APPENDIX *Table A.I.*

1.	Model	MEDA 2	MEDA 40TA	MEDA 80T
	Manufacturer	Aritma	Aritma	
	Country	Czechoslovakia	Czechoslovakia	
2.	Size, description	S, desk-top Fixed arrangement (see Figs. 9.1, 9.2)	S, desk-top Modular construction (see Fig. 9.9) 20 modules 40TA can be extended to 80T	S-M, desk-top 40 modules
	Electronic elements	Valves	Transistors	
3.	Operational amplifiers: Type		TZP-I	
	Max. number — total (integrators)	20 (10)	40 (12)	80 (24)
	Max. output voltage D.c. gain Bandwidth (for inverter) Summing junction offset Integrator drift H.t. supply voltages	$\pm$ 50 V at 1mA 5×10^6 20 kc/s $\leqq$ 1 mV/8 hours $\leqq$ 1 mV/sec + 230, − 150, − 300 V	$\pm$ 10 V at 25 mA 10^8 $\leqq$ 50 kc/s $<$ 50 μV (long-term) $<$ 0.1 mV/sec (R = 200 kΩ, C = 5 μF) $\pm$ 14 V, $\pm$ 12 V	
4.	Non-linear elements: electronic servomechanical	1 DM (E) 8 diode limiters —	DM, type TDQ-1 (E) VFG, type TFM-1 (E, 20S) CAR, type TZK-1 (I) —	
5.	Computing impedances: R_j, R_0 C_0 Position	500 kΩ etc. 0.5 μF Below fixed patchboard	10, 100, 200 kΩ (w.w., 0.1 %) 5 μF, 10 nF (0.1 %) Integrator networks built-in, summer networks plug-in	
6.	Coefficient potentiometers Setting system	40 (1T) Servo operated null meter	18 (5T), 20 (1T) Null meter with 5T potentiometer	32 (5T), 40 (1T) Meter, DV
7.	Patchpanel	Fixed	Fixed (see Figs. 9.9 to 9.11)	
8.	Special computing facilities	Provisions for repet. oper. (see Figs. 9.6 and 9.7) Master/slave mode	Repetitive operation (50 c/s from internal pulse gen., other freq. from external pulse gen.) Master/slave mode	
9.	Time control facilities	Analogue timer (see Fig. 9.6)		Digital timer (up to 99 sec)
10.	Checking facilities: overload system problem checks	Individual —	Individual/central (see Fig. 9.15) —	
11.	Input/output devices	Servo operated measuring system (Fig. 8.21) special OS (Fig. 9.8)	Panel meter External: recorders, OS	DV (Figs. 9.16 and 9.17)
12.	Power consumption	450 W	60 – 200 VA	100 – 250 VA
13.	Dimensions: height (mm) width (mm) depth (mm)	860 550 1,020	840 640 400 – 600	840 1,300 400 – 600
14.	Weight (kp)	145	120	240

ANALOGUE AND HYBRID COMPUTER CHARACTERISTICS

Analogon	RAT 740	RA 800
VÚMS	Telefunken	
Czechoslovakia	Federal German Republic	
M – L, console (see Fig. 9.18)	S, desk-top Data below applies to fully expanded computers	M – L, console
Valves	Transistors	Transistors
(See Fig. 2.25)		
108 (40)	23 (10) (32)	
± 100 V at 25 mA 2×10^8 50 kc/s < 100 μV/8 hours < 100 μV/sec (see Fig. 2.25)	± 10 V at 10 mA 10^9 (110 db – main, 70 db – auxiliary) 300 kc/s ≦ 0.5 μV/°C + ≦ 10 μV/8 hours (≦ 1 mV p – p noise) ± 15 V, + 30 V	
8 DM (I) 4 VFG (I) 20 CAR (E) etc. 10 SM with functional potentiometers	4 DM (E) 4 VFG (E, 10S) 4 CAR –	8 TDM (2 products) 8 VFG (E, 20 S) 10 CAR (I), L 4 SR 8 SM or 16 FG 2 noise generators
1 MΩ etc. (0.01 %) 1 μF (0.01 %) In temperature controlled oven (45 ± 1 °C)	(0.02 %) 200 kΩ, 20 kΩ (0.01 %) (0.05 %) 5 μF, 0.05 μF (0.01 %) Behind the patchpanel	
220 (20T), digitally adressed Servo operated setting system	20 (10T, 10 kΩ) Null meter	100 Digitally addressed DV
Removable (3,500 holes)	Removable (450 holes)	Removable (2,520 holes)
Provisions for iterative and repetitive operation	Repetitive-iterative operation Master/slave mode	
Digital timer (0.1 msec to 1 000 sec), (see Fig. 9.23)		1 to 100 sec
Individual/central Static, dynamic, amplitude scale, time scale	Static	Static and dynamic
Meter, DV (± 0,01 FS, see Fig. 9.26). External: recorders, special OS	Meter Accessory: DV OS (13 cm, 2 beams), recorders	Meter DV (0.01 % ± 1 mV), 360 msec/read., printer OS, recorders
6 kVA	150 VA	800 VA
2,200 3,600 600	670 550 500	2,026 1,200 + 600 600
1,500	105	625 + 260

APPENDIX *Table A. I.*

1.	Model	NADAC-20	NADAC-100	HYBRID 48
	Manufacturer	SEA		Electronic Associates
	Country	France		U.K./U.S.A.
2.	Size, description	S, desk-top Modular (24 modules), optional arrangement	M–L, console Standard units located in an extendable cabinet	M, desk-top Modular
	Electronic elements	Transistors	Valves	Transistors
3.	Operational amplifiers: Type	M 20 – A2		1006, 0020
	Max. number – total (integrators)	Up to 24	Up to 120 (40)	80 (16)
	Max. output voltage D.c. again Bandwidth (for inverter) Summing junction offset Integrator drift H.t. supply voltages	± 20 V at 10 mA $> 10^7$ > 50 kc/s 40 μV/2 or 3 weeks < 2 mV/min + 50 V, ± 25 V	± 100 V at 30 mA $\geqq 10^9$ 100 kc/s 20 μV (long-term) 1 mV/min + 250 V, −400 V	± 10 V at 25 mA 3×10^7 500 kc/s 30 μV 7 μV/sec. (10 μF) ± 15, + 30 V
4.	Non-linear elements: electronic	DM (E), FG (E) VFG (E, 10 S) CAR (I)	DM VFG (20 S) VFG 2(0 S)	2 FG(E), 7 DM(E) 3 VFG(E) 6 CAE 4 DL
	servomechanical	SM (0,2 %, 6 c/s 5 pots)	SM (< 5°/10 c/s)	–
5.	Computing impedances: R_f, R_0 C_0 Position	1 MΩ, 100 kΩ (0.01 %) 1 μF, 0,01 μF (0.01 %) In amplifier modules	In oven	10kΩ, 100kΩ (0.01 %) .01, .1, 1, 10 μF (0.05 %) Behind patch panel
6.	Coefficient potentiometers Setting system	3 per module (1T or 10T) Null meter with 10T potentiometer	150 (10T), digitally addressed DV	60 (10T) Manual (servo option)
7.	Patchpanel	Fixed (composed of module patch panels)	Removable (2,346 holes, 6 modules)	Detachable
8.	Special computing facilities	Repetitive oper. (0.2 to 2 sec period) Master/slave mode	Repetitive/iterative operation	Repetitive/iterative Logic facilities
9.	Time control facilities	For repetitive operation	Digital timer	Digital timers .1 msec to 10 sec
10.	Checking facilities: overload system problem checks	Central	Individual/central Static/dynamic	Individual Static/dynamic
11.	Input/output devices	Meter (log or linear with 10T pot. or 3-decade divider)	DV (0.01 %, autom. scale changing, built-in printer), OS (43 cm, 4 channels)	DV, OS Recorders, meter
12.	Power consumption	300 W		300 W
13.	Dimensions: height (mm) width (mm) depth (mm)	 375 935 375	 1,640 3,150 820 to 1,280	
14.	Weight (kp)	90		

ANALOGUE AND HYBRID COMPUTER CHARACTERISTICS

680	8800	Ci 5000	HYBRID 7-6
Electronic Associates	Electronic Associates	Comcor	Solartron
U.K./U.S.A	U.K./U.S.A.	U.S.A.	U.K.
L, console Modular Maximum given	L, console Modular Maximum complement	L, console Modular	L, console Various complements Typical given
Transistors	Transistors	Transistors	Transistors
		Ci 308	AA1674
Up to 156 (30)	260 (66)	192	Up to 160(32)
± 10 V at 30 mA 3×10^7 500 k c/s 20 μV 5 μV/sec. (10 μF) ± 15, + 30 V	± 100 V at 40 mA 2×10^7 125 k c/s 15 μV/8 hrs. 1.2 mV/min. (1 μF)	± 100 V at 50 mA 10^8 150 kc/s 10 μV/8 hrs 30 μV/sec (1 μF)	± 100 V at 20 mA 3×10^7 50 kc/s 20 μV 10 μV/sec (1 μF) ± 150 V
24 DM(E), 24 CAE 24 DL, 18 FG(E) 18 VFG	30 VFG, 72 DM 30 CAE, 12 GF 30 DL —	DM(E), VFG(LS) DL, FG(E) CAE —	9 DM(E), 20 CAE (E) 9 VFG(E, 10S) 9 FG(E) —
100kΩ, 10kΩ (0.01 %) 10, 1, .1, .01 μF (0.01 %) Behind patch panel	1 MΩ, 100 kΩ (0:0025 %) .001, .01, .1, 1, 10 μF Behind patch panel	1 MΩ, 100 kΩ(0.0025%) .001, .01, .1, 1, 10 μF	1 MΩ, 100 kΩ (.01%) 1, .1, .01 μF (0.01 %) In plug-ins
120 (10T) Manual/servoset	240 (10T) Manual/servoset	Manual/servoset	96 (10T) Manual/servoset
Detachable	Detachable	Detachable	Detachable (1,632)
Repetitive/iterative Logic facilities	Repetitive/iterative Logic facilities	Repetitive/iterative Logic facilities	Repetitive/iterative Logic facilities
Digital timers .1 msec to 100 sec.	Digital timers (quad)	Digital timers	Digital timers 1 msec to 100 sec
Individual Static/dynamic	Individual/central Static/dynamic	Individual Static/dynamic	Individual/common Static/dynamic
DV, OS Recorders, meter	DV, OS, printer Recorders	DV, OS Recorders, meter	DV, printer Recorder, meter
1 kW	12 kVA	6–8 kW	1.5–2 kW

APPENDIX *Table A. I.*

1.	Model	TY 1451	AD 256	CP 10/50
	Manufacturer	Solartron	Applied Dynamics	Computer Products
	Country	U.K.	U.S.A	U.S.A.
2.	Size, description	M, console Various Complements Typical given	L, console Modular Typical complement	M, desk-top Modular Typical complement
	Electronic elements	Valves	Transistors	Transistors
3.	Operational amplifiers: Type	AA1,054.2		
	Max. number — total, (integrators)	up to 24(16)	256(64)	50(16)
	Max. output voltage D.c. gain Bandwidth (for inverter) Summing junction offset Integrator drift H.t. supply voltages	± 100 V at 10 mA 10^7 20 μV/24 hrs 100 μV/sec (1 μF) ± 300, − 200 V	± 100 V	± 10 V
4.	Nonlinear elements: electronic servomechanical	3 DM(E) 3 VFG (E, 10S) 2 SM	84 DM(E) 32 CAE, 20 DL 12 VFG (E, 20S) 18 FG(E) —	10 DM(E) 8 FG(E) 8 CAE —
5.	Computing impedances: Rj, R_0 C_0 Position	 1 MΩ, 100 kΩ (.1 %) 1, .1, .01 μF In plug-ins	 1 MΩ, 100 kΩ (.01 %)	 10kΩ, 100kΩ .01, .1, 1, 10 μF
6.	Coefficient potentiometers Setting system	18 (10T) 3 decade divider	200 (10T) Manual/servoset	70 (10T) Manual
7.	Patchpanel	Detachable	Detachable	Detachable
8.	Special computing facilities	Repetitive/iterative Master/slave	Repetitive/iterative Logic facilities	Repetitive/iterative Logic facilities
9.	Time control facilities		Digital timer	Digital timers 1 msec to 1 sec
10.	Checking facilities: overload system problem checks	 Individual/common Static check	 Individual Static/dynamic	 Individual Static/dynamic
11.	Input/output devices	Meter Recorders	DV, OS Recorders, meter	DV, OS Recorder, meter
12.	Power consumption	<600 W	11 kW	
13.	Dimensions: height(mm) width (mm) depth (mm)	 1,370 560 680		
14.	Weight (kp)			

ANALOGUE AND HYBRID COMPUTER CHARACTERISTICS

40	80	MN-10M	MN-17
Systron-Donner	Systron-Donner		
U.S.A.	U.S.A.	U.S.S.R.	U.S.S.R.
S, desk-top	S-M, desk-top	S, desk-top	L, console 0
Modular construction (5 types of modules placed behind patchboard)		Modular construction	Below is presented the fully extended system
Transistors		Transistors	Valves
42	84	24 (10)	186 (80)
± 100 at 25 mA > 10^7 > 200 kc/s (100 kΩ), > 50 kc/s (1 MΩ) 100 μV/8 hours 20 μV/sec (R = 1 MΩ, C = 1 μF)		± 25 V at 10 mA 10^6 2 mV/8 hours	± 100 V
6 DM (E) 9 VFG (E, 12S) 8 CAE (E), 4 CAR (E) —	12 DM (E) 18 VFG (E, 12 S) 16 CAE (E), 8 CAR (E) —	1 DM VFG Up to 6 CA	10 DM, 16 VFG 8 FG, etc In additional racks
1 MΩ, 100 kΩ, 50 kΩ, etc. (0.01 %) 1 μF, 0.1 μF (0.01 %) In amplifier modules whose temperature is controlled to ± 1 °C			
Up to 65 (10T) Null meter with 0.01 % reference nulling pot, DV	Up to 125 (10T) digitally addressed	60 Null meter	160 (digitally addressed) DV
Removable, couples into modules (1,764 holes)	(3,528 holes)	Fixed	2, removable
Repetitive operation Master/slave mode			
For repetitive operation (compute time 5 msec to 10 msec, reset time 5 msec to 5 sec)		Up to 200 sec (analogue)	Up to 999 sec (digital)
Static and dynamic			Individual/central
Meter (ranges: 300 V, 100 V, 30 V, 10 V, 1 V, + null, − null; ± 2 %, sensitivity 10 mV); DV (4 digits, 5 read./sec) External: OS, X−Y recorders)		Meter Various external output devices	Meter, OS, DV
440 W	650 W	250 VA	10 kW
660 1,320 580	660 1,730 580	615 460 445	

The booktitle: Analogue and Hybrid Computers, by Nenadal and Mirtes
Here is the meaning of the Abbreviations appearing in the List:

S, M, L Sizes of computers: small, medium, large
M Multiplier
DM (E) Diode multiplier (with external amplifiers)
TDM (I) Time division multiplier (with built in amplifiers)
FG (E) Function generator (with external amplifiers)
VFG (E) Variable function generator (with external amplifiers)
VFG (E, lOS) Variable function generator (with external amplifiers,
with 10 linear segments)
CAR (I) Relay-type comparator (with built in amplifiers)
CAE (E) Electronic comparator (with external amplifiers)
DL Diode limiter
SM Servomultiplier
SR Servoresolver
SI Servointegrator
pot (10T) Potentiometer (ten-turn)
DV Digital voltmeter
OS Oscilloscope

Compiled by Achim Dassow