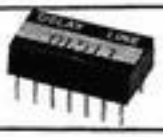
FIXED AND TAPPED DELAY LINES

MODEL	DELAY RANGE	RISE TIME OR FREQ. RESP.	IMPED-ANCE OHMS	SIZE INCHES
SUB-MINIATURE DUAL-IN-LINE TAPPED LUMPED CONSTANT LINES				
D1900-10	10 Nsec	2 Nsec	100	.21 x .30 x .78
D1900-20	20	3	100	.21 x .30 x .78
D1900-40	40	6	100	.21 x .30 x .78
D1900-60	60	9	100	.21 x .30 x .78
D1900-80	80	10	100	.21 x .30 x .78
D1900-100	100	20	100	.21 x .30 x .78
D8001	5	1	50	.21 x .30 x .78
D8004	10	2	100	.21 x .30 x .78
D8005	25	5	100	.21 x .30 x .78
D8007	30	6	100	.21 x .30 x .78

Each line has 10 tap delays spaced at equal intervals. Attenuation less than 1 dB. Temp. Coeff. less than 50 PPM/°C. DIP configuration compatible with automatic inserting equipment. Commercial and MIL Spec. models available.

TAPPED DELAYS				
D1511-1	10 Nsec	3 Nsec		
D1511-2	20	6		
D1511-4	40	13		Dual-In-Line Pin Spacing .21 x .39 x .7
D1511-6	60	20	100	
D1511-8	80	26		
D1511-10	100	33		

Each line provides 10 tap delays spaced at equal intervals.



MINIATURE LUMPED CONSTANT				
D647-110	50 Nsec	12 Nsec	50	.30 x 1.0 x 1.25
D647-211	100	12.5	50	.30 x 1.0 x 2.45
D647-312	250	21	50	.30 x 1.0 x 3.45
D647-323	500	42	150	.30 x 1.0 x 3.45
D647-334	750	63	500	.30 x 1.0 x 3.45
D647-115	1,000	250	50	.30 x 1.0 x 1.25
D647-236	1,450	160	500	.30 x 1.0 x 2.45
D647-327	2,900	240	150	.30 x 1.0 x 3.45
D647-338	4,350	360	500	.30 x 1.0 x 3.45

Hermetically sealed in a metal container. Delay tolerance ±5%. Temperature stability less than 50 PPM/°C, P.C. Mounting.

ATC TRANSPONDER AND BEACON CODING DELAY LINES				
D1560	10.15 μsec	.33 μsec	400	.55 x 2.25 x 3.62
D1365	20.3	.5	180	.87 x 3.5 x 3.5
D1000	20.3	.5	330	.35 x 2 x 4
D120	25.0	.55	180	.75 x 5 x 4.37
D298A	25.3	.6	500	1.62 x 2.87 x 4.25
D637	20.3	.3	180	2.37 x 2.75 x 3.18
D1190	20.3	.4	400	.63 x 4 x 5
D1191	24.65	.5	500	.63 x 4 x 5
D1210	8.0	.5	500	5 x 1 x 4

Standard 1.45 μsec tap spacings plus other special delay points are provided. Hermetically sealed steel cased, plastic encapsulated and P.C. mounted units are offered.

VARIABLE DELAY LINES

DUAL-IN-LINE COMPATIBLE VARIABLE DELAY LINES				
V1570-1	0 - 10 Nsec	2 Nsec	100	.25 x .75 x 1.5
V1570-2	0 - 20	4	100	.25 x .75 x 1.5
V1570-3	0 - 40	8	100	.25 x .75 x 1.5
V1570-4	0 - 80	16	100	.25 x .75 x 1.5
V1570-5	0 - 160	32	200	.25 x .75 x 1.5
V1570-6	0 - 320	64	200	.25 x .75 x 1.5

Sealed in plastic case. Temp. coeff. less than 50 PPM/°C. .020" P.C. mounting pins.

MIL VERSION				
V1768-1	0 - 10 Nsec	2 Nsec	100	.25 x .87 x 1.6
V1768-2	0 - 20	4	100	.25 x .87 x 1.6
V1768-3	0 - 40	8	100	.25 x .87 x 1.6

Hermetically sealed in a metal case.

MINIATURE LUMPED VARIABLE Nanosecond Range				
V447-1	0 - 55 Nsec	15 Nsec	150	.31 x 1 x 1.25
V447-2	0 - 100	30	50	.31 x 1 x 1.25
V447-3	0 - 150	25	150	.31 x 1 x 2.45
V447-4	0 - 250	30	50	.31 x 1 x 2.45
V447-5	0 - 300	30	150	.31 x 1 x 3.45
V447-6	0 - 500	60	50	.31 x 1 x 3.45

Hermetically sealed in a metal case. Lumped constant parameter. Temperature coefficient less than 50 PPM/°C. .030" P.C. mounting pins.

NOVEL INFINITE RESOLUTION				
DV575-1	2 - 25 Nsec	70 MHz	200	1 x 1.25 x 5.37
DV575-2	2 - 50	70	100	1 x 1.25 x 5.37
DV575-3	2 - 50	70	200	1 x 1.25 x 5.37
DV575-4	2 - 50	70	93	1 x 1.25 x 5.37
DV575-5	2 - 25	70	50	1 x 1.25 x 5.37
DV575-6	2 - 50	70	93	1 x 1.25 x 5.37

With input and output impedance of equal value. Voltage standing wave ratio less than ½ db to 45 MHz.

DELAY LINE COMPUTER MEMORIES DELCOMS

THE DELAY LINE COMPUTER MEMORY (DELCOM) offers the **Lowest Price Per Bit** of any high speed memory device. Computer Devices Corp. offers convenient standard packages for all practical storage capacities from 10 bits to 20,000 bits in single delay line units as well as multi delay line units with massive storage capacities. All Delcoms are compatible with DTL and T²L logic. Normal power requirements are +12 and −12 VDC and +5 VDC. However, Delcoms are tailored to your bit rate, delay, input-output logic and power requirements.

MANY OTHER MODELS AND SPECIALTY Delay Lines are available. If exactly what you want is not listed, please call.

COMPUTER DEVICES CORP.
63 AUSTIN BOULEVARD COMMACK, N.Y. 11725
(516) 543-4220

DELAY LINES
TO MILITARY AND COMMERCIAL SPECIFICATIONS

New products for 1965

SUB-MINIATURE VARIABLE DELAY LINE

SIZE: .3 x .3 x .8 in.

V982	—1	—2	—3	—4
Delay Nanosec.	3-25	3-30	4-50	5-100
Impedance Ohms	1000	500	270	50
Rise Time Nanosec.	20	25	40	90

V982

ELECTRICALLY VARIABLE DELAY LINES • LOW DISTORTION • DELAY LINEAR FUNCTION OF VOLTAGE

Model	Delay Range microsec.	Rise Time microsec.
DEV997	.01-10	0.2
DEV998	1-1000	20
DEV999	10-10000	200 Kc

(See CORRELATION D.L. below)


DEV999

LUMPED CONSTANT DELAY LINES

FIXED AND TAPPED DELAYS

CODING LINES for Radar Recognition Sets — Tap spacing 1.45 μsec. Accuracy up to ±.02 μsec over Mil. specs. Lumped Constant hermetically sealed units — Other special tap spacings are also provided — Lines may be used for encoding or decoding —
*Equalizing Resistors included in package.

TYPICAL LUMPED CONSTANT TYPES — Large variety of performance characteristics available. Delay to rise time ratios of up to 175 to 1 — accuracies up to .1% over Mil. Spec. range. Hermetically sealed in metal containers.

Model	Delay Microsec.	Rise Time Microsec.	Step or Tap Delays μsec.	Imped. Ohms	Attenuation db	Size
D1000	20.3	.5	1.45	330	6	2 x 4 x .31
D389	20.3	.4	1.45	330	4	4 x 4 x .37
D637	20.3	.3	1.45	180	10*	2.37 x 2.75 x 3.18
D203	20.3	.35	1.45	470	3	10 x 2.5 x 2.25
D170	20.3	.60	1.45	510	3	4 x 2 x 1
D231	20.3	.50	1.45	2200	2	4 x 3 x 2
D978	24.65	.45	2.90	180	6*	7.5 x 4 x 2
D297A	24.65	.50	1.45	500	3	2.87 x 2 x 4.25
D298A	25.3	.50	Special	500	3	2.87 x 1.62 4.25
D702	2.5	.075	.05	220	3	3.5 x 5.5 x 1.0
D992	6.0	.3		1000	2	1.37 x 1.37 x 2.5
D148	10.0	.3		1000	3	2.12 x 2.12 x 4
D754	50	1.5	.5	1000	6	4 x 4 x 2
D414	100	3.0	1.0	500	4	6 x 3.5 x 3

AUDIO DELAY AND SONAR LAG LINES

FIXED AND TAPPED DELAYS of low frequency C.W. signals. High accuracy of delay — Temperature stability 40 PPM/°C, VSWR ±½ db. Phase linearity ±¼%.
*DA921 has VSWR of ±1 db.

VARIABLE DELAYS — Decade insertion type switching — provides low signal distortion and input and output impedance of equal value — Other characteristics same as fixed line.

Model	Delay Microsec.	3 db B.W. Kc	Step or Tap Delays μsec.	Imped. Ohms	Attenuation db	Size
*DA921	420	100		2000	4	14 x 2 x 1
DA563	500	30	25	1000	6	7 x 2.5 x 2
DA301	1000	20	20	600	3	19 x 3.5 x 9
DA261	5000	5	40	500	3	19 x 5.25 x 10
DA607	20000	3.5	80	500	1	19 x 7 x 15
DA177	100000	.2	1000	1000	10	19 x 21 x 12
AV175	0 - 150	30	.1	500	6	9 x 3 x 6
AV287	0 - 500	20	.002	1000	3	19 x 3.5 x 12
AV206	0 - 1000	20	1.0	600	3	19 x 3.5 x 12
AV731	0 - 5000	5	.1	1000	2	19 x 5.25 x 15
AV211	0 - 10000	2.5	.1	600	3	19 x 5.25 x 15

VARIABLE DELAYS

		Model	Delay Range Microsec.	Rise Time Microsec.	Resolution	Imped. Ohms	Attenuation db	Size
One Turn	Movable tap on coil type.	DV252	0 - .06	.02	1/300	330	.5	1.5 dia. x .75
Multi-Turn	Movable tap on coil type.	V172	0 - .55	.08	1/1000	1000	1	.5 x 1.5 x 4.5
Multi-Turn	Movable tap on coil type.	V289	0 - 1.0	.2	1/1000	500	1	.5 x 1.5 x 4.5
Multi-Turn	Movable tap on coil type.	DV219	0 - 1.0	.11	1/1000	1000	1	.62 x 1.25 x 6.5
Multi-Turn	Movable tap on coil type.	V176	0 - 3	.5	1/1000	330	2	.75 x 1.87 x 7
Phase Shifter for up to 200 Kc.		V649	0 - 10	1.8	1/2000	100	4	2 x 2 x 8
INFINITE RESOLUTION — Inductive pick-off — Distributed Constant.		VP162	0 - 7	.3	Infinite	150	30	2 x .75 x 5
		VP333	0 - 12	1.2	Infinite	10000	30	1.37 dia. x 10

ULTRA MINIATURE VARIABLES

NANOSECOND RANGE COMPUTER TRIM-DELAYS. Hermetically sealed in metal cases — "O" ring seal on control shaft — for printed circuit board mounting. Can be cascaded with Series D647.

Model	Delay Range Nanosec.	Rise Time Nanosec.	Resolution Nanosec.	Imped. Ohms	Attenuation db	Size
V447-1	0 - 55	15	.5	150	1	1 x .31 x 1.25
V447-2	0 - 100	30	.7	50	1	1 x .31 x 1.25
V447-3	0 - 150	25	.6	150	1	1 x .31 x 2.45
V447-4	0 - 250	30	1.0	50	1.5	1 x .31 x 2.45
V447-5	0 - 300	30	.6	150	1.5	1 x .31 x 3.45
V447-6	0 - 500	60	1.0	50	2	1 x .31 x 3.45
DV875	0 - 100	20	.3	1000	1	1 x .31 x 3.45
DV810	0 - 200	40	.6	1000	1	1 x .31 x 2.45
V975	0 - 40	10	.02	200	1	1 x .31 x 2.45
V887	0 - 300	60	1.0	75	2	1 x .31 x 2.45

D647 SERIES — MINIATURE MODULES

Lumped Constant Printed circuit mounting modules can be cascaded to obtain any desired delay. Case size depends on delay to rise time required. Units are compatible with variable V447 series.
* Tapped each 1.45 μsec. for use in coders.

Delay Choice	Choice Imped.	Delay to Rise Time Ratio	Size
50; 100; 250; 500 and 750 nanosec.	50 ohms		
1.0; 1.45; 2.90* and 4.35* microsec.	150 ohms and 500 ohms	4:1 8:1 12:1	1 x .31 x 1.25 1 x .31 x 2.20 1 x .31 x 3.45

DO IT YOURSELF DELAY ADJUSTMENT

5 completely separate sections in each module. Cascaded modules allow selection of any desired delay in 5 nanosec. increments. Ideal for experimental work. Size of all modules 1 x .31 x 2.25 for printed circuit mounting.

Part No. Imp. 93 Ω	Part No. Imp. 330 Ω	Section Delay — Nanosec.	Tot. Delay Nanosec.	Rise Time Nanosec.
D740	D741	5; 10; 20; 30; 40	105	15
D742	D743	50; 100; 200; 300; 400	1050	150
D744	D745	One Delay	100	15
D746	D747	One Delay	1000	150

ELECTRICALLY VARIABLE

Delay is varied by varying a D.C. control voltage. Both L & C are controlled to minimize mismatch.

Model	Delay μsec.	Rise Time μsec.	Distortion %	Imped. Ohms	Attenuation db	Size
DEV623A	.03 to .04	.008	10	150	2	2 x 1 x .31
DEV350	3 to 7	.25	10	1000	3	3.5 x 4 x 4

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New products for 1965

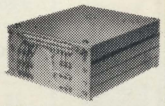
MO965

STABLE OSCILLATOR

Frequency — .1 cps to 25 Kc
Accuracy — .001% standard up to — .0002% special
Stability — 0°C to 50°C .005% Std. to .0005% special
Featuring — adjustable frequency and/or Electrically Variable
Size — 5 x 7 x 1.12

COMPUTER MEMORY FOR AIRBORNE USE

For airborne use
24,000 bits Max. stor.
3 separate channels
2 Mc clock rate
Size — 7 x 5.87 x 3
To MIL specs



MA917

DELAY LINES TO MILITARY AND COMMERCIAL SPECIFICATIONS

WIRE SONIC — MAGNETOSTRICTIVE DELAY LINES

FIXED DELAYS

LONGITUDINAL MODE — Short delays with ±4 μsec trim adjustment; standard temperature coefficient 150 PPM/°C, provided as low as 2 PPM/°C.

TORSIONAL MODE — Ultra stable with temperature coefficient less than .5 PPM/°C available. Signal to spurious noise 10:1 dynamic 30:1 static. All units provide a ±4 μsec adjustment. Unsealed or hermetically sealed to meet MIL specs.

Model	Maximum Delay Microsec.	Max. Bit Rate RZ or C.W. Cent. Freq. Mc.	Size
ML545A	23	2.0	1 x 5 x .375
ML755A	20	2.5	1 x 6 x .375
ML756A	50	2.0	2 x 8 x .375
ML757	100	1.5	2 x 14 x .375
MT762A-1	250	2.5	4 x 5 x .50
MT762A-2	500	2.0	4 x 5 x .50
MT762A-3	2000	1.5	4 x 5 x .50
MT763A-1	3000	1.5	6 x 7 x .50
MT763A-2	5000	1.2	6 x 7 x .50
MT765A-1	10000	1.0	10.5 x 11.5 x .56
MT765A-2	15000	0.75	10.5 x 11.5 x .56

SERIAL COMPUTER MEMORIES

COMPLETE UNITY GAIN MEMORY SYSTEMS supplied with transistorized circuitry for operation in any required mode RZ, NRZ or Bi-Polar. These units use the MT760 Delay Line series and have the exceptional stability and high signal to noise ratio of these Delay Lines. Can be cascaded and complete memory stacks are also provided. Maximum storage can be doubled by operating in the NRZ mode.

Model	Maximum Storage Bits RZ	Maximum Bit Rate RZ — MC	Size
MS772B-1	625	2.5	4.5 x 6.20 x 1.12
MS772B-2	1000	2.0	4.5 x 6.20 x 1.12
MS772B-3	3000	1.5	4.5 x 6.20 x 1.12
MS773A-1	4500	1.5	8 x 10.5 x .62
MS773A-2	6000	1.2	8 x 10.5 x .62
MS775A-1	10000	1.0	12.0 x 15.0 x .7
MS775A-2	11250	.75	12.0 x 15.0 x .7

VARIABLE DELAYS

SINGLE SHAFT CONTROL provides infinite resolution over a wide range of delays. Ideal for Radar Range Calibration, Simulation or Correlation work.
6 decade switch system provides .1 μsec resolution.

Model	Delay Range Microsec.	Max Bit Rate RZ MC	C.W. B.W. MC	Size
MV994	2-18	2.0	1.5-2.5	1 x 5 x .5
MV781A	2-30	2.0	1.5-2.5	1 x 9 x .5
MV782	30-100	1.0	.8-1.2	2 x 15 x .5
MV784	10-5000	.3	.2- .4	10.0 Dia. x 8
MV785	10-100,000	1.0	.8-1.2	19 x 17 x 10.5

CORRELATION DELAY LINES — ELECTRICALLY VARIABLE

LONG DELAYS OF COMPLEX SIGNALS with very little distortion. Ideal for correlation work. Supplied as: Fixed Delays; Multi-tap Delays; Variable Delays by means of switches or as an Electrically Variable system wherein delay is a function of a control voltage.

Model	Max. Delay Seconds	Frequency Response	Size
MA574	.01	10 cps to 50 Kc	12 x 12 x 3
MA880	.03	10 cps to 50 Kc	12 x 22 x 18
MA1005	.10	10 cps to 25 Kc	15 x 22 x 18
MA1006	1.0	10 cps to 10 Kc	24 x 27 x 49

MULTIPLE OUTPUT DELAYS

CODE GENERATORS — Provide as many tap positions as desired at any spacing desired (.2 μsec min.). Fast rise times. Also provided with in and out circuitry. Used as parallel to serial and serial to parallel converters.

MULTIPLE OUTPUTS — Adjustable independently over range ±6 μsec for radar correlation work. Units are supplied as unity gain packages complete with drivers, amplifiers and shapers.

Model	Total Delay Microsec.	No. of Taps	Tap Spacing or Location Microsec.	Size
ML790	16	16	1.0	1.75 x 8 x .50
ML718	15	12	1.25	1.75 x 8 x .50
ML791	20.3	14	1.45	1.75 x 8 x .50
ML883	28	24	1.0	3 x 9.37 x .50
MS283	30.5	4	12, 15, 18, 30	4 x 12 x 1.5
MS402	48.0	6	2, 5, 8, 12, 14, 48	5 x 10 x 2.75
MS399	16.3	3	6, 12, 16	4 x 12 x 1.5

DISTRIBUTED CONSTANT DELAY LINES

DD680 SERIES NANOSECOND MODULES

DISTRIBUTED CONSTANT — Epoxy encapsulated. Temperature coefficient less than 120 PPM/°C. Case size depends on delay to rise time ratio.

Delay Choice Nanosec.	Impedance Choice Ohms	Delay to Rise Time Ratio	Size
5, 10, 20, 30	93, 330	5:1	.5 x .31 x 2.25
40, 50, 60, 70 80, 90, 100	500, 1000	10:1	1.0 x .31 x 2.25

DD679 SERIES MICROSECOND MODULES

DISTRIBUTED CONSTANT — Epoxy encapsulated. Temperature coefficient less than 120 PPM/°C — Can be cascaded to obtain longer delays — other delays and impedance available.

Delay Choice Microsec.	Impedance Choice Ohms	Delay to Rise Time Ratio	Size
.1, .2, .3, .4, .5, .6, .7, .8, .9, 1.0	330, 500 1000	5:1 10:1	.5 x .375 x 4.5 1.0 x .375 x 4.5
2.0; 4.0; 5.0; 10.0	500, 1000	10:1	1.0 x .5 x 4.5

INFINITE RESOLUTION VARIABLE *REEL DELAY LINE*

DISTRIBUTED CONSTANT — With input and output impedance of equal value — can be spliced directly into interconnecting coaxial cables — IDEAL PHASE SHIFTER. Usable to 200 Mc — Single shaft control — BNC connectors.

Model	Delay Range Nanosec.	3 db B.W. Mc	Resolution	Impedance Ohms	Attenuation Db	Size
DV581	2-50	70	Infinite	200	1	1.0 x 1.75 x 5.37
DV576A	2-50	70	Infinite	93	1	1.0 x 1.75 x 5.37

DELAYS UP TO 100 NANOSEC. AND OTHER IMPEDANCES ALSO AVAILABLE.

HIGHEST QUALITY • FASTEST DELIVERY

This condensed catalogue information is only meant to serve as a guide. Before finalizing on a design it is most prudent to utilize the experience, ingenuity and up-to-date information of our Engineering Staff. Expert guidance, which can save you hours of searching, is as close to you as your telephone —

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COMPUTER DEVICES CORP.

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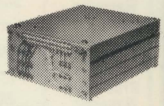
STABLE OSCILLATOR

Frequency — .1 cps to 25 Kc
Accuracy — .001% standard up to — .0002% special
Stability — 0°C to 50°C .005% Std. to .0005% special
Featuring — adjustable frequency and/or Electrically Variable
Size — 5 x 7 x 1.12

MO965

COMPUTER MEMORY FOR AIRBORNE USE

For airborne use
24,000 bits Max. stor.
3 separate channels
2 Mc clock rate
Size — 7 x 5.87 x 3
To MIL specs



MA917

DELAY LINES TO MILITARY AND COMMERCIAL SPECIFICATIONS

WIRE SONIC — MAGNETOSTRICTIVE DELAY LINES

FIXED DELAYS

LONGITUDINAL MODE — Short delays with ±4 μsec trim adjustment; standard temperature coefficient 150 PPM/°C, provided as low as 2 PPM/°C.

TORSIONAL MODE — Ultra stable with temperature coefficient less than .5 PPM/°C available. Signal to spurious noise 10:1 dynamic 30:1 static. All units provide a ±4 μsec adjustment. Unsealed or hermetically sealed to meet MIL specs.

Model	Maximum Delay Microsec.	Max. Bit Rate RZ or C.W. Cent. Freq. Mc.	Size
ML545A	23	2.0	1 x 5 x .375
ML755A	20	2.5	1 x 6 x .375
ML756A	50	2.0	2 x 8 x .375
ML757	100	1.5	2 x 14 x .375
MT762A-1	250	2.5	4 x 5 x .50
MT762A-2	500	2.0	4 x 5 x .50
MT762A-3	2000	1.5	4 x 5 x .50
MT763A-1	3000	1.5	6 x 7 x .50
MT763A-2	5000	1.2	6 x 7 x .50
MT765A-1	10000	1.0	10.5 x 11.5 x .56
MT765A-2	15000	0.75	10.5 x 11.5 x .56

SERIAL COMPUTER MEMORIES

COMPLETE UNITY GAIN MEMORY SYSTEMS supplied with transistorized circuitry for operation in any required mode RZ, NRZ or Bi-Polar. These units use the MT760 Delay Line series and have the exceptional stability and high signal to noise ratio of these Delay Lines. Can be cascaded and complete memory stacks are also provided. Maximum storage can be doubled by operating in the NRZ mode.

Model	Maximum Storage Bits RZ	Maximum Bit Rate RZ — MC	Size
MS772B-1	625	2.5	4.5 x 6.20 x 1.12
MS772B-2	1000	2.0	4.5 x 6.20 x 1.12
MS772B-3	3000	1.5	4.5 x 6.20 x 1.12
MS773A-1	4500	1.5	8 x 10.5 x .62
MS773A-2	6000	1.2	8 x 10.5 x .62
MS775A-1	10000	1.0	12.0 x 15.0 x .7
MS775A-2	11250	.75	12.0 x 15.0 x .7

VARIABLE DELAYS

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6 decade switch system provides .1 μsec resolution.

Model	Delay Range Microsec.	Max Bit Rate RZ MC	C.W. B.W. MC	Size
MV994	2-18	2.0	1.5-2.5	1 x 5 x .5
MV781A	2-30	2.0	1.5-2.5	1 x 9 x .5
MV782	30-100	1.0	.8-1.2	2 x 15 x .5
MV784	10-5000	.3	.2- .4	10.0 Dia. x 8
MV785	10-100,000	1.0	.8-1.2	19 x 17 x 10.5

CORRELATION DELAY LINES — ELECTRICALLY VARIABLE

LONG DELAYS OF COMPLEX SIGNALS with very little distortion. Ideal for correlation work. Supplied as: Fixed Delays; Multi-tap Delays; Variable Delays by means of switches or as an Electrically Variable system wherein delay is a function of a control voltage.

Model	Max. Delay Seconds	Frequency Response	Size
MA574	.01	10 cps to 50 Kc	12 x 12 x 3
MA880	.03	10 cps to 50 Kc	12 x 22 x 18
MA1005	.10	10 cps to 25 Kc	15 x 22 x 18
MA1006	1.0	10 cps to 10 Kc	24 x 27 x 49

MULTIPLE OUTPUT DELAYS

CODE GENERATORS — Provide as many tap positions as desired at any spacing desired (.2 μsec min.). Fast rise times. Also provided with in and out circuitry. Used as parallel to serial and serial to parallel converters.

MULTIPLE OUTPUTS — Adjustable independently over range ±6 μsec for radar correlation work. Units are supplied as unity gain packages complete with drivers, amplifiers and shapers.

Model	Total Delay Microsec.	No. of Taps	Tap Spacing or Location Microsec.	Size
ML790	16	16	1.0	1.75 x 8 x .50
ML718	15	12	1.25	1.75 x 8 x .50
ML791	20.3	14	1.45	1.75 x 8 x .50
ML883	28	24	1.0	3 x 9.37 x .50
MS283	30.5	4	12, 15, 18, 30	4 x 12 x 1.5
MS402	48.0	6	2, 5, 8, 12, 14, 48	5 x 10 x 2.75
MS399	16.3	3	6, 12, 16	4 x 12 x 1.5

DISTRIBUTED CONSTANT DELAY LINES

DD680 SERIES NANOSECOND MODULES

DISTRIBUTED CONSTANT — Epoxy encapsulated. Temperature coefficient less than 120 PPM/°C. Case size depends on delay to rise time ratio.

Delay Choice Nanosec.	Impedance Choice Ohms	Delay to Rise Time Ratio	Size
5, 10, 20, 30	93, 330	5:1	.5 x .31 x 2.25
40, 50, 60, 70	500, 1000	10:1	1.0 x .31 x 2.25
80, 90, 100			

DD679 SERIES MICROSECOND MODULES

DISTRIBUTED CONSTANT — Epoxy encapsulated. Temperature coefficient less than 120 PPM/°C — Can be cascaded to obtain longer delays — other delays and impedance available.

Delay Choice Microsec.	Impedance Choice Ohms	Delay to Rise Time Ratio	Size
.1, .2, .3, .4, .5, .6, .7, .8, .9, 1.0	330, 500 1000	5:1 10:1	.5 x .375 x 4.5 1.0 x .375 x 4.5
2.0; 4.0; 5.0; 10.0	500, 1000	10:1	1.0 x .5 x 4.5

INFINITE RESOLUTION VARIABLE *REEL DELAY LINE*

DISTRIBUTED CONSTANT — With input and output impedance of equal value — can be spliced directly into interconnecting coaxial cables — IDEAL PHASE SHIFTER. Usable to 200 Mc — Single shaft control — BNC connectors.

Model	Delay Range Nanosec.	3 db B.W. Mc	Resolution	Impedance Ohms	Attenuation Db	Size
DV581	2-50	70	Infinite	200	1	1.0 x 1.75 x 5.37
DV576A	2-50	70	Infinite	93	1	1.0 x 1.75 x 5.37

DELAYS UP TO 100 NANOSEC. AND OTHER IMPEDANCES ALSO AVAILABLE.

HIGHEST QUALITY • FASTEST DELIVERY

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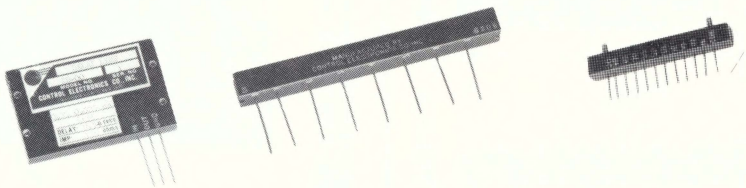
Telephone:
516 AR 1-0666
TWX:
516-421-4235

COMPUTER DEVICES CORP.

Miniature Tapped Delay Lines

- **DELAY TOLERANCE:** ±3% or ±.01 μsec
- **TAPS:** 10, equally spaced
- **THERMAL STABILITY:** 45 ppm/°C
- **TEST VOLTAGE:** 500 Vdc
- **WORKING VOLTAGE:** 300 Vdc
- **PULSE VOLTAGE:** 50 volts peak
- **TEMPERATURE RANGE:** —50°C to +125°C
- **LEADS:** #22 AWG tinned copper or brass



LC-6402

Delay μsec.	Maximum Output Rise Time μsec.	Bandwidth Mc/s	Impedance Range (Ohms)	Dimensions (inches)
0.05	.008	64	50-100	½x½x3
0.1	.014	32	50-200	½x½x3
0.2	.028	16	100-400	½x½x3
0.3	.043	12	50-500	½x½x3
0.4	.057	9	60-600	½x½x3
0.5	.072	6.4	80-800	½x½x3
0.6	.085	5.3	100-1000	½x½x3
0.7	.1	4.6	100-1500	½x½x3
0.8	.115	4	100-2000	½x½x3
0.9	.129	3.5	100-2000	½x½x3
1	.145	3.2	200-2000	½x½x3
2	.286	1.6	250-1500	½x½x3
3	.428	1.06	300-2000	½x¾x3
4	.57	0.82	500-1000	½x¾x3
5	.715	0.63	400-1000	½x¾x3
6	.85	0.53	500-1000	½x¾x3
7	.95	0.455	600-1000	½x¾x3
8	1.05	0.40	1000	½x¾x3
9	1.25	0.35	750	½x¾x3
10	1.4	0.32	500	½x¾x3

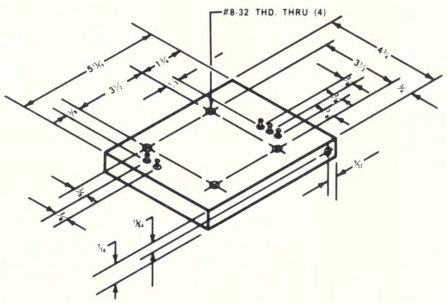
Compact Magline

Model	Delay	Adj. From Center Delay	Max. Pulse Rep. Rate	Attenuation
FM 401 Commercial 402 Military	50 to 1200 μsec	±4 μsec	1 Mc/s	55-65 db

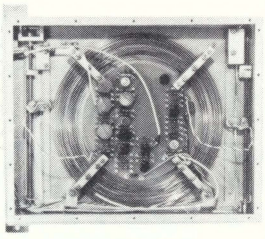
TYPICAL CHARACTERISTICS:

1. **Input impedance** ..... 50Ω to 2000Ω*
2. **Output termination** ..... 50Ω to 5KΩ*
3. **Signal to noise ratio** 20:1
4. **Change in delay with temp.** ..... $1 \times 10^{-5} \frac{\mu sec}{\mu sec} / °C$ nominal
   $1 \times 10^{-6} \frac{\mu sec}{\mu sec} / °C$ on order

*Specify when ordering



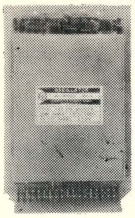
Magline Memory Systems



Model	Delay	PRR	S/N	Input Level
FMS 4013	5000 μsec	250 Kc/s	26 db	3-15V
FMS 4037	4400 μsec	650 Kc/s	32 db	3-15V
FMS 4047	250 μsec	340 Kc/s	20 db	5V
FMS 4066	3500 μsec	850 Kc/s	35 db	6V

CONTROL ELECTRONICS COMPANY, INC.
153 Florida Street, Farmingdale, L.I., N.Y. 11735 • (516) 694-0125

New products for 1965



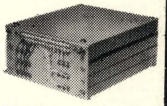
MO965

STABLE OSCILLATOR

Frequency — .1 cps to 25 Kc
Accuracy — .001% standard up to — .0002% special
Stability — 0°C to 50°C .005% Std. to .0005% special
Featuring — adjustable frequency and/or Electrically Variable
Size — 5 x 7 x 1.12

COMPUTER MEMORY FOR AIRBORNE USE

For airborne use
24,000 bits Max. stor.
3 separate channels
2 Mc clock rate
Size — 7 x 5.87 x 3
To MIL specs



MA917

DELAY LINES TO MILITARY AND COMMERCIAL SPECIFICATIONS

WIRE SONIC — MAGNETOSTRICTIVE DELAY LINES

FIXED DELAYS

Model	Maximum Delay Microsec.	Max. Bit Rate RZ or C.W. Cent. Freq. Mc.	Size
ML545A	23	2.0	1 x 5 x .375
ML755A	20	2.5	1 x 6 x .375
ML756A	50	2.0	2 x 8 x .375
ML757	100	1.5	2 x 14 x .375
MT762A-1	250	2.5	4 x 5 x .50
MT762A-2	500	2.0	4 x 5 x .50
MT762A-3	2000	1.5	4 x 5 x .50
MT763A-1	3000	1.5	6 x 7 x .50
MT763A-2	5000	1.2	6 x 7 x .50
MT765A-1	10000	1.0	10.5 x 11.5 x .56
MT765A-2	15000	0.75	10.5 x 11.5 x .56

LONGITUDINAL MODE — Short delays with ±4 μsec trim adjustment; standard temperature coefficient 150 PPM/°C, provided as low as 2 PPM/°C.

TORSIONAL MODE — Ultra stable with temperature coefficient less than .5 PPM/°C available. Signal to spurious noise 10:1 dynamic 30:1 static. All units provide a ±4 μsec adjustment. Unsealed or hermetically sealed to meet MIL specs.

SERIAL COMPUTER MEMORIES

Model	Maximum Storage Bits RZ	Maximum Bit Rate RZ — MC	Size
MS772B-1	625	2.5	4.5 x 6.20 x 1.12
MS772B-2	1000	2.0	4.5 x 6.20 x 1.12
MS772B-3	3000	1.5	4.5 x 6.20 x 1.12
MS773A-1	4500	1.5	8 x 10.5 x .62
MS773A-2	6000	1.2	8 x 10.5 x .62
MS775A-1	10000	1.0	12.0 x 15.0 x .7
MS775A-2	11250	.75	12.0 x 15.0 x .7

COMPLETE UNITY GAIN MEMORY SYSTEMS supplied with transistorized circuitry for operation in any required mode RZ, NRZ or Bi-Polar. These units use the MT760 Delay Line series and have the exceptional stability and high signal to noise ratio of these Delay Lines. Can be cascaded and complete memory stacks are also provided. Maximum storage can be doubled by operating in the NRZ mode.

VARIABLE DELAYS

Model	Delay Range Microsec.	Max Bit Rate RZ MC	C.W. B.W. MC	Size
MV994	2-18	2.0	1.5-2.5	1 x 5 x .5
MV781A	2-30	2.0	1.5-2.5	1 x 9 x .5
MV782	30-100	1.0	.8-1.2	2 x 15 x .5
MV784	10-5000	.3	.2- .4	10.0 Dia. x 8
MV785	10-100,000	1.0	.8-1.2	19 x 17 x 10.5

SINGLE SHAFT CONTROL provides infinite resolution over a wide range of delays. Ideal for Radar Range Calibration, Simulation or Correlation work.
6 decade switch system provides .1 μsec resolution.

CORRELATION DELAY LINES — ELECTRICALLY VARIABLE

Model	Max. Delay Seconds	Frequency Response	Size
MA574	.01	10 cps to 50 Kc	12 x 12 x 3
MA880	.03	10 cps to 50 Kc	12 x 22 x 18
MA1005	.10	10 cps to 25 Kc	15 x 22 x 18
MA1006	1.0	10 cps to 10 Kc	24 x 27 x 49

LONG DELAYS OF COMPLEX SIGNALS with very little distortion. Ideal for correlation work. Supplied as: Fixed Delays; Multi-tap Delays; Variable Delays by means of switches or as an Electrically Variable system wherein delay is a function of a control voltage.

MULTIPLE OUTPUT DELAYS

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