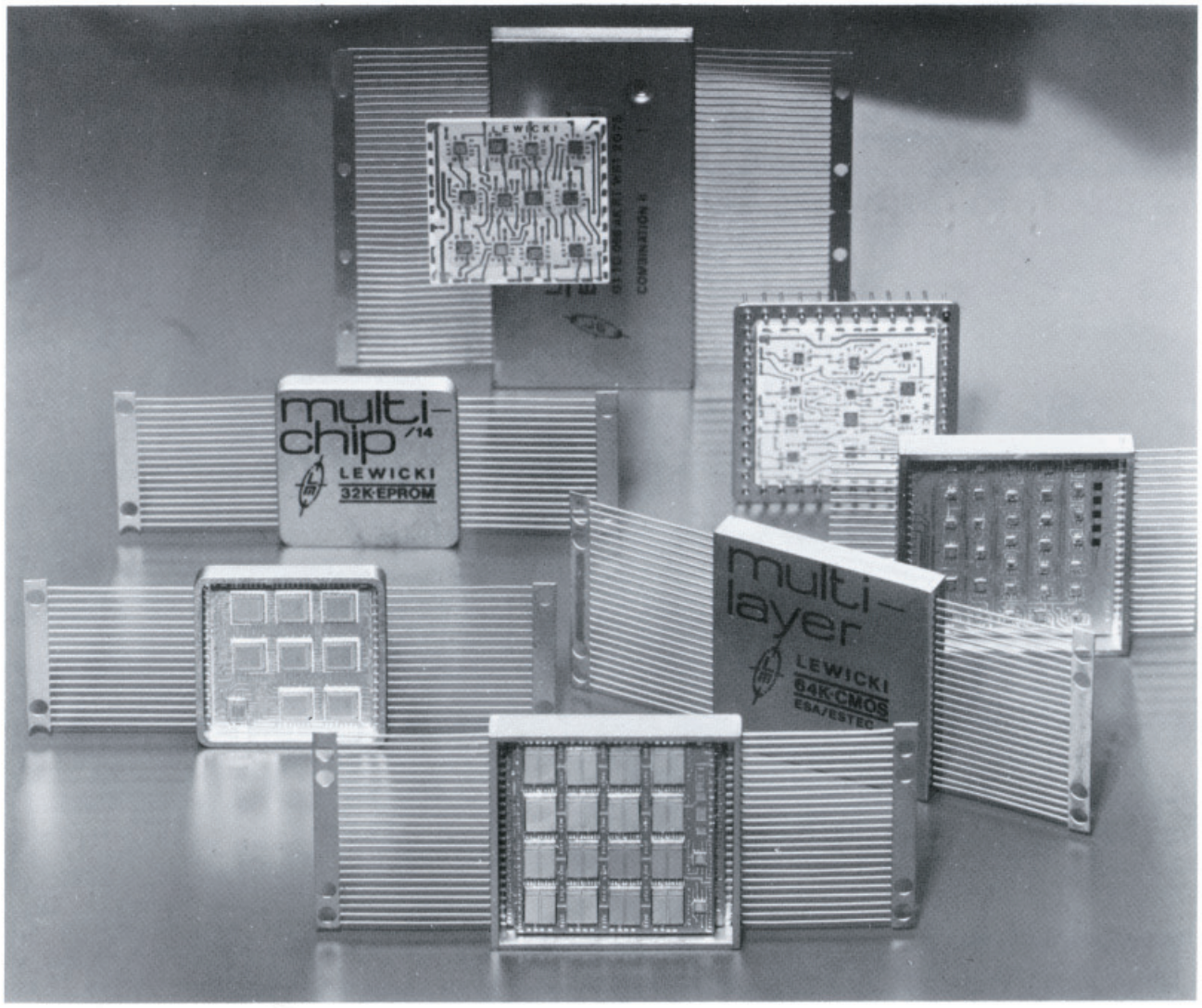
STATISCHE CMOS RAMs Batterie gepuffert in Multichip-Hybrid-Technologie

64 kbits bis Megabit (Mehrfachsubstrate), für die Speicherung von Daten, die bei Ausfall der Versorgungsspannung durch Batteriepufferung erhalten werden müssen. Bei Einsatz moderner Lithium-Kleinbatterien können die Daten in statischen CMOS-Speichersystemen auch über viele Jahre erhalten werden.
Im Vergleich zu elektrisch programmierbaren und löschbaren Festwertspeichern, wie Magnetblasenspeichern und rotierenden Speichermedien, zeigen nichtflüchtige CMOS-Speicher entscheidende Vorteile: Sie sind sehr preisgünstig, solange nur einige kByte gegen Datenverlust geschützt werden müssen, sie sind leicht in ein Mikrocomputersystem zu integrieren, da CMOS-RAMs wie jedes übliche RAM-System angesteuert werden, und sie können beim plötzlichen Ausfall der Versorgungsspannung sehr schnell reagieren, da sie Daten mit der vollen Geschwindigkeit der CPU übernehmen können.

STATIC CMOS RAMs with Lithium Standby Batteries Multichip Hybrid Technology

64 kbit to megabit (multisubstrate versions) for data retention over years with modern miniature Lithium Batteries.
As compared with magnetic bubble and Floppy Disc memories non volatile static CMOS RAMs offer important advantages:

- Lower cost in the smaller capacity range (kByte)
- Easy to integrate with microcomputers by their small size and direct signal compatibility
- Very fast take-over of data from the CPU in case of line power breakdown.



Compact hi-rel hybrid multichip Static-CMOS-RAMs

MIL/Aerospace/Medical, human implantable Diagnostic Memories UNIVERSAL TYPE-U

Type of memory
Hi-rel, very high density, thickfilm multilayer-multichip Hybrid Microcircuit. Can be organised as 64 x 1, 32 x 2, 16 x 4, or 8 x 8 Static RAM by means of external selection.
Medium to high speed, medium power Version Type – U.
128 K, 256 K, and Megabit with multisubstrate packages.

Supply voltage
+ 5 V VCC for logic
+ 5 V VDD for memory operating
Memory supply voltage can be reduced to 2.0 V during standby.
By the application of low threshold CMOS RAM Chips, operating supply voltage in the range of 2 V shall be feasible for single lithium battery cell power sources (e. g. for heart pacemakers).

Cycle time
400 ns Access time down to 70 ns (P-Version)

Power consumption
Memory standby 1 µW/kbit. 1 mW in operation

Operating temperature ranges

Military Version:	–55 °C to +125 °C
Industrial Version:	–40 °C to + 85 °C
Commercial Version:	0 °C to + 75 °C

Radiation resistance
The hi-rel LEW STATIC-CMOS-RAM has been developed under contract of EUROPEAN SPACE AGENCY (ESA/ESTEC) for applications on board of space craft and can thus be delivered in a "radiation hardened" version for military + medical devices such as human implantable devices and life support systems as an option.

Package
Gold plated, hi-rel military metal (Kovar) Flatpack, hermetically sealed by precision Electron Beam Microwelding.
Fine leak tested by Helium Mass Spectrometry to MIL-STD-883, Meth. 1014.

Size:	32 mm x 32 mm x 5 mm (other Standards on request)	
Weight:	17 g	
Pins:	2 x 23 = 46	horizontal leads, pitch = 1.27 mm ref. pin assignment outline (completely TELEDYNE compatible)

Commercial Version in Ceramic Flatpack or with Ceramic Chip Carriers.

Hybrid design
The LEW-STATIC-CMOS-RAM microcircuits consist of 2 thickfilm multilayer-multichip substrates, 28 mm x 29 mm in size, one attached on top of the other.

a) Memory substrate: The upper substrate carries the CMOS VLSI Chips (e. g. 4 K, 8 K or 16 K bit each), and 2 chip capacitors, all interconnected by conductive (gold) multilayers. Thickfilm resistors are printed onto the reverse of the memory substrate.

b) Logic substrate: (optional) The lower substrate carries Low Power Schottky (LS) TTL chips for the "memory enable" circuitry, control logic, and for the data distribution (IN/OUT). These chips are interconnected again by a 4-layer thickfilm multilayer (gold/ceramic).

Contact us for modifications:

Low Power Type-LP
Slower cycle time – lower operating power consumption.

Low Voltage Type-LV
Low Voltage CMOS Chips for 1.5 V VDD to 3.0 V VDD battery cells or power supplies operation.

Your custom design Type-CD
On your request we evaluate, custom design and manufacture other hi-density, hi-rel Multichip CMOS Memories. We either start the design from your Black-Box specifications or from your Breadboard model.
Especially we draw your attention to our capability to manufacture very complex, multisubstrate modules, up to the Megabit range.
High speed as well as low power versions are possible. Special logic interfaces can be introduced on request.

Prices/Delivery
For our up-to-date offer, taking into account the most recent semiconductor price situation, please specify
- temperature range
- your further environmental test conditions or qualification levels (MIL, industrial, commercial)
- quantities and desired delivery schedule

Weitere Informationen:

LEWICKI microelectronic GmbH
Allee 35, Postfach 20, D-7931 Oberdischingen b. Ulm, Telefon (07305) 6588 + 5588, Telex 712355

INNOVATIVE ANWENDUNG MIKRO-ELEKTRONIK

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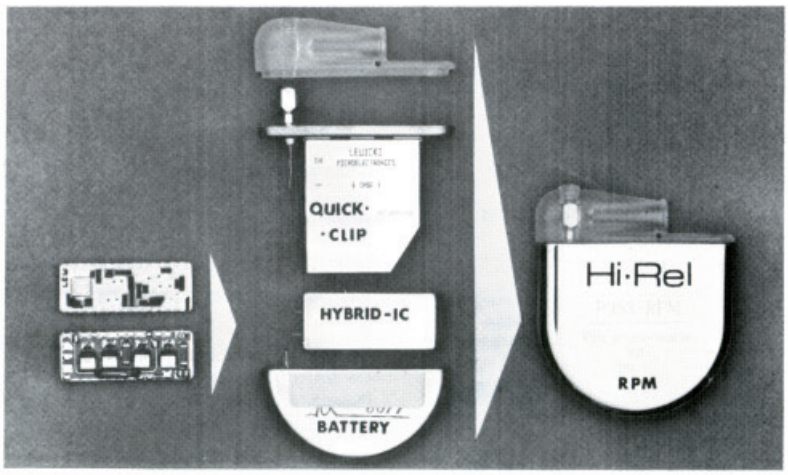
Sonderschau µE

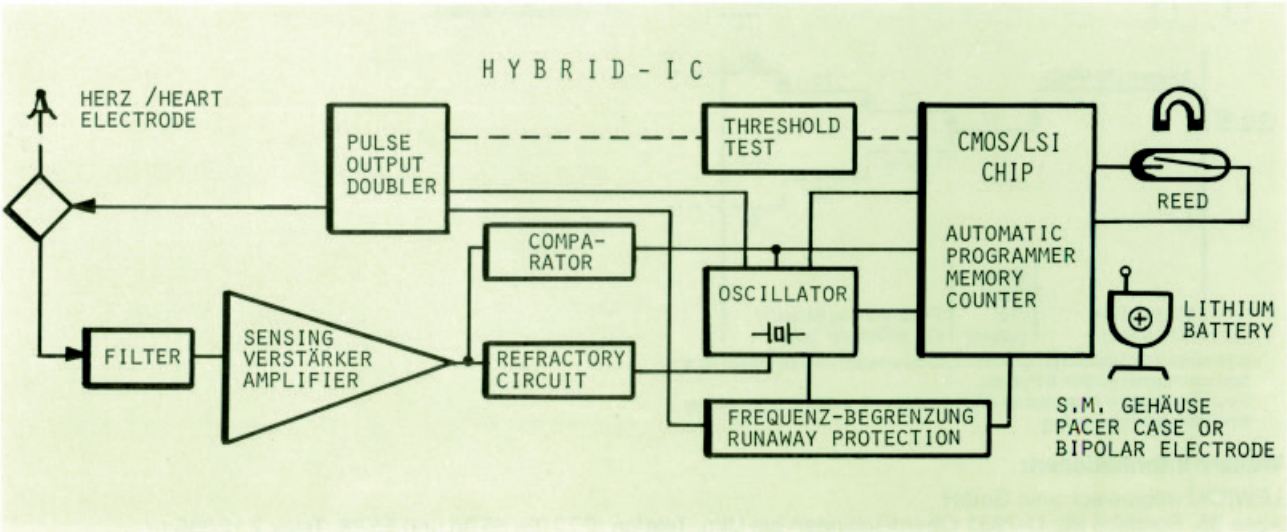
Frequenzprogrammierbarer Herzschrittmacher

- **Exportorientiert**
- Durch modernste Microelectronic Technologie: CMOS/ LSI Hybrid
- Für preisempfindliche Märkte: Stückpreise wie für nichtprogrammierbare S. M.
- Einfache und sichere Handhabung: durch vollautomatischen Batterietest und Frequenzprogrammierung
- Keine Zusatzgeräte – Keine Wartung: Programmierung durch Magnet statt Programmiergerät
- Tropenfeste Komponenten: Hybrid-IC in hermetischem SPACE-PACK® Edelstahlgehäuse enthält sämtliche Komponenten
- Zollgünstig und entwicklungshilfegerecht auch als Bausatz lieferbar: hochzuverlässige, korrosionsfeste, leicht zu reinigende, robuste Komponenten, leicht und rasch montierbar durch innovatives „Quick-Clip" System (allmetall, kunststofffrei, lötfrei)
- Moderne, leichte und flache Bauweise (9 mm flach, 42 und 53 g)
- Automatischer Schwellwerttest wahlweise

Rate programmable Cardiac Pulse Generator

- **Export oriented,** for price sensitive markets
- Low priced – like Non-Programmables
- CMOS fully automatic, Simple + Safe Battery Test + Rate Programming
- No Programmer required
- hi-rel, hermetically sealed SPACE-PACK®
- self contained – 2 Pin connection only (Reed, Capacitors, Z-Diode etc. incl.)
- all-metal/plastic free/ simple + safe Hybrid-Battery-Pacer "Clip" assembling
- Low volume – Low Weight (42 and 53 g) 9 mm flat
- automatic THRESHOLD TEST





Rate Programmable Demand Pacemaker hi-rel compact Hybrid-IC

General Specifications

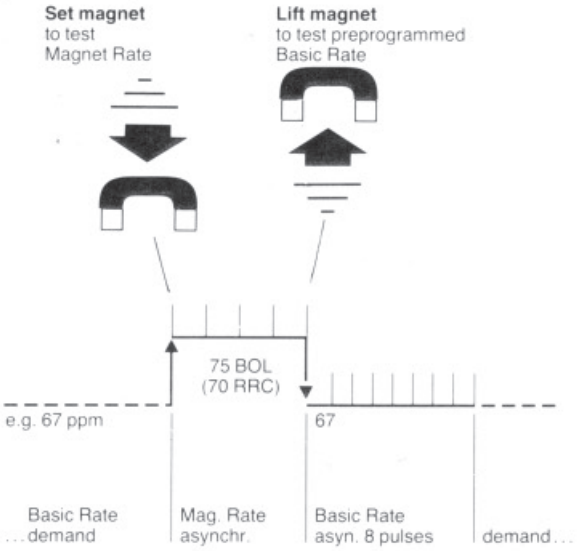
Type:

Type VVI Rate Programmable Demand Pulse Generator, runaway protected, longevity, high reliability, 9 mm thin, low weight (42 or 53 g).

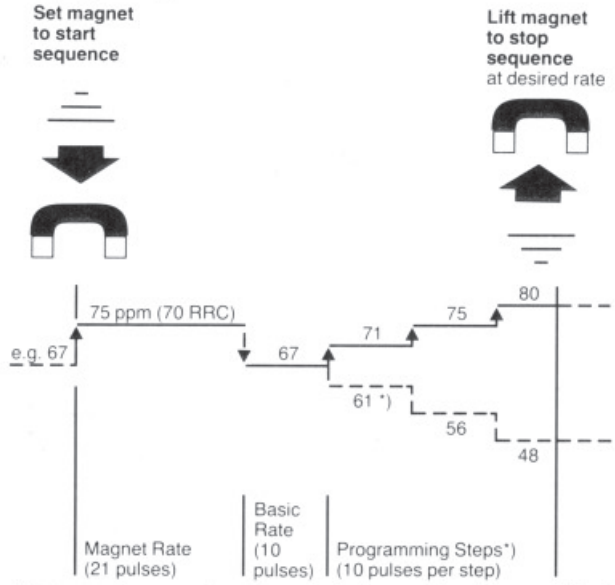
External components
None required except battery.
Hybrid contains all tantalum capacitors, reed switch, zener diode etc.

Hybrid size:	13.5 x 7.0 x 33.5 mm
Hybrid wheight:	9.3 g
Pacemaker size	P 953: 9 x 47 x 53 mm P 958: 9 x 47 x 58 mm
Pacemaker wheight	P 953: 42 g P 958: 53 g
Pacemaker case	Titanium
Feedthrough:	Ceramic/gold braze
Battery	P 953: WG 8077 or CRC 910 P 958: WG 7911 or CRC 911

Magnet Rate & Basic Rate Test
These tests perform as simple and fast as with the traditional non-programmable VVI pacemaker:



Rate programming



*) to reverse from upward programming to downward (or vice versa) lift and replace magnet (within 8 Pulses).
Reversion can be repeated as often as desired, without delay, at any time during programming.

Electronic Specifications

Nominal values and tolerances at 37 °C/510 Ohms load

Type	VVI
Rate	Programmable in 12 steps (upward encloseward) from
Basic pulse rate:	45 to 110 ppm
Test pulse rate:	75 or 85 ± 2 ppm (Changes from VVI to V00 mode)
Hysteresis pulse rate:	71 ± 1 ppm
Interference pulse rate:	71 ± 1 ppm (Changes from VVI to V00 mode)
Rate runaway protection	120 ± 10 ppm (in the presence of **one** rate sensitive fault)
Pulse duration	
with load:	0.53 ± 0.05 ms
without load:	0.55 ± 0.05 ms
magnet + load	0.48 ± 0.05 ms
at min. operation: voltage (1.8 V)	1.00 ± 0.15 ms
Pulse amplitude	
with load:	≧ 5.0 V
without load:	≧ 5.2 V
Refractory interval at 71 ppm sensing and pacing, automatically adjusted physiologically with rate:	340 ± 30 ms
Sensitivity "R" Wave sensing threshold positive (+ Ve) and negative (– Ve) going:	2.2 ± 0.4 mV
Recommended Replacement Time:	≧ 1.5 mV
Noise immunity (50 Hz/EMI rejection):	3–5 mV
Input impedance	> 30 Kohm
Operating voltage	
Nominal (BOL):	2.76 V
Recommended Replacement (RRT) at:	2.25 V
Guaranteed Minimum:	1.80 V

Mean current consumption
Typical values at 71 ppm (845 ms), load 510 Ohm, pulse amplitude 5 V, pulse duration 0.530 ms, 37 °C.

inhibited:	6.8 µA
pacing:	19 µA (14 µA at 0.25 ms)
Nominal service life	P 953: 7 years min. (100 % pacing) P 958: 12 years min. (100 % pacing)

Battery depletion indicators

Decrease in basic and test pulse rates:	5 ± 1 ppm
Increase in basic and test pulse periods:	65 ms
Increase in pulse duration:	0.15 ms

Trimming range of functions
Pulse Rate (pulse period), pulse duration, refractory interval, and sensitivity of inhibition level can be factory set by functional laser trimming in a wide range of values upon request.

Weitere Informationen:

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Allee 35, Postfach 20, D-7931 Oberdischingen bei Ulm, Telefon (0 73 05) 65 88 und 55 88, Telex 7 12 355 or

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