that the mirrors must traverse.

B66-10652
ROCKET ENGINE VIBRATION ACCURATELY MEASURED BY PHOTOGRAPHY
CRAIG, K. A. /N. AM. AVIATION/ DEC. 1966
M-FS-1916
High speed instrumentation camera focused on a partially masked light bulb which is securely mounted to the test fixture permits measurement of engine performance parameters when usual electronic vibration instrumentation is unavailable. Vibration is recorded as a light trace deviating from the light rays photographed in the static hardware condition.

B66-10654
CRYOGENIC FLUID SAMPLING DEVICE PERMITS TESTING UNDER HAZARDOUS CONDITIONS
MITCHELL, J. A. /N. AM. AVIATION/ DEC. 1966
M-FS-1927
Remotely controlled sampling device obtains timed sample of flowing cryogenic liquid propellants in remote or hazardous testing conditions. The device consists of a calibrated container, a dewar, a solenoid valve, a pressure gauge, and a manual bleed valve.

B66-10657
SIMPLE TECHNIQUE DETERMINES AC PROPERTIES OF HARD SUPERCONDUCTIVE MATERIALS
HARPER, C. M. HECHT, R. /RCA/ DEC. 1966
M-FS-1818
Critical current density of a neodymium- titanium alloy samples is analyzed from manentization curves to determine the ac properties of hard semiconductive materials. A complete family of magnetization curves is obtained, each curve representing performance at a different temperature.

B66-10660
PROCESS PRODUCES ACCURATE REGISTRY BETWEEN CIRCUIT BOARD PRINTS
INNOVATOR NOT GIVEN /BENDIX CORP./ DEC. 1966
LANGLEY-288
Tapes and quick-mount circles of contrasting colors aid in obtaining precise registry between the two circuits of two-sided printed circuit boards. The tapes and circles are mounted on opposite sides of transparent plastic film to define the conductive path and feed-through hole locations.

B66-10682
PRIMARY CELLS UTILIZE HALOGEN-ORGANIC CHARGE TRANSFER COMPLEX
GUTMANN, F. HERMANN, A. M. REMBAUM, A. DEC. 1966
JPL-926
Electrochemical cells with solid state components, employ charge transfer complexes or donor-acceptor complexes in which the donor component is an organic compound and the acceptor component is a halogen. A minor proportion of graphite added to these compositions helps reduce the resistivity.

B66-10693
LASER DOPPLER FLOWMETER MEASURES GAS VELOCITY
FOREMAN, W. /BROWN ENG. CORP./ HUFFAKER, R. M. DEC. 1966
M-FS-1747
Utilizing the large magnitudes of Doppler shifts obtainable from a CW gas laser local velocity vectors are measured by using the visible light from the laser. This technique is applicable for the measurement of velocity of any moving surface.

B66-10700
PROBLEM OF OSCILLATING CONE IN SUPERSONIC FLOW IS SOLVED BY SMALL PERTURBATION TECHNIQUES
PAO, T.-H. /MIT/ DEC. 1966
M-FS-869
Small perturbation technique solves the problem of an oscillating cone in supersonic flow. The logic of the program is straightforward, as reflected in the actual instructions for solving the problem.

03 MATERIALS (CHEMISTRY)

B63-10004
REFERENCE BLACK BODY IS COMPACT, CONVENIENT TO USE
DIMEFF, J. NEEL, C. B. APR. 1964
ARC-3
To replace the classical hollow sphere, a compact reference black body has been constructed from stacked razor blades. Treated with a deposit of black oxide on the surfaces or notches between the upper edges of the blades, the device is useful over a wide range of incident angles.

B63-10207
THERMALLY CONDUCTIVE METAL WOOL-SILICONE RUBBER MATERIAL CAN BE USED AS SHOCK AND VIBRATION DAMPER
HOUGH, W. W. APR. 1964
JPL-321
Bronze wool pads, impregnated with silicon rubber, meet the requirement for a thermally conductive, shock and vibration absorbing material. They serve as spacers in equipment mounting and are resistant to high temperatures.

B63-10234
FILTER FOR HIGH-PRESSURE GASES HAS EASY TAKE-DOWN, ASSEMBLY
MAC GLASHAN, W. F. FEB. 1964
JPL-373

A small metal filter body, for use in tubing supplying sterilization gases, has an inlet end that can be unscrewed. Inside, the high pressure filter is supported on both sides and sealed by an O-ring. Design facilitates assembly and disassembly of parts.

B63-10235
CRYOGENIC FILTER METHOD PRODUCES SUPER-PURE HELIUM AND HELIUM ISOTOPES
HILDEBRANDT, A. F. MAR. 1964
JPL-374
To purify helium, it is cooled in a low pressure environment until it becomes superfluid. The liquid helium is then filtered through iron oxide particles. Heating, cooling and filtering processes continue until the purified liquid helium is heated to a gas.

B63-10263
FRESNEL CUP REFLECTOR DIRECTS MAXIMUM ENERGY FROM LIGHT SOURCE
LAUE, E. G. YOUNGBERG, C. L. MAY 1964
JPL-424
To minimize shielding and overheating, a composite Fresnel cup reflector design directs the maximum energy from a light source. It consists of a uniformly ellipsoidal end surface and an extension comprising a series of confocal ellipsoidal and concentric spherical surfaces.

B63-10311
OIL-SMEARED MODELS AID WIND TUNNEL MEASUREMENTS
KATZOFF, S. LOVING, D. K. 1 APR. 1964 /SEE NASA-MEMO-3-17-59L/
LANGLEY-4
For visualizing flow characteristics in wind tunnel tests, model surfaces are smeared with any common petroleum-base oils. These fluoresce under ultraviolet light and the flow patterns are readily visualized.

B63-10318
QUICK-HARDENING PROBLEMS ARE ELIMINATED WITH SPRAY GUN MODIFICATION WHICH MIXES RESIN AND ACCELERATOR LIQUIDS DURING APPLICATION
JOHNSON, O. W. MAR. 1964 /SEE U.S. PATENT NO. 2,930,532/
LANGLEY-6A
A modified spray gun, with separate containers for resin and additive components, solves the problems of quick hardening and nozzle clogging. At application, separate atomizers spray the liquids in front of the nozzle face where they blend.

B63-10337
GALLIUM USEFUL BEARING LUBRICANT IN HIGH-VACUUM ENVIRONMENT
BUCKLEY, D. H. MAY 1964 /SEE U.S. PATENT NO. 3,072,574/
LEWIS-12
Solid gallium is used as a lubricant on bearings made of compatible materials. Such lubricants perform well in a high vacuum and under low temperature.

B63-10345
APPARATUS FACILITATES HIGH-TEMPERATURE TENSILE TESTING IN VACUUM
SIKORA, P. F. JUN. 1964
LEWIS-42
An apparatus for heating refractory materials to high temperatures during tensile testing includes a water-cooled stainless steel vacuum chamber. This contains a resistance heater consisting of a slit tube of tantalum or tungsten to enclose the tensile test rod.

B63-10351
NEW COBALT ALLOYS HAVE HIGH-TEMPERATURE STRENGTH AND LONG LIFE IN VACUUM ENVIRONMENTS
ASHBROOK, R. L. FRECHE, J. C. KLIMA, S. J. MAR. 1964
LEWIS-47
Cobalt refractory metal alloys combine sheet formability with high temperature strength and low material loss in vacuum.

B63-10365
LOW-COST INSULATION SYSTEM FOR CRYOSTATS ELIMINATES NEED FOR A VACUUM
CALVERT, H. F. MAY 1964
LEWIS-64
In order to eliminate the hazard caused by residual air trapped between the concentric shells of a cryostat, these annular spaces are pressurized with helium gas. This system is more economical than the use of powdered insulation maintained at low vacuums.

B63-10378
LIQUID-LEVEL METER HAS NO MOVING PARTS
ESCUE, W. T. /BENDIX CORP./ JUN. 1964
M-FS-3
An electro-optical system, without moving parts, reliably indicates liquid levels at cryogenic temperatures. Glass prisms, which act as liquid level probes inside the tank, extend from optically aligned photoelectric assemblies mounted on the outside.

B63-10389
LIGHTWEIGHT MAGNESIUM-LITHIUM ALLOYS SHOW PROMISE
ADAMS, W. T. CATALDO, C. E. JUN. 1964
M-FS-17
Evaluation tests show that magnesium-lithium alloys are lighter and more ductile than other magnesium alloys. They are being used for packaging, housings, containers, etc., where light weight is more important than strength.

B63-10424
VARIABLE LIGHT SOURCE WITH A MILLION-TO-ONE INTENSITY RATIO
SNOW, W. B. /SPACE TECHNOL. LAB./ MAY 1964
JPL-WOO-008
A wide range, variable intensity light source of constant color characteristics has been developed for testing and calibrating photomultiplier tubes. A light attenuator first diffuses light from a constant source, then permits variable attenuation through a series of chambers and adjustable apertures.

B63-10429
WELDED PRESSURE TRANSDUCER MADE AS SMALL AS 1/8TH-INCH IN DIAMETER
COON, G. W. MAR. 1964 /SEE U.S. PATENT NO. 3,027,769/
ARC-11
A special spot welding technique is used to make miniature capacitance transducers for placing in a wind tunnel model. Rugged and relatively low in cost, they have a flat response up to one-third of the resonant frequency.

B63-10453
MOLYBDENUM DISULFIDE MIXTURES MAKE EFFECTIVE HIGH-VACUUM LUBRICANTS
INNOVATOR NOT GIVEN /MIDWEST RES. INST./ NOV. 1964
M-FS-54
Five different mixtures of molybdenum disulfide are found to be effective bearing lubricants when tested at very low pressures and high temperatures.

B63-10476
CESIUM IODIDE CRYSTALS FUSED TO VACUUM TUBE FACEPLATES
FLECK, H. G. /ELECTRO-MECHANICAL RES. INC./ MAY 1964
GSFC-67
A cesium iodide crystal is fused to the lithium fluoride faceplate of a photon scintillator image tube. The conventional silver chloride solder is then used to attach the faceplate to the metal support.

B63-10479
IMPROVED MOLYBDENUM DISULFIDE-SILVER MOTOR BRUSHES HAVE EXTENDED LIFE
HORTON, J. C. KING, H. M. MAY 1964
M-FS-64
Motor brushes of proper quantities of molybdenum disulfide and copper or silver are manufactured by

sintering techniques. Graphite molds are used. These brushes operate satisfactorily for long periods in normal atmosphere or in a high-vacuum environment.

B63-10481
REFRACTORY CERAMIC HAS WIDE USAGE, LOW FABRICATION COST
INNOVATOR NOT GIVEN /GEORGIA INST. OF TECH./ APR. 1964
M-FS-67
Particulate, fused amorphous silica is formed into complex shapes by casting in plaster molds. High temperature firing is not required. This ceramic is resistant to thermal shock and exhibits good strength properties.

B63-10528
VARIABLE-TRANSPARENCY WALL REGULATES TEMPERATURES OF STRUCTURES
OSULLIVAN, W. J., JR. JUN. 1964
LANGLEY-25
An effective temperature regulating wall consists of one layer /e.g., one of the paraffins/ relatively opaque to thermal radiation in the solid state and transparent to it in the molten state and placed between two transparent layers. A mirror coating is applied to back layer.

B63-10546
TEST DEVICE PREVENTS MOLECULAR BOUNCE-BACK
HARDGROVE, W. F. SHAPIRO, H. JULY 1964
GSFC-82
A test device, which consists of six pyramidal reflectors joined together, acts as a baffle to impede the free path of the molecule to the test item by interposing a slanted surface which imparts an angular vector to the molecule and bounces it back to the chamber wall.

B63-10557
RAPID HELIUM-AIR ANALYZER CAN MEASURE OTHER BINARY GAS MIXTURES
MELFI, L. T. WOOD, G. M. YEAGER, P. R. FEB. 1964
LANGLEY-16
An instrument comprised of an ionization pressure gauge and a diaphragm pressure gauge consisting of strain gauges to make a four-arm bridge, and a ratio meter is constructed for analyzing gas mixtures. The ratio of the outputs of the two gauges is proportional to the mixture composition.

B63-10562
GATE VALVE WITH CERAMIC-COATED BASE OPERATES AT HIGH TEMPERATURES
BRASS, A. JUL. 1964
ARC-23
A copper base insert coated with a layer of aluminum oxide ceramic prevents frictional binding between the gate and base surfaces of a gate valve which are subject to rapid sliding action and high temperatures.

B63-10612
METALS PLATED ON FLUOROCARBON POLYMERS
FORD, H. KRASINSKY, J. B. VANGO, S. P. OCT. 1964
JPL-544
Electroplating lead on fluorocarbon polymer parts is accomplished by etching the parts to be plated with sodium, followed by successive depositions of silver and lead from ultrasonically agitated plating solutions. Metals other than lead may be electroplated on the silvered parts.

B64-10068
MECHANICAL PROPERTIES OF PLASTICS PREDETERMINED BY EMPIRICAL METHOD
LOHR, J. J. PARKER, J. A. JUL. 1964
ARC-28
To predetermine the mechanical properties of rigid plastics as a function of plasticizer content and composition, a set of equations has been empirically derived. These relate strain rate, yield stress, temperature, and weight fraction of the plasticizer.

B64-10099
REFRACTORY THERMAL INSULATION FOR SMOOTH METAL SURFACES
INNOVATOR NOT GIVEN /GOODYEAR AEROSPACE CORP./ OCT. 1964
M-FS-160
To protect rocket metal surfaces from engine-exhaust heat, a refractory thermal insulation mixture, which adheres to smooth metals, has been developed. Insulation protection over a wide temperature range can be controlled by thickness of the applied mixture.

B64-10113
ELASTOMERS BONDED TO METAL SURFACES SEAL ELECTROCHEMICAL CELLS
SHERFEY, J. M. AUG. 1964
GSFC-168
A leakproof seal secondary cell containing alkaline electrolytes was developed by bonding an alkali-resistant elastomer, such as neoprene, to metal contact surfaces. Test results of several different elastomers strongly indicate the feasibility of this sealing method.

B64-10116
LEAD OXIDE CERAMIC MAKES EXCELLENT HIGH-TEMPERATURE LUBRICANT
JOHNSON, R. L. SLINEY, H. E. AUG. 1964
LEWIS-144
A dry lubricant coating in ceramic form consisting of 95 percent lead monoxide and 5 percent silicon dioxide withstood a temperature of 1200 deg F, with a bearing operating at various atmospheric pressures. From this testing, there was no galling or metal transfer of the bearing.

B64-10138
NOVEL SHOCK ABSORBER FEATURES VARYING YIELD STRENGTHS
GEIER, D. J. JUL. 1964
MSC-63A
A shock absorbent webbing of partially drawn synthetic strands is arranged in sections of varying density related to the varying mass of the human body. This is contoured to protect the body at points of contact, when subjected to large acceleration or deceleration forces.

B64-10142
STRINGENT CLEANING TECHNIQUE ASSURES RELIABLE EPOXY BOND
INNOVATOR NOT GIVEN /RCA/ JUN. 1964
GSFC-161
For reliable aluminum bonding to withstand stress, the mating surfaces are carefully cleaned, etched, rinsed and dried. An epoxy and hardener designed for metal-to-metal bonding is then used for a rigid assembly.

B64-10151
PLASTIC FILMS FOR REFLECTIVE SURFACES REPRODUCED FROM MASTERS
INNOVATOR NOT GIVEN /MINNEAPOLIS HONEYWELL/ OCT. 1964
GSFC-188
Accurate reproduction in plastic of the surface of the optical master to which a reflective finish may be applied is done by using backing from any suitable material to which cured plastic will adhere tightly. Plastics used for reflectors should be of the thermosetting or catalytically hardened type.

B64-10166
FILLER DEVICE FOR HANDLING HOT CORROSIVE MATERIALS
INNOVATOR NOT GIVEN /PRATT AND WHITNEY AIRCRAFT/ OCT. 1964
MSC-85
A bellows-type bag with its own heating element is developed for safe handling and injection of hot corrosive liquids into modules.

B64-10206
SOLDER FLUX LEAVES CORROSION-RESISTANT COATING ON METAL
BAUMAN, A. J. OCT. 1964
JPL-611

A soldering flux consisting of perfluoro-octanoic acid hydrazine provides a corrosion resistant film on metal surface, particularly copper. It is ineffective for soldering aluminum.

B64-10270
PRESSURE MOLDING OF POWDERED MATERIALS IMPROVED BY RUBBER MOLD INSERT
INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS CORP./ NOV. 1964
WOO-100
Pressure molding tungsten microspheres is accomplished by applying hydraulic pressure to a silicone rubber mold insert with several barrel shaped chambers which is placed in a steel die cavity. This technique eliminates castings containing shear fractures.

B64-10282
FINE-MESH SCREEN MADE BY SIMPLIFIED METHOD
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ DEC. 1964
WOO-104
Strong fine-mesh screens are fabricated by a method involving uniform distribution of fine ferromagnetic particles on a nonmagnetic plate. Such screens are commonly used for grids in electron tubes and ion devices.

B64-10319
GAS DIFFUSION CELL REMOVES CARBON DIOXIDE FROM OCCUPIED AIRTIGHT ENCLOSURES
INNOVATOR NOT GIVEN /IOWA U./ DEC. 1964
MSC-118
A small, lightweight permeable cell package separates and removes carbon dioxide from respiratory regenerative while chemically inert in the presence of carbon dioxide so that only adsorption takes place.

B65-10004
SCREENING TECHNIQUE MAKES RELIABLE BOND AT ROOM TEMPERATURE
INNOVATOR NOT GIVEN /IBM/ JAN. 1965
M-FS-227
Stainless-steel screen used to lay room temperature curing epoxy adhesive permits reliable bonding of electronic circuits boards. This technique would be useful with thin-walled structures that warp during conventional bonding operations.

B65-10015
IMPROVED CONDUCTIVE PASTE SECURES BIOMEDICAL ELECTRODES
INNOVATOR NOT GIVEN /BAYLOR UNIV./ JAN. 1965 SEE ALSO B64-10025
MSC-107
Nontoxic paste consisting of a dispersion of graphite or silver granules in a mixture of polyvinylpyrrolidone and diluted glycerol secures biomedical electrodes to human skin. Silver paste has a high electrical conductivity and forms a bond between metal and moist or dry skin.

B65-10016
ADHESIVE FOR VACUUM ENVIRONMENTS RESISTS SHOCK AND VIBRATION
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965
MSC-56
A mixture of a polyamide, an epoxy resin, and fine silica or glass microballoons provides an adhesive which is flexible, resistant to shock and vibration, and has improved heat-transfer characteristics.

B65-10024
FLUID PRESSURE USED TO TEST TURBOPUMP BEARINGS
INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ FEB. 1965
NU-0001
Testing of turbopump bearings operating in an intense radiation field is accomplished by the use of a fluid bearing tester providing radial and axial loading.

B65-10032
WIRE WINDING INCREASES LIFETIME OF OXIDE-COATED CATHODES
KERSLAKE, W. VARGO, D. FEB. 1965 SEE ALSO AIAA PAPER-64-683
LEWIS-154
Refractory-metal heater base wound with a thin refractory metal wire increases the longevity of oxide-coated cathodes. The wire-wound unit is impregnated with the required thickness of metal oxide. This cathode is useful in magneto-hydrodynamic systems and in electron tubes.

B65-10034
GAGE MEASURES ELECTRICAL CONNECTOR PIN RETENTION FORCE
INNOVATOR NOT GIVEN /RCA/ FEB. 1965
JPL-SC-071
The retention force of a female connector pin is measured by observing the action of a calibrated spring in a gauge consisting of housing, a plunger terminating in a male subminiature connector pin and the tension spring.

B65-10043
MOUTHPIECE ADAPTER FOR PIPETTES PROTECTS MOUTH FROM HARMFUL LIQUIDS
MC SMITH, D. G. FEB. 1965
LANGLEY-47
To prevent the laboratory technicians mouth from contacting harmful liquids, a device with a hermetically sealed elastic bellows is attached to a standard pipette.

B65-10044
FLEXIBLE CURTAIN SHIELDS EQUIPMENT FROM INTENSE HEAT FLUXES
INNOVATOR NOT GIVEN /ARROWHEAD PROD./ MAR. 1965
M-FS-48
Flexible, high strength curtain made of fiberglass-silicone elastomer laminate provides thermal shielding for equipment.

B65-10065
SPHERICAL MODEL PROVIDES VISUAL AID FOR CUBIC CRYSTAL STUDY
BACIGALUPI, R. J. SPAKOWSKI, A. E. MAR. 1965
LEWIS-108
Transparent sphere of polymethylmethacrylate with major zones and poles of cubic crystals is used to make crystallographic visualizations and to interpret Laue X-ray diffraction of single cubic crystals.

B65-10083
DIDYMIUM COMPOUND IMPROVES NICKEL-CADMIUM CELL
INNOVATOR NOT GIVEN /GE/ MAR. 1965
GSFC-295
Nickel electrodes impregnated with an additive solution of didymium hydrate and nitric acid mixed with nickel nitrate increases ampere-hour capacity of cells and does not affect the voltage characteristics.

B65-10088
FIBERGLASS PARTS CURED DURING FILAMENT WINDING ELIMINATES OVEN, SAVES TIME
CARMODY, R. J. APR. 1965
M-FS-14
Resistance wire layer is introduced during winding of the fiberglass filaments with simultaneous heating. Emission of heat from the wire layer cures second fiberglass layer.

B65-10092
LIGHTWEIGHT ALUMINUM CASTING ALLOY IS USEFUL AT CRYOGENIC TEMPERATURES
APR. 1965
M-FS-267
M-45, a lightweight, high purity aluminum casting alloy has superior tensile properties for use at cryogenic temperatures.

B65-10095
CARBON-ARC ROD HOLDER HAS LONG LIFE, REDUCES ARC SPLATTER
INNOVATOR NOT GIVEN /RCA/ APR. 1965 1965
MSC-144
Carbon-arc rod holder with front end of beryllium oxide, a high electrical resistor and good thermal

conductor, prevents nonuniform burning of the positive carbon rod and corrosion of the rod holder. Useful in optical instrument light sources.

B65-10106
MINIATURE BEARINGS LUBRICATED BY SONIC DISPERSION METHOD
INNOVATOR NOT GIVEN /LITTON IND./ APR. 1965
M-FS-202
Evenly distributing a monomolecular film over the balls and tracks of miniature precision ball bearings by sonic dispersion results in precise lubrication which prevents lubricant bleed out to adjacent components. Varying the lubricant-to-solvent ratio of the mixture causes varying lubricant coating thicknesses.

B65-10107
CRACK DETECTION METHOD IS SAFE IN PRESENCE OF LIQUID OXYGEN
INNOVATOR NOT GIVEN /BOEING CO./ APR. 1965
M-FS-236
Visual flaw detection method for metals utilizes color precipitate. This method can be used safely in the presence of liquid oxygen.

B65-10117
DOUBLE GLOVES REDUCE CONTAMINATION OF DRY BOX ATMOSPHERE
HERBELL, T. P. QUANTINETZ, M. REINHARDT, G.
APR. 1965
LEWIS-211
Pair of encased low permeability hand gloves between which an inert gas circulates reduces dry box contamination. This innovation is applicable to dry boxes using radioactive and alkali metal compounds, submicron powders, and liquid metals.

B65-10136
VAPOR PRESSURE MEASURED WITH INFLATABLE PLASTIC BAG
INNOVATOR NOT GIVEN /GEOPHYS. CORP. OF AM./ MAY 1965
GSFC-281
Deflated plastic bag in a vacuum chamber measures initial low vapor pressures of materials. The bag captures the test sample vapors and visual observation of the vapor-inflated bag under increasing external pressures yields pertinent data.

B65-10140
GALVANIC CORROSION REDUCED IN ALUMINUM FABRICATIONS
INNOVATOR NOT GIVEN MAY 1965
M-FS-272
Titanium alloy fasteners dipped in zinc chromate primer are installed while wet in protective coated aluminum panels to reduce galvanic corrosion. Moisturetight seals at fastener points are also provided.

B65-10156
INORGANIC PAINT IS DURABLE, FIREPROOF, EASY TO APPLY
SCHUTT, J. B. JUN. 1965
GSFC-366
Inorganic paint with a water-potassium silicate base is impervious to water. It is also fireproof and adheres to various surfaces exposed to wide temperature fluctuations

B65-10162
ELECTROLESS NICKEL RESIST USED IN ALKALI-ETCHING OF ALUMINUM
INNOVATOR NOT GIVEN /SCHJELDAHL /G. T./ CO./ JUN. 1965
GSFC-284
Electroless nickel resist is unaffected by caustic soda applied as a milling or etching agent on aluminum.

B65-10164
IRRADIATION IMPROVES PROPERTIES OF AN AROMATIC POLYESTER
BELL, V. L., JR. JUN. 1965
LANGLEY-115
Aromatic polyester, PEN-2,6, is improved through cross-linking effected by radiation. Polymer retains properties of high tensile strength and toughness and stability at high temperatures.

B65-10167
REFRACTORY OXIDES EVALUATED FOR HIGH-TEMPERATURE USE
JUN. 1965
LANGLEY-121
Partially calcia-stablized zirconia used for insulation and heat-storage in high temperature /3000 deg to 4000 deg F/ cyclically operated pebble bed air heater.

B65-10172
ALUMINUM ALLOYS PROTECTED AGAINST STRESS-CORROSION CRACKING
INNOVATOR NOT GIVEN /ALCOA RES. LABS./ JUN. 1965
M-FS-235
Topcoat of epoxy-polyamide paint is effective protection for aluminum alloys against stress corrosion cracking. The paint can be used on unprimed surfaces.

B65-10173
PEEL RESISTANCE OF ADHESIVE BONDS ACCURATELY MEASURED
INNOVATOR NOT GIVEN /RCA/ JUN. 1965
GSFC-320
Strength of adhesive bond between layers of laminated material is tested by peel force to the facing with a tensile testing machine. Testing jig has stainless steel rollers which constrain material to move horizontally while maintaining free end of facing at constant 90 deg angle.

B65-10175
TANTALUM CATHODE IMPROVES ELECTRON-BEAM EVAPORATION OF TANTALUM
INNOVATOR NOT GIVEN /ELECTRO- OPTICAL SYSTEMS/ JUN. 1965
JPL-WOO-021
Tantalum cathode is used in assembly for electron beam evaporation of tantalum onto a substrate. The cathode and anode are made of pure tantalum rather than tungsten to prevent contamination of the tantalum film deposited on the substrate.

B65-10179
REUSABLE NEOPRENE JACKET PROTECTS PARTS FOR CHEMICAL MILLING
INNOVATOR NOT GIVEN /RYAN AERONAUTICAL CO./ JUN. 1965
WOO-071
Reusable neoprene jacket is used to prepare metal part or panel for chemical milling. Jacket covers back and upper rim of part and is sealed before the masking solution is applied to surface to be milled. This reduces amount of masking material required for milling identical parts and increases production.

B65-10189
TESTING DEVICE SUBJECTS ELASTIC MATERIALS TO BIAXIAL DEFORMATIONS
BECKER, G. W. JUN. 1965
JPL-616
Testing device stretches elastic materials biaxially over large deformation ranges and varies strain ratios in two perpendicular directions. The device is used in conjunction with a tensile testing machine, which holds the the specimen and permits control over the direction and magnitude of the stresses applied.

B65-10190
IR-TRANSMISSION GLASSES FORMED FROM OXIDES OF BISMUTH AND TELLURIUM
ULRICH, D. R. JUN. 1965
M-FS-279
Bismuth trioxide-tellurium dioxide glasses have improved infrared transmission characteristics.

B65-10214
EMERGENCY SOLAR STILL DESALTS SEAWATER
INNOVATOR NOT GIVEN /MELPAR/ JUL. 1965
MSC-135
Solar energy apparatus distills seawater into fresh water. The inflatable buoyant still

produces two pints of drinking water a day.

B65-10217
THIN TRANSPARENT FILMS FORMED FROM POWDERED GLASS
INNOVATOR NOT GIVEN /HOFFMAN ELECTRON./ JUL. 1965
GSFC-352
Glass film less than five mils thick is formed from powdered glass dispersed in an organic liquid, deposited on a substrate, and fused into place. The thin films can be cut and shaped for contact lenses, optical filters and insulating layers.

B65-10220
THORIATED NICKEL BONDED BY SOLID-STATE DIFFUSION METHOD
BALES, T. T. MANNING, R. C., JR. AUG. 1965
LANGLEY-116
Solid-state diffusion bonding in an inert-gas atmosphere forms high-strength joints between butting or overlapping surfaces of thoriated nickel. This method eliminates inert-phase agglomeration.

B65-10250
COATING METHOD ENABLES LOW-TEMPERATURE BRAZING OF STAINLESS STEEL
SEAMAN, F. D. /WESTINGHOUSE ELEC. CO./ AUG. 1965
NU-0030
Gold coated stainless steel tubes containing insulated electrical conductors are brazed at a low temperature to a copper coated stainless steel sealing block with a gold-copper eutectic. This produces an effective seal without using flux or damaging the electrical conductors.

B65-10261
BORON CARBIDE WHISKERS PRODUCED BY VAPOR DEPOSITION
INNOVATOR NOT GIVEN /GE/ SEP. 1965
HQ-24
Boron carbide whiskers have an excellent combination of properties for use as a reinforcement material. They are produced by vaporizing boron carbide powder and condensing the vapors on a substrate. Certain catalysts promote the growth rate and size of the whiskers.

B65-10270
CERAMIC MATERIALS PURIFIED BY EXPERIMENTAL METHOD
INNOVATOR NOT GIVEN /IIT RES. INST./ SEP. 1965
LEWIS-225
Crystalline ceramic materials are purified for use as high-temperature electrical insulators. Any impurities migrate to the cathode when a dc voltage is applied across the material while it is heated in an inert gas atmosphere.

B65-10288
ORGANIC REACTANTS RAPIDLY PRODUCE PLASTIC FOAM
LOOK, G. F. SEP. 1965 SEE ALSO B65-10090
LANGLEY-37
Adding trichlorofluoromethane to polyether resin accelerates the reaction between the resin and toluene diisocyanate. This accelerated reaction instantaneously produces a plastic foam of low density and uniform porosity needed to provide buoyancy for flotation recovery of instrument packages dropped into the sea from spacecraft.

B65-10294
ADHERENT PROTECTIVE COATINGS PLATED ON MAGNESIUM-LITHIUM ALLOY
INNOVATOR NOT GIVEN /IBM/ OCT. 1965 SEE ALSO B63-10389
M-FS-365
Zinc is plated on a magnesium-lithium alloy by using a modification of the standard zinc-plate immersion bath. Further protection is given the alloy by applying a light plating of copper on the zinc plating. Other metals are plated on the copper by using conventional plating baths.

B65-10302
BURNISHING TECHNIQUE IMPROVES LUBRICATION OF THREADED FASTENERS
GRUPER, J. L. /LOCKHEED MISSILES AND SPACE CO./ OCT. 1965
LEWIS-217
Burnishing a molydisulfide coating into the thread surfaces of fasteners eliminates the need for binders and vehicles which ensure coverage and retention of the lubricant during fastening. The coating may be applied by any convenient method.

B65-10303
NICKEL SOLUTION PREPARED FOR PRECISION ELECTROFORMING
INNOVATOR NOT GIVEN /ELECTRO-OPTICAL SYSTEMS/ OCT. 1965
WOO-070
Lightweight, precision optical reflectors are made by electroforming nickel onto masters. Steps for the plating bath preparation, process- control testing, and bath composition adjustments are prescribed to avoid internal stresses and maintain dimensional accuracy of the electrodeposited metal.

B65-10316
REMOVABLE WELL IN REACTION FLASK FACILITATES CARBON DIOXIDE COLLECTION
INNOVATOR NOT GIVEN OCT. 1965
ARC-47
Removable plastic well with a flange that seats on the rim of an Erlenmeyer screwcap flask aids quantitative collection of carbon dioxide liberated in the flask. The well can be removed without danger of cross-contamination. It can collect other gases using appropriate absorbents.

B65-10321
PLATED NICKEL WIRE MESH MAKES SUPERIOR CATALYST BED
SILL, M. /BELL AEROSYSTEMS CO./ OCT. 1965
MSC-216
Porous nickel mesh screen catalyst bed produces gas evolution in hydrogen peroxide thrust chambers used for attitude control of space vehicles. The nickel wire mesh disks in the catalyst bed are plated in rugose form with a silver-gold coating.

B65-10335
MAGNETIC FLUID READILY CONTROLLED IN ZERO GRAVITY ENVIRONMENT
PAPELL, S. S. NOV. 1965
LEWIS-126
Colloid composed of finely ground iron oxide in a fluid such as heptane, is controlled and directed magnetically in a zero gravity environment. It will not separate on standing for long periods or after exposure to magnetic or centrifugal forces. Because of its low density and low viscosity, it is easily pumped.

B65-10336
ANODIZATION PROCESS PRODUCES OPAQUE, REFLECTIVE COATINGS ON ALUMINUM
INNOVATOR NOT GIVEN /LOCKHEED MISSILES AND SPACE CO./ NOV. 1965
M-FS-348
Opaque, reflective coatings are produced on aluminum articles by an anodizing process wherein the anodizing bath contains an aqueous dispersion of finely divided insoluble inorganic compounds. These particles appear as uniformly distributed occlusions in the anodic deposit on the aluminum.

B65-10337
SPECIAL COATINGS CONTROL TEMPERATURE OF STRUCTURES
FULK, M. M. MAYER, R. W. /BALL BROTHERS RES. CORP./ NOV. 1965
GSFC-444
Special coatings in the form of paints that exhibit controlled ratios of sunlight absorptivity to grey-body emissivity control the temperature of structures in space flight. These finishes exhibit good resistance to ultraviolet radiation and do not discolor.

B65-10341
LIGHTWEIGHT HINGED BELLOWS RESTRAINT HAS HIGH LOAD CAPACITY
IMUS, E. E. /N. AM. AVIATION/ NOV. 1965
WOO-151

High angular stresses in fluid-handling ducts are accommodated by a lightweight hinged bellows restraint. This device transmits angular stress to points close to the axis center and spreads it over a rigid configuration.

B65-10344
SOLUBLE UNDERCOATING FACILITATES REMOVAL OF FOAMED-IN-PLACE INSULATION
DUNCAN, A. C. HILL, C. L., JR. NOV. 1965
LEWIS-193
Foamed-in-place insulation can be removed and reused by coating the surface with a soluble peel coat before applying the foam mixture. Removal of the insulation is effected by slitting it and pouring a solvent in the slit to dissolve the peel coat. The insulation can then be stripped off intact.

B65-10354
PIGMENTED COATING RESISTS THERMAL SHOCK
HARADA, Y. /IIT RES. INST./ RECHTER, H. L. NOV. 1965
JPL-SC-083
Coating pigment composed of zinc oxide and potassium silicate resists the effects of thermal shock and long exposure to direct sunlight.

B65-10357
AIR-CURED CERAMIC COATING INSULATES AGAINST HIGH HEAT FLUXES
SEITZINGER, V. F. NOV. 1965
M-FS-150
Reflective insulating ceramic coating protects supporting structures in area adjacent to rocket engines from the intense heat fluxes in the rocket exhaust plumes.

B65-10364
POROUS GLASS MAKES EFFECTIVE SUBSTRATE FOR OZONE-SENSING REAGENT
INNOVATOR NOT GIVEN /PARAMETRICS/ DEC. 1965
GSFC-388
Porous-glass substrate is used for absorption of a dye used in measuring the concentration of atmospheric ozone at high altitudes. This measurement is based on the chemiluminescence produced in the reaction between ozone and the dye, rhodamine B. The porous glass provides a large interstitial surface area which promotes this reaction.

B65-10366
UNIQUE GEAR DESIGN PROVIDES SELF-LUBRICATION
WINIARSKI, F. J. /SPACE TECHNOL. LAB./ DEC. 1965
JPL-SC-079
Composite gear configuration provides a reliable automatic means for replenishing gear mechanism lubricants that dissipate in the harsh environment of space. The center or hub section of the gear consists of a porous, oil-impregnated material, and the outer or toothed section has radially drilled passages to cause the oil to gradually flow to the gear teeth surfaces.

B65-10372
WIRE BUNDLE FORMED INTO GRIDS WITH MINUTE INTERSTICES
TODD, H. H. /ELECTRO-OPT. SYSTEMS/ DEC. 1965
WOO-089
Deforming the ends of a bundle of closely packed parallel wires to restrict the interstices to substantially uniform and minute dimensions produces grids or filters for ion engines. Porous metal structures made by this process are also used as fuel cell electrodes, diffusion membranes, and catalysts.

B65-10374
PLASTIC PLUS STAINLESS-STEEL FIBERS MAKE RESILIENT, IMPERMEABLE MATERIAL
SMIRRA, J. R. /THOMPSON RAMO WOOLDRIDGE/ DEC. 1965
WOO-246
Plastic material combined with stainless-steel fibers and molded under heat and pressure into a desired configuration is both soft enough to deform under a load and resilient enough to return to its original shape when the load is removed.

B65-10384
PROBE SAMPLES COMPONENTS OF ROCKET ENGINE EXHAUST
SCHUMACHER, P. E. /N. AM. AVIATION/ DEC. 1965
M-FS-485
Water-cooled, cantilevered probe samples the exhaust plume of rocket engines to recover particles for examination. The probe withstands the stresses of a rocket exhaust plume environment for a sufficient period to obtain a useful sample of the exhaust components.

B65-10390
TEST STRIPS DETECT DIFFERENT CO2 CONCENTRATIONS IN CLOSED COMPARTMENTS
INNOVATOR NOT GIVEN /MELPAR/ DEC. 1965
MSC-210
Four different test strips, using crystal violet for one pair of strips and basic fuchsin as a dye for the second pair, give unambiguous colorimetric indications of four different concentrations of carbon dioxide in the atmosphere of a closed compartment. Tetraethylene pentamine is used as a dye decoloring agent.

B65-10397
NEW BRAZING ALLOY ELIMINATES METAL-STRESS CRACKING
HUSCHLER, E., JR. /N. AM. AVIATION/
ROEDER, E. R. DEC. 1965
WOO-249
Silver 15 zinc brazing alloy avoids the liquid-metal stress cracking of base metals when applied to 347, 316, and 410 stainless steels and certain other alloys.

B65-10398
NICKEL/TIN COATING PROTECTS THREADED FASTENERS IN CORROSIVE ENVIRONMENT
CHARLES, J. VEEDER, L. /N. AM. AVIATION/ DEC. 1965
MSC-253
Threaded fasteners used in corrosive environments are plated with electroless nickel and electroplated, over the nickel, with tin. This provides a corrosion-resistant coating for the fasteners.

B66-10005
FLUORIDE COATINGS MAKE EFFECTIVE LUBRICANTS IN MOLTEN SODIUM ENVIRONMENT
JAN. 1966 SEE ALSO NASA-TN-D-2348
LEWIS-229
Coating bearing surfaces with calcium fluoride-barium fluoride film provides effective lubrication against sliding friction in molten sodium and other severe environments at high and low temperatures.

B66-10009
COILED SHEET METAL STRIP OPENS INTO TUBULAR CONFIGURATION
PARK, J. J. JAN. 1966 SEE ALSO B64-10011
GSFC-425
Copper alloy is converted into a spring material that can be rolled into a compact coil which will spontaneously open to form a tube in the long direction of the strip. The copper alloy is passed through a furnace at a prescribed temperature while restraining the strip in the desired tubular configuration.

B66-10024
ALUMINIZED FIBER GLASS INSULATION CONFORMS TO CURVED SURFACES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
M-FS-477
Layers of fiber glass with outer reflective films of vacuum-deposited aluminum or other reflective metal, provide thermal insulation which conforms to curved surfaces. This insulation has good potential for cryogenic systems.

B66-10027
FLEXIBLE PROTECTIVE COATINGS MADE FROM SILICON-NITROGEN MATERIALS
INNOVATOR NOT GIVEN /SOUTHERN RES. INST./ JAN. 1966
M-FS-528

Flexible protective coatings formed from either of two polymers endure high temperatures for long periods. One polymer is a byproduct in hexaphenylcyclotrisilazane preparation, the other is obtained by heating bis/methylamino/-diphenylsilane.

B66-10029
EPOXY BLANKET PROTECTS MILLED PART DURING EXPLOSIVE FORMING
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
M-FS-307
Epoxy blanket protects chemically milled or machined sections of large, complex structural parts during explosive forming. The blanket uniformly covers all exposed surfaces and fills any voids to support and protect the entire part.

B66-10033
ELECTRON BEAM SEALS OUTER SURFACES OF POROUS BODIES
HERZ, W. H. /KULITE TUNGSTEN CO./ KURTZ, A. D. KURTZ, R. A. FEB. 1966
M-FS-562
Porous tungsten plugs provide even airflow for frictionless bearings used in air bearing supported gyros. The plugs have their outer cylindrical surface sealed by an electron beam process to ensure unidirectional airflow through their exit ends.

B66-10037
PROCESS REDUCES PORE DIAMETERS TO PRODUCE SUPERIOR FILTERS
TODD, H. H. /ELECTRO-OPT. SYSTEMS/ FEB. 1966
WOO-093
Porous metal structure with very small pore diameters is produced by heating the structure in oxygen for an oxidized surface layer, cooling it, and heating it in hydrogen to deoxidize the oxidized portion. Such structures are superior catalyst beds and filters.

B66-10043
POLYMER FILM EXHIBITS THERMAL AND RADIATION STABILITY
BELL, V. L., JR. FEB. 1966
LANGLEY-100
Aromatic/heterocyclic polymers /Pyrrones/ have the ability to absorb large quantities of photolytic, thermal and radiolytic energies while retaining their useful properties. They are prepared from the room temperature reaction of tetraamines and tetraacids.

B66-10044
PROTECTIVE COATING WITHSTANDS HIGH TEMPERATURE IN OXIDIZING ATMOSPHERE
MELLOR, C. H. /FENWAL, INC./ FEB. 1966
M-FS-529
Protective coating containing a plasma arc sprayed mixture of hafnium oxide and zirconium diboride will withstand high temperatures in an oxygen rich atmosphere. Used on a homogeneous tungsten thermocouple, it does not flake or crack on subsequent cooling and reheating, and does not degrade the thermocouple response time.

B66-10053
SPRAY-ON TECHNIQUE SIMPLIFIES FABRICATION OF COMPLEX THERMAL INSULATION BLANKET
BOND, W. E. G. RAYMOND, R. /N. AM. AVIATION/ FEB. 1966
M-FS-497
Spray-on process constructs molds used in forming sections of thermal insulation blankets. The process simplifies the fabrication of blankets by eliminating much of the equipment formerly required and decreasing the time involved.

B66-10070
REFLECTIVE INSULATOR LAYERS SEPARATED BY BONDED SILICA BEADS
ZUVER, N. T., JR. /GRUMMAN AIRCRAFT CORP./ FEB. 1966
MSC-215
Nonconductive silica beads are bonded to metallic reflecting insulation sheets prior to fabrication of multilayer reflectors. This eliminates the need for separate nonconductive sheets and simplifies the fabrication process.

B66-10081
POLYTETRAFLUOROETHYLENE LUBRICATES BALL BEARINGS IN VACUUM ENVIRONMENT
INNOVATOR NOT GIVEN /BENDIX CORP./ MAR. 1966
SEE ALSO NASA-SP-5014
M-FS-379
Polytetrafluoroethylene /PTFE/ balls are interspersed among steel ball bearings to provide a dry lubricant in a high vacuum environment. The steel balls are lubricated by the film worn off the PTFE balls.

B66-10083
CRYOSTAT MODIFIED TO AID ROTATING BEAM FATIGUE TEST
DURHAM, T. F. /N. AM. AVIATION/ MAR. 1966
M-FS-435
Modified stainless steel dewar aids rotating beam fatigue test in a cryogenic environment. The dewar is modified to receive extended specimen supporting members through specially designed rotary seals. The test set can be fully enclosed and pressurized with an inert gas to make the system explosion proof.

B66-10087
SOLID-FILM LUBRICANT IS EFFECTIVE AT HIGH TEMPERATURES IN VACUUM
SLINEY, H. E. MAR. 1966 SEE ALSO B63-10453 AND B63-10562
LEWIS-228
Calcium fluoride with a suitable inorganic binder forms a stable solid-film lubricant when fused to the surface to be lubricated. It is effective in environments at elevated temperatures and gas pressures ranging from atmospheric to high vacuum. It is not stable in reducing atmospheres.

B66-10098
RADIOACTIVE TRACER SYSTEM DETECTS OIL CONTAMINANTS IN FLUID LINES
ROTH, B. /N. AM. AVIATION/ MAR. 1966
M-FS-512
Radioactive tracer system continuously detects and monitors lubricating oil contamination in high pressure fluid lines.

B66-10104
VAPOR CONDENSATION PROCESS PRODUCES SLURRY OF MAGNESIUM PARTICLES IN LIQUID HYDROCARBONS
PROK, G. M. WALSH, T. J. WITZKE, W. R. MAR. 1966
LEWIS-263
Vapor condensation apparatus produces a physically stable, homogeneous slurry of finely divided magnesium and liquid hydrocarbons. The magnesium is vaporized and the resultant vapor is cooled rapidly with a liquid hydrocarbon spray, which also serves as the dispersing medium for the condensed magnesium particles.

B66-10110
ETCHING PROCESS MILLS PH 14-8 MO ALLOY STEEL TO PRECISE TOLERANCES
CHIPMAN, B. L. /N. AM. AVIATION/ MULLAND, P. W. MAY 1966
MSC-270
Chemical milling process, which combines an aqua regia etchant with a sulfonate wetting agent, produces finishes on PH 14-8 molybdenum alloy steel to precise tolerances. This process permits precision removal of excess metal from the steel in annealed and/or aged conditions.

B66-10111
STORAGE-STABLE FOAMABLE POLYURETHANE IS ACTIVATED BY HEAT
INNOVATOR NOT GIVEN /GOODYEAR AEROSPACE CORP./ MAY 1966
LANGLEY-187
Polyurethane foamable mixture remains inert in storage unit activated to produce a rapid foaming reaction. The storage-stable foamable composition is spread as a paste on the surface of an expandable structure and, when heated, yields a rigid open-cell polyurethane foam that is

systems in vacuum tubes. Chromium oxide is applied either as a surface layer or as a doping material. The new coatings eliminate the high-temperature migration problems of carbon surface treatments.

B66-10230
ELECTRIC ARC HEATER IS SELF STARTING
BROWN, R. D. MAY 1966
LANGLEY-208
Remote method initiates an electric arc over a large range of gaps between two water-cooled electrodes of an arc-heated wind tunnel without disassembling the arc unit. This type of starting system can be used on both three-phase ac arc heaters and dc arc heaters.

B66-10234
STANDARDS FOR ELECTRON PROBE MICROANALYSIS OF SILICATES PREPARED BY CONVENIENT METHOD
WALTER, L. S. JUN. 1966
GSFC-469
Standard compositions suitable for electron probe microanalysis of various silicates are prepared by coprecipitation of specified salts with colloidal silica to form a gel which is decomposed into a powdered oxide mixture and compressed into thin pellets. These pellets of predetermined standard are compared with a silicate sample to determine its composition.

B66-10256
DRY FILM LUBRICANT IS EFFECTIVE AT EXTREME LOADS
INNOVATOR NOT GIVEN /MIDWEST RES. INST./ JUN. 1966 SEE ALSO NASA-TM-X-53331
M-FS-628
Dry film lubricant protects low speed sliding surfaces under extreme loading. The lubricant in an inorganic binder is applied to substrates with sufficient hardness to prevent surface deformation in the applicable load range.

B66-10259
SUBSTITUTED SILANE-DIOL POLYMERS HAVE IMPROVED THERMAL STABILITY
BYRD, J. D. CURRY, J. E. JUN. 1966
M-FS-469
Organosilicon polymers were synthesized to produce improved physical and chemical properties, including high thermal stability. Of the polymers produced, poly/4, 4 prime-bisoxybiphenylene/diphenylsilane, formed from bis/anilino/diphenylsilane and p, p prime-biphenol, was found to have the most desirable properties.

B66-10273
BORON-DEOXIDIZED COPPER WITHSTANDS BRAZING TEMPERATURES
SCHMIDT, E. H. /N. AM. AVIATION/ JUN. 1966
M-FS-762
Boron-deoxidized high-conductivity copper is used for fabrication of heat transfer components that are brazed in a hydrogen atmosphere. This copper has high strength and ductility at elevated temperatures and does not exhibit massive intergranular failure.

B66-10281
VAPOR DIFFUSION ELECTRODE IMPROVES FUEL CELL OPERATION
SMITH, J. O. /MONSANTO RES. CORP./ JUN. 1966
LEWIS-187
Vapor diffusion type fuel cell electrode presents a nonwetting barrier to the liquid feedstocks so they may contact the electrolyte only in the vapor state. Thus, it effects feedstock mixing with the electrolyte at the electrolyte/catalyst interface but prevents feedstock decomposition and catalyst poisoning from liquid mingling.

B66-10288
IMPROVED THERMAL INSULATION MATERIALS MADE OF FOAMED REFRACTORY OXIDES
MOUNTVALA, A. J. NAKAMURA, H. H. RECHTER, H. L. /IIT RES. INST./ JUN. 1966 SEE ALSO B65-10357
M-FS-735
Foamed refractory oxides provide lightweight, reflective thermal insulation materials. The materials have a low bulk density and high thermal shock resistance.

B66-10296
APPARATUS ENABLES ACCURATE DETERMINATION OF ALKALI OXIDES IN ALKALI METALS
DUPRAW, W. A. GAHN, R. F. GRAAB, J. W. MAPLE, W. E. ROSENBLUM, L. JUL. 1966
LEWIS-256
Evacuated apparatus determines the alkali oxide content of an alkali metal by separating the metal from the oxide by amalgamation with mercury. The apparatus prevents oxygen and moisture from inadvertently entering the system during the sampling and analytical procedure.

B66-10298
ULTRASONIC CLEANING RESTORES DEPTH-TYPE FILTERS
INNOVATOR NOT GIVEN /LITTLE /ARTHUR D./ INC./ JUL. 1966
M-FS-540
Cleaning process uses a nonionic surfactant and ultrasonic agitation to restore depth-type fibrous filters to maximum effectiveness.

B66-10299
ELECTROLYTIC ETCHING PROCESS PROVIDES EFFECTIVE BONDING SURFACE ON STAINLESS STEEL
INNOVATOR NOT GIVEN /RCA/ JUL. 1966
GSFC-484
Electrolytic etching process prepares surfaces of a stainless steel shell for reliable, high strength adhesive bonding to dielectric materials. The process uses a 25 percent aqueous solution of phosphoric acid.

B66-10305
SIMPLE, NONDESTRUCTIVE TEST IDENTIFIES METALS
DODDS, D. J. /N. AM. AVIATION/ JUL. 1966
MSC-525
Rapid, nondestructive test for identifying metals measures the characteristic potential difference produced by galvanic reaction between a reference electrode and the test metal. A drop of water is used as an electrolyte.

B66-10312
CHEMICAL MILLING SOLUTION PRODUCES SMOOTH SURFACE FINISH ON ALUMINUM
LORENZEN, H. C. /N. AM. AVIATION/ JUL. 1966
MSC-549
Elementary sulfur mixed into a solution of caustic soda and salts produces an etchant which will chemically mill end-grain surfaces on aluminum plate. This composition results in the least amount of thickness variation and pitting.

B66-10313
SEA DYE MARKER PROVIDES VISIBILITY FOR 20 HOURS
DE LAAT, F. /N. AM. AVIATION/ JUL. 1966
MSC-714
Sea dye marker block releases a visible slick which lasts at least twelve hours. The dye marker uses a fluorescent dye in a heat cured binder which, when immersed in seawater, releases the dye at a controlled rate.

B66-10322
VALVE SEAT PORES SEALED WITH THERMOSETTING MONOMER
OLMORE, A. B. /N. AM. AVIATION/ JUL. 1966
M-FS-900
Hard anodic coating provides a smooth wear-resistant value seating surface on a cast alumimum alloy valve body. Vacuum impregnation with a thermosetting monomer, diallyl phthalate, seals the pores on the coating to prevent galvanic corrosion.

B66-10327
INFLATABLE HOLDING FIXTURE PERMITS X-RAYS TO BE TAKEN OF INNER WELD AREAS
HENDRICKSON, D. R. SPENCE, T. M. /N. AM. AVIATION/ JUL. 1966
M-FS-856

self-bondable to the substrate.

B66-10119
SMALL, HIGH-INTENSITY FLASHER PERMITS CONTINUOUS CLOSE-IN PHOTOGRAPHY
PASCALE, C. /PRINCETON UNIV./ MAR. 1966
NU-0043
Compact, high-intensity spark-flash unit is used as a light source for continuous rapid photography. The spark-breakdown flash source is enclosed in polymethylmethacrylate and incorporates a parabolic reflector.

B66-10120
OXYGEN-HYDROGEN TORCH IS A SMALL-SCALE STEAM GENERATOR
MASKELL, C. E. /AEROJET-GEN. CORP./ MAR. 1966
NU-0042
Standard oxygen-hydrogen torch generates steam for corrosion-rate analysis of various metals. The steam is generated through local combustion inside a test chamber under constant temperature and pressure control.

B66-10131
SURFACTANT FOR DYE-PENETRANT INSPECTION IS INSENSITIVE TO LIQUID OXYGEN
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1966
M-FS-475
LOX insensitive solvent is blended into a mixture of commercially available surfactants to clean metal surfaces which are to be investigated by the dye-penetrant method. The surfactant mixture is applied before and after application of the dye.

B66-10138
BISMUTH ALLOY POTTING SEALS ALUMINUM CONNECTOR IN CRYOGENIC APPLICATION
FLOWER, J. F. /DOUGLAS AIRCRAFT CO./ STAFFORD, R. L. APR. 1966
WOO-260
Bismuth alloy potting seals feedthrough electrical connector for instrumentation within a pressurized vessel filled with cryogenic liquids. The seal combines the transformation of high-bismuth content alloys with the thermal contraction of an external aluminum tube.

B66-10139
HOT-WIRE DETECTOR FOR CHEMICALLY ACTIVE MATERIALS USED IN GAS CHROMATOGRAPHY
INNOVATOR NOT GIVEN /N. AM. AVIATION/ APR. 1966
MSC-269
Hot-filament detector analyzes chemically active materials used in gas chromatography. The detector reacts chemically with the effluent vapors in the gas chromatographic apparatus to change the electrical resistance of the filament as a function of the affluent composition. Due to the changes produced by chemical action on the filament, the system is often calibrated.

B66-10140
CORROSION OF METAL SAMPLES RAPIDLY MEASURED
MASKELL, C. E. /AEROJET-GEN. CORP./ APR. 1966
NU-0041
Corrosion of a large number of metal samples that have been exposed to controlled environment is accurately and rapidly measured. Wire samples of the metal are embedded in clear plastic and sectioned for microexamination. Unexposed wire can be included in the matrix as a reference.

B66-10165
GALLIUM ALLOY FILMS INVESTIGATED FOR USE AS BOUNDARY LUBRICANTS
APR. 1966 SEE ALSO NASA-TN-D-2721 AND B63-10337
LEWIS-245
Gallium alloyed with other low melting point metals has excellent lubricant properties of fluidity and low vapor pressure for high temperature or vacuum environments. The addition of other soft metals reduces the corrosivity and formation of undesirable alloys normally found with gallium.

B66-10166
DISPENSER LEAK-TESTS AND STERILIZES RUBBER GLOVES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ APR. 1966
MSC-285
Portable vacuum-operated apparatus leak-tests and sterilizes rubber gloves. The gloves are fitted to the hands directly from the apparatus without external handling.

B66-10185
IMPROVED ADHESIVE FOR CRYOGENIC APPLICATIONS CURES AT ROOM TEMPERATURE
KLINGER, H. J. SMITH, M. B. /TELECOMPUTING CORP./ MAY 1966
WOO-132
Adhesive cured at room temperature provides an effective adhesive bond over the range from room temperature down to the temperature of liquid hydrogen. The adhesive consists of one part of 200-mesh powdered nylon filler to two parts of an epoxy-polyamine resin.

B66-10194
SILAZANE POLYMERS SHOW PROMISE FOR HIGH-TEMPERATURE APPLICATION
JUN. 1966 SEE ALSO NASA-SP-5030
M-FS-466
Several silazane intermediate compounds and polymers have been prepared which are potentially useful as high temperature coatings and elastomers. These silazane polymers exhibit stability in a temperature range of 300 to 400 degrees C.

B66-10196
FIBERS OF NEWLY DEVELOPED REFRACTORY CERAMICS PRODUCED BY IMPROVED PROCESS
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ MAY 1966
WOO-169
Rods of refractory ceramic material and glasses having relatively high fusion temperatures and tensile strengths are converted to fiber by subjecting these rods to alternate fusion and gas-jet bursts. The refractory, high-tensile-strength fibers produced are combined with suitable binder to produce heat-resistant fabrics and rigid structures.

B66-10207
WHITE PRIMER PERMITS A CORROSION-RESISTANT COATING OF MINIMUM WEIGHT
ALBRECHT, R. H. JENSEN, D. P. SCHNAKE, P. /SHERWIN WILLIAMS CO./ MAY 1966
M-FS-304
White primer for coating 2219 aluminum alloy supplies a base for a top coating of enamel. A formulation of pigments and vehicle results in a primer with high corrosion resistance and minimum film thickness.

B66-10221
SUBMICRON METAL POWDERS PRODUCED BY BALL MILLING WITH GRINDING AIDS
QUATINETZ, M. SCHAFER, R. J. MAY 1966 SEE ALSO NASA-TN-D-879
LEWIS-188
In ball milling metal powders to submicron size, various salts are more effective as grinding aids than conventional surfactants. Absolute ethyl alcohol is used as the grinding liquid.

B66-10222
NICKEL-BASE SUPERALLOYS DEVELOPED FOR HIGH-TEMPERATURE APPLICATIONS
FRECHE, J. C. MAY 1966 SEE ALSO NASA-MEMO-4-13-59E, NASA-TN-D-260, NASA-TN-D-1531, AND NASA-TN-D-2495
LEWIS-226
Class of nickel-base superalloys containing varying percentages of alloying elements have good workability and high strength at elevated temperatures /1500 to 2200 degrees F/.

B66-10227
CHROMIUM OXIDE COATINGS IMPROVE THERMAL EMISSIVITY OF ALUMINA
UPSHAW, V. /HUGHES AIRCRAFT CO./ MAY 1966
WOO-263
Chromium oxide coatings improve thermal radiation characteristics of alumina-coated heater-cathode

Inflatable rubber gland positions and holds X-ray film in positive contact with inner weld areas of mainfold torus assemblies for verifying the weld quality. The gland is constructed to conform to the inside diameter of the manifold torus.

B66-10340
DEVICE REMOVES HYDROGEN GAS FROM ENCLOSED SPACES
CARSON, W. N. /GE/ JUL. 1966
GSFC-495
Hydrogen-oxidant galvanic cell removes small amounts of hydrogen gas continually released from equipment, such as vented silver-zinc batteries, in enclosed compartments where air venting is not feasible. These cells are used in satellite compartments.

B66-10358
ELECTROCHEMICAL MILLING REMOVES BURRS AND SOLDER FROM TUBING ENDS
HINSHAW, J. O. /N. AM. AVIATION/ AUG. 1966
M-FS-714
Electrochemical milling removes burrs and solder from the cut ends of stainless steel capillary tubing. An electrolyte consisting primarily of a solution of sulfuric and phosphoric acids is used.

B66-10373
BEARING ALLOYS WITH HEXAGONAL CRYSTAL STRUCTURES PROVIDE IMPROVED FRICTION AND WEAR CHARACTERISTICS
BUCKLEY, D. H. JOHNSON, R. L. AUG. 1966 SEE ALSO NASA-TN-D-2523, NASA-TN-D- 2524, NASA-TN-D-2671, NASA-TN-D-3235
LEWIS-320
Bearings of titanium, cobalt, and other hexagonal crystal alloys are used in vacuum and high temperature environments. These temperature-stabilized alloys have reduced friction and wear characteristics and therefore have potential use in aircraft seals, hydraulic equipment, and artificial human joints.

B66-10380
SUBMICRON HOLES IN THIN FILMS INCREASE SAMPLING RANGE OF MASS SPECTROMETERS
WILLENS, R. H. /CONSOLIDATED SYSTEMS/ AUG. 1966

JPL-SC-097
Gold film is vapor deposited onto a glass slide containing submicron latex spheres which are removed, leaving submicron holes in the film. These thin-film apertures allow accurate mass spectrometer sampling of gas mixtures at pressures on the order of 100 torr.

B66-10387
SELF-SUPPORTED ALUMINUM THIN FILMS PRODUCED BY VACUUM DEPOSITION PROCESS
NEFF, J. E. TIMME, R. W. SEP. 1966
ARC-58
Self-supported aluminum thin film is produced by vacuum depositing the film on a polyvinyl formal resin film and then removing the resin by radiant heating in the vacuum. The aluminum film can be used as soon as the resin is eliminated.

B66-10395
COMPOSITE GASKETS ARE COMPATIBLE WITH LIQUID OXYGEN, RESIST COMPRESSION SET
GOSNELL, R. B. /WHITTAKER CORP./ SEP. 1966

M-FS-455
Gaskets fabricated by laminating fluorocarbon polymers with fiber glass cloth have a low compression set. Their flexibility is not subject to drastic changes at the temperature of liquid oxygen with which they are used. The fabrication process is controlled so that the fibers are not impregnated with the polymer.

B66-10398
THIN-FILM FERRITES VAPOR DEPOSITED BY ONE-STEP PROCESS IN VACUUM
HACSKAYLO, M. /MELPAR/ SEP. 1966
MSC-259
Thin-film ferrites are formed by vapor deposition of a mixture of powdered ferrites and powdered boron oxide at controlled temperatures in a vacuum chamber. These films are used in memory devices for computers and as thin-film inductors in communications and telemetry systems.

B66-10400
SYSTEM FOR ETCHING THICK ALUMINUM LAYERS MINIMIZES BRIDGING AND UNDERCUTTING
INNOVATOR NOT GIVEN /BENDIX CORP./ SEP. 1966
M-FS-1366
Four step photoresist process for etching thick aluminum layers for semiconductor device contacts produces uniform contact surfaces, eliminates bridging, minimizes undercutting, and may be used on various materials of any thickness.

B66-10421
COPPER WIRE PLATED WITH NICKEL AND SILVER RESISTS CORROSION
INNOVATOR NOT GIVEN /N. AM. AVIATION/ SEP. 1966
M-FS-761
Copper wire for electrical harnesses, when plated with both nickel and silver, resists galvanic corrosion and high temperatures while maintaining electrical properties and solderability.

B66-10445
WELDABLE ALUMINUM ALLOY HAS IMPROVED MECHANICAL PROPERTIES
WESTERLUND, R. W. /ALCOA RES. LABS./ OCT. 1966
M-FS-295
Weldable aluminum alloy has good resistance to stress-corrosion cracking, shows unchanged strength and formability after storage at room temperature, and can be pre-aged, stretched, and aged. Since toxic fumes of cadmium oxide are evolved when the new alloy is welded, adequate ventilation must be provided.

B66-10448
THERMAL STRESS-RELIEF TREATMENTS FOR 2219 ALUMINUM ALLOY ARE EVALUATED
INNOVATOR NOT GIVEN /BOEING CO./ OCT. 1966
M-FS-1213
Evaluation of three thermal stress relief treatments for 2219 aluminum alloy in terms of their effect on residual stress, mechanical properties, and stress corrosion resistance. The treatments are post aging and stress relieving fullscale and subscale parts formed in the aged T81 condition, and aging subscale parts formed in the unaged T31 condition.

B66-10451
REUSABLE CHELATING RESINS CONCENTRATE METAL IONS FROM HIGHLY DILUTE SOLUTIONS
BAUMAN, A. J. WEETAL, H. H. WELIKY, N. OCT. 1966
JPL-758
Column chromatographic method uses new metal chelating resins for recovering heavy-metal ions from highly dilute solutions. The absorbed heavy-metal cations may be removed from the chelating resins by acid or base washes. The resins are reusable after the washes are completed.

B66-10453
THERMOPLASTIC RUBBERLIKE MATERIAL PRODUCED AT LOW COST
HENDEL, F. J. OCT. 1966
JPL-793
Thermoplastic rubberlike material is prepared by blending a copolymer of ethylene and vinyl acetate with asphalt and a petroleum distillate. This low cost material is easily molded or extruded and is compatible with a variety of fillers.

B66-10454
GAGE OF 6.5 PER CENT SI-FE SHEET IS CHEMICALLY REDUCED
GOLDMAN, A. PAVLOVIC, D. M. /WESTINGHOUSE ELEC. CORP./ OCT. 1966
MSC-537
Chemical milling process aids the production of 6.5 per cent silicon-iron soft magnetic-alloy sheets to very thin gauges. Following conventional rolling to safe gauge limits, the

material is chemically reduced to the desired gauge.

B66-10458
HEAT TREATMENT STABILIZES WELDED ALUMINUM JIG AND TOOL STRUCTURES
MEHNERT, R. S. /N. AM. AVIATION/ OCT. 1966
MSC-800
Heat treatment processes, applied after welding but before machining, imparts above normal stability to welded aluminum jigs and tool structures. Weight saving will not be realized in these tools if rigidity equal to that of a comparable steel tool is required.

B66-10467
XENON FORMS STABLE COMPOUND WITH FLUORINE
CLAASSEN, H. H. MALM, J. G. SELIG, H. H. OCT. 1966
ARG-4
Experiments show that xenon and fluorine combine readily at 400 deg C to form xenon tetrafluoride, which is colorless, crystalline, chemically stable and solid at room temperature. This process can be used for the separation of xenon from mixtures with other noble gases.

B66-10475
BORATE GLASS EFFICIENTLY TRANSMITS ULTRAVIOLET LIGHT
BISHAY, A. NOV. 1966
ARG-91
Borate glass has high ultraviolet transmissability characteristics. Applications for the borate glass include germicidal lamps, window glass, and optical instruments.

B66-10479
ELECTROLESS NICKEL PLATING ON STAINLESS STEELS AND ALUMINUM
INNOVATOR NOT GIVEN /GE/ NOV. 1966
GSFC-533
Procedures for applying an adherent electroless nickel plating on 303 SE, 304, and 17-7 PH stainless steels, and 7075 aluminum alloy was developed. When heat treated, the electroless nickel plating provides a hard surface coating on a high strength, corrosion resistant substrate.

B66-10487
ADHESIVE FOR POLYESTER FILMS CURES AT ROOM TEMPERATURE, HAS HIGH INITIAL TACK
CHRISTIAN, C. M. FUST, G. W. WELCHEL, C. J. /THIOKOL CHEM. CORP./ NOV. 1966
M-FS-938
Quick room-temperature-cure adhesive bonds polyester-insulated flat electrical cables to metal surfaces and various other substrates. The bond strength of the adhesive may be considerably increased by first applying a commercially available polyamide primer to the polyester film.

B66-10517
COLD TRAP INCREASES SENSITIVITY OF GAS CHROMATOGRAPH
GARRARD, G. G. WESLEY, R. D. /N. AM. AVIATION/ DEC. 1966
M-FS-1617
Cold trap concentrates oxygen and argon to determine trace amounts /as low as 0.1 ppm/ in helium by gas chromatography.

B66-10519
BRAZE ALLOY HOLDS BONDING STRENGTH OVER WIDE TEMPERATURE RANGE
INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ NOV. 1966
LEWIS-337
Copper-based quaternary alloys of the solid solution type is used for vacuum furnace brazing of large stainless steel components at a maximum temperature of 1975 deg F. The allow has high bonding strength and good ductility over a temperature range extending from the cryogenic region to approximately 800 deg F.

B66-10527
CRUCIBLE CAST FROM BERYLLIUM OXIDE AND REFRACTORY CEMENT IS IMPERVIOUS TO FLUX AND MOLTEN METAL
JASTRZEBSKI, Z. D. NOV. 1966
ARG-22
Crucible from a mixture of a beryllium oxide aggregate and hydraulic refractory cement, and coated with an impervious refractory oxide will not deteriorate in the presence of fused salt-molten metal mixtures such as uranium-magnesium-zinc-halide salt systems. Vessels cast by this process are used in the flux reduction of oxides of thorium and uranium.

B66-10528
LOWER-COST TUNGSTEN-RHENIUM ALLOYS
KLOPP, W. D. RAFFO, P. L. WITZKE, W. R. DEC. 1966
LEWIS-332
Tungsten-rhenium alloys with a substantially more dilute rhenium content have ductilities and other mechanical properties which compare favorably with the tungsten-rhenium alloys having much higher concentrations of the costly rhenium.

B66-10535
PROCESS YIELDS CO-FE ALLOYS WITH SUPERIOR HIGH TEMPERATURE MAGNETIC PROPERTIES
BARRANGER, J. P. NOV. 1966
LEWIS-333
Cobalt-iron alloys containing from 7.0 to 9.3 percent iron prepared from ultrapure cobalt and iron have the highest curie point of all known magnetically soft materials. Their high permeability, low hysteresis loss, good saturation induction, and squareloop characteristics recommend them for use in power transformers and rotating machinery.

B66-10538
TUNGSTEN INSULATED SUSCEPTOR CUP FOR HIGH TEMPERATURE INDUCTION FURNACE ELIMINATES CONTAMINATION
GERINGER, H. J. NOV. 1966
LEWIS-283
METILUR /Materials Experimental Tungsten Induction Laboratory Unit Replacement/ is an improved, unitized design of a susceptor cup and shielding that uses only one type of construction material /tungsten/ which eliminates contamination. Cycling runs can be accomplished with METILUR.

B66-10540
SILVER-BASE TERNARY ALLOY PROVES SUPERIOR FOR SLIP RING LEAD WIRES
ERNST, R. H. WILLIAMS, D. N. NOV. 1966
M-FS-1540
Slip ring lead wires composed of ternary alloys of silver, have high electrical conductivity, a tensile strength of at least 30,000 psi, high ductility, and are solderable and weldable. An unexpected advantage of these alloys is their resistance to discoloration on heating in air.

B66-10551
NEW TUNGSTEN ALLOY HAS HIGH STRENGTH AT ELEVATED TEMPERATURES
DEC. 1966 SEE ALSO NASA-TN-D-3248
LEWIS-336
Tungsten-hafnium-carbon alloy has tensile strengths of 88,200 psi at 3000 deg F and 62,500 psi at 3500 deg F. Possible industrial applications for this alloy would include electrical components such as switches and spark plugs, die materials for die casting steels, and heating elements.

B66-10558
TANTALUM ALLOYS RESIST CREEP DEFORMATION AT ELEVATED TEMPERATURES
BUCKMAN, R. W., JR. /WESTINGHOUSE ELEC. CORP./ DEC. 1966
LEWIS-350
Dispersion-strengthened tantalum-base alloys possess high strength and good resistance to creep deformation at elevated temperatures in high vacuum environments. They also have ease of fabrication, good weldability, and corrosion resistance to molten alkali metals.

B66-10572
TUNGSTEN FIBER-REINFORCED COPPER COMPOSITES FORM HIGH STRENGTH ELECTRICAL CONDUCTORS
MC DANELS, D. L. SIGNORELLI, R. A. DEC. 1966
SEE ALSO NASA-TN-D-3590
LEWIS-338
Tungsten fiber-reinforced copper composites have tensile strength, yield strength, and modulus of elasticity proportional to fiber content. The composites form high strength electrical conductors.

B66-10578
SPRAYABLE BIREFRINGENT COATING ENABLES STRAIN MEASUREMENTS ON LARGE SURFACES
HUMPHREY, F. T. MC GEE, W. M. /LOCKHEED AIRCRAFT CORP./ DEC. 1966
M-FS-1484
Birefringent coating for strain measurements on large surfaces contains constituents that can be premixed and sprayed as a single component with conventional paint spray equipment. Elevated temperatures are not required for spraying or curing of the coating material which has long pot life.

B66-10586
GAS CHROMATOGRAPHIC COLUMN ENABLES ANALYSIS OF PROPELLANT HYDRAZINES
WELZ, E. A., JR. /N. AM. AVIATION/ DEC. 1966
MSC-1161
Stainless steel column is used in gas chromatographic analysis of propellant-grade hydrazine. The column has also been found effective for the separation of other amines and alcohols and nitriles.

B66-10594
USE OF STEEL AND TANTALUM APPARATUS FOR MOLTEN CD-MG-ZN ALLOYS
BENNETT, G. A. BURRIS, L., JR. KYLE, M. L. NELSON, P. A. DEC. 1966
ARG-199 ARG-200
Steel and tantalum apparatus contains various ternary alloys of cadmium, zinc, and magnesium used in pyrochemical processes for the recovery of uranium-base reactor fuels. These materials exhibit good corrosion resistance at the high temperatures necessary for fuel separation in liquid metal-molten salt solvents.

B66-10609
FILM COATING PERMITS LOW-FORCE SCRIBING
WILLING, R. /N. AM. AVIATION/ DEC. 1966
MSC-990
Film coating requires low scribing force, is relatively unaffected by aging, and gives off a soft, fine scribe residue containing a proven lubricant.

B66-10616
HEAT-TREATMENT OF METAL PARTS FACILITATED BY SAND EMBEDMENT
BRISCOE, C. C. KELLEY, R. C. /BOEING CO./ DEC. 1966
M-FS-1543
Embedding metal parts of complex shape in sand contained in a steel box prevents strains and warping during heat treatment. The sand not only provides a simple, inexpensive support for the parts but also ensures more uniform distribution of heat to the parts.

B66-10631
SILVER-PALLADIUM BRAZE ALLOY RECOVERED FROM MASKING MATERIALS
CIERNIAK, R. COLMAN, G. DECARLO, F. /N. AM. AVIATION/ DEC. 1966
M-FS-1845
Method for recovering powdered silver-palladium braze alloy from an acrylic spray binder and rubber masking adhesive used in spray brazing is devised. The process involves agitation and dissolution of masking materials and recovery of suspended precious metal particles on a filter.

B66-10639
PROCESS FOR PREPARING DISPERSIONS OF ALKALI METALS
LANDEL, R. F. REMBAUM, A. /JPL/
JPL-734
Finely divided particles of alkali metals are produced by combining alkali metals with certain aromatic compounds in selected solvents to form low-temperature soluble complexes from which the pure alkali metals precipitate quantitatively when the solutions are warmed. All operations must be carried out in an inert gas atmosphere.

B66-10643
COMBUSTION CHAMBER STRUTS CAN BE EFFECTIVELY TRANSPIRATION COOLED
PALMER, G. H. /N. AM. AVIATION/ DEC. 1966
M-FS-1830
Vapor-deposited sintering technique increases the feasible temperature range of transpiration-cooled structural members in combustion chambers. This technique produces a porous mass of refractory metal wires around a combustion chamber structural member. This mass acts as a transpiration-cooled surface for a thick-walled tube.

B66-10646
PROCESS PRODUCES CHLORINATED AROMATIC ISOCYANATE IN HIGH YIELD
TRISCHLER, F. /WHITTAKER CORP./ DEC. 1966
M-FS-1658
Tetrachloreterephthaloyl chloride reacts with sodium azide in an atmosphere of nitrogen to form a high yield of tetrachloro-p-phenylene diisocyanate. The chlorinated diisocyanate should have application as an intermediate in the preparation of polyurethane foams. The high halogen content would impart added flame resistance to these foams.

B66-10651
INTERGRANULAR METAL PHASE INCREASES THERMAL SHOCK RESISTANCE OF CERAMIC COATING
CARPENTER, H. W. /N. AM. AVIATION/ DEC. 1966
M-FS-1862 M-FS-1865
Dispersed copper phase increases the thermal shock resistance of a plasma-arc-sprayed coating of zirconia used as a heat barrier on a metal substrate. A small amount of copper is deposited on the granules of the zirconia powder before arc-spraying the resultant powder composite onto the substrate.

B66-10666
WIRE MATERIAL REDUCES COMPRESSOR BLADE VIBRATION
JOHNSON, R. L. DEC. 1966
LEWIS-357
Wire material /Inconel/ having high friction and low wear characteristics, reduces vibratory stress and prevents compressor blade failure.

B66-10673
COLD SOLID PROPELLANT MOTOR HAS STOP-RESTART CAPABILITY
HENDEL, F. J. DEC. 1966
JPL-836
Solid propellant rocket is kept and fired at low temperatures in launch vehicles or spacecraft. The motor is capable of developing a specific impulse comparable to that of liquid propellant motors, is started, stopped, and restarted, and is stored in space without solar radiation causing hot spots on the motor casing.

B66-10681
THIN PLASTIC SHEET ELIMINATES NEED FOR EXPENSIVE PLATING
STREMEL, R. L. /N. AM. AVIATION/ DEC. 1966
M-FS-1896
Gasket of a commercially available plastic material is interposed between the mating surfaces in axial joints where a hard and a soft metal are in intimate contact under stress conditions. This eliminates the fretting problem and is quicker and less expensive than the plating process.

B66-10684
IMPROVED METHOD OF EDGE COATING FLAT RIBBON

WIRE
INNOVATOR NOT GIVEN /SCHJELDAHL CO. /G.T.// DEC. 1966
M-FS-902
Method to coat the edges of flat ribbon wire is devised by using enamel with modified flow properties due to addition of 2 to 4 percent silicon. Conventional coating procedes several edge coatings to minimize oxidation and additional conventional coats are applied after edge coating to build up thickness.

B66-10701
TRACE LEVELS OF METALLIC CORROSION IN WATER DETERMINED BY EMISSION SPECTROGRAPHY
SNELL, H. H. /N. AM. AVIATION/ DEC. 1966
MSC-1193
Emission spectrographic method determines trace amounts of inorganic impurities in potable water. The capability of this innovation should arouse considerable interest among plant biologists, chemists working in organic synthesis, and pathologists.

B66-10705
GLASS FORMULATION HAS HIGH COEFFICIENT OF THERMAL EXPANSION
DAVIS, E. K. SEIDEL, J. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966 SEE ALSO B66-10704
NU-0084
Glass formulation has a high coefficient of thermal expansion. The glass makes a good hermetic seal for the end of a stainless steel or copper tube such as a sheath of an instrumentation cable.

B66-10710
RADIOACTIVE METHOD ENABLES DETERMINATION OF SURFACE AREAS RAPIDLY AND ACCURATELY
ROESMER, J. ROLL, J. A. RYMER, G. T. SUNDAY, J. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0088
Radioactive krypton adsorption technique is used to determine the surface area of more than one sample of material simultaneously.

04 LIFE SCIENCES

B63-10003
NEW LOW-LEVEL A-C AMPLIFIER PROVIDES ADJUSTABLE NOISE CANCELLATION AND AUTOMATIC TEMPERATURE COMPENSATION
SMITH, J. R., JR. MAR. 1964
ARC-2
A circuit utilizing a transistorized differential amplifier is developed for biomedical use. This low voltage operating circuit provides adjustable cancellation at the input for unbalanced noise signals, and automatic temperature compensation is accomplished by a single active element across the input-output ends.

B64-10025
IMPROVED ELECTRODE GIVES HIGH-QUALITY BIOLOGICAL RECORDINGS
DAY, J. L. LIPPITT, M. W. MAY 1964
MSC-17
To obtain high quality waveforms from a subject engaged in physical activity, an improved electrode assembly has been devised. This consists of a cup containing an electrically conductive paste and a silver electrode. The paste maintains contact between the skin and the plate.

B64-10108
DEVICE INDUCES LUNGS TO MAINTAIN KNOWN CONSTANT PRESSURE
LIPPITT, M. W. REED, J. H. JUL. 1964
MSC-50
This device requires the use of thoracic muscles to maintain prescribed air pressure in the lungs for brief periods. It consists of a clear plastic hollow cylinder fitted with a mouthpiece, a spring-loaded piston, and a small vent for escaping air when exhalation into the mouthpiece displaces the piston.

B64-10146
TECHNIQUE SIMULATES EFFECT OF REDUCED GRAVITY
HEWES, D. E. SPADY, A. A. JR. JUN. 1964
LANGLEY-44
To simulate the effects of lunar gravity, an arrangement of near-vertical cables has been devised. These suspend the test subject perpendicular to an inclined walkway to give the effect of reduced gravitational pull.

B65-10332
TEST MONKEYS ANESTHETIZED BY ROUTINE PROCEDURE
INNOVATOR NOT GIVEN /SPACE/DEFENSE CORP./ NOV. 1965
HQ-18
Test monkeys are safely anesthetized for five minutes by confining them for less than six minutes in enclosures containing a controlled volume of ether. Thus the monkeys can be properly and safely positioned on test couches and fitted with electrodes or other devices prior to physiological tests.

B66-10049
IMPROVED ELECTRODE PASTE PROVIDES RELIABLE MEASUREMENT OF GALVANIC SKIN RESPONSE
DAY, J. L. FEB. 1966 SEE ALSO B64-10025 AND B65-10015
MSC-146
High-conductivity electrode paste is used in obtaining accurate skin resistance or skin potential measurements. The paste is isotonic to perspiration, is nonirritating and nonsensitizing, and has an extended shelf life.

B66-10117
MICROORGANISMS DETECTED BY ENZYME-CATALYZED REACTION
VANGO, S. P. WEETALL, H. H. WELIKY, N. MAR. 1966
JPL-782
Enzymes detect the presence of microorganisms in soils. The enzyme lysozyme is used to release the enzyme catalase from the microorganisms in a soil sample. The catalase catalyzes the decomposition of added hydrogen peroxide to produce oxygen which is detected manometrically. The partial pressure of the oxygen serves as an index of the sample*s bacteria content.

B66-10118
INTEGRAL SKIN ELECTRODE FOR ELECTROCARDIOGRAPHY IS EXPENDABLE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1966
MSC-299
Inexpensive, expendable skin electrode for use in electrocardiography combines an electrical contact, conductive paste, and a skin-attachment adhesive. Application of the electrode requires only degreasing of the skin area.

B66-10154
PHONOCARDIOGRAPH SYSTEM MONITORS HEART SOUNDS
INNOVATOR NOT GIVEN /BECKMAN INSTR., INC./ APR. 1966
MSC-185
Phonocardiograph system monitors the mechanical activity of the heart in extreme environments. It uses a piezoelectric-crystal microphone with an integral preamplifier, and a signal conditioner having special frequency characteristics. The output signals can be recorded on tape, presented aurally, or transmitted telemetrically to a remote station.

B66-10184
SELF-INFLATING LIFEVEST STORES IN SMALL PACKAGE
RADNOFSKY, M. I. MAY 1966
MSC-5A
Emergency lifevest is inflated with carbon dioxide from a self-contained cartridge in 10 seconds. When deflated, it fits into a package occupying less than 20 cubic inches and weighing less than one pound.

B66-10252
SEMICONDUCTOR FORMS BIOMEDICAL RADIATION PROBE
BURNS, F. P. FRIEDERICKS, J. E. /SOLID STATE RADIATION, INC./ JUN. 1966
MSC-320
Semiconductor radiation dosimeter in the form of a slender probe is easily inserted into body tissue. The probe has a signal-to-noise ratio that is acceptable to recording equipment and provides realistic measurements of the spatial and energy distributions of radiant electrons and protons.

B66-10314
PHONOCARDIOGRAPH MICROPHONE IS RUGGED AND MOISTUREPROOF
YOUNG, W. J. JUL. 1966
MSC-212
Microphone used as a phonocardiograph transducer monitors small amplitude audio signals in the presence of large shock loads and high humidity. It contains a lead zirconate-lead titanate piezoelectric plate encapsulated in a flexible polyurethane resin. The resin is contained in a sealed nylon case having a diameter of less than one inch.

B66-10406
PLANT RESPIROMETER ENABLES HIGH RESOLUTION OF OXYGEN CONSUMPTION RATES
FOSTER, D. L. /SPACE DEFENSE CORP./ SEP. 1966
HQ-47
Plant respirometer permits high resolution of relatively small changes in the rate of oxygen consumed by plant organisms undergoing oxidative metabolism in a nonphotosynthetic state. The two stage supply and monitoring system operates by a differential pressure transducer and provides a calibrated output by digital or analog signals.

B66-10468
RADON GAS, USEFUL FOR MEDICAL PURPOSES, SAFELY FIXED IN QUARTZ
FIELDS, P. R. MOSHE, H. Z. STEIN, L. NOV. 1966
ARG-2
Radon gas is enclosed in quartz or glass ampules by subjecting the gas sealed at a low pressure in the ampules to an ionization process. This process is useful for preparing fixed radon sources for radiological treatment of malignancies, without the danger of releasing radioactive gases.

B66-10515
APPARATUS ENABLES AUTOMATIC MICROANALYSIS OF BODY FLUIDS
SOFFEN, G. A. STUART, J. L. NOV. 1966
JPL-962
Apparatus will automatically and quantitatively determine body fluid constituents which are amenable to analysis by fluorometry or colorimetry. The results of tests are displayed as percentages of full scale deflection on a strip-chart recorder. The apparatus can also be adapted for microanalysis of various other fluids.

B66-10647
MODIFIED ALGESIMETER PROVIDES ACCURATE DEPTH MEASUREMENTS
TURNER, D. P. /N. AM. AVIATION/ DEC. 1966
MSC-616
Algesimeter which incorporates a standard sensory needle with a sensitive micrometer, measures needle point depth penetration in pain tolerance research. This algesimeter provides an inexpensive, precise instrument with assured validity of recordings in those biomedical areas with a requirement for repeated pain detection or ascertaining pain sensitivity.

B66-10649
SPRAY-ON ELECTRODES ENABLE EKG MONITORING OF PHYSICALLY ACTIVE SUBJECTS
DEC. 1966 SEE ALSO NASA-TN-D-3414
FRC-36
Easily applied EKG electrodes monitor the heart signals of human subjects engaged in various physical exercises. The electrodes are formed from an air drying, electrically conductive cement mixture that can be applied to the skin by means of a modified commercially available spray gun.

05 MECHANICAL

B63-10007
HIGH PURITY ELECTROFORMING YIELDS SUPERIOR METAL MODELS
HAEFELI, R. M. HOUSTON, J. P. JAN. 1964
ARC-6
Ultrasonic electroforming has proven successful in making high purity metal models for heat transfer studies. This process provides smooth, pit-free models.

B63-10008
VACUUM FORMING OF THERMOPLASTIC SHEET RESULTS IN LOW-COST INVESTMENT CASTING PATTERNS
CLARKE, A. E., JR. MAR. 1964
ARC-7
Vacuum forming of a sheet of thermoplastic material around a mandrel conforming to the shape of the finished object provides a pattern for an investment mold. The thickness of the metal part is determined by the thickness of the plastic pattern.

B63-10009
CHAIN FRICTION SYSTEM GIVES POSITIVE, REVERSIBLE DRIVE
DAVIDSEN, J. S. APR. 1964
ARC-8
By cementing a strip of an elastomer to the smooth metal rim of the pulley and neoprene covered idlers providing suitable tension to the chain around the pulley, a positive reversible drive is accomplished more quietly and with less vibration.

B63-10023
V-SLOTTED SCREW HEAD AND MATCHING DRIVING TOOL FACILITATE INSERTION AND REMOVAL OF SCREW FASTENERS
HANDLEY, M. G. JAN. 1964
FRC-16
A V-slotted designed screw and a screwdriver with a V-shaped tang facilitate driving the screw into difficult locations and minimize axial forces thus avoiding damage to the screw.

B63-10123
ELASTIC ORIFICE AUTOMATICALLY REGULATES GAS BEARINGS
BATSCH, F. LAUB, J. L. JUN. 1964
JPL-135
An elastic, pressure-sensitive orifice is used to automatically regulate the rate of gas flow into bearings under varying loads. Formed of a molded elastomer, tests show these orifices increase the stability of gas bearings.

B63-10139
METHOD OF WELDING JOINT IN CLOSED VESSEL IMPROVES QUALITY OF SEAM
FREEMAN, R. LEVOE, C. MAY 1964
JPL-170
To facilitate welding of closed vessels, a metal backup strip is used at the junction inside the vessel. After welding from the outside, this strip is dissolved by a chemically reactive solvent poured through a filler hole into the vessel.

B63-10141
VENTED PISTON SEAL PREVENTS FLUID LEAKAGE BETWEEN TWO CHAMBERS
MAC GLASHAN, W. F. MORRISON, R. DEC. 1964
JPL-179
To prevent fluid leakage around piston seals separating two fluids under differential pressure, a venting system has been devised. Two methods may be used for venting seals through internal passages to an external low-pressure area, O-ring or split-ring seals.

B63-10143
COINCIDENT SWITCH CLOSING REDUCES ERROR IN MOTOR-DRIVEN TIMER

RICH, S. DEC. 1964
JPL-182
To cut the lag-lead in motor-driven timing devices, the timing circuit has been extended to include a second switch. This is actuated in time with the first but driven directly at a speed x times faster than the first.

B63-10170
HIGH-PRESSURE REGULATING SYSTEM PREVENTS PRESSURE SURGES
KELLER, O. F. MAC GLASHAN, W. F. JUN. 1964 /SEE U.S. PATENT NO. 3,105,515/
JPL-231
Gas flow is controlled by means of a pressure regulating system which prevents pressure surges. A high-pressure fluid source, a spring-loaded fluid-damped regulator valve, an accumulator, a conventional normally closed command valve, and a control valve are the main components.

B63-10198
DEVICE TRANSMITS ROTARY MOTION THROUGH HERMETICALLY SEALED WALL
PORTER, R. N. APR. 1964
JPL-303
A wobble plate, metal bellows, and two shafts, assembled in a four-section housing, make it possible to transmit rotary motion through a hermetically sealed wall. In operation a rotational torque is developed by the wobble plate.

B63-10200
APPARATUS OF SMALL SIZE CAN BE EXTENDED INTO LONG, RIGID BOOM
MILLER, J. V. MAY 1964
JPL-305
Three metal sheets, having prenotched edges, are interlocked as they are unrolled from three feed rollers, which form a triangle. The apparatus is relatively small, and the sheets can be erected into a rigid trianglar boom of considerable length.

B63-10226
SELF SEALING DISCONNECT FOR TUBING FORMS METAL SEAL AFTER BREAKAWAY
GERNANDT, H. H. JAN. 1964
JPL-354
Disconnect fittings form a positive metal seal when the fill tube pulls against a metal sleeve when disconnected by force. A specially designed sleeve surrounds the fill tube. O-rings in the shoulder of the sleeve and near the outer end of the fill tube seal against leakage.

B63-10228
PACKLESS VALVE WITH ALL-METAL SEAL HANDLES WIDE TEMPERATURE, PRESSURE RANGE
MAC GLASHAN, W. F. MAR. 1964
JPL-361
A durable line valve utilizes stacked metal disks to seal off an inlet port. No packing or shaft sealing in needed, and the valve operates satisfactory over a wide temperature and pressure range.

B63-10236
LIGHTWEIGHT UNIVERSAL JOINT TRANSMITS BOTH TORQUE AND THRUST
BAMFORD, R. M. JAN. 1964
JPL-375
A lightweight universal joint uses a thin steel flexure plate to transmit torque and a steel rod to transmit thrust. Both the plate and rod are independently mounted and can act individually.

B63-10237
SUPERCOLD TECHNIQUE DUPLICATES MAGNETIC FIELD IN SECOND SUPERCONDUCTOR
HILDEBRANDT, A. F. NOV. 1964
JPL-376
A superconductor cylinder, charged with a high magnetic field, can be used to create a similar field in a larger cylinder. The uncharged cylinder is precooled, lowered into a helium dewar system, and fitted around the cylinder with the magnetic field. Magnetic flux lines pass through the two cylinders.

B63-10240
SLEEVE AND CUTTER SIMPLIFY DISCONNECTING WELDED JOINT IN TUBING
PERKINS, G. S. APR. 1964
JPL-384
To test equipment, welded tubing joints may have to be disconnected and rewelded. To eliminate rewelding, a nonstandard welding sleeve permits the tubing to be welded and then disconnected by a specially designed sleeve cutter. Use of this tool assures that only the sleeve is cut.

B63-10241
VEITCH DIAGRAM PLOTTER SIMPLIFIES BOOLEAN FUNCTIONS
RUBIN, D. K. APR. 1964
JPL-385
This device for simplifying the plotting of a veitch diagram consists of several overlays for blocking out the unwanted squares. This method of plotting the various input combinations to a computer is used in conjunction with the boolean functions.

B63-10247
NEW PACKAGE FOR BELLEVILLE SPRING PERMITS RATE CHANGE, EASY DISASSEMBLY
MAC GLASHAN, W. F. MAR. 1964
JPL-392
A spring package, with grooves to hold the spring washers at the inner and outer edges, reduces hysteresis to a minimum. Three-segment retainers permit easy disassembly so that the spring rate can be changed.

B63-10251
HELICAL TUBE SEPARATES NITROGEN GAS FROM LIQUID NITROGEN
STEPHENS, J. B. JUN. 1964
JPL-398
To prevent a boiloff problem, liquid nitrogen flowing from a storage tank to a container, is separated into liquid and gaseous components. This is accomplished by centrifugal and venting action, using a section of perforated helical aluminum tubing.

B63-10289
FRICTIONAL WEDGE SHOCK MOUNT IS INEXPENSIVE, HAS GOOD DAMPING CHARACTERISTICS
TENER, W. M. MAY 1964
JPL-IT-1001
A wedge-shaped shock mount uses rubber for energy absorption, and the frictional characteristics of ordinary brake material for damping.

B63-10291
SPECIAL PLIERS CONNECT HOSE CONTAINING LIQUID UNDER PRESSURE
BLAYDES, R. A. MAR. 1964
JPL-IT-1003
For speed and safety in handling disconnect fittings on a hose carrying liquid under pressure, special pliers have been constructed. A gear and rack mechanism is combined with two or more wide-opening U-shaped jaws which are placed over the quick-disconnect fittings.

B63-10292
HEAVY-DUTY STAPLE REMOVER OPERATED BY HAND
MORRISON, T. RENNER, R. MAR. 1964
JPL-IT-1004
To remove staples from thick reports, a rooter, bending hook and post are incorporated into a heavy duty hand tool. This makes possible one-step extraction of long staples.

B63-10304
BREAK-UP OF METAL TUBE MAKES ONE-TIME SHOCK ABSORBER, BARS REBOUND
HATHAWAY, M. MC GEHEE, J. R. ZAVADA, E. FEB. 1964 /SEE NASA-TN-D-1477/
LANGLEY-1A
A frangible metal tube has the capability to dissipate the energy generated when a vehicle lands with excessive velocity. The tube is so placed that, at impact, it is forced against a die

and, as it fragments, energy is absorbed.

B63-10340
CRYOPUMPING OF HYDROGEN IN VACUUM CHAMBERS IS AIDED BY CATALYTIC OXIDATION OF HYDROGEN
CHILDS, J. H. GROBMAN, J. RAYLE, W. JUN. 1964
/SEE NASA-TN-D-863/
LEWIS-15
Vacuum test facilities are required for high speed cryopumping of gaseous hydrogen at low pressures. One method involves the catalytic oxidation of hydrogen and condensation of the resulting water on a liquid nitrogen-cooled surface.

B63-10341
DESIGN OF VALVE PERMITS SEALING EVEN IF THE STEM IS MISALIGNED
SCHMIDT, H. W. JAN. 1964
LEWIS-38
A conical-walled valve plug is designed to seal against a recessed spherical valve seat. This insures proper sealing during numerous seating cycles even though the valve stem is misaligned or forced out of its proper axis.

B63-10354
RAPID BILLET LOADER AIDS EXTRUSION OF REFRACTORY METALS
DOLINSHEK, A. F. HERMAN, L. E. APR. 1964
LEWIS-50
A combination gravity and manually powered rapid billet loader reduces the time required for transferring hot metal billets from a heating furnace to an extrusion press. Positioned between the furnace and extrusion press, this loader is a simple slide-delivery device.

B63-10367
CONNECTOR FOR VACUUM-JACKETED LINES CUTS TUBING SYSTEM COST
CALVERT, H. F. MAY 1964
LEWIS-66
A low-cost fitting, fabricated from standard connectors, is used for disconnecting flow lines in cryogenic systems. Utilizing vacuum-jacketed lines made from two sizes of tubing welded at the ends, the connectors are stronger and setup time is reduced.

B63-10368
COMPOSITE, VACUUM-JACKETED TUBING REPLACES BELLOWS IN CRYOGENIC SYSTEMS
CALVERT, H. F. JUN. 1964
LEWIS-67
For reliability control of high pressure cryogenic systems, one or more 90 degree elbow expansion devices are substituted for the metal bellows normally used. The device consists of a conducting tube inside a support tube, with the space between the tubes evacuated for insulation.

B63-10376
NOVEL CLAMPS ALIGN LARGE ROCKET CASES, ELIMINATE BACK-UP BARS
FRANKLIN, W. J. MARTIN, N. C. JAN. 1964
M-FS-1
Welding clamps, placed inside and outside a rocket case, hold it in proper alignment during tungsten inert gas welding. These metal blocks, connected by a stainless steel band, eliminate the need for backup bars.

B63-10384
VACUUM-TYPE BACKUP BAR SPEEDS WELD REPAIRS
CARMODY, R. J. AUG. 1964
M-FS-12
A backup bar designed to use both vacuum and air pressure provides a method of sealing the weld root of a faulty section of seam weld. With slight redesign, the bar can be made sufficiently flexible to fit any large cylindrical surface.

B63-10385
FLEXIBLE HONEYCOMB STRUCTURE CAN BEND TO FIT COMPOUND CURVES
CARMODY, R. J. APR. 1964
M-FS-13
For flexibility in forming a curved surface, a honeycomb configuration using multiple pleats has proved superior to the usual core structures. The partial pleats formed in individual cell walls permit movements to and from the central axis without tearing.

B63-10387
PORTABLE FLOORING PROTECTS FINISHED SURFACES, IS EASILY MOVED
CARMODY, R. J. MAR. 1964
M-FS-15
To protect curved, finished surface and provide support for workmen, portable flooring has been made from rigid plastic foam blocks, faced with aluminum strips. Held together by nylon webbing, the flooring can be rolled up for easy carrying.

B63-10420
SIMPLE MECHANISM COMBINES POSITIVE LOCKING AND QUICK-RELEASE FEATURES
CLAYTON, L. B. /HUGHES AIRCRAFT CO./ FEB. 1964
WOO-4
For secure locking and quick release of two objects, this device uses a spring-loaded slotted bolt, locked in position by two retainer arms. When these retainer arms are freed from contact, the bolt is ejected and the objects released.

B63-10431
HIGH-TEMPERATURE, HIGH-PRESSURE SPHERICAL SEGMENT VALVE PROVIDES QUICK OPENING
GIOVANNETTI, A. HIMMELRIGHT, R. MEYER, K. NITTA, H. APR. 1964
ARC-13
A hollow spherical segment valve with an eccentric permits non-rubbing closure and provides a means for gas-cooling the seal. The design allows quick opening at high temperatures and discharge pressures.

B63-10435
PORTABLE DISPLAY PANELING HAS WIDE USE, EASY TAKE DOWN AND ASSEMBLY
DEVOTO, H. J., JR. MAR. 1964
ARC-17
Design for a modular display panel is based on a cross-shaped corner connector and wooden lattice bars. The bars are fitted into the arms of the metal connector and a pocket slot holds a modular-size panel.

B63-10442
KINETIC-ENERGY ABSORBER EMPLOYS FRICTIONAL FORCE BETWEEN MATING CYLINDERS
CONRAD, E. W. MAY 1964
LEWIS-75
A kinetic energy absorbing device uses a series of coaxial, mating cylindrical surfaces. These surfaces have high frictional resistance to relative motion when axial impact forces are applied. The device is designed for safe deceleration of vehicles impacting on landing surfaces.

B63-10489
FINE-PARTICLE FILTER PREVENTS DAMAGE TO VACUUM PUMPS
HARLAMERT, P., JR. APR. 1964
LEWIS-106
A filter system for mechanical pumps is designed with a baffle assembly that rotates in a circulating oil bath which traps destructive particles. This prevents severe damage to the pump and is serviceable for long periods before it requires cleaning.

B63-10497
INTEGRAL COOLANT CHANNELS SIMPLY MADE BY MELT-OUT METHOD
ESCHER, W. J. D. JUN. 1964
M-FS-91
A melt-out method of constructing strong, pressure-tight fluid coolant channels for chambers is accomplished by cementing pins to the surface and by depositing a melt-out material on the surface followed by two layers of epoxy-resin impregnated glass fibers. The structure is heated to melt out the low-melting alloy.

B63-10502
FLUID-PRESSURE METER CAN BE CALIBRATED WITHOUT REMOVAL FROM FLOW LINE
MELTON, D. E. MAR. 1964
M-FS-98
The construction of a fluid pressure meter with two inlet ports, flexible diaphragms and a pressure-responsive transducer is described. One port can be connected to the line and the other to a source of standard pressures for calibration.

B63-10517
MINIATURE OXYGEN-HYDROGEN CUTTING TORCH CONSTRUCTED FROM HYPODERMIC NEEDLE
SHLICHTA, P. APR. 1964
JPL-545
A miniature cutting torch consisting of a main body member, upon which the hydrogen and oxygen containers are mounted, valves for controlling gas flow, and a hypodermic needle that acts as a mixing tube and flame tip is constructed.

B63-10519
TOOL FACILITATES SEALING OF METAL FILL TUBES
COOLEY, H. H., JR. /UNITED AIRCRAFT CORP./ JUL. 1964
MSC-24
A hand tool is designed for sealing metal fill tubes containing corrosive or inflammable liquids without the use of heat or open flame. The tool aligns the fill tube into which a tapered sealing pin is dropped and driven below the neck of tube.

B63-10526
BUILT-IN TEMPLATES SPEED UP PROCESS FOR MAKING ACCURATE MODELS
INNOVATOR NOT GIVEN FEB. 1964
LANGLEY-23
From accurate scale drawings of a model, photographic negatives of the cross sections are printed on thin sheets of aluminum. These cross-section images are cut out and mounted, and mahogany blocks placed between them. The wood can be worked down using the aluminum as a built-in template.

B63-10530
NEW ANEMOMETER HAS FAST RESPONSE, MEASURES DYNAMIC PRESSURE DIRECTLY
LYNCH, J. W. REED, W. H., III OCT. 1964
LANGLEY-28
A simple anemometer having a fast response to high frequency wind fluctuations by direct measurement of two drag-force components in orthogonal planes is described. It may be used to determine wind profiles to extensive heights and would be helpful in takeoff and landing of light planes.

B63-10547
ELLIPSOIDAL OPTICAL REFLECTORS REPRODUCED BY ELECTROFORMING
HUNGERFORD, W. J. LARMER, J. W. LEVINSOHN, M. OCT. 1964
GSFC-92
An accurately dimensioned convex ellipsoidal surface, which will become a master after polishing, is fabricated from 316L stainless steel. When polishing of the master is completed, it is suspended in a modified watt bath for electroforming of nickel reflectors.

B63-10556
LATHE CONVERTED FOR GRINDING ASPHERIC SURFACES
LARMER, J. W. LEVINSOHN, M. MC CRAW, D. PESSAGNO, E. H. TAUB, F. J. JUL. 1964
GSFC-115
A standard overarm tracing lathe converted by the addition of an independently driven diamond grinding wheel is used for grinding aspheric surfaces. The motion of the wheel is controlled by the lathe air tracer following the template which produces the desired aspheric profile.

B63-10558
NEW METHOD FORMS BOND LINE FREE OF VOIDS
KING, C. B. OCT. 1964
LANGLEY-20
A new bonding method using vacuum, pressure and heat, which produces a bond line free of voids, is described. This method is very successful in bonding ablation shields to a magnesium structural component in simulated reentry tests involving great heat and air turbulence.

B63-10560
CAMERA SHUTTER IS ACTUATED BY ELECTRIC SIGNAL
NEFF, J. E. NOV. 1964
ARC-20
A rotary solenoid energized by an electric signal opens a camera shutter and when the solenoid is de energized a spring closes it. By the use of a microswitch, the shutter may be opened and closed in one continuous, rapid operation when the solenoid is actuated.

B63-10564
A TECHNIQUE FOR MAKING ANIMAL RESTRAINTS
CLARKE, A. E., JR. REITMAN, J. SEP. 1964
ARC-25
A contoured shell for restraining animals is made by thermoforming plastic over the anesthetized, frozen specimen. It may be vented, or pieces may be cut out to facilitate working in localized areas.

B63-10568
PLASTIC MOLDS REDUCE COST OF ENCAPSULATING ELECTRIC CABLE CONNECTORS
KNOTT, D. NOV. 1964
M-FS-69
Resin casting of the aluminum master pattern forms a plastic mold for encapsulating a cable connector. An elastomer is injected into the mold and cured. The mold is disassembled leaving an elastomeric encapsulation around the connector.

B63-10571
SELF-BALANCING BEAM PERMITS SAFE, EASY LOAD HANDLING UNDER OVERHANG
EDWARDS, O. H. MAR. 1964
M-FS-84
The use of a self-balancing I-beam with a counterweight and motor simplifies moving heavy loads that are inaccessible for cranes. The beam cannot be overloaded, as the counterweight will not balance the load, and thus acts as an automatic safety device.

B63-10590
STAINLESS-STEEL ELBOWS FORMED BY SPIN FORGING
INNOVATOR NOT GIVEN /CHANCE-VOUGHT CORP./ DEC. 1964
M-FS-122
Large seamless austenitic stainless steel elbows are fabricated by spin forging /rotary shear forming/. A specially designed spin forging tool for mounting on a hydrospin machine has been built for this purpose.

B64-10001
NEW INFLATABLE LIFERAFT IS NONTIPPABLE
RADNOFSKY, M. I. SHEWMAKE, G. A. MAR. 1964 /SEE NASA-TN-D-1083/
MSC-4A
A one-seamed lightweight life raft has three underwater ballast buckets as stabilizers. Non-tippable, it can be compactly packaged and inflated with carbon dioxide.

B64-10006
SPEED-SENSING DEVICE AIDS CRANE OPERATORS
INNOVATOR NOT GIVEN OCT. 1964
WS-4
So that crane operators can judge payload movements accurately, a friction-driven multilobed cam device energizes a buzzer and indicator lamp in the crane cab. The signal frequency of this speed sensor has a sensitivity to hoist movement of 1/8 inch.

B64-10011
METAL STRIP FORMS 21 FOOT BOOM, ROLLS UP FOR COMPACT STORAGE
INNOVATOR NOT GIVEN /CANADIAN COMMERCIAL CORP./ MAY 1964
GSFC-151
An extensible boom, carrying three separate electric conductor tapes, can be rolled into a compact storage drum. The tape is curved in cross

section so that the boom automatically forms a tube as it is extended.

B64-10014
GUIDE FOR EXTRUSION DIES ELIMINATES STRAIGHTENING OPERATION
GYORGAK, C. A. HOOVER, R. J. NOV. 1964
LEWIS-152
To prevent distortion of extruded metal, a guidance assembly is aligned with the die. As the metal emerges from the extrusion dies, it passes directly into the receiver and straightening tube system, and the completed extrusion is withdrawn.

B64-10015
COMFORTABLE, LIGHTWEIGHT SAFETY HELMET HOLDS RADIO TRANSMITTER, RECEIVER
ATLAS, N. D. /N. AM. AVIATION, INC./ MAY 1964
MSC-53
For two-way radio communication where safety gear is required, a lightweight helmet with few protrusions has been designed. The electronics components and power supply are mounted between the inner and outer shells, and resilient padding is used for the lining.

B64-10021
PRESSURE TRANSDUCER 3/8-INCH IN SIZE CAN BE FAIRED INTO SURFACE
SCHAFFER, R. J. /N. AM. AVIATION, INC./ MAY 1964
WOO-065
To measure fluid pressure with minimum disturbance to fluid flow, a miniature pressure transducer can be imbedded and faired into the test surface. Incorporated in the design are piezoresistive elements, mounted on a diaphragm, which transform pressure strains into an electrical signal.

B64-10028
QUICK-ACTING CLUTCH DISENGAGES IDLE DRIVE MOTOR
STARK, K. W. AUG. 1964
GSFC-143
Positive-drive, no drag, over-running clutch is developed to conserve power of idle motor in a low-power system using multiple drive motors. This device is useful where a number of shaft speeds are required with frequent shifting.

B64-10031
MULTIPLE PORT PRESSURE SCANNER VALVE FEATURES GREATER ACCURACY, QUICKER DATA
VINCENT, E. R. SEP. 1964
JPL-555
A fast, accurate, multipressure measuring system, which employs a multiple port pressure scanning valve that connects a pressure transducer to many pressures, is described.

B64-10050
MODIFIED GAS BEARING IS ADJUSTABLE TO OPTIMUM STIFFNESS RATIO
EVANS, J. L. AUG. 1964
M-FS-145
Inexpensive and rapid-adjustments of the radial-to-axial stiffness ratio of a spherical gas bearing are achieved by a series of gas passages in the equatorial plane of the sphere which feed into orifices that can be readily changed in size.

B64-10058
INSULATED WELD TOOLING PERMITS UNIFORM, HIGH-QUALITY WELD
INNOVATOR NOT GIVEN /N. AM. AVIATION/ AUG. 1964
MSC-42
The application of a ceramic material coating to all surfaces contacting parts to be welded permits greater weld strength than the conventional weld tooling method.

B64-10066
ENCAPSULATION PROCESS STERILIZES AND PRESERVES SURGICAL INSTRUMENTS
MONTGOMERY, L. C. MORELLI, F. A. JUL. 1964
JPL-484
Ethylene oxide is blended with an organic polymer to form a sterile material for encapsulating surgical instruments. The material does not bond to metal and can be easily removed when the instruments are needed.

B64-10069
METAL-BENDING BRAKE FACILITATES LIGHTWEIGHT, CLOSE-TOLERANCE FABRICATION
ERCOLINE, A. L. WILTON, K. B. OCT. 1964
ARC-29
A lightweight, metal bending brake ensures very accurate bends. Features of the brake that adapt it for making complex reverse bends to close tolerances are a pronounced relief or cutaway of the underside of the bodyplate combined with modification in the leaf design and its suspension.

B64-10084
MOLDED ELESTOMER PROVIDES COMPACT FERRITE-CORE HOLDER, SIMPLIFIES ASSEMBLY
HAYDEN, R. R. NOV. 1964
JPL-584
A ferrite-core holder, fabricated by casting an elastomer in a simple mold, simplifies the assembly of modular matrix units for computers. Use of the device permits the core leads to be multiply threaded and soldered to terminals, without requiring intermediate terminals.

B64-10119
BUCKLE JOINS WEB STRAPS QUICKLY, ADJUSTS EASILY
WILKINSON, J. E. /CHANCE VOUGHT CORP./ JUN. 1964
LANGLEY-21
To join web straps used to hoist heavy loads, a novel buckle permits two straps to be quickly joined and held by the combined forces of strap load tension and friction.

B64-10121
ELECTRONIC ASSEMBLY RACK PANELS SNAP ON AND OFF
BAILEY, J. W. JUN. 1964
GSFC-59
Snap fasteners on each side of an electronic assembly rack blank panel give quick access to the interior. Guide pins extending from the inside face easily slip into standard screw holes on the frame and provide additional support.

B64-10124
ATTACHMENT CONVERTS MICROSCOPE TO POINT SOURCE AUTOCOLLIMATOR
SHLICHTA, P. J. JUL. 1964
JPL-499
A low-power microscope or telescope provides a simple means of autocollimation. This is done by fitting the instrument with a light source to permit alignment from a reflecting surface normal to the optic axis of the instrument.

B64-10130
BEARING TRANSMITS ROTARY AND AXIAL MOTION
DOW, N. F. PETERS, R. W. SEP. 1964
LANGLEY-27
A low friction, two-component bearing comprised of a pair of ball-bearing races for transmitting rotary motion and an inner series of ball bearing assemblies for transmitting axial motion is described and should be useful in mechanisms such as stress-strain testing machines.

B64-10141
PNEUMATIC POWER IS TRANSMITTED THROUGH AIR BEARING
JOHNSON, H. I. WOBIG, O. A. JUL. 1964
MSC-8
A more efficient method for supplying high pressure air to an air bearing and pneumatic equipment mounted on it has been developed. The system uses a conventional air bearing and an air-supported sphere with a central passage. High pressure air is channeled through it into the pneumatic equipment on the sphere.

B64-10145
FLEXIBLE FASTENER ALLOWS THERMAL EXPANSION
CRUMPLER, W. B. JUN. 1964
LANGLEY-40
A flexible fastener permits thermal expansion of model skin sections which are rigidly attached to

supporting structures in wind tunnel tests. The device uses a modified ball joint contact between the fastener and a skin section.

B64-10164
UPSETTING BUTT EDGE INCREASES WELD-JOINT STRENGTH
VESCO, D. OCT. 1964
M-FS-175
Mechanical upsetting /a mode of cold forging/ of butt edges to be welded is accomplished by the use of hydraulic rams and pressure rollers. The mechanical upsetting increases the thickness of the material in the heat-affected zone and compensates for the lower specific strength per unit thickness common to this area.

B64-10170
BALL BEARING USED IN DESIGN OF RUGGED FLOW-METER
MINKIN, H. L. JAN. 1965
LEWIS-159
A volumetric flowmeter which has a small magnet imbedded in the outer perimeter of the turbine wheel or in the bearing permits measurement of liquid flow rates in the presence of wide ranges and violent surges.

B64-10178
MACHINE TESTS CREASE DURABILITY OF SHEET MATERIALS
JONES, L. K. STANFORD, H. B. NOV. 1964
JPL-604
To test the crease resistance of sheet materials, the mid-section is folded over crease-control blades. One end is clamped to a motor-driven eccentric, the other to a spring, and durability is measured by the cycles required to produce failure.

B64-10185
THREADING HOOK FACILITATES SAFE RECOVERY OF HEAVY LOADS
ARTHUR, J. S. WILLIAMS, D. C. OCT. 1964
MSC-46
A C-shaped threading hook and shuttle mounted on a spring-loaded driving rod located inside the long-handled pole are developed for recovering massive loads afloat in the sea.

B64-10188
BLADE VALVE ISOLATES COMPARTMENT IN PIPE, OPENS TO ALLOW FREE FLOW
IMUS, R. NOV. 1964
JPL-585
Two thin blades are incorporated into a valve which, when closed, form a sealed compartment in the shock-tube portion of a pipeline. When forced open by an actuator, gas flows through the system.

B64-10211
MICROMACHINING PRODUCES OPTICAL APERTURES TO MICRON DIMENSIONS
WALCH, A. J. OCT. 1964
GSFC-206
A micron dimensioned rectangular optical aperture is formed under a high-powered toolmaker*s microscope by laying two knife-edged blocks over the miniature knife-edged hole in the base.

B64-10223
TWO-PART VALVE ACTS AS QUICK COUPLING
MAC GLASHAN, W. F., JR. NOV. 1964
JPL-478
A two-part valve simplifies the problem of filling large tanks from smaller ones. One part acts as a check valve and remains integral to the recipient system, while the other part is integral to the donor system.

B64-10249
INSTRUMENT ADJUSTMENT KNOB LOCKS TO PREVENT ACCIDENTAL MALADJUSTMENT
INNOVATOR NOT GIVEN /LEAR SIEGLER CORP./ NOV. 1964
M-FS-190
A device, incorporating a collar with a hexagonal opening which fits snugly over a hexagonal nut used to engage instrument panel components, keeps the adjustment knob locked. A quick release mechanism frees the knob for rotational adjustment.

B64-10272
VISCOUS-PENDULUM DAMPER SUPPRESSES STRUCTURAL VIBRATIONS
REED, W. H., III NOV. 1964
LANGLEY-45
The viscous pendulum damper consists of a cylinder containing round trays on which round lead slugs rest. When assembled, the container is filled with a viscous liquid and attached, with axis vertical, to the structure. The device permits varying the damping of structural vibrations.

B64-10274
VEHICLE WALKS ON VARIED TERRAIN, CAN ASSIST HANDICAPPED PERSONS
INNOVATOR NOT GIVEN NOV. 1964
WOO-005 WOO-005
A battery-powered motorized vehicle with three pairs of legs connected to push rods and a series of linkages is constructed for traversing varied terrains. Two cams connected to the drive mechanism control the motion of the legs. The basic design may be adapted for use with motorized wheelchairs.

B64-10277
APPARATUS ALTERS POSITION OF OBJECTS TO FACILITATE DEMAGNETIZATION
RINARD, G. WATSON, J. D. NOV. 1964
GSFC-234
An apparatus consisting of pulleys, a drive shaft and an inner compartment, in which components to be demagnetized are mounted, is constructed. Due to the speed ratio of the three frames, every point on a component in the inner compartment is cycled through an optimum locus in the demagnetization field.

B64-10278
SENSITIVE LOW-PRESSURE RELIEF VALVE HAS POSITIVE SEATING AGAINST LEAKAGE
INNOVATOR NOT GIVEN /N. AM. AVIATION INC./ NOV. 1964
WOO-041
A pilot-operated relief valve which provides positive seating against leakage in cryogenic systems is described. The principal advantage is that the pilot poppet is unaffected by variations in control pressures in the pilot cavity, and results in a more accurate sensing of inlet pressure conditions.

B64-10284
APPARATUS MEASURES VERY SMALL THRUSTS
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ NOV. 1964
WOO-048
Measurement of very small thrusts of an ion engine are made by mounting the engine on a platform supported by leaf springs which are loaded to have a zero spring constant. Measuring apparatus includes an inductive sensor, servo amplifier, and a counterthrust feedback system.

B64-10306
COMPRESSED GAS SYSTEM OPERATES SEMITRAILER BRAKES DURING WINCHING OPERATION
TUPPER, W. E. DEC. 1964
JPL-0036
To move van-type semi-trailers into and out of confined spaces, an auxiliary braking system is mounted on a standard dolly converter. Compressed nitrogen is used to actuate the brakes which are used in conjunction with a power winch.

B64-10327
CONNECTOR SEALS FLUID LINES AT CRYOGENIC TEMPERATURES AND HIGH VACUUMS
KITTS, W. T. PLATT, P. K. JAN. 1965
GSFC-253
A connector that will serve as a seal for fluids at cryogenic temperatures and in high vacuums was constructed by installing a metal disk between two sets of mating serrations to form two sealing surfaces. Compression on both sealing surfaces is

ensured by spring action of the disk.

B64-10348
SAFETY RESTRAINER PREVENTS WHIPPING OF RUPTURED HIGH-PRESSURE HOSE
THOMPSON, W. E. DEC. 1964
LEWIS-99
The braid at each end of a standard electric cable puller is modified to reinforce high pressure, flexible, fluid transfer hoses. This safety device acts as a restraint if the line ruptures.

B64-10406
POLYCHART CONTOUR PLOTTER ENABLES DATA EXTRAPOLATION FROM MULTIPLE PLOTTING CHARTS
SWINDALL, P. M. WISE, T. E. JUL. 1964
M-FS-37
A polychart contour plotter is used to reduce the data from all 19 antenna pattern charts to a one-chart form.

B65-10003
ILLUMINATED DISPLAY PANEL IS EASILY CHANGED
INNOVATOR NOT GIVEN /IBM/ JAN. 1965
MSC-108
Photographic negative placed between two plastic sheets and back-lighted in selected areas prepares illuminated multicolored display panels. The device is inexpensive, easily changed, and quickly fabricated.

B65-10007
THERMOCOMPRESSION BONDING PRODUCES EFFICIENT SURFACE-BARRIER DIODE
INNOVATOR NOT GIVEN /IBM/ JAN. 1965
JPL-SC-066
Thermocompression bonding of a gold wire to a gallium-arsenide wafer produces a quality surface barrier diode with fast recovery times. The properties of this combination may be useful in semiconductor devices.

B65-10008
SHOCK ABSORBER PROTECTS MOTIVE COMPONENTS AGAINST OVERLOADS
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ JAN. 1965
WOO-092
Shock absorber with an output shaft, hollow gear, and a pair of springs forming a resilient driving connection between shaft and gear, operates when abnormally high torques are applied. This simple durable frictional device is valuable in rotating mechanisms subject to sudden overloads.

B65-10009
FORMING BLOCKS SPEED PRODUCTION OF STRAIN GAUGE GRIDS
BONN, J. L. GARDNER, D. E. FEB. 1965
LEWIS-182
A tool is designed which facilitates the forming of wire grids used in manufacturing strain gauge grids. Flattening the grid wire by a cold working process produces a stabilized grid which can be readily handled for storage or shipment.

B65-10014
USE OF TEAR RING PERMITS REPAIR OF SEALED MODULE CIRCUITRY
INNOVATOR NOT GIVEN /IBM/ JAN. 1965
M-FS-210
Improved packaging technique for modulator electronic circuitry utilizes a tear ring which may be removed for repair and resealed. The tear ring is put over the container and header to which the electronic circuit assembly has been attached.

B65-10017
EXPLOSIVES ACTUATE NONMAGNETIC INDEXING DEVICE
BAUERNSCHUB, J. P., JR. JAN. 1965
GSFC-237
Nonmagnetic explosive-actuated indexing device creates magnetic field that can be tolerated by a sensor.

B65-10019
WIDE-ANGLE SENSOR MEASURES RADIANT HEAT ENERGY IN CORROSIVE ATMOSPHERES
INNOVATOR NOT GIVEN /BOEING CO./ JAN. 1965 SEE ALSO B63-10004
M-FS-228
Ellipsoidal cavity device measures radiant heat energy over wide incident angles in corrosive atmospheres. The instrument consists of a cavity in copper heat sink sealed with sapphire window to protect thermocouple.

B65-10020
OPTICAL ARRANGEMENT INCREASES USEFUL LIGHT OUTPUT OF SEMICONDUCTOR DIODES
INNOVATOR NOT GIVEN /IBM/ JAN. 1965 SEE ALSO B64-10297
JPL-SC-064
Useful light output of semiconductor diodes increased by incorporating the diode in an integral reflector and lens assembly. This reduces normal reflection losses between the diode and the air.

B65-10021
PICKUP DEVICE READS PRESSURES FROM PORTS IN ROTATING MECHANISMS
JANAS, B. JAN. 1965 SEE ALSO B64-10031
LEWIS-158
Indexing pickup monitors fluid pressures from ports at various angles on high or low speed rotating mechanisms in operation. By a simple axial movement of a takeoff connector, angle changing takes place. This device can be adapted for electric current monitoring.

B65-10022
KNOB LINKAGE PERMITS ONE-HAND CONTROL OF SEVERAL OPERATIONS
CODDING, G. C. LAVENDER, C. E. JAN. 1965
MSC-30
Electromechanical device with single knob provides one-hand control of numerous electrical or mechanical functions. The principle of this design may have application to remote-control switching devices.

B65-10027
FLUID-PRESSURE MEASUREMENT APPARATUS USES SHORT-LENGTH MANOMETER TUBES
SATHER, B. I. MAR. 1965
LEWIS-28
System of short length U-tube manometers with a proportionally divided reference pressure measures high fluid pressures.

B65-10029
SEISMIC TRANSDUCER MEASURES SMALL HORIZONTAL DISPLACEMENTS
GREENWOOD, T. L. MAR. 1965
M-FS-81
Pendular seismic transducer mounted on base plate measures small horizontal displacements of structures subjected to vibration where no fixed reference point is available. Enclosure of transducer in transparent plastic case prevents air currents from disturbing the pendulum balance.

B65-10031
SPRING LOADED BEADED CABLE MAKES EFFICIENT WIRE PULLER
INNOVATOR NOT GIVEN /N. AM. AVIATION/ FEB. 1965
WOO-108
An efficient wire puller consists of a steel probe with a hole in one end fastened to a steel cable which is strung with metal beads compressed by spring loaded ferrules. This device allows cables to be pulled or forced around bends and elbows in pipes or tubes.

B65-10035
OCEANBORNE TRANSPONDER PLATFORM HAS GOOD STABILITY
INNOVATOR NOT GIVEN /IBM/ FEB. 1965
M-FS-171
Determination of space vehicle range and orbit is aided by a stable subsurface oceanic transpounder. This device consists of a buoy held below the surface by a three-point system of anchors and mooring lines with an above surface antenna.

B65-10037
IMPROVED HOLDER PROTECTS CRYSTAL DURING HIGH ACCELERATION AND IMPACT
LE VAY, K. H. FEB. 1965
JPL-463
A plastic holder, which retains a crystal blank with standard silvered contacts sandwiched between two copper contacts, protects the crystal against vibration during high acceleration and impact.

B65-10038
FASTENER PROVIDES COOLING AND COMPENSATES FOR THERMAL EXPANSION
INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ FEB. 1965
NU-0003
A fastener composed of a concentric bellows welded to two plates forming an annular cavity provides cooling and thermal expansion compensation in a high temperature environment.

B65-10039
NONRESONANT SUPPORT FACILITATES VIBRATION TESTING OF STRUCTURES
INNOVATOR NOT GIVEN /BOEING CO./ FEB. 1965
M-FS-224
An essentially frictionless four-point support system which utilizes bearings and pistons and allows for determination of vibration frequencies of large structures. Retardation of vertical or horizontal motion is due to the viscous damping by the hydrostatic pressure of the oil or by adjustment of the gas volume in the accumulator.

B65-10040
VALVE DESIGNED WITH ELASTIC SEAT
MAC GLASHAN, W. F., JR. FEB. 1965
JPL-442
Absolute valve closure is accomplished by a machined valve with an axially annular channel which changes the outlet passage into a thin tubular elastic seat member with a retainer backup ring. The elasticity of the seat provides tight conformity to ball irregularity.

B65-10042
FLEXURE SUPPORT SYSTEM PROTECTS THERMALLY AND DYNAMICALLY LOADED MODELS
CRUMPLER, W. B. FEB. 1965
LANGLEY-39
The design of an eight legged flexure support system which permits differential thermal expansion of thin skinned models subjected to high temperatures is done by setting the length- wise axes of the supporting legs approximately normal to the line of absolute motion of the model supported.

B65-10049
SCREW LOCKING CUPS QUICKLY AND NEATLY CRIMPED
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965
NU-0009
A tool consisting of a positioning pin which is engaged in the screw and depressed until the tool body contacts the locking cup permits quick and neat crimping.

B65-10053
SEAL ALLOWS BLIND ASSEMBLY AND THERMAL EXPANSION OF COMPONENTS
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ FEB. 1965
NU-0005
The design of a seal consisting of two concentric cylinders with outer and inner threaded elements attached to each side of the system interface withstands large temperature changes and allows for blind assembly.

B65-10060
NEW ALLOY BRAZES TITANIUM TO STAINLESS STEEL
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1965 1965
MSC-102
Brazing alloy of palladium, silver and silicon is used in brazing titanium to stainless steel without embrittling metals at the brazed interfaces.

B65-10063
CERAMIC-COATED BOAT IS CHEMICALLY INERT, PROVIDES GOOD HEAT TRANSFER
SPITZER, C. R. MAR. 1965
LANGLEY-90
Refractory metal foil sprayed with ceramic coating serves as evaporating boat for inorganic materials. The high thermal conductivity of this boat makes it useful with ohmic heaters.

B65-10064
DEVICE MEASURES CURVED SURFACE FINISH ON GEAR TEETH
INNOVATOR NOT GIVEN /GE/ MAR. 1965
WOO-112
Measurement of the curved surface finish on gear teeth is made by a device used in conjunction with a conventional profilometer.

B65-10070
SIMPLE SCALE INTERPOLATOR FACILITATES READING OF GRAPHS
FETTERMAN, D. E., JR. MAR. 1965
LANGLEY-88
Simple transparent overlay with interpolation scale facilitates accurate, rapid reading of graph coordinate points. This device can be used for enlarging drawings and locating points on perspective drawings.

B65-10074
NITROGEN DIOXIDE PRODUCED BY SELF-SUSTAINED PYROLYSIS OF NITROUS OXIDE
SABOL, A. P. MAR. 1965
LANGLEY-32
Apparatus is developed for achieving continuous self-sustaining pyrolysis reaction in the production of nitrogen dioxide from nitrous oxide. The process becomes self-sustaining because of the exothermic reaction and the regenerative heating of the gases in the pyrolysis chamber.

B65-10075
TENSION IS SERVO CONTROLLED IN FILM ADVANCE SYSTEM
INNOVATOR NOT GIVEN /AM. OPT. CO./ MAR. 1965
LANGLEY-54
Servocontrol device feeds film into a roller system. Two linear potentiometers connected to spring loaded tension rollers furnish servo input signal. Can be used in any continous material transport system.

B65-10077
NEW COUPLING COMPENSATES FOR SHAFT MISALIGNMENT
INNOVATOR NOT GIVEN /WESTINGHOUSE ELEC. CORP./ MAR. 1965
NU-0013
Coupling of splined shafts with slight misalignment is accomplished by means of a crown spline and sleeve arrangement.

B65-10078
FABRICATION METHOD PRODUCES HIGH-GRADE ALUMINA CRUCIBLES
PALMOUR, H. MAR. 1965
M-FS-216
Alumina-binder mixture, which has been dry pressed in a die using a mating punch, forms crucibles of various configurations and after firing results in a ceramic structure for use in diffusion experiments.

B65-10090
COMPACT ASSEMBLY GENERATES PLASTIC FOAM, INFLATES FLOTATION BAG
INNOVATOR NOT GIVEN APR. 1965
LANGLEY-96
Device for generating plastic foam consists of an elastomeric bag and two containers with liquid resin and a liquid catalyst. When the walls of the containers are ruptured the liquids come into contact producing foam which inflates the elastomeric bag.

B65-10094
CUTTER AND STRIPPER REDUCES COAXIAL CABLE CONNECTION TIME

THOMPSON, F. E. APR. 1965
ARC-40
Consisting of three pivoted members, this hand cutter and stripper positions to cut shielding and insulation at the right distance and depth. Coaxial cable is prepared quickly and accurately for connector attachment.

B65-10098
CONTACT STRESSES CALCULATED FOR MINIATURE SLIP RINGS
ALBRIGHT, F. G. DOMEREST, K. E. HORTON, J. C.
APR. 1965
M-FS-280
Using mathematical formulations to plot the graphs of the contact preload versus the Hertzian load, calculations of unit loading of the preloaded brushes on slip rings can be made. This optimizes the design of contact brushes and miniature slip rings.

B65-10099
SLIT FEEDS REDUCE UNBALANCED TORQUES IN GAS-LUBRICATED BEARINGS
BATSCH, F. F. LAUB, J. H. APR. 1965 SEE ALSO B63-10123 AND B64-10050
JPL-264
Gas-lubricated journal bearing with narrow radial slits forming circular gas-feed passages regulates gas flow in precision instruments. Asymmetrical flow pattern and unbalanced torques are prevented.

B65-10101
JIG AND FIXTURE AID FABRICATION OF TUNGSTEN RIVETS
CHATTIN, J. H. APR. 1965
LEWIS-185
Jig and fixture that holds several lengths of tungsten rods produces rivets simply and inexpensively. The apparatus allows sufficient tungsten to be exposed for heating and forging into a rivet head.

B65-10104
LEAF-SPRING SUSPENSION PROVIDES ACCURATE PARALLEL DISPLACEMENTS
MC CREARY, R. A. APR. 1965
JPL-480
Leaf-spring suspension device with the springs symmetrically mounted on suspension frames provides accurate parallel displacements of loads over short linear distances.

B65-10109
ROCK BIT REQUIRES NO FLUSHING MEDIUM TO MAINTAIN DRILLING SPEED
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ APR. 1965
JPL-WOO-031
Steel drill bit having terraces of teeth intersected by spiral grooves with teeth permits the boring of small holes through rock with low power. The cuttings are stored in a chamber behind the cutting head. Could be used as sampling device.

B65-10110
MAGNETS POSITION X-RAY FILM FOR WELD INSPECTION
WAGNER, R. P. APR. 1965
M-FS-253
Film-positioning device uses magnets to hold X-ray film for weld inspection in nonferrous structures, such as tanks, where access to interior points is difficult.

B65-10111
PROBE TESTS MICROWELD STRENGTH
INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ APR. 1965
WOO-118
Probe is developed to test strength of soldered, brazed or microwelded joints. It consists of a spring which may be adjusted to the desired test pressure by means of a threaded probe head, and an indicator lamp. Device may be used for electronic equipment testing.

B65-10113
SHOCK MOUNT ISOLATES PRESSURE TRANSDUCERS FROM VIBRATION
ROGERO, R. S., JR. APR. 1965
JPL-631
Pressure transducer is isolated from shock and vibration forces by a pressure-compensated shock mount. Silicone elastomer O-rings within the shock mount serve as shock and vibration-damping pads.

B65-10114
AVERAGING PROBE REDUCES STATIC-PRESSURE SENSING ERRORS
RITCHIE, V. S. APR. 1965
LANGLEY-36
Averaging the high and low pressure admitted to a plenum through circumferentially spaced orifices provides a probe that accurately senses the free-stream static pressure on an aerodynamic surface. This surface does not have a preferred angle of inclination to the direction of the airstream cross flow.

B65-10115
INERT GAS SPRAYING DEVICE AIDS IN REPAIR OF HAZARDOUS SYSTEMS
TELEMA, S. APR. 1965
LEWIS-8B
Inert gas spraying device aids in safely making mechanical repairs to a cryogenic fluid system without prior emptying of the system. This method can be applied to any natural or bottled gas system and with modifications to gasoline transports.

B65-10116
LOW-COST TOOL MINIMIZES DAMAGE TO O-RINGS DURING INSTALLATION
INNOVATOR NOT GIVEN /N. AM. AVIATION/ APR. 1965
MSC-140
Tapered cylindrical tool enables O-ring installation over threaded fasteners without seal damage.

B65-10121
FLOW CONTROL VALVE IS INDEPENDENT OF PRESSURE DROP
INNOVATOR NOT GIVEN /THIOKOL CHEM. CORP./ APR. 1965
JPL-WOO-039
Remote control of fluid flow in a low-power system is established by a flow control valve with a flapper and nozzle flow control. Constant rates are maintained despite fluctuating pressure across the valve.

B65-10126
COLLAPSIBLE TRUSS STRUCTURE IS AUTOMATICALLY EXPANDABLE
INNOVATOR NOT GIVEN /GE/ MAY 1965
GSFC-265
Coil springs wound with maximum initial tension in a three-truss, closed loop structure form a collapsible truss structure. The truss automatically expands and provides excellent rigidity and close dimensional tolerance when expanded.

B65-10130
COLLAR POSITIONS STRIP STOCK USED TO FORM COIL ON MANDREL
BLAZE, C. J. MAY 1965
JPL-198
Guide collar fastened to a mandrel helps form a coil of strip sheet metal stock. The collar maintains the strip stock in its proper position during winding of each turn of the coil.

B65-10131
APPARATUS FACILITATES PRESSURE-TESTING OF METAL TUBING
GYORGAK, C. A. MAY 1965
LEWIS-174
Burst-testing of refractory metal tubing is conducted in an apparatus in which tubular specimens are firmly gripped and test pressures and temperatures are applied. Porosity, flaw, and fatigue-stress rupture are also tested.

B65-10134
HIGH PERMEABILITY SEMICONDUCTORS PERMIT CLOSE-TOLERANCE SOLDERING
INNOVATOR NOT GIVEN /HUGHES AIRCRAFT CO./ MAY 1965
GSFC-319
High permeability semiconductors concentrate magnetic field energy in small areas to allow soldering of small components. This device can be used in microminiature parts in thin-film fabrication.

B65-10135
COILED SPRING MAKES SELF-LOCKING DEVICE FOR THREADED FASTENERS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAY 1965
MSC-149
Coiled spring device provides both easy self-locking and disassembly for screw-threaded fasteners. When the fastener turns in one direction the spring grips one of the fastener threads and releases when the fastener turns in the opposite direction.

B65-10141
INTEGRAL RIBS FORMED IN METAL PANELS BY COLD-PRESS EXTRUSION
BRADIE, P. R. SCHUERER, P. H. MAY 1965
M-FS-230
Metal panels with integral ribs are formed by the cold-press extrusion method without material loss. Integral ribs in aluminum-alloy panels are formed by this process.

B65-10144
LIGHTWEIGHT LOAD SUPPORT SERVES AS VIBRATION DAMPER
LAYMAN, W. E. MAY 1965
JPL-661
Omnidirectional antennas and solar panels can be supported by a thin-walled tubular strut. Silicon grease is used as the vibration-damping medium and a coil spring supports static loads.

B65-10147
IMPROVED FLUID CONTROL VALVE EXTENDS DIAPHRAGM LIFE
MAC GLASHAN, W. F. MAY 1965
JPL-345
Wear resistance of flexible diaphragms in fluid control valves is increased by incorporating a soft rubber washer at the bottom of the piston, a flexible buffer between the diaphragm and the valve seat, and a fluid feedback arrangement. The stress and wear of components at the valve seat are minimized.

B65-10148
BIDIRECTIONAL TORQUE FILTER ELIMINATES BACKLASH
BAKER, R. VEILETTE, L. WILLIAMS, S. MAY 1965
GSFC-335
Two elastic springs connecting a hub and two spur gears absorb bidirectional step torque differentials and provide antibacklash characteristics between input and output shafts. This device is used in precise control systems.

B65-10149
CANTILEVER SPRINGS MAINTAIN TENSION IN THERMALLY EXPANDED WIRES
TERSELIC, R. A. MAY 1965
LEWIS-136
Two deflected cantilever springs strung with wire provide force displacement compensation to maintain tension in the wires as they undergo thermal expansion. This method of maintaining tension in thermally expanded wires is used in electric space heaters and residential heat exchangers.

B65-10150
METAL BELLOWS CUSTOM-FABRICATED FROM TUBING
INNOVATOR NOT GIVEN MAY. 1965
LEWIS-192
Mandrel assembly mounted in a lathe chuck is used with a forming wheel to roll-form bellows from standard sheet metal tubing. Spacers and mandrels of various sizes custom-fabricate bellows of any desired dimensions.

B65-10153
TITANIUM TREATMENT IMPROVES BRAZED JOINTS
INNOVATOR NOT GIVEN /MIT/ MAY 1965
MSC-127
Pretreating metal with a thin coating of pure titanium improves the wettability and flow of brazing alloys. This can be used in the manufacturing of aviation and aerospace components where high strength-to-weight ratio must be achieved.

B65-10154
SYSTEM MEASURES UNIDIRECTIONAL FORCES, EXCLUDES EXTRANEOUS FORCES
BEHRENDT, D. R. HEGLAND, D. E. MAY 1965
LEWIS-170
System measures unidirectional force without interference from other directional forces. The measuring apparatus is mounted so that it only moves vertically and is constrained from horizontal and rotational movement. This system can be used to accurately measure small forces in one direction, or as an analytic balance.

B65-10160
LOW-COST SEAL COMPENSATES FOR SURFACE IRREGULARITIES
INNOVATOR NOT GIVEN /AEROJET-GEN. CORP./ JUN. 1965
NU-0016
Seal assembly consisting of a steel V-ring and a perforated tubular fluorocarbon polymer O-ring provides a barrier to gaseous and liquid hydrogen under high pressure.

B65-10163
DEVICE DISCONNECTS SEVERAL COUPLINGS SIMULTANEOUSLY
KORSYTHE, A. K. JUN. 1965
JPL-226
Actuator assembly disconnects electric cable and fluid-line coupling from a rocket. The disconnector incorporates interconnected hydraulic cylinders which effect an equal and simultaneous displacement of pistons upon admission of compressed air through a solenoid control valve.

B65-10166
SPLICE PLATE DESIGN ASSURES STRUCTURAL SEPARATION BY MILD EXPLOSIVE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965
MSC-137
Splice plate with mechanical joint is separated by expanding gases of a mild detonating fuse. The gas pressures of the low-yield explosive eliminate component fragmentation and achieve excellent control of the separation line.

B65-10168
LATHE ATTACHMENT USED TO MACHINE ELLIPTICAL CONES
ALLEN, J. H., SR. WOBIG, O. A. JUN. 1965
MSC-100
Close-tolerance elliptical cones are fabricated by cutting-tool guide assembly used with conventional tracer cartridge on turret lathe accurately produced in two machine operations

B65-10170
METAL PARTS HYDROSIZED BY EXPLOSIVE FORCE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965
M-FS-289
Large metal parts are sized by a charge exploded above a sealed container filled with evacuated die and water. Explosive hydrosizing achieves close dimensional tolerances, eliminates damage to the surface, and allows longer force application and more even pressure distribution.

B65-10174
PRESSURE TRANSDUCER SYSTEM IS FORCE-BALANCED, HAS DIGITAL OUTPUT
INNOVATOR NOT GIVEN /GIANNINI CONTROLS CORP./ JUN. 1965

M-FS-154
Forced-balanced pressure transducer and associated circuitry controls pressure testing of space equipment systems under actual operating conditions. The transducer and circuitry automatically converts the sensed pressure to digital form.

B65-10176
DEVICE ENABLES MEASUREMENT OF MOMENTS OF INERTIA ABOUT THREE AXES
CONN, J. JUN. 1965
GSFC-49
Device measures moments of inertia of an irregularly shaped mass about three mutually perpendicular axes by the standard pendulum and torque methods. A fixture suspends the test mass at one point and can be adjusted to allow oscillation of the mass.

B65-10177
EPOXY-RESIN PATTERNS SPEED SHELL-MOLDING OF ALUMINUM PARTS
INNOVATOR NOT GIVEN /ALABAMA UNIV./ JUN. 1965
M-FS-303
Half patterns cast from commercial epoxy resin containing aluminum powder are used for shell-molding of aluminum parts. The half patterns are cast in plastic molds of the original wooden pattern. Ten serviceable sand-resin molds are made from each epoxy pattern.

B65-10180
NEW NUT AND SLEEVE IMPROVE FLARED CONNECTIONS
GARRARD, J. S. JUN. 1965
M-FS-194
Improved nut and sleeve of standard stainless steel flared tube connection allows forces on the mating surfaces to be uniformly applied. This can be applied to pressurized fluid systems such as refrigeration, air conditioning, and hydraulic systems.

B65-10181
HAND TOOL BENDS COMPONENT LEADS ACCURATELY
INNOVATOR NOT GIVEN /CHRYSLER CORP./ JUN. 1965
CORP./ JUN. 1965
M-FS-308
Hand-operated die set bends, without damage, electrical component leads to perfectly match holes in printed circuit board. This tool speeds up printed circuit fabrication and reduces the number of component rejections.

B65-10185
DISPENSING SYSTEM ELIMINATES TORSION IN DEPLOYED HOSES
INNOVATOR NOT GIVEN /IIT RES. INST./ JUN. 1965
INST./ JUN. 1965
MSC-80
Dispensing system uses a rotating drum, transfer arm, and stationary drum to deploy, reel in, and store an attached hose. This system which eliminates torsion and minimizes strain and wear of flexible hoses, is used for handling flexible cables that have one end permanently attached to an outlet or connector.

B65-10191
EXTENDIBLE COLUMN CAN BE STOWED ON DRUM
HOLTZ, G. M. HOWARD, E. A. JUN. 1965
JPL-686
Column formed from a series of segments held together by an internal spring or cable can be coiled on a drum or extended into a rigid structure. This storable coil is useful in boring for soil samples and supporting electrical and optical sensors.

B65-10192
SPIRAL HEATER COILS HAND-FORMED WITH FIXTURE
CHATTIN, J. H. JUN. 1965
LEWIS-208
Bench model jig and fixture used for hand fabricating spiral coils of various lengths from flat strip stock. This tool is used to make springs and coils to custom lengths.

B65-10198
SELF-ALIGNING FIXTURE USED IN LATHE CHUCK JAW REFACING
LINN, C. C. JUN. 1965
FRC-21
Self-aligning tool positions and rigidly holds lathe chuck jaws for refacing and truing of the clamping surface. The jaws clamp the fixture in the manner of clamping a workpiece. The fixture can be modified to accommodate four-jawed checks.

B65-10201
ELECTRICAL CABLE CONNECTOR-CLAMP HAS SMOOTH EXTERIOR SURFACE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1965
1965
MSC-154
Electrical cable connector-clamp fitted with a collet has a smooth exterior surface that can be easily gripped. The collet clamps a portion of the cable and provides for connecting it to a standard electrical connector.

B65-10205
BALL-AND SOCKET JOINTS PROVIDE ACCURATE BIAXIAL GIMBAL
ROUZE, E. R. JUL. 1965
JPL-658
Ball-and-socket joints are used to connect two rotating inputs to orthogonally pivoted outputs. This provides an accurate biaxial gimbal which will operate in continuous motion without backlash.

B65-10207
FLUID CHECK VALVE HAS FAIL-SAFE FEATURE
GAUL, L. C. JUL. 1965
JPL-0019
Check valve ensures unidirectional fluid flow and, in case of failure, vents the downstream fluid to the atmosphere and gives a positive indication of malfunction. This dual valve consists of a master check valve and a fail-safe valve.

B65-10210
FIBERGLASS DIES SPEED FORMING OF LARGE METAL SHEETS
BROWN, R. L. SCHUERER, P. JUL. 1965
M-FS-214
Fiberglass tooling dies accelerate forming of large metal sheets. The dies, fabricated to fit over and fasten to the die bases, are lightweight, quickly replaced and have nongalling surfaces.

B65-10216
WIRE MESH ISOLATOR PROTECTS SENSITIVE ELECTRONIC COMPONENTS
KERLEY, J. J., JR. JUL. 1965
GSFC-347
Sensitive electronic components are enclosed in wire mesh for protection. The wire mesh isolates the component from shock and vibration. It acts as a heat sink and as a screen against rf interference.

B65-10219
FLEXIBLE MAGNETIC PLANNING BOARDS ARE EASILY TRANSPORTED
INNOVATOR NOT GIVEN /GEN. DYN./ASTRONAUTICS/ AUG. 1965
M-FS-340
Easily transportable preprinted magnetic planning boards are made by coating thin sheet steel with clear plastic. Flexible magnetic boards used with paper charts are constructed from close mesh steel screen.

B65-10222
INEXPENSIVE CHECK VALVE IS INSTALLED IN STANDARD AN FITTINGS
MARTINEZ, J. S. AUG. 1965
JPL-2A
Check valve with a cylindrical flanged tube body is used in standard AN fittings. The valve also has an easily removable spring-loaded piston.

B65-10227
DIAPHRAGM ELIMINATES LEAKAGE IN CRYOGENIC FLUID DUCT COUPLING

INNOVATOR NOT GIVEN /DOUGLAS AIRCRAFT CO./ AUG. 1965
WOO-142
Duct coupling with nickel steel diaphragm of low thermal expansivity is leakproof when used with cryogenic fluids. The diaphragm, located between the two flanges of the coupling, reduces axial shrinkage at the coupling flanges to a minimum.

B65-10229
SCOOP ATTACHMENT MAKES HELICOPTER RECOVERIES EASIER AND SAFER
KOONS, W. E. AUG. 1965
MSC-130
Helicopter with rigid boom and net attachment performs rescue or recovery operations easily and safely. The attachment in the front of the helicopter scoops objects from difficult and otherwise inaccessible areas and pivots to the side hatch of the aircraft so that no crew member need leave the craft.

B65-10230
HYDRAULIC DEVICE PROVIDES ACCURATE DISPLACEMENTS TO MICROINCHES
TSUTSUMI, K. /MIT/ AUG. 1965
MSC-112
Hydraulic drive device translates microinch deviation measurements into precise corrective displacements. The unit is driven by a servomotor activated by the output of an attitude sensing device.

B65-10231
HANDTOOL FACILITATES EXTRACTION OF CIRCUIT MODULES
LUSBY, T. K., JR. AUG. 1965
LANGLEY-38
Compact handtool extracts electronic modules from circuit board socket. It is used on modules that have four small notches in the base of the plastic housing.

B65-10235
ANGULAR GLASS TUBING DRAWN FROM ROUND TUBING
INNOVATOR NOT GIVEN /DEBELL AND RICHARDSON/ AUG. 1965
HQ-20
Round glass tubing softened in a furnace is drawn over a shaped plug or mandel to form shapes with other than a circular cross section. Irregularly shaped tubing is formed without limitations on tube length or wall thickness.

B65-10236
BURST DIAPHRAGM PROTECTS VACUUM VESSEL FROM INTERNAL PRESSURE TRANSIENTS
HOTZ, G. M. HOWARD, E. A. AUG. 1965
JPL-687
Supported dual-mode burst diaphragm protects vacuum vessels from transient internal pressures. It forms the interface between the vacuum in the vessel and an external pressure.

B65-10241
SHOCK ABSORBER OPERATES OVER WIDE RANGE
CREASY, W. K. JONES, J. C. AUG. 1965
MSC-168
Piston-type hydraulic shock absorber, with a metered damping system, operates over a wide range of kinetic energy loading rates. It is used for absorbing shock and vibration on mounted machinery and heavy earth-moving equipment.

B65-10245
CAPTIVE NUT FASTENER SECURELY JOINS BRITTLE MATERIALS
SACCOCIO, R. M. /WESTINGHOUSE ELEC. CORP./ AUG. 1965
NU-0008
Extension tube captive nut with a standard bolt joins assemblies with an inaccessible nut location. This fastener is excellent for joining brittle materials.

B65-10246
THERMOCOUPLE-TO-INSTRUMENTATION CONNECTOR FEATURES QUICK ASSEMBLY
HENSHAW, E. /WESTINGHOUSE ELEC. CORP./ AUG. 1965
NU-0022
Rigid thermocouple leads are connected to flexible instrumentation leads by a crimping and bridging process. This method eliminates the need for expensive transition sections and can be accomplished in about five minutes.

B65-10248
SYSTEM TRANSMITS MECHANICAL VIBRATION INTO HAZARDOUS ENVIRONMENT
ARMSTRONG, D. G. /WESTINGHOUSE ELEC. CO./ GAAL, A. E. AUG. 1965
NU-0025
Vibration transducers are tested in a hazardous environment using a single axis transmission system with an electromagnetic shaker table and vibrating wires which drive identical rocker arms, one in the test cell and the other outside. This system can be modified for a multiaxis configuration.

B65-10251
CONTROL OF COMPONENT DIFFERENTIAL HARDNESS INCREASES BEARING LIFE
ANDERSON, W. J. PARKER, R. J. ZARETSKY, E. V. AUG. 1965
LEWIS-190
Bearing fatigue life is maximized when the bearing ball or roller hardness is between one and two points greater than that of the bearing race as measured on the Rockwell C scale.

B65-10254
REMOTELY OPERATED CLAMPING TOOL HAS POSITIVE GRIP
ADUCCI, S. A. /WESTINGHOUSE ELEC. CORP./ SEWALD, A. W. AUG. 1965
NU-0020
Jaw-type clamping tool inserts or removes objects in a hazardous environment. It has a strong, positive gripping force which is remotely operated by means of a wedge-screw mechanism.

B65-10256
HOLLOW PLASTIC HOOPS PROTECT THERMOCOUPLE IN STORAGE AND HANDLING
OSMOND, L. H. /WESTINGHOUSE ELEC. CORP./ AUG. 1965
NU-0023
Thermocouples are shipped and stored in hollow plastic hoops. The hoop is an inexpensive but efficient method of protection.

B65-10262
ROTATING HOLDER PERMITS ACCURATE GRINDING OF METALLURGICAL MICROSAMPLES
CRAMER, D. L. SEP. 1965
LEWIS-131
Metallurgical microsamples are held in a fixture which rotates the sample across a rotating grinding wheel. The dual rotation results in a level, flat surface on the sample.

B65-10266
ONE-SHOT VALVE MAY BE REMOTELY ACTUATED
KAMI, S. /HUGHES AIRCRAFT CO./ SEP. 1965
WOO-195
One-shot valve, with spring-loaded plunger and sealing diaphragm, incorporates an emergency release actuated by a remote sensor. The plunger is released by the electrical melting of a fuse link and pierces the valve seal. The valve lowers fluid pressure in a container without losing the contained fluid.

B65-10285
DIFFERENTIAL PRESSURE GAUGE HAS FAST RESPONSE
WEBER, H. S. /ARMOUR RES. FOUND./ SEP. 1965
M-FS-358
Differential pressure gauge with semiconductor-type strain gauge elements measures rapidly changing pressure. Output of the strain gauge elements is a dc voltage that is directly proportional to the pressure difference being measured.

B65-10312
AIR BRAKE-DYNAMOMETER ACCURATELY MEASURES TORQUE

INNOVATOR NOT GIVEN OCT. 1965
LEWIS-163
Air brake-dynamometer assembly combines the principles of the air turbine and the air pump to apply braking torque. The assembly absorbs and measures power outputs of rotating machinery over a wide range of shaft speeds. It can also be used as an air turbine.

B65-10319
REFRACTORY METALS WELDED OR BRAZED WITH TUNGSTEN INERT GAS EQUIPMENT
WISNER, J. P. OCT. 1965
LEWIS-219
Appropriate brazing metals and temperatures facilitate the welding or brazing of base metals with tungsten inert gas equipment. The highest quality bond is obtained when TIG welding is performed in an inert atmosphere.

B65-10323
VOLUMETRIC SYSTEM CALIBRATES METERS FOR LARGE FLOW RATES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ NOV. 1965
WOO-130
Volumetric system calibrates meters used for large liquid flow rates. The system employs trip probes and equipment to time the flow of liquid from a tare vessel into a calibrated vessel. This calibration system is used in the petroleum and chemical industries.

B65-10326
ROUGH SURFACE IMPROVES STABILITY OF AIR-SOUNDING BALLOONS
SCOGGINS, J. R. NOV. 1965
M-FS-320
Aerodynamic stability of balloons used for measuring the intensity and direction of atmospheric winds at various elevations is improved by incorporating a rough surface on the balloons. The rough-surfaced balloon is useful for collecting wind profiles and other meteorological data.

B65-10327
PRESSURE RESPONSIVE SEAL HANDLES STATIC AND DYNAMIC LOADS
MARSH, H. W. /N. AM. AVIATION/ NOV. 1965
GSFC-441
Ported ball valves are sealed under both static and dynamic load conditions by a line-pressure responsive double-acting seal. The top of the seal engages the ported ball at the outer circumferential edge of the seal upper end, and the bottom of the seal seats on a flat circular land with a continuous wall.

B65-10338
INERT-GAS WELDING AND BRAZING ENCLOSURE FABRICATED FROM SHEET PLASTIC
WISNER, J. P. NOV. 1965
LEWIS-220
Custom-fabricated plastic bag maintains an inert-gas atmosphere for welding and brazing certain metals. The bag fits over part of the workpieces and the welding and brazing tools. It is also used for metal brazing and fusion plating which require an inert-gas atmosphere.

B65-10339
DISK CALCULATOR INDICATES LEGIBLE LETTERING SIZE FOR SLIDE PROJECTION
HULTBERG, R. R. NOV. 1965
GSFC-409
Hand-operated disk calculator indicates the minimum size of letters and numbers in relation to the width and height of a working drawing. The lettering is legible when a slide of the drawing is projected.

B65-10342
ELECTROMAGNETIC HAMMER REMOVES WELD DISTORTIONS FROM ALUMINUM TANKS
SCHWINGHAMER, R. J. NOV. 1965
M-FS-287
Distortions around weld areas on sheet-aluminum tanks and other structures are removed with a portable electromagnetic hammer. The hammer incorporates a coil that generates a controlled high-energy pulsed magnetic field over localized areas on the metal surface.

B65-10346
IMPROVED POPPET VALVE PROVIDES POSITIVE DAMAGEPROOF SEAL
WALLACE, E. D. NOV. 1965
M-FS-293
Soft-seat poppet valve provides positive closure against fluid without damage to the seating surface on repeated cycling. It incorporates two compressible soft rings and a retaining ring of hard metal. Sealing is effected when the poppet seat is forced into intimate contact with a mating surface on one of the soft rings.

B65-10348
STANDOFF TOOL SPEEDS PLACEMENT OF FRICTION-FIT ELECTRICAL TERMINALS
MOORE, D. J. SKIFSTROM, W. W. /SPACE TECHNOL. LABS./ NOV. 1965
WOO-029
Hand operated tool inserts terminals through compartment walls in electronic equipment. The tool is in the configuration of a modified pair of pliers with jaws consisting of a split chuck and anvil.

B65-10351
HYDRAULIC DRIVE SYSTEM PREVENTS BACKLASH
ACORD, J. D. NOV. 1965
JPL-371
Hydraulic drive system uses a second drive motor operating at reduced torque. This exerts a relative braking action which eliminates the normal gear train backlash that is intolerable when driving certain heavy loads.

B65-10358
FASTENER DISTRIBUTES STRESS EVENLY FROM SANDWICH-PANEL-HUNG ITEMS
SHAPIRO, J. /N. AM. AVIATION/ NOV. 1965
MSC-236
Items are attached externally to cellular-core sandwich panels by a fastener anchored in the panel by a constant amount of adhesive. The changes caused to the core cells and skin sheets are minimized.

B65-10360
PORTABLE TOOL REMOVES BURRS FROM PIPE AND TUBING
HEADLEY, C. A. PADILLA, V. E. SCHOPPMAN, R. A. /MCDONNELL AIRCRAFT CORP./ NOV. 1965
MSC-237
Portable tool cleanly removes burrs that remain on tubing when it is cut. It restores the cut end to its original configuration, and carries away all chips and pieces. This tool is used in places of limited access where a larger tool could not be used.

B65-10367
FLEXIBLE PLASTIC RING ASSEMBLY MAKES DURABLE SHAFT SEAL
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965
WOO-227
Stacked flexible rings interleaved with solid metal rings of smaller width provide a durable seal ring for rotating shafts used in vacuum or pressure pumps.

B65-10370
BRAZING METHOD PRODUCES SOLID-SOLUTION BOND BETWEEN REFRACTORY METALS
INNOVATOR NOT GIVEN /AVCO CORP./ DEC. 1965
LEWIS-212
Brazing two refractory metals by diffusion bonding minimizes distortion and avoids excessive grain growth in the metals. This method requires the selection of an interface metal that forms intermediate low-melting eutectics or solid solutions with the metals to be brazed.

B65-10371
UNIVERSAL BELLOWS JOINT RESTRAINT PERMITS ANGULAR AND OFFSET MOVEMENT
KUHN, R. F., JR. /N. AM. AVIATION/ DEC. 1965

W00-102
Universal joint-type restraint that employs ball joints permits maximum angular and lateral- offset movement in a bellows joint without danger of rupture or pressure drop in the line. It is used in high pressure and high- temperature applications in refineries, steam plants, or stationary power plants.

B65-10375
PORTABLE TOOL CLEANS PIPES AND TUBING
HEADLEY, C. A. /MCDONNELL AIRCRAFT CORP./
HEADLEY, R. JONES, D. D. DEC. 1965
MSC-238
Portable tool cleans and polishes the external surfaces of tubes and pipes without contaminating the interior areas with loose particles. The tool is driven by an electric drill and is connected to a vacuum source that removes debris resulting from the cleaning and polishing action.

B65-10378
REINFORCEMENT CORE FACILITATES O-RING INSTALLATION
INNOVATOR NOT GIVEN /N. AM. AVIATION/ DEC. 1965
W00-228
Reinforcement core holds O-ring in place within a structure while adjacent parts are being assembled. The core in the O-ring adds circumferential rigidity to the O-ring material. This inner core does not appreciably affect the sectional elasticity or gland-sealing characteristics of the O-ring.

B65-10383
THREADED SPLIT RING CONNECTOR SEPARATES STRUCTURAL SECTIONS
MAYO, J. W. JUL. 1965
LANGLEY-145
Threaded split ring connector quickly and cleanly separates two structural members by remote control. The connector is retained in an expanded position by spring plates that are deflected and held by an explosive bolt. Ignition of the bolt effects the separation. This conceptual approach lends itself to various configurations and sizes of structures.

B65-10385
RACK MOUNT DEVICE QUICKLY INSERTS OR EXTRACTS CHASSIS UNITS
HAERTHER, L. W. ZIMMERMAN, P. A. /COLLINS RADIO CO./ DEC. 1965
MSC-244
Rack mounted chassis units are quickly inserted or extracted by a device which is driven in either direction by turning a simple hand crank. This device is used in aircraft and water craft.

B65-10386
DRILL BIT DESIGN ASSURES CLEAN HOLES IN LAMINATED MATERIALS
TILLOTSON, R. N. /DOUGLAS AIRCRAFT CO./ DEC. 1965
W00-098
Drill bit eliminates delamination when drilling laminated material. It cuts or shaves the material as it progresses through it. The bit acts to hold down the material during drilling to prevent tearing or ripping and produces a clean, smooth and defect-free hole. It prevents chipping in stretched plastic windows for high-altitude, high-performance aircraft.

B65-10388
STRAINER FITS INSIDE FLARED-TUBE FITTINGS
PARKER, O. J. DEC. 1965
LANGLEY-180
Cylindrical wire-mesh strainer which fits inside flare-tube fittings is readily installed and easily replaced. It has a collar that seats on the tapered shoulder of the male fitting.

B65-10391
TUNGSTEN WIRE AND TUBING JOINED BY NICKEL BRAZING
INNOVATOR NOT GIVEN /AUTO-CONTROLS LABS./ DEC. 1965
M-FS-394
Thin tungsten wire and tungsten tubing are brazed together using a contacting coil of nickel wire heated to its melting point in an inert-gas atmosphere. This method is also effective for brazing tungsten to tungsten-rhenium parts.

B65-10393
DIE AND TELESCOPING PUNCH FORM CONVOLUTIONS IN THIN DIAPHRAGM
INNOVATOR NOT GIVEN /HONEYWELL/ DEC. 1965
JPL-SC-135
Die and punch set forms convolutions in thin dished metal diaphragm without stretching the metal too thin at sharp curvatures. The die corresponds to the metal shape to be formed, and the punch consists of elements that progressively slide against one another under the restraint of a compressed-air cushion to mate with the die.

B65-10394
CENTRIFUGAL DEVICE SEPARATES LIQUID FROM GAS
HANDLEWICH, R. M. /UNITED AIRCRAFT CORP./
STROUP, K. E. DEC. 1965
MSC-282
Liquid-to-gas ratio is reduced from maximum efficiency of jet engine fuel by a centrifugal separator. The amount of liquid removed from the fuel is controlled by the separator-screen mesh size and its rotational speed.

B65-10401
PHOTOSENSORS USED TO MAINTAIN WELDING ELECTRODE-TO-JOINT ALIGNMENT
BOWEN, J. B. /N. AM. AVIATION/ DEC. 1965
MSC-243
Photosensors maintain electrode-to-joint alignment in automatic precision arc welding. They detect the presence and relative position of a joint to be welded and actuate a servomechanism to guide the welding head accordingly thus permitting alignment for more than straight line or true circle joints.

B65-10402
LIGHTWEIGHT DOOR SEALS CRYOGENIC CONTAINER AGAINST DIAPHRAGM TYPE LOADING
ENGLEHART, R. C., JR. /N. AM. AVIATION/ DEC. 1965
M-FS-476
Lightweight, removable, sealed joint access door for a spherical or semispherical pressure vessel containing cryogenic materials uses a joint overlock design to take the shear and moment loads. Oversize bolt holes are used so that the attaching bolts are in tension only.

B66-10001
FORMING TOOL IMPROVES QUALITY OF TUBING FLARES
INNOVATOR NOT GIVEN /GEN. DYN./ASTRONAUTICS/ JAN. 1966
W00-231
Punch and die set improves the quality of tubing flares for use with standard flared-tube fittings in high-pressure systems. It forges a dimensionally accurate flare in the tubing and forces more tubing material into the high-stress areas to improve the strength and tightness of the tubing connection.

B66-10003
IMPROVED TOOL EASILY REMOVES BRAZED TUBE CONNECTORS
SCHOPPMAN, R. A. /MCDONNELL AIRCRAFT CORP./ JAN. 1966
MSC-263
Portable, compact tool quickly and cleanly removes brazed connectors from system tubes. The tool uses an induction coil to melt the braze and a compression spring to automatically separate the connection. An inert gas is force-fed about the heated area to prevent oxidation of the tube.

B66-10007
FLOATING DEVICE ALIGNS BLIND CONNECTIONS
RESEL, J. E. /N. AM. AVIATION/ JAN. 1966
MSC-256
Panel-mounted connectors overcome the misalignment of blind connectors in electronic rack mounted equipment. The connector is free to move in the

vertical direction by the action of a parallelogram mount. This freedom of motion maintains the guide pin hole centerline parallel to the guide pin centerline at all times.

B66-10011
TORQUE WRENCH DESIGNED FOR RESTRICTED AREAS
FAGERBERG, E. R. /LOCKHEED MISSILES AND SPACE CO./ JAN. 1966
LEWIS-246
Wrench with twisting handle grip applies torque to a fastener in a restricted area. The wrench handle may be any length without affecting output torque.

B66-10014
EXPLOSIVE FORCE OF PRIMACORD GRID FORMS LARGE SHEET METAL PARTS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
SEE ALSO NASA-SP-5017
M-FS-316
Primacord which is woven through fish netting in a grid pattern is used for explosive forming of large sheet metal parts. The explosive force generated by the Primacord detonation is uniformly distributed over the entire surface of the sheet metal workpiece.

B66-10018
COMPACT RETRACTOR PROTECTS CABLING LOOPS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
M-FS-561
Core and swivel retractor mechanism combined with cable stiffeners provides compact, long-wearing protection for cabling loops in cabinet-mounted electronic equipment drawers.

B66-10019
BUOYANT STOKES LITTER ASSEMBLY USED FOR SEA RESCUE OPERATIONS
POLLARD, R. A. SHEWMAKE, G. A. JAN. 1966
MSC-131
Standard Stokes litter is fastened to inflatable flotation units for sea rescue operations. The assembly keeps an injured person immobilized during transportation to a first aid station.

B66-10020
O-RING TUBE FITTINGS FORM LEAKPROOF SEAL IN HYDRAULIC SYSTEMS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
M-FS-481
Leakproof fittings for hydraulic systems are designed to be welded to the ends of the tubing to be joined and mated to form a seal with one O-ring at the joint. Since the fittings are coupled at only one joint, they tend to be more reliable than standard fittings coupled at two joints.

B66-10022
RING VALVE RESPONDS TO DIFFERENTIAL PRESSURE CHANGES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
WOO-247
Pressure valve has a moving annular ring seal that automatically reacts to differential pressure changes across the seat. This valve has good potential for the petroleum and chemical industries.

B66-10023
SIMPLE KEY LOCKS TURBINE ROTOR BLADES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
WOO-103
Symmetrical, cruciform key has end tabs which bend up to lock turbine rotor blades against axial displacement. The key locks without introducing aerodynamic resistance or upsetting rotor balance.

B66-10030
FRICTION DEVICE DAMPS LINEAR MOTION OF ROTATING SHAFT
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JAN. 1966
WOO-214
Damping device checks the axial motion of a rotating shaft by exerting a controllable, radial frictional load to the outer race of the ball bearing in which the shaft is mounted. The device can be used as a soft bearing mount to damp resonant frequencies at critical shaft speed.

B66-10032
SHEET METAL STRIP UNROLLS TO FORM CIRCULAR BOOM
INNOVATOR NOT GIVEN /MELPAR, INC./ JAN. 1966
GSFC-423
Preformed metal strip, coiled flat on a storage drum, unrolls to form a cylindrical boom. Tabs and slots on opposite sides of the strip interlock to form a continuous circular cross section. This retractable boom can be used as a spacecraft antenna, gravity gradient, or positioning device.

B66-10035
RESILIENT CLAMP HOLDS FUEL CELL STACK THROUGH THERMAL CYCLE
SHINN, B. H. /UNITED AIRCRAFT CORP./ FEB. 1966
MSC-313
Resilient clamping device holds a stack of fuel cells during thermal expansion and contraction periods. The clamp has torsion bar action which maintains seal integrity over a wide stress range.

B66-10040
ASSEMBLY JIG ASSURES RELIABLE SOLAR CELL MODULES
OFARRELL, H. O. /TRW SPACE TECHNOL. LABS./ FEB. 1966
GSFC-455
Assembly jig holds the components for a solar cell module in place as the assembly is soldered and bonded by the even heat of an oven. The jig is designed to the configuration of the planned module. It eliminates uneven thermal conditions caused by hand soldering methods.

B66-10047
HEATED DIE FACILITATES TUNGSTEN FORMING
CHATTIN, J. H. HAYSTRICK, J. E. LAUGHLIN, J. C. LEIDY, R. A. FEB. 1966
LEWIS-25A
Tungsten forming in a press brake employs a bottom die assembly with a heating manifold between two water-cooled die sections. The manifold has hydrogen-oxygen burners spaced along its length for even heat during forming.

B66-10052
COMBUSTION CHAMBER INLET MANIFOLD SEPARATES VAPOR FROM LIQUID
BAKER, D. I. /N. AM. AVIATION/ FEB. 1966 SEE ALSO B63-10251
M-FS-531
Circular manifold with tangential orifices at the inner circumference provides for the vapor constituent of a vaporized cryogenic propellant to enter a rocket combustion chamber before the liquid constituent. The vapor is separated from the liquid by centrifugal action and precedes it into the chamber through carefully positioned orifices.

B66-10054
MODIFIED POWER TOOL RAPIDLY DRIVES SERIES TORQUE BOLTS
INNOVATOR NOT GIVEN /N. AM. AVIATION/ FEB. 1966
MSC-221
Feeder attachment, which fits on a standard power driver, drives a series of longitudinally attached torque bolts into place with great speed. It allows loading of a series of bolts and then positions individual bolts in the driving head for assembly. The attachment contains a socket gun which may be modified to accommodate different types and sizes of bolts.

B66-10055
HYDROGEN-ATMOSPHERE INDUCTION FURNACE HAS INCREASED TEMPERATURE RANGE
CAVES, R. M. GRESSLIN, C. H. FEB. 1966
LEWIS-153
Improved hydrogen-atmosphere induction furnace operates at temperatures up to 5,350 deg. F. The furnace heats up from room temperature to 4,750 deg. F in 30 seconds and cools down to room temperature in 2 minutes.

B66-10056
BENCH VISE ADAPTER GRIPS TUBING SECURELY AND SAFELY
HOWLAND, B. T. JONES, A. S., JR. /N. AM. AVIATION/ FEB. 1966
MSC-279
Plastic self-compressing adapter with grooves, attached to the jaws of a bench vise, secures thin-wall tubing vertically or horizontally during cutting and flaring operations without marring or damaging it. Magnets incorporated in both sections of the adapter prevent detachment from the jaws when the vise is opened.

B66-10059
CALIBRATED CLAMP FACILITATES PRESSURE APPLICATION
INNOVATOR NOT GIVEN /N. AM. AVIATION/ FEB. 1966
MSC-298
Spring-loaded clamp applies specific pressure to hold materials together during bonding, welding, and machining. The clamp has two adjustable legs terminating in suction cups for easy attachment to a surface.

B66-10061
INSTRUMENT QUICKLY TRANSPOSES GROUND REFERENCE TARGET TO EYE LEVEL
GREEN, B. E. VAN DEVENTER, E. L. /N. AM. AVIATION/ FEB. 1966
MSC-275
Optical alignment of equipment is facilitated by a traverse target with a string suspending a plumb bob to transpose the ground level point to eye-level operation. This instrument appreciably decreases the time required from the present method but achieves the same degree of precision.

B66-10063
TENSILE-STRENGTH APPARATUS APPLIES HIGH STRAIN-RATE LOADING WITH MINIMUM SHOCK
COTRILL, H. E., JR. MAC GLASHAN, W. F., JR. FEB. 1966
JPL-28 JPL-29
Tensile-strength testing apparatus employs a capillary bundle through which a noncompressible fluid is extruded and a quick-release valve system. This apparatus applies the test loads at relatively constant very high strain rates with minimal shock and vibration to the tensile specimen and apparatus.

B66-10065
T-HANDLE WRENCH HAS TORQUE-LIMITING ACTION
KEMPLE, S. B. /N. AM. AVIATION/ FEB. 1966
MSC-280
T-handle wrench can be preset to release when a certain torque value is exceeded by means of a spring-loaded roller and groove torque-limiting mechanism contained in the handle of the wrench. The wrench is also equipped with a push button in the handle that permits the operator to lock the handle to the spindle shaft, thus eliminating the torque-limiting function.

B66-10069
RUN-IN WITH CHEMICAL ADDITIVE PROTECTS GEAR SURFACE
HARTMAN, M. A. /N. AM. AVIATION/ FEB. 1966
M-FS-548
Run-in treatment provides a protective coating on turbopump gear surfaces so that they are capable of operation under marginal conditions in mineral oil and diester lubricants. This treatment protects highly loaded gears during relatively short-term operation.

B66-10071
MECHANISM ISOLATES LOAD WEIGHING CELL DURING LIFTING OF LOAD
HAIGLER, J. S. /N. AM. AVIATION/ FEB. 1966
MSC-297
Load weighing cell used in conjunction with a hoist is isolated during lifting and manipulation of the load. A simple mechanism, attached to a crane hook, provides a screw adjustment for engaging the load cell during weighing of the load and isolating it from lift forces during hoisting of the load.

B66-10073
CALCULATIONS ENABLE OPTIMUM DESIGN OF MAGNETIC BRAKE
KOSMAHL, H. G. FEB. 1966
LEWIS-251
Mathematical analysis and computations determine optimum magnetic coil configurations for a magnetic brake which controllably decelerates a free falling load to a soft stop. Calculations on unconventionally wound coils determine the required parameters for the desired deceleration with minimum electrical energy supplied to the stationary coil.

B66-10074
THREADED PILOT INSURES CUTTING TOOL ALIGNMENT
GOLDMAN, R. /N. AM. AVIATION/ SCHNEIDER, W. E. FEB. 1966
M-FS-527
Threaded pilot allows machining of a port component, or boss, after the reciprocating hole has been threaded. It is used to align cutting surfaces with the boss threads, thus insuring precision alignment.

B66-10076
SHOULDER ADAPTER STEADIES SPOT WELDING GUN
LOVE, T. H. MAR. 1966
M-FS-321
Shoulder adapter fits on one end of a hand-held spot welding gun. With the adapter, the operator can hold the gun steadily at uniform pressure to ensure defect-free welds.

B66-10077
PLUGGED HOLLOW SHAFT MAKES FATIGUE-RESISTANT SHEAR PIN
HANKINSON, T. W. E. MAR. 1966
LANGLEY-195
Shear pin coupling with plugged hollow shaft provides required load capacity for shaft protection and has no groove to induce fatigue failure.

B66-10078
THERMAL MOTOR POSITIONS MAGNETOMETER SENSORS
KERWIN, W. J. SCOTT, S. G. MAR. 1966
ARC-51
Reversing, thermal, motor-driven device positions magnetometer sensors for checking zero offset. The device alternately positions two sensors at fixed positions 90 degrees apart. The thermal motor is fabricated completely of nonmagnetic materials.

B66-10080
NYLON SHOCK ABSORBER PREVENTS INJURY TO PARACHUTE JUMPERS
MANDEL, J. A. /GOODYEAR AEROSPACE CORP./ MAR. 1966
MSC-226
Nylon shock absorbers reduce the canopy-opening shock of a parachute to a level that protects the wearer from injury. A shock absorber is mounted on each of the four risers between the shroud lines and the harness. Because of their size and location, they pose no problem in repacking the chute and harness after a jump.

B66-10092
FINGERTIP CURRENT CONTROL FACILITATES USE OF ARC WELDING GUN
ROTH, B. /N. AM. AVIATION/ MAR. 1966
MSC-289
Fingertip-operated trigger accurately controls the current supplied to an arc welding gun. The trigger is mounted directly on the handle of the gun.

B66-10093
TOOL PROVIDES CONSTANT PURGE DURING TUBE WELDING
LANG, E. R. /N. AM. AVIATION/ MAR. 1966
M-FS-547
Tool provides a constant purge of inert gas during in-place welding of tubular components to prevent contamination and oxidation. It also permits self-jigging of the tube and sleeve to be welded.

B66-10100
QUEUING REGISTER USES FLUID LOGIC ELEMENTS
INNOVATOR NOT GIVEN /UNIVAC DIV. OF SPERRY RAND/
MAR. 1966
M-FS-317
Queuing register /a multistage bit-shifting device/ uses a series of pure fluid elements to perform the required logic operations. The register has several stages of three-state pure fluid elements combined with two-input NOR gates.

B66-10102
PIPE CUTTING TOOL IS USEFUL IN LIMITED SPACE
HEADLEY, C. A. /MCDONNELL AIRCRAFT CORP./ JONES, D. D. MAR. 1966
MSC-36
Portable pipe cutting tool is used in areas of limited space. The pipe is clamped in the tool and then cut by a rotating cutter assembly that is internally connected to a drive shaft engaged in the chuck of a portable electric drill. The tool is held in a fixed position during the cutting operation.

B66-10107
MECHANISM CONTINUOUSLY MEASURES STATIC AND DYNAMIC CABLE LOADS
MAR. 1966
MSC-217
Pulley mechanism measures the tensile loads on a cable under static and dynamic conditions, without disturbing the continuity of operation of the system. A set of takeoff pulleys are mounted on a pivoted frame that is linked to a strain gage which measures the frame displacement as a function of the static or dynamic tensile load on the cable.

B66-10115
SOLDERING TOOL HEATS WORKPIECES AND APPLIES SOLDER IN ONE OPERATION
GUDKESE, V. W. MAY 1966
LEWIS-247
Fountain-pen type soldering iron heats workpieces and applies solder to joints in densely packed electronics assemblies. The basic soldering tool is used with different-sized orifice tips, eliminating the need for an assortment of conventional soldering guns.

B66-10116
TELESCOPING OF INSTRUMENTATION TUBING ELIMINATES SWAGING
MC CLELLAN, E. L. /N. AM. AVIATION/ MAY 1966
M-FS-546
Short sections of stainless steel tubing of slide-fit sizes fitted together and silver-soldered at the junctions form small-diameter tubing assemblies with accurately stepped-down dimensions. This method of fabrication eliminates the costly swaging operations formerly used.

B66-10123
HAND DRILL ADAPTER LIMITS HOLES TO DESIRED DEPTH
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1966
MSC-346
Adjustable adapter fastened to the shank of a drill bit limits the depth of bored holes. The adapter may be made in sizes appropriate for bits of different diameters.

B66-10124
ECONOMICAL AND MAINTENANCE-FREE GAS SYSTEM OPERATES RAILROAD SWITCHES
VISSING, G. S. MAR. 1966
NU-0045
Remote control system that uses bottled nitrogen as a power source operates infrequently used railroad switches. This system is economical and maintenance free.

B66-10125
ALUMINUM OXIDE FILLER PREVENTS OBSTRUCTIONS IN TUBING DURING WELDING
OKELLY, K. P. MAR. 1966
MSC-222
Granular aluminum oxide is used as filler in serpentine tubing while welding the tubing to a flat surface. The filler eliminates obstructions in the tubes formed by molten weld nuggets and is porous enough to allow gases to escape from the welding area.

B66-10132
EXPANDABLE INSERT SERVES AS SCREW ANCHOR
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAR. 1966
MSC-301
Expandable self-locking adapter secures components to panels having one accessible side. Mounting holes in the panels may not be threaded to accommodate screws, therefore, the adapter contains a female thread that will mate a mounting screw.

B66-10135
CHART CASE OPENS TO FORM BRIEFING EASEL
NELSON, R. A. /N. AM. AVIATION/ APR. 1966
MSC-349
Aluminum carrying case protects charts during transit and opens to form a rigid easel for their presentation. Looseleaf clamps hold the charts in place for both carryng and displaying them.

B66-10136
CRYOGENIC TRAP VALVE HAS NO MOVING PARTS
BRANUM, L. W. WELLS, G. /N. AM. AVIATION/ APR. 1966
M-FS-487
Aluminum-body trap valve with an invar stem keeps cryogenic materials in the liquid state while entering the final component of a system. The valve has no moving parts and is self-actuated and self-monitoring.

B66-10137
ROTATING MANDREL SPEEDS ASSEMBLY OF PLASTIC INFLATABLES
MAC FADDEN, J. A. /SCHJELDAHL /G. T./ CO./
STENLUND, S. J. WENDT, A. J. APR. 1966
LANGLEY-155
Rotating mandrel permits the accurate cutting, forming, and sealing of plastic gores for assembly of an inflatable surface of revolution. The gores remain on the mandrel until the final seam is reached. Tolerances are tightly controlled by the mandrel configuration.

B66-10145
PORTABLE POWER TOOL MACHINES WELD JOINTS IN FIELD
SPIER, R. A. APR. 1966
M-FS-258
Portable routing machine for cutting precise weld joints required by nonstandard pipe sections used in the field for transfer of cryogenic fluids. This tool is adaptable for various sizes of pipes and has a selection of router bits for different joint configurations.

B66-10146
EXTENDABLE MAST USED IN ONE SHOT SOIL PENETROMETER
HOTZ, G. M. HOWARD, G. A. APR. 1966
JPL-685
Penetrometer to test soil characteristics has a piercing head with soil instrumentation equipment attached to an expandable mast actuated by compressed air. The penetrometer gives continuous measurements as the mast pushes the piercing head through the soil.

B66-10149
DEPTH INDICATOR AND STOP AID MACHINING TO PRECISE TOLERANCES
LAVERTY, J. L. /N. AM. AVIATION/ APR. 1966
M-FS-553
Attachment for machine tools provides a visual indication of the depth of cut and a positive stop to prevent overcutting. This attachment is used with drill presses, vertical milling machines, and jig borers.

B66-10150
MOUNTING FACILITATES REMOVAL AND INSTALLATION OF FLAME-DETECTOR RODS
CASTLE, F. /N. AM. AVIATION/ APR. 1966

M-FS-555
Flame-detector-rod holder is easily removed from the wall of a gas-fired furnace for maintenance or replacement of the detector rod without requiring shutdown of the furnace. The holder consists of an externally threaded outer bushing, a sleeve which is held inside the outer bushing with a set screw, and a detector rod assembly which screws into the sleeve.

B66-10151
SPLIT GLASS TUBE ASSURES QUALITY IN ELECTRON BEAM BRAZING
KRESSIN, W. J. /N. AM. AVIATION/ APR. 1966
M-FS-564
Sealed enclosure of heat-resistant glass tubing and silicone rubber molds provide good visibility for electron beam brazing of metal tubes in an inert gas atmosphere. The glass tubing and rubber molds, which are bonded together, are easily applied to and removed from the brazing area by operation of a clamp.

B66-10152
NYLON BIT REMOVES CORK INSULATION WITHOUT DAMAGE TO SUBSTRATE
CRANDALL, J. C. /N. AM. AVIATION/ APR. 1966
MSC-381
Nylon router bit in an electric hand-held drill removes small quantities of cork insulation from a metal or fiberglass surface without cutting or scratching the surface.

B66-10155
SIMPLE DEVICE FACILITATES INERT-GAS WELDING OF TUBES
CARRITHERS, K. V. /N. AM. AVIATION/ KELLEY, W. B. APR. 1966
M-FS-558
Metal Y-tube simultaneously directs argon streams over weld areas on both sides of tubes being joined along a line on their outer periphery. The device is advanced along the junction in step with the welding operation.

B66-10167
DUAL REGULATOR CONTROLS TWO GASES FROM A SINGLE REFERENCE
JACKSON, K. /GARRETT CORP./ APR. 1966
MSC-227
Dual-pressure regulator uses single reference for parallel control of two gases. The regulator uses an external fluid pressure to modulate the flow of one gas, and the regulated flow of the first gas to modulate the flow of the second.

B66-10168
SAFETY SWITCH PERMITS EMERGENCY BRIDGE CRANE SHUTDOWN
LONG, E. J. R. /N. AM. AVIATION/ APR. 1966
M-FS-549
Safety switch on a crane control pendant must be held closed to operate the crane. This provides for immediate power cutoff to the crane in an emergency or a pendant circuit failure.

B66-10169
MODIFIED DRILL PERMITS ONE-STEP DRILLING OPERATION
LIBERTONE, C. /N. AM. AVIATION/ APR. 1966
M-FS-559
Drill with modified cutting faces permits one-step drilling operation without chatter upon contact and premature wear. The modification of the drill, which has the same diameter as that of the desired hole, consists of a groove across the bottom of each of the cutting faces of the drill flutes.

B66-10171
MULTISURFACE FIXTURE PERMITS EASY GRINDING OF TOOL BIT ANGLES
JONES, C. R. /N. AM. AVIATION/ APR. 1966
M-FS-586
Multisurface fixture with a tool holder permits accurate grinding and finishing of right- and left-hand single point threading tools. All angles are ground by changing the fixture position to rest at various reference angles without removing the tool from the holder.

B66-10172
FLEXIBLE COILED SPLINE SECURELY JOINS MATING CYLINDERS
COPPERNOL, R. W. /GEN. DYN./ASTRONAUTICS/ APR. 1966
WOO-270
Mating cylindrical members are joined by spline to form an integral structure. The spline is made of tightly coiled, high-tensile-strength steel spiral wire that fits a groove between the mating members. It provides a continuous bearing surface for axial thrust between the members.

B66-10174
EPOXY-COATED CONTAINERS EASILY OPENED BY WIRE BAND
MC COY, J. W. /N. AM. AVIATION/ APR. 1966
M-FS-592
Epoxy coating reduces punctures, abrasions, and contamination of synthetic cellular containers used for shipping and storing fragile goods and equipment. A wire band is wound around the closure joint, followed by the epoxy coating. The container can then be easily opened by pulling the wire through the epoxy around the joint.

B66-10175
DEVICE SPOT-LAPS SPHERES TO VERY CLOSE TOLERANCES
AVERY, H. W. /GE/ MAY 1966
JPL-SC-119
Device laps precise amounts of metal from high spots on a spherical body to correct minute surface imperfections. The device generates the lapped surface with reference to an existing true surface on the spherical workpiece. Lapping is performed by applying a rotary and oscillatory motion to the workpiece while the lapping tool is held on the workpiece high spot.

B66-10176
LIFTING CLAMP POSITIVELY GRIPS STRUCTURAL SHAPES
REINHARDT, E. C. MAY 1966
M-FS-593
Welded steel clamps securely grip structural shapes of various sizes for crane operations. The clamp has adjustable clamping jaws and screw-operated internal V-jaws and provides greater safety than hoisting slings presently used. The structural member can be rotated in any manner, angle, or direction without being released by the clamp.

B66-10188
CONTROL SYSTEM MAINTAINS COMPARTMENT AT CONSTANT TEMPERATURE
LINDBERG, J. G. /N. AM. AVIATION/ MAY 1966
JPL-SC-145
Gas-filled permeable insulating material maintains an enclosed compartment at a uniform temperature. The material is interposed between the two walls of a double-walled enclosure surrounding the compartment.

B66-10189
PNEUMATIC SHUTOFF AND TIME-DELAY VALVE OPERATES AT CONTROLLED RATE
HORNING, J. L. TOMLINSON, L. E. /N. AM. AVIATION/ MAY 1966
M-FS-602
Shutoff and time delay valve, which incorporates a metering spool that moves at constant velocity under pneumatic pressure and spring compression, increases fluid-flow area at a uniform rate. Diaphragm areas, control cavity volume, and bleed-orifice size may be varied to give any desired combination of time delay and spool travel time.

B66-10190
BELLOWS DESIGN FEATURES LOW SPRING RATE AND LONG LIFE
LUSIC, R. F. /N. AM. AVIATION/ MAY 1966
MSC-521
High pressure bellows has high strength rigid hoops for strength and stability and sheet stock

for low spring rate effects. The simplicity of this bellows design facilitates mass production.

B66-10191
TOOL POST MODIFICATION ALLOWS EASY TURRET LATHE CUTTING-TOOL ALIGNMENT
FOUTS, L. /N. AM. AVIATION/ MAY 1966
M-FS-581
Modified tool holder and tool post permit alignment of turret lathe cutting tools on the center of the spindle. The tool is aligned with the spindle by the holder which is kept in position by a hydraulic lock-in feature of the tool post. The tool post is used on horizontal and vertical turret lathes and other engine lathes.

B66-10195
SEGMENTED BALL VALVE IS EASY TO OPEN AND CLOSE
PRONO, E. SHINAULT, L. H. /N. AM. AVIATION/
SPEISMAN, C. JUN. 1966
WOO-248
Segmented ball valve and flowmeter in the same spherical housing provide a valve that will handle large fluid volume without bulkiness and weight of blade valves or conventional ball valves. The valve is easily opened or closed and the flowmeter remains stationary, so errors are eliminated.

B66-10197
INTERMEDIATE ROTATING RING IMPROVES RELIABILITY OF DYNAMIC SHAFT SEAL
MESNY, P. R. /N. AM. AVIATION/ MAY 1966
M-FS-575
Intermediate rotating ring improves the reliability of dynamic shaft seals whose rubbing surfaces wear down rapidly at high shaft speeds. The rotating ring is placed between the rotating shaft sealing surfaces and the stationary surface, and driven at one-half the shaft speed.

B66-10201
SELF-CONTAINED CLOTHING SYSTEM PROVIDES PROTECTION AGAINST HAZARDOUS ENVIRONMENTS
INNOVATOR NOT GIVEN /GARRETT CORP./ MAY 1965
M-FS-536
Self-contained clothing system protects personnel against hazardous environments. The clothing has an environmental control system and a complete protection envelope consisting of an outer garment, inner garment, underwear, boots, gloves, and helmet.

B66-10202
BODY-FITTED HARNESS PROVIDES SAFE AND EASY COMPONENT HANDLING
MILLER, E. G. ROTHWELL, G. E. /IBM/ MAY 1966
M-FS-533
Body-fitted restraint harness enables workers to safely and conveniently handle critical components during their installation or removal. Since the harness supports the components, the worker is able to maneuver through restricted areas with his hands free. It is easily put on, adjusted, and removed, or comfortably worn without interfering with normal activities.

B66-10204
TORQUE WRENCH ALLOWS READINGS FROM INACCESSIBLE LOCATIONS
DE BARNARDO, M. /N. AM. AVIATION/ MAY 1966
M-FS-598
Torque wrench with an adjustable drive shaft permits indicator to remain in view when used on sections of equipment with limited access. The shaft is capable of protruding from either side of the wrench head by means of spring loaded balls.

B66-10206
LOW POWER HEATING ELEMENT PROVIDES THERMAL CONTROL DURING SWAGING OPERATIONS
CROWELL, J. W. /CHRYSLER CORP./ MAY 1966
M-FS-457
Low-power, cylindrical heating element in a swaging anvil assembly heats the material being worked on. The increased ductility of heated material results in crack-free deformation.

B66-10208
TOOL ENABLES PROPER MATING OF ACCELEROMETER AND CABLE CONNECTOR
STEED, C. N. /N. AM. AVIATION/ MAY 1966
M-FS-611
Tool supports accelerometer in axial alignment with an accelerometer cable connector and permits tightening of the accelerometer to the cable connector with a torque wrench. This is done without damaging the components or permitting them to work loose under sustained, high-level vibrations.

B66-10209
SPECIAL TOOL SEALS CONDUCTORS WITH COMBINATION OF PLASTIC SLEEVES
YOUNG, S. /N. AM. AVIATION/ MAY 1966
M-FS-579
Special tool seals electrical conductors connecting instrumentation within space vehicle cryogenic fuel tanks and oxidizer tanks. An inner sleeve of fluorinated ethylene-propylene and an outer sleeve of tetrafluoroethylene enclose a bundle of conductors and are heated with the tool to form a tight seal of the bundle and each individual wire.

B66-10210
ADJUSTABLE CUTTING GUIDE ALIGNS AND POSITIONS STACKS OF MATERIAL
THIEL, A. M. MAY 1966
MSC-321
Adjustable guide tool aligns and positions stacks of material for cutting at various angles. The device adapts its shape to stacks of any corner angle, adjusts to any cutting angle, and quickly aligns the stacks for repeated cutting. With this device, an operator need not place his hands under the knife during alignment.

B66-10211
PRESSURE SEAL RING MAY BE EFFECTIVE OVER WIDE TEMPERATURE RANGE
INNOVATOR NOT GIVEN /N. AM. AVIATION/ MAY 1966
M-FS-486
Positive pressure seal rings seal bolted flange joints in pressure vessels containing fluids whose temperatures can vary over a wide range. The seal rings mate with grooves in the flanges and compensate for the excessive thermal expansion or contraction of a gasketed joint.

B66-10212
LIQUID TRAP SEALS THERMOCOUPLE LEADS
RUPPE, E. P. /N. AM. AVIATION/ MAY 1966
M-FS-688
Liquid trap seals thermocouple leads coming out of a brazing retort that operates with a controlled atmosphere so that air cannot enter the retort and hydrogen cannot escape. The trap is fastened to a duct welded to the retort. Thermocouple leads are led out through the duct and trap, with the fluid forming a gastight seal between the atmosphere and the retort.

B66-10213
CYLINDRICAL CLAW CLAMP HAS QUICK RELEASE FEATURE
GOODWIN, G. D. /CHRYSLER CORP./ MAY 1966
M-FS-513
Claw clamp grasps cylindrical shapes by pressing its jaws around the object. The clamp is released by retraction of a release pin which extends beyond the clamp handle on both sides for better purchase.

B66-10214
COLLOIDAL SUSPENSION SIMULATES LINEAR DYNAMIC PRESSURE PROFILE
MC CANN, R. J. /LOCKHEED MISSILES AND SPACE CO./
JUN. 1966
WOO-266
Missile nose fairings immersed in colloidal suspension prepared with various specific gravities simulate pressure profiles very similar to those encountered during reentry. Stress and deflection conditions similar to those expected during atmospheric reentry are thus attained in the laboratory.

B66-10215
ELECTRON BEAM WELDING OF COPPER-MONEL FACILITATED BY CIRCULAR MAGNETIC SHIELDS
LAMB, J. N. /N. AM. AVIATION/ MAY 1966
M-FS-569
High permeability, soft magnetic rings are placed on both sides of electron beam weld seams in copper-Monel circular joint. This eliminates deflection of the electron beam caused by magnetic fields present in the weld area.

B66-10216
SOFT-SEAL VALVE HOLDS HAZARDOUS FLUIDS SAFELY
MAY 1966 SEE ALSO NASA-TN-D-1727
LEWIS-275
Valve assembly allows transfer of hazardous or reactive fluids such as liquid fluorine without corrosion of valve face and seat material. The assembly consists of a plug to block bulk flow and a soft-seal outer seat to effect zero-leak stoppage.

B66-10217
FIBERGLASS CONTAINER SHELLS FORM CONTAMINATION-FREE STORAGE UNITS
KRAUS, H. M. /N. AM. AVIATION/ JUN. 1966
WOO-275
Interchangeable molded fiberglass shells are locked together to form storage units of various depths. These units can hold components weighing 1500 pounds, are easily transportable, and protect contents from contamination.

B66-10218
PRESSURE VESSELS FABRICATED WITH HIGH-STRENGTH WIRE AND ELECTROFORMED NICKEL
ROTH, B. /N. AM. AVIATION/ JUN. 1966
M-FS-580
Metal pressure vessels of various shapes having high strength-to-weight ratios are fabricated by using known techniques of filament winding and electroforming. This eliminates nonuniform wall thickness and unequal wall strength which resulted from welding formed vessel segments together.

B66-10219
TOOL PERMITS DAMAGE-FREE REMOVAL OF SOLAR CELL
BECKLEY, J. E., JR. /COMPREHENSIVE DESIGNERS/ MAY 1966
GSFC-467
Modified soldering iron extracts a wrap-around solar cell that is attached with solder or adhesive to a substrate without destroying the cell removed or damaging adjacent cells. Heat, vacuum, and compressed air, operated from a special head attached to the soldering iron, loosen, extract, and protect the cell.

B66-10226
A CONCEPTUAL DESIGN FOR SQUEEZE FILM BEARINGS
INNOVATOR NOT GIVEN /BENDIX CORP./ JUN. 1966
M-FS-573
Squeeze film bearings which require at least one of two adjacent surfaces to oscillate at high frequency and low amplitude have the oscillating /strain-producing/ member on a double gas film. This means of support allows dynamic changing of the gap between the bearing surfaces without the disadvantages produced when the oscillator is affixed to the bearing base itself.

B66-10228
STUDIES REVEAL EFFECTS OF PIPE BENDS ON FLUID FLOW CAVITATION
STONEMETZ, R. E. MAY 1966
M-FS-516
Incipient cavitation in liquids flowing in pipes curved in one plane are affected by the pipe bend radii and pipe diameters, but little by pipe bend angles ranging from 60 to 120 degrees. Critical cavitation indices decrease with higher Reynolds number and pressure ratio. Bulk liquid temperature increase lowers the mean critical velocity at which cavitation occurs.

B66-10229
EXPANDABLE RUBBER PLUG SEALS OPENINGS FOR PRESSURE TESTING
MAY 1966
NU-0048
Plug assembly seals openings in piping systems, vessels, and chambers for low pressure leak testing. The assembly, which consists of a rubber sealing plug and the mechanism for expanding it into a pressure-tight configuration, adequately seals irregular diameters without damage to mating surfaces.

B66-10233
QUICK-CLOSING VALVE IS ACTUATED BY EXPLOSIVE DISCHARGE
MAJESKI, S. J. JUN. 1966
ARC-55
Remotely controlled plug-type valve shuts off a high-pressure, high-temperature gas flow in a few milliseconds. The valve is actuated by a commercially available electrically initiated squib of low explosive power. More rapid closure is attainable with squibs containing heavier explosive changes.

B66-10235
KEY-LOCKED GUARD PREVENTS ACCIDENTAL SWITCH ACTUATION
HAWTHORNE, K. C. /N. AM. AVIATION/ JUN. 1966
MSC-419
Switch guard, which locks in place on a panel, protects individual switches from accidental activation. The guard consists of a cup to cover the switch lever, a standard screw lock tumbler, and a stud that mates with a threaded adapter in the panel.

B66-10236
AUTOMATIC REEL CONTROLS FILLER WIRE IN WELDING MACHINES
MILLETT, A. V. /N. AM. AVIATION/ JUN. 1966
MSC-416
Automatic reel on automatic welding equipment takes up slack in the reel-fed filler wire when welding operation is terminated. The reel maintains constant, adjustable tension on the wire during the welding operation and rewinds the wire from the wire feed unit when the welding is completed.

B66-10237
ADJUSTABLE KNIFE CUTS HONEYCOMB MATERIAL TO SPECIFIED DEPTH
RAUSCHL, J. A. /N. AM. AVIATION/ JUN. 1966
MSC-475
Calibrated, adjustable knife cuts aluminum honeycomb or other soft materials to a desired depth. The frame of the device accommodates standard commercial blades. Since the blade is always visible to the operator, the device can be used on any straight or irregular layout line.

B66-10238
INSERT SLEEVE PREVENTS TUBE SOLDERING CONTAMINATION
STEIN, J. /N. AM. AVIATION/ JUN. 1966
MSC-552
Teflon sleeve insert prevents contamination of internal tube surfaces by solder compound during soldering operations that connect and seal the tube ends. The sleeve insert is pressed into the mating tube ends with a slight interference fit.

B66-10239
HAND TOOL PERMITS SHRINK SIZING OF ASSEMBLED TUBING
MILLETT, A. ODOR, M. /N. AM. AVIATION/ JUN. 1966
MSC-504
Portable tool sizes tubing ends without disassembling the tubing installation. The shrink sizing tool is clamped to the tubing and operated by a ratchet wrench. A gear train forces the tubing end against an appropriate die or mandrel to effect the sizing.

B66-10240
JIG PROTECTS TRANSISTORS FROM HEAT WHILE TINNING LEADS
PELLETIER, A. J. WILLIS, G. A. /N. AM. AVIATION/ JUN. 1966

MSC-515
In tinning transistor leads, an aluminum jig is used to dip the leads into the molten tin. The jig*s mass shunts excess heat given off by the molten tin before it reaches and damages the transistor body.

B66-10241
BRAZING PROCESS USING AL-SI FILLER ALLOY RELIABLY BONDS ALUMINUM PARTS
BEUYUKIAN, C. S. JOHNSON, W. R. /N. AM. AVIATION/ JUN. 1966
MSC-448
Brazing process employs an aluminum-silicon filler alloy for diffusion bonding of aluminum parts in a vacuum or inert gas atmosphere. This process is carried out at temperatures substantially below those required in conventional process and produces bonds of greater strength and reliability.

B66-10242
PORTABLE SANDBLASTER CLEANS SMALL AREAS
SEVERIN, H. J. /N. AM. AVIATION/ JUN. 1966
MSC-523
Portable sandblasting unit rapidly and effectively cleans localized areas on a metal surface. The unit incorporates a bellows enclosure, masking plate, sand container, and used sand accummulator connected to a vacuum system. The bellows is equipped with an inspection window and light for observation of the sanding operation.

B66-10243
LATHE CHUCK KEY INCORPORATES SAFETY FEATURE
CHRISTMAN, G. L. /N. AM. AVIATION/ JUN. 1966
MSC-506
Lathe chuck key with spring loaded plunger cannot inadvertently be left in the chuck when the lathe is started. The plunger automatically ejects the key from the chuck when hand pressure is released.

B66-10244
HOLLOW NEEDLE USED TO CUT METAL HONEYCOMB STRUCTURES
GREGG, E. A. /N. AM. AVIATION/ JUN. 1966
MSC-486
Hollow needle tool cuts metal honeycomb structures without damaging adjacent material. The hollow needle combines an electrostatic discharge and a stream of oxygen at a common point to effect rapid, accurate metal cutting. The tool design can be varied to use the hollow needle principle for cutting a variety of shapes.

B66-10246
MODIFIED SOLDERING IRON SPEEDS CUTTING OF SYNTHETIC MATERIALS
SCHAFER, W. G., JR. /N. AM. AVIATION/ JUN. 1966
M-FS-725
Modified soldering iron cuts large lots of synthetic materials economically without leaving frayed or jagged edges. The soldering iron is modified by machining an axial slot in its heating element tip and mounting a cutting disk in it. An alternate design has an axially threaded bore in the tip to permit the use of various shapes of cutting blades.

B66-10247
PRESSURE-WELDED FLANGE ASSEMBLY PROVIDES LEAKTIGHT SEAL AT REDUCED BOLT LOADS
MARTENSON, A. J. /GE/ JUN. 1966
M-FS-640
Vibration resistant flange-connector assembly provides a leaktight seal under reduced bolt loads. The assembly consists of ductile metal plates that are pressure welded between dies mounted in recessed flanges.

B66-10248
ELECTRICAL UPSETTING OF METAL SHEET FORMS WELD EDGE
SCHERBA, E. S. /N. AM. AVIATION/ JUN. 1966
M-FS-720
Electric gathering of sheet stock edges forms metal sheets in the shape of gore sections with heavier edge areas that can be welded without loss of strength. The edges are gathered by progressive resistance heating and upsetting, and are formed automatically. This process avoids disturbance of the metal*s internal structure.

B66-10249
FLUID DAMPING REDUCES BELLOWS SEAL FATIGUE FAILURES
INNOVATOR NOT GIVEN /N. AM. AVIATION/ JUN. 1966
M-FS-565
Service life of a bellows-type seal in the presence of mechanical vibration is increased by a system of interconnected bellows with intervening cavities filled with a fluid which damps the amplitude of periodic deflection of the sealing bellows. Different damping fluids are used according to environmental conditions.

B66-10250
DIFFUSION BONDING MAKES STRONG SEAL AT FLANGED CONNECTOR
GITZENDANNER, L. G. LANIEWSKI, J. P. RATHBUN, F. O., JR. /GE/ JUN. 1966
M-FS-637
Copper strip seals a high pressure fluid system connector so that it is insensitive to relaxation of the bolt loads. The copper strip is diffusion bonded to the surfaces of the connector flange by application of high pressure and temperature.

B66-10253
TOOL SEPARATES SLEEVE-TYPE UNIONS WITHOUT HEAT
MILLETT, A. U. /N. AM. AVIATION/ JUN. 1966
MSC-497
Tool that uses conventional milling and cutting techniques separates sleeve type tubing unions and tubes without using heat. A selection of holders, associated bits, and cutting wheels permits preparation of varied diameter unions.

B66-10254
MILL PROFILER MACHINES SOFT MATERIALS ACCURATELY
RAUSCHL, J. A. /N. AM. AVIATION/ JUN. 1966
M-FS-692
Mill profiler machines bevels, slots, and grooves in soft materials, such as styrofoam phenolic-filled cores, to any desired thickness. A single operator can accurately control cutting depths in contour or straight line work.

B66-10255
FLOW RING VALVE IS SIMPLE, QUICK-ACTING
LINDFORS, J. A. /N. AM. AVIATION/ JUN. 1966
M-FS-752
Two porting rings, one within the other, control gas or liquid flow by using seal buttons as the sliding valve closers. Multiporting within the ring allows close control of the flow by the slight rotation of the outer porting ring.

B66-10258
CRITICAL PARTS ARE STORED AND SHIPPED IN ENVIRONMENTALLY CONTROLLED REUSABLE CONTAINER
KUMMERFELD, K. R. /N. AM. AVIATION/ JUN. 1966
M-FS-703
Environmentally controlled, hermetically sealed, reusable metal cabinet with storage drawers is used to ship and store sensitive electronic, pneumatic, or hydraulic parts or medical supplies under extreme weather or handling conditions. This container is compatible with on-site and transportation handling facilities.

B66-10262
ALUMINUM/STEEL WIRE COMPOSITE PLATES EXHIBIT HIGH TENSILE STRENGTH
INNOVATOR NOT GIVEN /HARVEY ALUMINUM CO./ JUN. 1966
M-FS-401
Composite plate of fine steel wires imbedded in an aluminum alloy matrix results in a lightweight material with high tensile strength. Plates have been prepared having the strength of titanium with only 85 percent of its density.

B66-10265
COMPACT ACTUATOR CONVERTS ROTARY TO LINEAR MOTION
FORD, A. G. JUN. 1966

JPL-786
Compact motor mounted on a stationary base converts rotary to linear motion. The motor rotates a gear train assembly so that the end of an arm attached to the assembly moves in a linear path.

B66-10266
SEAL SURFACES PROTECTED DURING ASSEMBLY
RICHARDSON, G. L. /AEROJET-GEN. CORP./ JUN. 1966
NU-0067
Protection device for sealed surfaces is placed over the polished surface entrance of trapped bosses and removed when the seal fitting has been engaged with the boss threads. This technique applies to various seal types used in close fitting, spring-loaded, threaded fittings.

B66-10267
RADIAL COOLANT CHANNELS FABRICATED BY SIMPLIFIED METHOD
FREEMAN, A. /AEROJET-GEN. CORP./ JUN. 1966
NU-0070
Radial coolant channels for distributing a coolant over the inner wall of a circular section are fabricated by cold-rolling indentations on the inside circumference of the base section and covering the indentations with a rolled flange.

B66-10269
DIFFERENTIAL EXPANSION PROVIDES PRESSURE FOR DIFFUSION BONDING OF LARGE DIAMETER RINGS
INNOVATOR NOT GIVEN /BOEING CO./ JUN. 1966 2 P
M-FS-588
External pressure band is used to bond aluminum alloy collars to large diameter, stainless steel rings. The band contracts while cooling and exerts pressure on the joint between the silver-plated surfaces of the ring and collar which expand toward the band. This diffusion bonding by differential expansion minimizes aluminum deformation.

B66-10275
FASTENER PROVIDES FOR BOLT MISALIGNMENT AND QUICK RELEASE OF FLANGE
ENGLAND, C. /AEROJET-GEN. CORP./ JUN. 1966
NU-0074
Fastener enables two large flanges to be bolted together without close alignment between the bolt and bolt-hole diameters, and provides for a quick release of one of the flanges under emergency conditions. It contains a nut that is retained by a square head in a recess in one side of the removable flange and by a collar and snap ring on the other side of the flange.

B66-10276
REMOTELY CONTROLLED SYSTEM COUPLES AND DECOUPLES LARGE DIAMETER PIPES
GRIFFIN, P. A. /AEROJET-GEN. CORP./ JUN. 1966
NU-0062
Remote control, air-motor driven, chain-drive system engages and disengages a flange coupling from large-diameter, high pressure fluid lines.

B66-10277
DEVICE FACILITATES CENTERING OF WORKPIECES IN LATHE CHUCK
PRATER, L. /N. AM. AVIATION/ JUN. 1966
M-FS-685
Spring-loaded device used in conjunction with a standard dial indicator facilitates centering a workpiece in an independent four-jaw lathe chuck.

B66-10278
O-RINGS WITH MYLAR BACK-UP PROVIDE HIGH-PRESSURE CRYOGENIC SEAL
FUNK, G. M. /N. AM. AVIATION/ JUN. 1966
M-FS-603
Mylar lip type back-up ring installed in combination with three rubber O-rings seal the junctions between a tube stub and an adapter during high pressure gas flow at cryogenic to room temperatures. Mylar seals should not be used with oxygen under pressure or in the liquid state.

B66-10279
MAGNETIC LATCHES PROVIDE POSITIVE OVERPRESSURE CONTROL
LOY, J. L. /WESTINGHOUSE ASTRONUCL. LAB./ JUN. 1966
NU-0057
Louvers are used for overpressure safety venting in rooms or chambers where explosion hazards exist. The louvers have individually hinged closures that are held in locked position by commercially available magnets that quickly release them in an overpressure condition.

B66-10283
FIXED VACUUM PLATE CLAMPS STYROFOAM FOR MACHINING
RAUSCHL, J. A. /N. AM. AVIATION/ JUN. 1966
M-FS-683 M-FS-726
Aluminum plate holds styrofoam securely in place for machining operations. The styrofoam is clamped to rubber or cork pads on the plate surface by vacuum. Foam rubber tape provides the vacuum seal.

B66-10284
EXTENSOMETER AUTOMATICALLY MEASURES ELONGATION IN ELASTOMERS
HOOPER, C. D. JUN. 1966
M-FS-517
Extensometer, with a calibrated shaft, measures the elongation of elastomers and automatically records this distance on a chart. It is adaptable to almost any tensile testing machine and is fabricated at a relatively low cost.

B66-10285
HIGH PRESSURE TUBE COUPLING REQUIRES NO THREADS OR FLARES
STEIN, J. A. /N. AM. AVIATION/ JUN. 1966
MSC-600
High pressure tube coupling connects to any straight, unthreaded, and unflared tubing end without deforming or damaging the tubing. The coupling grips the tube wall tightly between an external compression sleeve and an internal hollow mandrel. It is adaptable to standard screw fittings for test stand attachment.

B66-10294
PNEUMATIC SEPARATOR GIVES QUICK RELEASE TO HEAVY LOADS
BUCHANAN, D. C. DAVIS, E. J. PHILLIPS, J. D.
JUL. 1966
KSC-66-10
Pneumatic separator, using applied pressure, quickly releases restraining devices securing heavy loads. With minor modifications this separator can be used as a coupling device.

B66-10297
DIAPHRAGM SPRING GIVES CLUTCH OVER-CENTER TOGGLE EFFECT
ROSENBERG, H. W. /GE/ AUG. 1966
GSFC-499
Diaphragm spring clutch mechanism is used in testing the relative merits of eddy-current and hysteresis dampers. The dampers are alternateey coupled to a single damping boom shaft. The floating clutch mechanism enables the inoperative damper to remain completely isolated from the damping boom shaft during test of the other damper.

B66-10301
TOOL PRE-TENSIONS COVERS PRIOR TO LACING
FORMAN, M. A. VOGEL, R. C. /N. AM. AVIATION/
JUL. 1966
MSC-631
In securing a bulky object in a storage compartment, a cinching or tightening tool is used to draw two opposing cover halves together at a predetermined tension to permit quick lacing to retain the stored object. This tool is also useful in fabrication industries to draw components together during assembly or treating.

B66-10302
SIMPLE SCALE INTERPOLATOR FACILITATES READING OF GRAPHS
FAZIO, A. HENRY, B. HOOD, D. JUL. 1966
LEWIS-92 LEWIS-93

Set of cards with scale divisions and a scale finder permits accurate reading of the coordinates of points on linear or logarithmic graphs plotted on rectangular grids. The set contains 34 different scales for linear plotting and 28 single cycle scales for log plots.

B66-10303
BYPASS ROD TRANSFERS HEAT DEVELOPED IN THERMIONIC DIODE
LAZARIDIS, L. J. /THERMO ELECTRON ENG. CORP./
JUL. 1966
JPL-SC-136
In a thermionic diode, a cesium tube joining the emitter-collector area and the cesium reservoir is fitted with a copper bypass rod held in place by two standoff brackets. The rod transfers heat from the emitter-collector to the reservoir without going through the ceramic seal structure which surrounds the cesium tube and cannot sustain large temperature gradients.

B66-10304
FLEXIBLE FASTENER EFFECTS AIRTIGHT MATERIAL CLOSURE
NAY, D. L. JUL. 1966
JPL-684
Flexible tube inserted into a 3/4-round strip receptacle inflates to form an airtight material fastener. Inflation is done with a carbon dioxide and deflation by a manually operated release valve. Device has potential use in space suits, underwater suits, and other protective clothing.

B66-10310
MODIFIED HYDRAULIC BRAKING SYSTEM LIMITS ANGULAR DECELERATION TO SAFE VALUES
BRIGGS, R. S. COUNCIL, M. GREEN, P. M. /COLLINS RADIO CO./ JUL. 1966
GSFC-476
Conventional spring-actuated, hydraulically released, fail-safe disk braking system is modified to control the angular deceleration of a massive antenna. The hydraulic system provides an immediate preset pressure to the spring-loaded brake shoes and holds it at this value to decelerate the antenna at the desired rate.

B66-10311
UNION WOULD FACILITATE JOINING OF TUBING, MINIMIZE BRAZE CONTAMINATION
TERRIL, A. E. /N. AM. AVIATION/ JUL. 1966
MSC-777
Union assembly provides a fluidtight joint between two lengths of tubing and minimizes introduction of braze contaminants into the tubing. The union contains two brazing preforms separated by a metal ring that serves as a dam for the molten brazing alloy.

B66-10317
FLEXIBLE ARMS PROVIDE CONSTANT FORCE FOR PRESSURE SWITCH CALIBRATION
CAIN, D. E. KUNZ, R. W. /GE/ JUL. 1966
HQ-38
In-place calibration of a pressure switch is provided by a system of radially oriented flexing arms which, when rotated at a known velocity, convert the centrifugal force of the arms to a linear force along the shaft. The linear force, when applied to a pressure switch diaphragm, can then be calculated.

B66-10318
TORUS ELEMENTS USED IN EFFECTIVE SHOCK ABSORBER
CUNNINGHAM, P. PLATUS, D. L. /AEROSPACE RES. ASSOC./ JUL. 1966
WOO-114
Energy absorbing device forces torus elements to revolve annularly between two concentric tubes when a load is applied to one tube. Interference forces can be varied by using focus elements of different thicknesses. The device operates repeatedly in compression or tension, and under problems of large onset rate tolerance or structural overload.

B66-10319
FIBER LENGTH AND ORIENTATION PREVENT MIGRATION IN FLUID FILTERS
REIMAN, P. A. /ARTHUR D. LITTLE/ JUL. 1966
M-FS-541
Stainless steel fiber web filter resists fiber migration which causes contamination of filtered fluids. This filter is capable of holding five times more particulate matter before arbitrary cutoff pressure drop and shows excellent retention in fuel flow at high rates.

B66-10321
SWIVELING LATHE JAW CONCEPT FOR HOLDING IRREGULAR PIECES
DAVID, J. /N. AM. AVIATION/ JUL. 1960
M-FS-783
Clamp holds irregularly shaped pieces in lathe chuck without damage and eliminates excessive time in selecting optimum mounting. Interchangeable jaws ride in standard jaw slots but swivel so that the jaw face bears evenly against the workpiece regardless of contour. The jaws can be used on both engine and turret lathes.

B66-10323
SPECIAL MANDREL PERMITS UNIFORM WELDING OF OUT-OF-ROUND TUBING
DOR, M. E. FUEG, L. B. WHIFFEN, E. L. /N. AM. AVIATION/ JUL. 1966
M-FS-706
Segmented, expandable mandrel provides uniform weld bead chilling in machine welding of circumferential seams on out-of-round tubes. Radial expansion of a rubber actuator forces the individual mandrel segments into intimate contact with the inner walls of mating tubes. Various sizes of tubing may be welded by using different mandrels and actuators.

B66-10326
EXTERNAL LINKAGE TIE PERMITS REDUCTION IN DUCTING SYSTEM FLANGE THICKNESS
PFLEGER, R. O. /N. AM. AVIATION/ JUL. 1966
M-FS-823
External linkage tie reduces flange thickness and increases seal efficiency in high pressure ducting and piping systems. The linkage transmits the pressure separating load to the tube wall behind the flange allowing the flange to support only the seal.

B66-10328
CORK IS USED TO MAKE TOOLING PATTERNS AND MOLDS
HOFFMAN, F. J. /N. AM. AVIATION/ JUL. 1966
MSC-425
Sheet and waste cork are cemented together to provide a tooling pattern or mold. The cork form withstands moderately high temperatures under vacuum or pressure with minimum expansion, shrinkage, or distortion.

B66-10329
INSPECTION OF FINE WIRES SIMPLIFIED BY CAPILLARY TUBE WIRE HOLDER
RAPHAEL, H. A. /N. AM. AVIATION/ JUL. 1966
MSC-358
Capillary tube wire holder provides a mount for fine wires for photomicrographs. The holder is mounted in a stainless steel tube and cast in a transparent casting material. It protects and permits easy location of the wire.

B66-10330
ADAPTER ASSEMBLY PREVENTS DAMAGE TO TUBING DURING HIGH PRESSURE TESTS
STINETT, L. L. /N. AM. AVIATION/ JUL. 1966
MSC-563
Portable adapter assembly prevents damage to tubing and injury to personnel when pressurizing a system or during high pressure tests. The assembly is capable of withstanding high pressure. It is securely attached to the tubing stub end and may be removed without brazing, cutting or cleaning the tube.

B66-10332
BELLOWS JOINT ABSORBS TORSIONAL DEFLECTIONS IN

DUCT SYSTEM
DANIELS, C. M. /N. AM. AVIATION/ JUL. 1966
M-FS-882
Long, thin-walled bellows compressed into a short length absorbs the same amount of torsional deflection as the same tube in full length condition and saves in cost, complexity and space. This bellows has lower torsional spring rate to absorb the bulk of the duct assembly tortional deflections, leaving the other bellows free to absorb axial and angular deflections.

B66-10333
VIBRATOR IMPROVES SPARK EROSION CUTTING PROCESS
THRALL, L. R. /AEROJET-GEN. CORP./ JUL. 1966
NU-0071
Variable frequency mechanical vibrator improves spark erosion cutting process. The vibration of the cutting tip permits continual flushing away of residue around the cut area with nondestructive electric transformer oil during the cutting process.

B66-10334
STRIPPABLE GRID FACILITATES REMOVAL OF GRID-SURFACED CONICAL WORKPIECE FROM DIE
RUPPE, E. P. /N. AM. AVIATION/ JUL. 1966
M-FS-716
Female die facilitates the removal of a sheet metal structure from a die used for explosive forming of the metal. The female die consists of a smooth conical frustrum made of fiberglass with a cured epoxy-resin surface on which a molded grid pattern made of a polyurethane resin is overlaid.

B66-10335
SHOCK-OPERATED VALVE WOULD AUTOMATICALLY PROTECT FLUID SYSTEMS
BRANUM, L. W. WELLS, G. H. /N. AM. AVIATION/ JUL. 1966
M-FS-801
Glandless valve shuts down high-pressure fluid systems when severe shock from an explosion or earthquake occurs. The valve uses a pendulum to support the valve closure plug in the open position. When jarred, the valve body is moved relative to the pendulum and the plug support is displaced, allowing the plug to seat and be held by spring pressure.

B66-10336
CONCEALED HINGE PERMITS FLUSH MOUNTING OF DOORS AND HATCHES
HOLMAN, E. V. /N. AM. AVIATION/ JUL. 1966
MSC-623
Hinge assembly permits flush mounting of doors and hatches of considerable thickness so that the axis of instant rotation, produced by the hinge, lies outside the panel surface and beyond the perimeter adjacent to the hinge. In operation, motion of the assembly is initially parallel, changing to angular after clearing the panel perimeter.

B66-10337
SEMIAUTOMATIC DEVICE TESTS COMPONENTS WITH BIAXIAL LEADS
MARSHALL, T. C. /N. AM. AVIATION/ AUG. 1966 SEE ALSO B65-10243
MSC-516
Semiautomatic device with a four-terminal network tests quantities of components having biaxial leads. The four-terminal network permits the testing of components in different environments. This device is easily modified for completely automatic operation.

B66-10338
LATCHING MECHANISM OPERATES IN LIMITED ACCESS AREA
HOLMAN, E. V. /N. AM. AVIATION/ JUL. 1966
MSC-230
Latching mechanism that is securely locked by the movement of the operating handle in one direction, is used in limited access areas. This mechanism is operated by a force applied to the handle at small angles.

B66-10339
SIMULATOR EFFECTS PARTIAL GRAVITY CONDITIONS
JOHNSON, H. I. TRADER, A. G. JUL. 1966
MSC-152
Adjustable apparatus which simulates partial to zero gravity partially supports the weight of convalescing patients in rehabilitation exercises. This device is an ideal tool for physical therapy.

B66-10342
GAS DIFFUSER FACILITATES WITHDRAWAL OF CRYOGENIC LIQUIDS FROM TANKS
DUNN, J. D. /N. AM. AVIATION/ JUL. 1966
M-FS-915
Compact, cylindrical gas diffuser with radial exhaust slots and internal axial flow channels maintains the necessary pressure for the desired withdrawal rate of cryogenic liquids from tanks. The diffuser minimizes pressure loss which results from condensation of nitrogen gas in the liquid and prevents direct impingement of gas jets on liquid surface to reduce turbulence.

B66-10343
CONCEPT FOR PASSIVE SYSTEM TO CONTROL GAS FLOW INDEPENDENTLY OF TEMPERATURE
CHAVEZ, E. S. MILLEMAN, S. E. RICKEMAN, E. C. /N. AM. AVIATION/ JUL. 1966
M-FS-982
Volumetric flow rate of gas is maintained at a constant value independent of temperature by passing the gas through a parallel or series combination of turbulent flow and laminar flow resistors. By proper combination of resistors, the flow rate may be automatically made to vary as an increasing or decreasing function of temperature.

B66-10345
FRICTION LOADING DEVICE ENABLES ACCURATE TESTING OF BRITTLE MATERIALS
HENGSTENBERG, T. F. ZIBRITOSKY, G. /WESTINGHOUSE ASTRONUCL. LAB./ JUL. 1966
NU-0051
Friction loading device gives axial symmetry to test specimen of brittle materials during tensile testing. This axial alignment prevents bending stresses which hinder measurement of tensile strength.

B66-10346
TOOL FORMS RIGHT ANGLES IN COMPONENT LEADS
GLENN, C. G. JUL. 1966
M-FS-722
Hand tool forms right angles in electronic component leads so they fit the spaced holes of a printed circuit board. This tool firmly holds the leads at points near the component ends to prevent damage and provide accuracy.

B66-10352
BRAZING PROCESS PROVIDES HIGH-STRENGTH BOND BETWEEN ALUMINUM AND STAINLESS STEEL
HUSCHKE, E. G., JR. NORD, D. B. /N. AM. AVIATION/ AUG. 1966
M-FS-803
Brazing process uses vapor-deposited titanium and an aluminum-zirconium-silicon alloy to prevent formation of brittle intermetallic compounds in stainless steel and aluminum bonding. Joints formed by this process maintain their high strength, corrosion resistance, and hermetic sealing properties.

B66-10354
WELDS CHILLED BY LIQUID COOLANT MANIFOLD
ODOR, M. E. WHIFFEN, E. E. /N. AM. AVIATION/ AUG. 1966
M-FS-679 M-FS-680
Liquid coolant chill tool provides uniform cooling to materials adjacent to weld areas on long or contoured butt welds. This tool incorporates a manifold that clamps to the weld joint by vacuum and circulates liquid in direct contact with adjacent material.

B66-10357
SUPPRESSOR PLATE ELIMINATES UNDESIRED ARCING

DURING ELECTRON BEAM WELDING
HANCHEY, K. K. KUBIK, J. MAHON, J. C. /HAYES INTERN. CORP./ AUG. 1966
M-FS-1126
Suppressor grid eliminates undesired arcing during electron beam welding in one of two ways. A grid at ground potential collects secondary emission of ions and electrons produced by the beam as it strikes the workpiece, or a negatively energized grid repels the plasma arc back to the workpiece. This eliminates ground screens used to cover view ports.

B66-10360
ALUMINUM CORE STRUCTURES BRAZED WITHOUT USE OF FLUX
INNOVATOR NOT GIVEN /AERONCA MFG. CORP./, AUG. 1966
M-FS-659
Aluminum alloy face sheets are brazed to aluminum alloy honeycomb cores without using corrosive flux by means of one or three methods. The completed brazed structure has the high-strength characteristics of heat treated aluminum alloys.

B66-10364
VERSATILE MACHINE MILLS, SAWS LIGHT MATERIALS
RAUSCHL, J. A. /N. AM. AVIATION/ AUG. 1966
M-FS-827
Versatile milling/sawing machine performs angle cuts, flat and profile milling, machining of grooves and slots, and edge trimming of phenolic panels. The machine is mounted on rails above a table equipped with vacuum capability for holding workpieces.

B66-10365
DIAPHRAGM VALVE FOR CORROSIVE AND HIGH TEMPERATURE FLUID FLOW CONTROL HAS UNIQUE FEATURES
EBIHARA, B. T. VARY, A. AUG. 1966
LEWIS-304
Monometallic diaphragm valve is used for corrosive and high temperature fluid flow control. The body, diaphragm, and plug of the valve are welded together to form an integral leakproof unit for containing the fluid as it passes through the valve from inlet to outlet.

B66-10366
HOLLOW SPHERICAL ROTORS FABRICATED BY ELECTROPLATING
AVERY, H. W. CONROY, T. F. /GE/ AUG. 1966
JPL-SC-117
Equatorial bands are fabricated to provide a locating fit for the hemispheres of hollow spherical rotors which are then jointed by electroplating. Several nonmagnetic materials may be used to form the joint, such as aluminum, copper, iron, gold, plantinum, and zinc.

B66-10367
DOT PATTERNS PROVIDE REPRODUCIBLE FLAW AREAS FOR STUDY OF ADHESIVE BONDS
FRANK, L. SCHMITZ, G. /GEN. AM. TRANSPORTATION CORP./ AUG. 1966
M-FS-862
Photographic production of a small-dot pattern of known geometry on the surface of a substrate for controlled area degradation enables a study of adhesive bond strengths. These dot patterns may also be applied to force-limiting devices which must depend on the adhesive bonding strength between mating surfaces.

B66-10369
AUTOMATIC PROTECTIVE VENT HAS FAIL-SAFE FEATURE
DAMERON, C. E. AUG. 1966
LANGLEY-218
Delayed vent valve system in a mechanical backing pump in a vacuum system allows the pneumatic foreline valve to seal before the pump vent opens. The system is designed to be fail-safe and operate even though there is loss of electrical power.

B66-10370
PORTABLE LIGHTWEIGHT CELL PROVIDES CONTROLLED ENVIRONMENT
SHELTON, S. TARR, J. /N. AM. AVIATION/ AUG. 1966
MSC-648
Inflatable, lightweight cell provides a separate, secondary environment for a spacesuited man in case of spacesuit damage or malfunction. The cell has a pressure-sealing zipper and is equipped to maintain a livable atmosphere.

B66-10371
BRAZING RETORT MANIFOLD DESIGN CONCEPT MAY MINIMIZE AIR CONTAMINATION AND ENHANCE UNIFORM GAS FLOW
RUPPE, E. P. /N. AM. AVIATION/ AUG. 1966
M-FS-707
Brazing retort manifold minimizes air contamination, prevents gas entrapment during purging, and provides uniform gas flow into the retort bell. The manifold is easily cleaned and turbulence within the bell is minimized because all manifold construction lies outside the main enclosure.

B66-10375
IMPACT- AND PUNCTURE-RESISTANT MATERIAL PROTECTS PARTS FROM DAMAGE
SHERIFF, D. D. /N. AM. AVIATION/ AUG. 1966
MSC-747
Uniform sized, laminated panels protect delicate parts and equipment from damage during storage and transportation. The panels consist of sheets of steel foil bonded between sheets of elastic foam. They are lightweight, impact- and puncture-resistant, and, when formed into an enclosure, provide a barrier against moisture and thermal shock.

B66-10378
NONHAZARDOUS ACID ETCHES WELD SAMPLES
ALLEN, B. C. /N. AM. AVIATION/ AUG. 1966
M-FS-975
Nonhazardous citric acid solution used with 24-volt dc power supply etches weld samples. This etching method is limited to 300 stainless steel and a small range of other high temperature alloys.

B66-10381
GAS-INJECTION VALVE OPERATES AT HIGH SPEED
HOH, F. C. LOWDER, R. S. /ADVANCED KINETICS, INC./ AUG. 1966 2 P
HQ-49
Fast acting gas valve is used for injecting a short pulse of gas into a vacuum chamber during plasma acceleration experiments. It contains a lightweight closure disk that is forced away from the valve seat when an electromagnetic coil is momentarily energized and immediately rebounds from a stop back onto the seat.

B66-10383
GEAR DRIVE AUTOMATICALLY INDEXES ROTARY TABLE
JOHNS, M. F. /N. AM. AVIATION/ AUG. 1966
M-FS-753
Combination indexer and drive unit drills equally spaced circular hole patterns on rotary tables. It automatically rotates the table a distance exactly equal to one hole spacing for each revolution of a special idler gear.

B66-10384
UNIVERSAL TRANSLOADER MOVES DELICATE EQUIPMENT WITHOUT STRESS
BARBOUR, J. R. KESSLER, P. N. /N. AM. AVIATION/ AUG. 1966
MSC-654
Transloader moves delicate or heavy items over irregular surfaces without transmitting stress to the load. The loader is supported on three pivot points which produce a wrap-free base. The base is supported by an articulated four-wheel frame.

B66-10385
INFLATABLE O-RING SEAL WOULD EASE CLOSING OF HATCH COVER PLATE
NEARY, K. J. /N. AM. AVIATION/ AUG. 1966
MSC-740
Inflatable O-ring seal provides positive sealing

means that does not require the manual exertion of a large compressive force during opening or closing of a rotary-type hatch cover plate. The O-ring is deflated during opening and closing, and inflated after closure by a gas pressure source.

B66-10390
ONE-PIECE TRANSPARENT SHELL IMPROVES DESIGN OF HELMET ASSEMBLY
JONES, R. L. OKANE, J. H. AUG. 1966
MSC-187
One-piece transparent helmet shell made of polycarbonate is equipped with a helmet protection pad, a visor assembly, a communications skull cap, and an emergency oxygen supply. This design offers improvements over previous designs in weight, visual field, comfort and protection.

B66-10399
EXPANDABLE TAKEUP REEL FACILITATES PAPER TAPE REMOVAL
WESTERMAN, H. E. /DOUGLAS AIRCRAFT CO./ SEPT. 1966
WOO-271
Takeup reel receives continuous paper tapes from data recording machines. The roller is recessed to have four longitudinal members about its periphery which can be extended or retracted to change the overall diameter of the assembly to allow easy removal of the tapes.

B66-10402
ROTARY VALVE CONTROLS MULTIPLE HYDRAULIC LEVELING CYLINDERS
INNOVATOR NOT GIVEN /BOEING CO./ SEP. 1966
M-FS-361
Single rotary valve controls a circular bank of hydraulic leveling cylinders that must maintain large loads within plus or minus three arc minutes of the true vertical. Since the position of the valve spool determines the flow rate of each bank of cylinders and hence cylinder position, different flow rates may be obtained by changing the spool shape.

B66-10403
SPECIAL TOOL KIT AIDS HEAVILY GARMENTED WORKERS
HOLMES, A. E. /MARTIN CO./ SEP. 1966
MSC-163
Triangular aluminum tool kit, filled with polyurethane is constructed to receive various tools and hold them in a snug but quick-release fit as an aid to heavily gloved workers. The kit is designed to allow mounting within easily accessable reach and to provide protection of the tools during storage.

B66-10405
DESIGN RELIABILITY GOAL DEVELOPED FROM SMALL SAMPLE
BURROWS, D. L. HEATHCOCK, R. SEP. 1966
M-FS-403
Sampling distributions, constructed by Monte Carlo simulation are used in hardware development to establish a design reliability goal, to place a confidence coefficient on reliability estimates, and to determine whether sample stress/strength data demonstrate a specified reliability at a specified confidence level.

B66-10408
CLOSED LOOP OPERATION ELIMINATES NEED FOR AUXILIARY GAS IN HIGH PRESSURE PUMPING STATION
LANDY, D. G. /N. AM. AVIATION/ SEP. 1966
M-FS-893
Closed loop system for a liquid nitrogen high pressure pump feeds back gaseous nitrogen generated by heat leak into the reservoir to maintain the pressure in the storage tank. This safer, more efficient system eliminates the need for auxiliary gas to maintain the tank pressure and can be used on relatively high cryogenic pumping systems.

B66-10410
ALIGNMENT TOOL FACILITATES PIN PLACEMENT ON IRREGULAR HORIZONTAL SURFACES
BOYLE, J. V. SEP. 1966
LANGLEY-219
Alignment tool facilitates spotting and cementing plastic pins on the true vertical to irregular concave and convex surfaces. The tool consists of a wood tripod with individually adjustable legs, a wood block with a hole for placing the pins and two spirit levels at a 90 degree angle for easy alignment.

B66-10411
HEAVY DUTY PRECISION LEVELING JACKS EXPEDITE SETUP TIME ON HORIZONTAL BORING MILL
DELLENBAUGH, W. JONES, C. /N. AM. AVIATION/ SEP. 1966
M-FS-1084
Leveling jack is a precise alignment tool which expedites the setup of components or assemblies up to 2500 pounds on horizontal boring mills. This tool eliminates the necessity of wedges and blocks to shim the components to proper position.

B66-10415
ELECTROPLATING ELIMINATES GAS LEAKAGE IN BRAZED AREAS
LEIGH, J. D. /N. AM. AVIATION/ SEP. 1966
M-FS-923
Electroplating method seals brazed or welded joints against gas leakage under high pressure. Any conventional electroplating process with many different metal anodes can be used, as well as the build up of layers of different metals to any required thickness.

B66-10416
MATCHING FLOW CHARACTERISTICS OF STANDARD SHUTOFF VALVES ELIMINATES NEED FOR CUSTOM FABRICATED VALVES
BEVAN, A. F. /N. AM. AVIATION/ SEP. 1966
M-FS-1069
Standard high pressure valves are used in low pressure fluid system testing when a substantial system pressure increase is required. The flow-vs-valve stroke is matched with that of the valves being replaced. Some correction to the plug contour may be necessary.

B66-10417
MODIFIED PLIERS FACILITATE COUPLING OF BAYONET-TYPE CONNECTORS
HARRIS, F. /N. AM. AVIATION/ SEP. 1966
M-FS-1344
Modified single-tube hole punch or grommet-setting pliers couples or uncouples spring-loaded bayonet-type connectors quickly and easily. The anvil and tube or punch of the single-tube hole punch or pliers are removed and an open-end slot is machined in the tips of the jaws.

B66-10418
BEARING PULLER FACILITATES REMOVAL AND REPLACEMENT OF BEARING ASSEMBLIES
SCHAUS, R. B. /N. AM. AVIATION/ SEP. 1966
M-FS-1538
Bearing puller removes ball bearing assemblies, which carry the rotor, from turbine type flowmeters. It matches the bearing configuration to facilitate removal of the bearing assemblies from the support members.

B66-10422
LARGE DIAMETER METAL RING SEAL PREVENTS GAS LEAKAGE AT 5000 PSI
MIDDELKOOP, J. H. /N. AM. AVIATION/ SEP. 1966
M-FS-1064
Large metal ring seal prevents gas leakage in hydrogen, helium, or nitrogen storage bottles at pressures up to 5,000 psi. The grooved ring seal which contains elastomer O-rings is installed between the mating faces of the access cover and the storage bottle.

B66-10424
LABYRINTH-TYPE VALVE SEAT INCREASES VALVE LIFE BY DECREASING FLUID VELOCITY
HICKS, J. E. /N. AM. AVIATION/ SEP. 1966
M-FS-1051

Labyrinth-type valve seat and a moving piston with V-notch openings reduce the fluid velocity and thus, the erosion rate of regulator valves.

B66-10425
INTERIOR SERVICING PLATFORM SIMPLIFIES MAINTENANCE OF STORAGE TANKS
RANGER, C. S. /N. AM. AVIATION/ OCT. 1966
M-FS-1300
Folded work platform simplifies the servicing of the interiors of storage tanks and vessels with limited access openings. The extendable platform which can be lowered through the limited access openings is mounted on a segmented shaft which is externally supported.

B66-10428
FLEXIBLE DRIVE ALLOWS BLIND MACHINING AND WELDING IN HARD-TO-REACH AREAS
HARVEY, D. E. ROHRBERG, R. G. /N. AM. AVIATION/ OCT. 1966
MSC-524
Flexible power and control unit performs welding and machining operations in confined areas. A machine/weld head is connected to the unit by a flexible transmission shaft, and a locking-indexing collar is incorporated onto the head to allow it to be placed and held in position.

B66-10434
ROTATING MAGNETIC POLES USED TO PUMP MERCURY
EBIHARA, B. T. LOWDERMILK, W. H. VARY, A. OCT. 1966 SEE ALSO NASA-TN-D-2965
LEWIS-276
Rotating magnetic pump with redesigned pump cell is used for pumping mercury. The modified pump has better electrical continuity, more efficient heat removal, and good wetting characteristics in the mercury flow channel.

B66-10443
NEW BACKUP-BAR GROOVE CONFIGURATION IMPROVES HELIARC WELDING OF 2014-T6 ALUMINUM
BLACK, F. J. /N. AM. AVIATION/ OCT. 1966
MSC-806
Backup chill bars with new grooved dimensions improve welding of 2014-T6 aluminum. This groove geometry affords optimum chilling characteristics, reduces shrinkage and the weld bead is narrower and consistently free from impurities or voids.

B66-10446
SEAL-OFF ASSEMBLY PERMITS RAPID EVACUATION OF AIR FROM CONTAINERS
DEMERS, R. R. /RCA/ OCT. 1966
GSFC-513
Seal-off assembly which permits rapid container evacuation using large diameter tubing has a vacuum valve that permits sealing plate transfer from the vacuum valve stem to the container after evacuation. The sealing plate can be reused repeatedly. This device can repump in case of a small leak without exposing the container to the atmosphere.

B66-10450
METAL TUBE CAN BE FOLDED FOR COMPACT STOWAGE, IS SELF-ERECTING
OCT. 1966 SEE ALSO NASA-TM-X-1187
LEWIS-288
Metal tube configuration reduces the section modulus to that of a thin plate, thus permitting the section to be bent into a coil for stowage in limited space without destructive yielding of the material. It is readily released to serve as a rigid fluid transportation conduit or structural member.

B66-10455
MYLAR FILM ELIMINATES SILK SCREENING OF EQUIPMENT PANELS
CONGER, D. R. /N. AM. AVIATION/ OCT. 1966
MSC-798
Equipment panel designs and nomenclature are photographed on clear Mylar film to permit fast and inexpensive panel redesigns and revisions and to eliminate the silk screen process. The film is coated with an adhesive and impressed on the panel. For revisions, the film is easily peeled off and replaced.

B66-10457
LOGIC SYSTEM AIDS IN EVALUATION OF PROJECT READINESS
MARIS, S. J. OBRIEN, T. J. /N. AM. AVIATION/ OCT. 1966
MSC-753
Measurement Operational Readiness Requirements /MORR/ assignments logic is used for determining the readiness of a complex project to go forward as planned. The system uses logic network which assigns qualities to all important criteria in a project and establishes a logical sequence of measurements to determine what the conditions are.

B66-10459
IMPROVED METHOD FACILITATES DEBULKING AND CURING OF PHENOLIC IMPREGMATED ASBESTOS
GAINES, P. /N. AM. AVIATION/ OCT. 1966
MSC-949
Workpieces covered with phenolic impregnated asbestos tape and then wrapped with a specified thickness of nylon yarn under pressure, are debulked and cured in a standard oven. This method of debulking and curing is used in the fabrication of ablative chambers for the Gemini and Apollo attitude control engines.

B66-10460
CHART SYSTEM SIMPLIFIES IDENTIFICATION OF COMPLEX DESIGN ASSEMBLIES
MORIN, H. P. /N. AM. AVIATION/ OCT. 1966
MSC-752
Identification breakdown chart that lists the component parts required for any specific end item is used to identify rapidly and accurately, from numerous drawings, all the component parts of a complex design assembly. Cylindrical and complex configurations are depicted as continuous flat surfaces for ready identification.

B66-10463
MICROMINIATURE THERMOCOUPLE MONITORS OWN INSTALLATION
GARRETT, A. J. SELLERS, J. P., JR. /N. AM. AVIATION/ OCT. 1966
M-FS-1111
Microminiature thermocouple makes precision gas sidewall temperature readings inside large thrust chambers. It is installed by a technique whereby the sensor monitors its own installation to insure against thermal damage to the thermocouple and ensure minimum disturbance to chamber surfaces.

B66-10464
LARGE SEALS FABRICATED FROM SMALL SEGMENTS REDUCE PROCUREMENT LEAD TIME
DANIELS, C. M. HANES, V. D. /N. AM. AVIATION/ OCT. 1966
M-FS-1117
Large diameter seals are fabricated from narrow strip stock welded in segments to form a complete ring. This technique could be used to reduce the cost of critical, large diameter seals in the heating and ventilating industry, petrochemical industry, and marine fabrication industry.

B66-10470
INDICATOR SYSTEM PROVIDES COMPLETE DATA OF ENGINE CYLINDER PRESSURE VARIATION
MC JONES, R. W. MORGAN, N. E. /VICKERS, INC./ DEC. 1966
LEWIS-291
Varying reference pressure used together with a balanced pressure pickup /a diaphragm switch/ to switch the electric output of the pressure transducer in a reference pressure line obtains precise engine cylinder pressure data from a high speed internal combustion engine.

B66-10471
COPPER-ACRYLIC ENAMEL SERVES AS LUBRICANT FOR COLD DRAWING OF REFRACTORY METALS
BEANE, C. KARASEK, F. NOV. 1966
ARG-54
Acrylic enamel spray containing metallic copper pigment lubricates refractory metal tubing during

cold drawing operations so that the tubing surface remains free from scratches and nicks and does not seize in the die. Zirconium alloys, zirconium, tantalum alloys, niobium alloys, and titanium alloys have been drawn using this lubricant.

B66-10472
RUBBER AND ALUMINA GASKETS RETAIN VACUUM SEAL IN HIGH TEMPERATURE EMF CELL
HESSON, J. C. NOV. 1966
ARG-17
Silicone rubber gasket and an alumina gasket retain a vacuum inside a high temperature emf cell in which higher and lower density liquid metal electrodes are separated by an intermediate density fused salt electrolyte. This innovation is in use on a sodium bismuth regenerable emf cell in which the fused salts and metals are at about 500 deg to 600 deg C.

B66-10473
MINIATURE VALVE ACCURATELY CONTROLS SMALL VOLUME FLUID FLOW
GRUNWALD, A. NOV. 1966
ARG-66
Hydraulic or pneumatic actuated valve accurately controls small volume flow of liquids or gases by expanding or relaxing an O-ring within an annular flow space. In one application, 2 such valves were used to accurately meter small volumes of helium under a pressure of 1000 psi.

B66-10477
CONCEPT OF PLANETARY GEAR SYSTEM TO CONTROL FLUID MIXTURE RATIO
MC GROARTY, J. D. /N. AM. AVIATION/ DEC. 1966
M-FS-1785
Mechanical device senses and corrects for fluid flow departures from the selected flow ratio of two fluids. This system has been considered for control of rocket engine propellant mixture control but could find use wherever control of the flow ratio of any two fluids is desired.

B66-10484
BRAKING MECHANISM IS SELF ACTUATING AND BIDIRECTIONAL
PIZZO, J. /N. AM. AVIATION/ OCT. 1966
M-FS-1299
Mechanism automatically applies a braking action on a moving item, in either direction of motion, immediately upon removal of the driving force and with no human operator involvement. This device would be useful wherever free movement is undesirable after an object has been guided into a precise position.

B66-10485
COMBINATION SPACER AND GASKET PROVIDES EFFECTIVE STATIC SEAL
JONES, F. B. /N. AM. AVIATION/ OCT. 1966
M-FS-1397
Closely machined steel ring having narrow sealing lands on both faces and a thin coating of a commercially available halocarbon polymer combines the functions of a spacer and static seal ring or gasket having a minimum of potential leak paths. The device is effective over a wide range of temperatures down to minus 423 deg F and at pressure up to 180 psig.

B66-10489
PLUG REPLACES WELD FILLER AS SEAL IN COMPLEX CASTING
GOUNDREY, R. L. HARRIS, C. L. /AEROJET-GEN. CORP./ OCT. 1966
NU-0049
Expandable metal plug is inserted to provide a seal to support the mold core with small blocks, referred to as chaplets, during the casting of a complex volute. Weld-warpage and multiple X-ray inspection are eliminated by use of this technique.

B66-10495
SPOOL VALVE CYCLES AT CONTROLLED FREQUENCY
CHARLTON, K. W. VAN ARNAM, D. E. /BECKMAN INSTR./ NOV. 1966
MSC-143
Spool valve accurately controls the cycle of a pneumatically-actuated system over long periods. Regulation of pressure from the external source, positioning of the adjusting plugs, and magnet selection, together afford wide variation in cyclic timing and speed of closure in either direction.

B66-10498
QUICK-RESPONSE SERVO AMPLIFIES SMALL HYDRAULIC PRESSURE DIFFERENCES
WIEGARD, D. E. NOV. 1966
ARG-99
Hydraulic servo, which quickly diverts fluid to either of two actuators, controls the flow rates and pressures within a hydraulic system so that the output force of the servo system is independent of the velocity of the mechanism which the system actuates. This servo is a dynamic feedback control device.

B66-10513
OPPOSED ARCS PERMIT DEEP WELD PENETRATION WITH ONLY ONE PASS
BUDDS, L. E. /N. AM. AVIATION/ NOV. 1966
M-FS-1696
Arc welding technique uses opposed electrodes on either side of the workpiece, operated in right angles, out-of-phase, pulsating direct current. Complete penetration has been obtained with this technique in metals ranging from 0.062- to 1.0-inch thickness.

B66-10514
IN-TANK SHUTOFF VALVE IS PROVIDED WITH MAXIMUM BLAST PROTECTION
HOLDEN, C. F. /N. AM. AVIATION/ NOV. 1966
M-FS-1529
In-tank shutoff valve is installed with the valve poppet and actuator inside the tank to provide maximum blast protection during rocket engine test operation. This valve design is applicable wherever explosive fuels are used and is currently being used in lox and liquid hydrogen tanks at a rocket engine test site.

B66-10522
SELF-ACTUATING GRAPPLE AUTOMATICALLY ENGAGES AND RELEASES LOADS FROM OVERHEAD CRANES
FROEHLICH, J. A. KARASTAS, G. A. NOV. 1966
ARG-81
Two-piece grapple mechanism consisting of a lift knob secured to the load and a grapple member connected to the crane or lift automatically disengages the load from the overhead lifting device when the load contacts the ground. The key feature is the sliding collar under the lift knob which enables the grapple latch to be stripped off over the lift knob.

B66-10523
HYDRAULIC FLUID SERVES AS MANDREL FOR SMALL DIAMETER REFRACTORY TUBE DRAWING
MAYFIELD, R. M. DEC. 1966
ARG-44
Sealing hydraulic fluid within a tube and passing the tube through a reducing die produces high quality small diameter refractory metal tubing. The encased fluid eliminates the need for mandrel or ductile core removal and drawing can proceed with less handling operations.

B66-10530
PERFORATIONS IN JET ENGINE SUPERSONIC INLET INCREASE SHOCK STABILITY
KEPPLER, C. R. /UNITED AIRCRAFT CORP./ NOV. 1966
NEO-8
Modification of a conventional jet engine internal compression supersonic inlet results in increased shock stability and thus, engine instantaneous response to changes in inlet air properties. This technique provides a large amount of bleed near the maximum pressure recovery at the expense of minor bleed flow during critical operation.

B66-10537
GAGE TESTS TUBE FLARES QUICKLY AND ACCURATELY

GRIFFIN, F. D. NOV. 1966
KSC-66-19
Flared tube gauge with a test cone that is precisely made with a tapering surface to complement the tube flare is capable of determining the accuracy of a tube flare efficiently and economically. This device should improve the speed, efficiency, and accuracy of tube flare inspections.

B66-10545
HOIST IS AUTOMATICALLY STOPPED AT LOW DECELERATION RATE
GEORGE, T. R. HESS, H. C. /N. AM. AVIATION/ DEC. 1966
M-FS-1639
In operating a hoist to transport delicate or fragile components, an automatic stopping device is adjusted to impose a predetermined deceleration rate during stopping.

B66-10546
INTERNAL MACHINING ACCOMPLISHED AT CONSTANT RADII
GOLLIHUGH, T. E. /N. AM. AVIATION/ DEC. 1966
M-FS-1573
Device machines fluid passages in workpieces at constant radii through two adjacent surfaces that are at included angles up to approximately 120 degrees. This technique has been used extensively in fabricating engine parts where close control of fluid flow is a requirement.

B66-10550
DAMPER REDUCES EFFECTS OF RESONANCE ON FORCE TRANSDUCER
POSTMA, R. W. /N. AM. AVIATION/ NOV. 1966
WSO-321
Viscous-film damper eliminates response lag of resonance generated noise when inserted into the thrust measuring system. This technique can be applied to automated devices when pulsed force or low order impact is involved, and where signal noise is produced by stopping or reversal of mechanical travel or by water hammer.

B66-10562
METALLOGRAPHIC HOLDING FIXTURE PERMITS POLISHING OF SOFT METALS ON VIBRATORY LAPPING MACHINE
MATRAS, S. DEC. 1966
ARG-42
Circular fixture which mounts several specimens within a single turret prevents specimen smearing during grinding and polishing operations performed on a vibratory lapping machine. Each specimen is loaded individually with a weight small enough to prevent smearing but large enough to promote polishing.

B66-10567
HEAT EXCHANGER TUBES SUPPORTED IN HIGH VIBRATION ENVIRONMENT
URQUIDI, R. /N. AM. AVIATION/ DEC. 1966
M-FS-1401
Cantilevered structure supports heat exchanger coils against vibration loading while allowing freedom for differential thermal growth. The support channels will accept a variety of coil angles with the same coil pitch, thus reducing the number of parts required. This design, with slight modification, could be used to support parallel rows of straight piping.

B66-10570
STATIONARY DEVICE PRODUCES HOMOGENEOUS MIXTURE OF FLUIDS
BAKER, D. I. CALLISON, M. P. /N. AM. AVIATION/ DEC. 1966
M-FS-525
Stationary device produces a homogeneous mixture of two or more one-phase or two-phase fluids. The device contains two concentric flow guides with helical passageways through which the fluids are forced into turbulent flow by the system pressure differential.

B66-10571
DUCTILE MANDREL AND PARTING COMPOUND FACILITATE TUBE DRAWING
BURT, W. R., JR. MAYFIELD, R. M. POLAKOWSKI, N. H. DEC. 1966
ARG-43
Refractory tubing is warm drawn over a solid ductile mandrel with a powder parting compound packed between mandrel and the tube*s inner surface. This method applies also to the coextrusion of a billet and a ductile mandrel.

B66-10573
ORTHOPEDIC STRETCHER WITH AVERAGE-SIZED PERSON CAN PASS THROUGH 18-INCH OPENING
LOTHSCHUETZ, F. X. /MASON-RUST CO./ DEC. 1966
M-FS-811
Modified robinson stretcher for vertical lifting and carrying, will pass through an opening 18 inches in diameter, while containing a person of average height and weight. A subject 6 feet tall and weighing 200 pounds was lowered and raised out of an 18-inch diameter opening in a tank to test the stretcher.

B66-10575
EMERGENCY ESCAPE SYSTEM USES SELF-BRAKING MECHANISM ON FIXED CABLE
BILLINGS, C. R. MC DARIS, R. A. MC GOUGH, J. T. NEAL, P. F. DEC. 1966
KSC-66-44
Slide-wire system with a twist level slide device incorporates automatic descent and braking for the safe and rapid evacuation of personnel from tall structures. This device is used on any tall structure that might require emergency evacuation. It is also used to transfer materials and equipment.

B66-10582
COMPOSITE BULKHEAD FABRICATION DEVELOPMENT
ORR, J. DEC. 1966
M-FS-1264
Composite bulkhead is produced by a fabrication concept utilizing vacuum and/or autoclave pressure to hold preformed welded sandwich elements in place during bonding and aging.

B66-10585
ROTATIONAL FLUID COUPLING ELIMINATES HOSE ENTANGLEMENTS
AUBOL, P. B. /TRW/ DEC. 1966
MSC-312
Rotational fluid coupling mechanism circulates a temperature controlled fluid between a stationary heat exchanger and a coolant plate on a rotating platform. The mechanism consists of two concentric cylinders containing one or more flexible tubes which are controlled and positioned in such a way that it eliminates tubing entanglement.

B66-10587
QUALITY CONTROL CRITERIA FOR ACCEPTANCE TESTING OF CROSS-WIRE WELDS
BRYANT, R. D. /N. AM. AVIATION/ DEC. 1966
MSC-627
Visual inspection criteria assure the metallurgical integrity of spot welds joining nickel leads and nickel ribbon in a 90-degree cross-wire configuration.

B66-10588
PLASTIC TUBING PROTECTS FLEXIBLE COPPER HOSE
MELLGREN, B. E. /N. AM. AVIATION/ DEC. 1966
M-FS-772
Flexible copper purge and coolant hoses is covered with a high-temperature shrinkable plastic for protection against severe vibration during rocket engine tests. This type of tubing is being used on all flexible water tubes used in F-1 engine tests.

B66-10589
POSITIVE DISPLACEMENT CYLINDER MEASURES CORROSIVE LIQUID VOLUME
MARIMAN, R. A. VENDL, C. J. /N. AM. AVIATION/ DEC. 1966
MSC-1038
Positive displacement cylinder accurately measures volumetric flow rates of corrosive liquids. The

cylinder is compatible with corrosive liquids and handles flow rates from zero to 75 gpm at pressures to 900 psig with an accuracy of 0.25 per cent.

B66-10593
FLUID LOGIC CONTROL CIRCUIT OPERATES NUTATOR ACTUATOR MOTOR
INNOVATOR NOT GIVEN /BENDIX CORP./ DEC. 1966 SEE ALSO NASA-CR-54788
LEWIS-294
Fluid logic control circuit operates a pneumatic nutator actuator motor. It has no moving parts and consists of connected fluid interaction devices. The operation of this circuit demonstrates the ability of fluid interaction devices to operate in a complex combination of series and parallel logic sequence.

B66-10595
TREATMENT INCREASES STRESS-CORROSION RESISTANCE OF ALUMINUM ALLOYS
JACOBS, A. J. /N. AM. AVIATION/ DEC. 1966
M-FS-1840
Overaging during heat treatment of the aluminum alloys immediately followed by moderate plastic deformation, preferably by shock loading achieves near optimum values of both yield strength and resistance to stress corrosion. Similar results may be obtained by substituting a conventional deformation process for the shock loading step.

B66-10597
GRIT BLASTING NOZZLE FABRICATED FROM MILD TOOL STEEL PROVES SATISFACTORY
MC FARLAND, J. E. TURBITT, B. DEC. 1966
M-FS-1420
Dry blasting with glass beads through a nozzle assembly descales both the outside and inside surfaces of tubes of inconel 718 used for the distribution of gaseous oxygen. The inside of the nozzle is coated with polyurethane and the deflector with a commercially available liquid urethane rubber.

B66-10601
EQUATIONS PROVIDE TUBULAR INFORMATION ON EFFECTS OF UNIFORM AND VARIABLE LOADS ON THIN, FLAT, CIRCULAR PLATES
HEAP, J. C. DEC. 1966
ARG-151 ARG-152
Unit-mass system of derivation of equations determines the deflection, slope, and moments for thin, flat, circular plates subjected to either a uniform or a symmetrical variable load. The derived equations are computed, organized in tabular form, and graphically depicted.

B66-10604
HOLE SAW DRILL ATTACHMENT HAS ZERO FORCE REACTION
RILEY, R. H., JR. /BLACK AND DECKER MFG. CO./
HOLMES, A. E. /MARTIN CO./
DEC. 1966
MSC-543
Zero reaction tools require no force application by workers in space. The tool accomplishes hole cutting by holding the workpiece and feeding the cutting blade into and through it by forces entirely absorbed within the tool.

B66-10608
FRICTION BRAKE CUSHIONS ACCELERATION AND VIBRATION LOADS
FRASER, G. F. ZAWADSKI, G. Z. /N. AM. AVIATION/
DEC. 1966
MSC-715
Friction brake cushions an object in a vehicle from axially applied vibration and steady-state acceleration forces. The brake incorporates a doubly tapered piston that applies a controlled radial force to friction brake segments bearing against the walls of a cylinder.

B66-10610
SELECTIVE TUBE ROUGHENING INCREASES HEAT TRANSFER CAPABILITY
CARLSON, L. W. DEC. 1966
M-FS-599
Selectively roughening inside surfaces of tubes increases the heat transfer capabilities, but, minimizes the pressure drop. This technique is used to construct roughened test sections for hydrogen heat transfer studies.

B66-10611
MULTILAYER REFRACTORY NOZZLES PRODUCED BY PLASMA-SPRAY PROCESS
BLITON, J. L. RAUSCH, J. L. /IIT RES. INST./
DEC. 1966
WOO-318
Multilayer rocket nozzles formed by plasma spraying have good thermal shock resistance and can be reheated in an oxidizing environment without loss of coating adherence. Suggested application of this process are for the production of refractory components, which can be formed as surfaces of revolution.

B66-10613
NEW WELDABLE HIGH STRENGTH ALUMINUM ALLOY DEVELOPED FOR CRYOGENIC SERVICE
INNOVATOR NOT GIVEN /ALUMIUM CO. OF AM./ DEC. 1966
M-FS-737
Wrought aluminum alloy has improved low temperature notch toughness and weldability. This alloy can be mill-fabricated to plate and sheet without difficulty. Post-weld aging improves weld ductility and strength properties. A typical treatment is 8 hours at 225 deg F plus 16 hours at 300 deg F.

B66-10618
A DESIGN PROCEDURE FOR THE WEIGHT OPTIMIZATION OF STRAIGHT FINNED RADIATORS
BURIAN, R. J. HARRIS, D. W. KETCHMAN, J. J. /BATTELLE MEM. INST./ DEC. 1966 SEE ALSO NASA-TN-D-3489
GSFC-547
Design technique evaluates optimum weight of space radiator consisting of finned, right circular cylinder.

B66-10620
TURBINE BLADE ROOT DESIGN CONCEPT PROMISES SUPERIOR ALIGNMENT
KING, O. D. /N. AM. AVIATION/ DEC. 1966
M-FS-1685
Blade-to-hub mounting concept assures excellent alignment integrity and results in elimination of some welding problems associated with present designs. With this design, if rework is required, blade removal and replacement may be readily accomplished without damage to blade positioning media on the wheel hub.

B66-10626
HYDRAULICALLY CONTROLLED FLEXIBLE ARM CAN BEND IN ANY DIRECTION
GRIFFIN, F. D. DEC. 1966
KSC-66-20
Arm assembly consisting of four flexible tubes controlled by a four-way hydraulic or pneumatic valve can bend in any direction. The flexible arm could be used for probing areas that cannot be reached by ordinary tools, handling hazardous materials, and for graph recording.

B66-10627
QUICK ATTACH AND RELEASE FLUID COUPLING ASSEMBLY IS SELF-ALIGNING, SELF-SEALING
HEROLD, C. P. STAHLEY, S. D. DEC. 1966
KSC-66-8
Fluid coupling assembly that is self-aligning, self-sealing and contains a bellow ball and socket coupling for quick attach and release is highly reliable and can handle cryogenic fluids where icing is encountered. The fluid coupling assembly is used in many fluid systems but is particularly applicable to cryogenic systems.

B66-10628
CONTROLLED RELEASE DEVICE PREVENTS DAMAGE FROM DYNAMIC STRESSES
BURCHAM, T. W. DEC. 1966
KSC-66-14
Controlled release device that retards motion by

extruding or drawing a tapered ductile pin through a die will control launch vehicle motion at liftoff. The device prevents the damaging dynamic stresses that are imposed on the vehicle when it is instantaneously released at full thrust.

B66-10633
PREDICTING SURFACE HEATING RATES AND PRESSURES RESULTING FROM HOT EXHAUST GASES
PIESKI, E. T. SIMKIN, D. J. /N. AM. AVIATION/ DEC. 1966
MSC-971
Structural tests determine experimentally the amount of thermal protection required on the Apollo service module because of plume impingement heating. Exhaust flow field analysis correlates with flat plate heating rate and surface pressure in a vacuum.

B66-10634
EMERGENCY ESCAPE SYSTEM PROTECTS PERSONNEL FROM EXPLOSION AND FIRE
OFFIK, W. G. /MARTIN CO./ DEC. 1966
KSC-66-12
Elevator-type emergency escape system evacuates personnel from tall structures, especially when the possibility of explosion or fire exists. The system consists of a spike shaped rescue cabin which descends along a vertical guide cable, penetrates the dome shaped roof of an underground blast shelter and stops in a deceleration bed of granular material.

B66-10635
LIGHTWEIGHT, ALL-METAL HOSE ASSEMBLY HAS HIGH FLEXIBILITY AND STRENGTH OVER WIDE RANGE OF TEMPERATURE AND PRESSURE
BESSING, L. L. /N. AM. AVIATION/ DEC. 1966
M-FS-1831
Lightweight flexible, metal braid reinforced hose assembly is used in high and low pressure oxygen, helium, and hydrogen systems. These hose assemblies have been successfully used on the Saturn-II stage to provide joints of sufficient flexibility to absorb movement resulting from structural and load induced excursions and temperature variations.

B66-10641
POWER ARC WELDER TOUCH-STARTED WITH CONSUMABLE ELECTRODE
JEANNETTE, J. C. /AIR REDUCTION CO./ DEC. 1966
M-FS-1485
Power arc welder formed as a hand-held welding gun touch-starts, retracts a consumable electrode to create the desired arc, and then commences feeding of the consumable electrode at the rate required to form the intended bead or spot. This device achieves uniform spot welds repeatedly.

B66-10642
DEVICE MEASURES REACTION ENGINE THRUST VECTOR DEVIATIONS
LEONARD, K. SHIEBER, H. /TRW SPACE TECHNOL. LABS./ DEC. 1966
JPL-SC-163
Gimbal mounted test device measures thrust vector deviation of reaction engines in terms of angular displacement and thus precludes force interaction.

B66-10648
FUEL AND OXIDIZER VALVE ASSEMBLY EMPLOYS SINGLE SOLENOID ACTUATOR
INNOVATOR NOT GIVEN /PARKER AIRCRAFT CO./ DEC. 1966
MSC-1046
Valve assembly simultaneously starts or stops the flow of oxidizer and fuel from separate inlet channels to reaction control motors. The assembly combines an oxidizer shutoff valve and a fuel shutoff valve which are mechanically linked and operated by a single high-speed solenoid actuator.

B66-10655
CHECK VALVE INSTALLATION IN PILOT OPERATED RELIEF VALVE PREVENTS REVERSE PRESSURIZATION
OSWALT, L. /N. AM. AVIATION/ DEC. 1966
M-FS-1925
Two check valves prevent reverse flow through pilot-operated relief valves of differential area piston design. Title valves control pressure flow to ensure that the piston dome pressure is always at least as great as the main relief valve discharge pressure.

B66-10656
MECHANICAL GAUGE ACCURATELY CHECKS TUBING FLARE, ROUNDNESS, AND CONCENTRICITY
CLARK, L. K. /IBM/ DEC. 1966
M-FS-1822
Mechanical gauge checks flare roundness and concentricity of metal tubing. The gauge, which is available from off-the-shelf standard toolmaking supplies, provides the needed accuracy and is easily operated.

B66-10662
METHOD FOR PREDICTING FRICTIONAL LOSS IN METAL BELLOWS AND FLEXIBLE HOSE
CLEVELAND, J. R. DANIELS, C. M. /N. AM. AVIATION/ DEC. 1966
M-FS-883
Test data obtained concerning the frictional pressure loss to fluids flowing in unsleeved bellows and flexible hose. This data should be useful in the design of fluid systems where high delivery velocities are involved and flexible hose or bellows must be employed.

B66-10663
LATERAL RING METAL ELASTIC WHEEL ABSORBS SHOCK LOADING
GALAN, L. /BENDIX CORP./ DEC. 1966
M-FS-1312
Lateral ring metal elastic wheel absorbs practically all shock loading when operated over extremely rough terrain and delivers only a negligible shock residue to associated suspension components. The wheel consists of a rigid aluminum assembly to which lateral titanium ring flexible elements with treads are attached.

B66-10665
SPHERICAL PIPE JOINT DELIVERS LOADS EQUALLY TO MATING FLANGE
PFLEGER, R. O. /N. AM. AVIATION/ DEC. 1966
M-FS-807
Oxidizer inlet duct with a ball joint pipe fitting incorporating two spherical bearing races and balls in contact with centering cage springs transmits an evenly distributed load to the mating flange. This design should find application in piping systems where unequal load distributions exist.

B66-10667
SILAZANE ELASTOMER REMAINS RESILIENT AT 400 DEG C
INNOVATOR NOT GIVEN /SOUTHERN RES. INST./ DEC. 1966
M-FS-1144
Smooth, unfoamed elastomer is unaffected by common acids, alkalies, and organic solvents. Its thermal stability, chemical resistance, and physical properties make it of interest for various applications.

B66-10672
RESONANT FREQUENCY CAN BE ADJUSTED ON VIBRATION MOUNT
HODGES, F. /RYAN AERON./ DEC. 1966
JPL-SC-134
Vibration mount allows adjustment of its resonant frequency and is insensitive to wide temperature variation. The concept is essentially a multidirectional, frictionally damped spring with an adjustable cap. The mount provides vibration isolation in both compression and shear and may be applicable to space use.

B66-10674
ELIMINATION OF ROCKET ENGINE ASYMMETRIC LOADS DURING TESTS AT SEA LEVEL
JOHNSON, J. R. /N. AM. AVIATION/ DEC. 1966
M-FS-1730
Secondary injection concept eliminates asymmetric

and may increase thrust rocket engine loads during sea level tests. The concept uses either a tubular manifold with evenly spaced injection ports or secondary fluid injected at the turbine exhaust inlet to the thrust chamber.

B66-10676
STUDY MADE OF DESTRUCTIVE SECTIONING OF COMPLEX STRUCTURES FOR EXAMINATION
RILEY, T. DEC. 1966
LEWIS-341
Advances in destructive sectioning of very small or complex structures are discussed. Examination is made by filling the structure in a vacuum with a low viscosity potting compound and then cutting without danger of spatial disorientation.

B66-10677
STUDY MADE TO CONTROL DEPTH OF POTTING COMPOUND FOR HONEYCOMB SANDWICH FASTENERS
CUSHMAN, J. /GEN. DYN./CONVAIR/ DEC. 1966
LEWIS-370
Study determines optimum fastener insert size and shape, type of embedding cement, diameter, undercut and depth control by fiberglass plug in a honeycomb structure for maximum tensile strength. The best potting compound is 5-5-1 weight mixture of epoxy resin, curing agent, and milled glass fibers.

B66-10678
IMPROVED ROLLING ELEMENT BEARINGS PROVIDE LOW TORQUE AND SMALL TEMPERATURE RISE IN ULTRAHIGH VACUUM ENVIRONMENT
GLENN, D. C. DEC. 1966
LEWIS-359
Rolling element bearing with stainless steel races and rolling elements and a porous bronze cage successfully operates in ultrahigh vacuum environments at a low torque and with small temperature rise. All components are burnished in molybdenum disulfide.

B66-10683
VALVE EFFECTIVELY CONTROLS AMOUNT OF CONTAMINANT IN FLOW STREAM
SCHNITZER, T. E. DEC. 1966
M-FS-1771
Contaminant valve with a coaxial groove rotor uniformly deposits contaminant into a flow stream under full pressure and flow conditions. The valve tests filters and filter elements of hydraulic oil, fuel, or lubricant systems without any detrimental effect on the performance.

B66-10686
ACTUATOR DEVICE SCHEDULES RATE OF VALVE CLOSURE
INNOVATOR NOT GIVEN /WHITTAKER CORP./ DEC. 1966
M-FS-1556
Prevalve actuator schedules the closure rate of a valve. The actuator is spring-loaded to produce a normally open valve and pneumatically powered to close the valve. The closure rate is controlled by means of pneumatic snubber and booster circuitry.

B66-10688
PREFORMED STIFFENERS USED TO FABRICATE STRUCTURAL COMPONENTS FOR PRESSURIZED TANKS
LEWIS, J. C. SHERBA, E. S. /N. AM. AVIATION/ DEC. 1966
M-FS-1796
Process of fabricating stiffened section components of pressurized tanks for aerospace use was developed. A potential use of the fabrication process is the production of gore and quarter-panel sections of hydrogen and oxygen tanks for space-vehicle boosters.

B66-10694
MECHANICAL DEVICE ACCURATELY MEASURES RF PHASE DIFFERENCES IN VHF OR UHF RANGES
HOPP, L. A. /N. AM. AVIATION/ DEC. 1966
M-FS-1738
Dual range linear measurement device accurately measures rf phase differences in either VHF or UHF ranges. The device has a capability consisting of a course range extending to 30 cm/readable to 1 mm/, and any fine range portion of 2.5 cm readable to .01 mm.

B66-10695
MOTION DRIVE SYSTEM IS ACCURATELY CONTROLLED IN THE 1-MICRON RANGE
MORECROFT, J. H. DEC. 1966
JPL-864
Motion drive system has been developed for use with interferometers where accurate control of minuscule distance in the 1-micron range is of prime importance. The drive system is applicable to any device that requires extremely accurate positioning control.

B66-10697
COMBINATION DOUBLE DOOR HIGH-VACUUM VALVE PROVIDES ACCESS TO VACUUM CHAMBER
YAGER, S. P. DEC. 1966
JPL-849
Double door provides an extreme high vacuum seal as well as access to a vacuum chamber for insertion of test devices into the vacuum environment. This arrangement is applicable to any vacuum chamber and could be of value in cryopumping or mechanically pumped chambers.

B66-10698
MECHANISM FACILITATES COATING OF INNER SURFACES OF METAL CYLINDERS
BILLINGSLEY, J. M. TAFT, A. R. DEC. 1966
GSFC-515
Cylinder is rotated about shielded hot filament to vapor deposit thin coatings of aluminum or other metallic substances on the inner surface of a cylinder while avoiding heat-producing high-density current flow which causes outgassing of the coating surface. This method is acceptable for glass or metal.

B66-10702
TEFLON SHEET PERMITS VALVE AND VALVE OPERATOR TO MOVE AS A SINGLE UNIT IN A CRYOGENIC PIPE LINE
KINDER, S. K. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0077
Free floating support system in cryogenic pipe lines maintains the valve and valve operator in alignment. A teflon sheet that is placed between the slide support plate and the base plate permits the valve and valve operator to move freely, as a unit, when the pipe line moves.

B66-10703
SILVER PLATING TECHNIQUE SEALS LEAKS IN THIN WALL TUBING JOINTS
BLENDERMAN, W. H. /N. AM. AVIATION/ DEC. 1966
NU-0090
Leaks in thin wall tubing joints are sealed by cleaning and silver plating the hot gas side of the joint in the leakage area. The pressure differential across the silver during hydrostatic test and subsequent use forces the ductile silver into the leak area and seals it.

B66-10704
METAL BOOT PERMITS FABRICATION OF HERMETICALLY SEALED SPLICES IN METAL SHEATHED INSTRUMENTATION CABLES
CHAMBERS, G. /WESTINGHOUSE ASTRONUCL. LAB./ DEC 1966 SEE ALSO B66-10705
NU-0083
Metal boot splices hard sheathed instrumentation cables used with high temperature strain gauges and thermocouples. Silver brazing the conductors together, hermetically seals the splice. This boot is a highly reliable sealed splice which is equally effective at cryogenic temperatures, high temperatures, nuclear environments, and combinations of the above.

B66-10707
PNEUMATIC WRENCH RETAINS OR DISCHARGES NUTS OR BOLTS AS DESIRED
BOUILLE, J. R. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0085

Pneumatic wrench grips, screws or unscrews, and discharges a nut or bolt as desired. The device consists of a standard pneumatic wrench modified with a special hex bolt head socket assembly and a diaphragm air cylinder.

B66-10708
AIR BEARING PROVIDES FRICTION-FREE SUPPORT FOR SHAKER SYSTEM SLIP TABLE
SKOFF, R. W. /WESTINGHOUSE ASTRONUCL. LAB./ DEC. 1966
NU-0086

Air bearing system supports a shaker system slip table with minimum friction. At each corner of a square of grooves made on the table, a hole is drilled through the table and fitted with air connections. Air pressure is simultaneously fed to the four fittings forming an air bearing.

B66-10711
CARRIAGE SYSTEM REMOTELY MOVES DRAWER OVER EXTENDED DISTANCE
SALZANO, G. H. /PARSONS-JURDEN CORP./ DEC. 1966
NU-0092

In the transferring of material remotely through thick radiation shielding walls, a drawer is mounted on rollers which operate on rails carried on a slide carriage to eliminate the feature of the slide hardware projecting beyond the drawer when the drawer is extended its full distance.

B66-10712
SIMPLE MOTOR DRIVE SYSTEM OPERATES HEAVY HINGED DOOR
PITKIN, R. G. /PARSONS-JURDEN CORP./ DEC. 1966
NU-0093

Motor drive system remotely operates heavy steel radiation shielding doors. The drive consists of a standard motor reducer unit which is mounted on the door. This reducer drives a sprocket which is linked by chain to a fixed sprocket of the same size on the door jamb.

B66-10713
SWING-OUT RAIL SYSTEM SEPARATES OVERHEAD CRANE RAILS
PITKIN, R. G. /PARSONS-JURDEN CORP./ DEC. 1966
NU-0094

Swing-out rail system separates and reconnects the overhead traveling crane rails of a building to provide for the passage of a thick concrete radiation shield sliding door through the rails. In the swing-out position, the rail cantilevered from an axial shaft.

Subject Index

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TECH BRIEF/ORIGINATOR NUMBER INDEX

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