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Page 1 of 8

HP 41 PROGRAM SUBMITTAL FORM
PROGRAMMFORMBLATT/DOCUMENTATION DU PROGRAMME/GENERALITÀ SUL PROGRAMMA

Program Title Programmtitel Titre du programme Titolo del programma		<u>CALCULATION OF THE TITER OF AN ANTISERUM WITH THE AID OF THE RADIAL IMMUNO DIFFUSION METHOD.</u>	
Category No. Kategorie Nr. Catégorie Nr. Categoria N°	Name Rubrik Rubrique Nome della categoria	<u>531 Biochemistry</u>	
No. of program lines Anzahl Programmzeilen Nombre de lignes de programme Nº di linee di programma	<u>146</u>	No. of data registers Anzahl des benötigten Datenspeicher Nombre de registres de données Nº di registri utilizzati	<u>17</u>
Recommended HP 41 System configuration Empfohlene System-Konfiguration Configuration recommandée Configurazione raccomandata		Port #1 <u>Memory module</u>	Port #2 _____
		Port #3 _____	Port #4 _____
<p>This program requires the following programs as subroutines: Dieses Programm benutzt folgende Programme als Unterprogramme: Ce programme utilise les programmes suivants comme sous-programmes: Questo programma usa i seguenti programmi come subroutine:</p>			
<p>Program Name: Programm: Nom du programme: Programma:</p>			
<p>HP Applications ROM HP Applikationen ROM ROM d'application HP ROM di applicazione HP</p>			
<p>Program Abstract Kurzbeschreibung Résumé Breve descrizione dei programmi</p> <p><u>With this program you can calculate the titer of an antiserum in mg/ml when using the radial immuno diffusion method according to Mancini. A possibility to correct erroneous data input is provided.</u></p>			
Program Size <u>038</u>			
<p>Name Name/Nom/Nome <u>Ed Nieuwenhuys</u></p>			
<p>Address Adresse/Adresse/Indirizzo <u>Langsom 39</u></p>			
<p>Country Land <u>Netherlands</u> Pays Paese</p>		<p>Postal Code Postleitzahl Code postal C.A.P.</p>	<u>1066 GC</u> <p>City Ort Localité Città</p> <p><u>Amsterdam</u></p>

ACKNOWLEDGMENT AND AGREEMENT

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Date
 Datum
 Date
 Das 20-10-82

Signature
 Unterschrift
 Signature
 Firma

(D. 11.11.)

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PROGRAM DESCRIPTION I

Page 2 of 2

PROGRAMMBESCHREIBUNG I
DESCRIPTION DU PROGRAMME I
DESCRIZIONE DEL PROGRAMMA I

Application, Equations, Variables
Anwendung, Gleichungen, Veränderliche
Application, Equations, Variables
Applicazione, Equazioni, Variabili

The next equations are used:

$$Q_{Ag} = \mu l \cdot Ag' \cdot conc \cdot Ag \cdot 10^{-3}$$

$$c = \frac{\partial D^2}{\partial Q_{Ag}} = \operatorname{tg} \alpha$$

$$T = \frac{1}{\frac{\pi \cdot k}{4} \cdot d \cdot c} = \text{titer in mg/ml}$$

k = ml antiserum

l = ml agar

d = thickness of the agar in cm!

Operating limits and Warnings
Grenzen und Einschränkungen
Limites et restrictions
Limiti operativi e avvertenze

If you want to change a diameter or a % after
pressing E, store 1 ST+16.

n is lowered by one in line 045 and 046 and will
be one to low when this is not corrected.

This program has been verified only with respect to the numerical example given in Program Description II. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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Dieses Programm wurde lediglich anhand des in der Programmbeschreibung II enthaltenen Zahlenbeispiels überprüft. Der Benutzer erhält und benutzt das Programmmaterial auf eigenes Risiko hin; er hat es deshalb - gleichgültig, ob es bereits anderweitig präsentiert oder beschrieben wurde - selbst zu untersuchen.

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Le présent programme n'a été vérifié qu'en ce qui concerne l'exemple numérique indiqué dans la description du programme II. L'utilisateur accepte et utilise le présent programme à ses propres risques et doit se fier uniquement à sa propre inspection du programme sans se référer à toute autre déclaration ou description.

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Questo programma è stato verificato soltanto per quanto concerne l'esempio numerico indicato nella Descrizione del Programma II. L'utilizzatore accetta e utilizzerà il presente programma a suo intero rischio, fidandosi unicamente della propria verifica del programma e non basandosi su altre dichiarazioni o descrizioni.

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PROGRAM DESCRIPTION II

PROGRAMMBESCHREIBUNG II

DESCRIPTION DU PROGRAMME II

DESCRIZIONE DEL PROGRAMMA II

Example The R.I.D. plate is made in 2% agar noble in 0,9% NaCl.

Beispiel

Exemple

Esempio

The agar is melted in an boiling waterbath. After dissolving it is cooled till 56°C, the antiserum is added and after mixing it is poured between two glassplates from which one is siliconated.

When the agar is congealed, holes of approx. 2,5 mm are made in the agar and filled with antigen dilution. 100% is 1+0, 50% is 1+1 a.s.o.

After 24-72 hours (the 100% ring should be between 5 and 7 mm) the ring diameter is measured.

Because diameter² vs concentration has a lineair relation a straight line can be calculated by lineair regression, with $t_{\text{gr}} = a$ and a correlation R. Then the titer is calculated.

For the example we made a R.I.D. plate with 0,150 ml antiserum in 12 ml agar, with a thickness of 0,15 cm.

We filled the holes with 3 µl antigen (1 mg/ml) and we found the next day the following ring diameters:

sketch
Skizze
Croquis
Schizzo

dilution		diameter in mm
1+0	100%	7,0
1+1	50%	5,3
1+3	25%	4,0
1+9	10%	3,0

PROGRAM DESCRIPTION III

(Example continued)

(Example continuation)
(Beispiel Fortsetzung)

[Exemple, suite]

(Esempio)

PROGRAM LISTING

PROGRAMMAUFLISTUNG

LISTAGE DU PROGRAMME

LISTATO DI PROGRAMMA

Page 5 of 8

Line Zeile Ligne Línea	Keystrokes Tastenfolge Touchés Tasti	Comments Kommentar Commentaires Commenti	Line Zeile Ligne Línea	Key pressed Tastenfolge Touchés Tasti	Comments Kommentar Commentaires Commenti
01	Δ LBL TI CLΣ "UL AG?" PROMPT		51	RCL 16 / -	
05	<AG> MG/ML PROMPT 1E3 / *		55	STO 00 RCL 12 RCL 11 X^2 RCL 16 /	
10	STO 09 1 STO 16 Δ LBL OO FIX 0		60	- STO 03 RCL 14 RCL 13 X^2	
15	"DIAM Y" ARCL 16 PROMPT STO 01 "% X"		65	STO 04 RCL 00 RCL 16 /	
20	ARCL 16 PROMPT CLA FIX 1 " "		70	STO 04 RCL 03 /	
25	ARCL 01 "/" FIX 0 ARCL X "↑%"		75	RCL 00 RCL 03 RCL 04 / SQRT	
30	AVIEW 1E2 / RCL 09 *		80	/	
35	STO 02 RCL 01 X^2 ENTER RCL 02		85	STO 06 Δ LBL C FIX 4 "R="	
40	• FS?C 07 ← RTN Σ+ GO TO 00 → Δ LBL E		90	ARCL 06 PROMPT FIX 2 "a="	
45	1 ST-16 RCL 15 RCL 11 RCL 13 *		95	ARCL 05 PROMPT RCL 11 RCL 16 / RCL 05 1E2 *	
50			00	CHS RCL 13 RCL 16	

Please use paper glue to attach listings. Adhesive tape may affect print!
Bitte Listings mit Papierkleim einkleben. Klebefilme können Druck bleichen!

S.V.P. utilisez de la colle à papier pour fixer les listings. Les rubans adhésifs peuvent altérer l'impression!
Per favore usare la colla per fissare i listati. Il nastro adesivo può alterare lo stampato!

PROGRAM LISTING

PROGRAMMAUFLISTUNG

LISTAGE DU PROGRAMME

LISTATO DI PROGRAMMA

Line Zeilic Ligne Linea	Keystrokes Tastenfolge Touches Tasti	Comments Kommentar Commentaires Commenti	Line Zeilic Ligne Lines	Key pressed Tastenfolge Touches Tasti	Comments Kommentar Commentaires Commenti
01	/		51		
	+				
	"b= "				
	ARCL X				
05	PROMPT		55		
	"ML AB?				
	PROMPT				
	STO 07				
	"ML AGAR?"				
10	PROMPT		60		
	STO 08				
	"MM AGAR?"				
	PROMPT				
	10				
15	/		65		
	STO 09				
	IT				
	4				
	/				
20	RCL 07		70		
	ENTER				
	ENTER				
	RCL 08				
	+				
25	/		75		
	■				
	RCL 09				
	■				
	RCL 05				
30	■		80		
	1/X				
	FIX 2				
	"TITER= "				
	ARCL X				
35	PROMPT		85		
	△LBL A				
	• SF 07				
	RCL 16				
	STO 10				
40	"?"		90		
	ASTO 16				
	XEQ 00 →				
	RCL 10				
	STO 16				
45	RDN		95		
	Σ-				
	GO TO 00 →				
	END				
50			00		

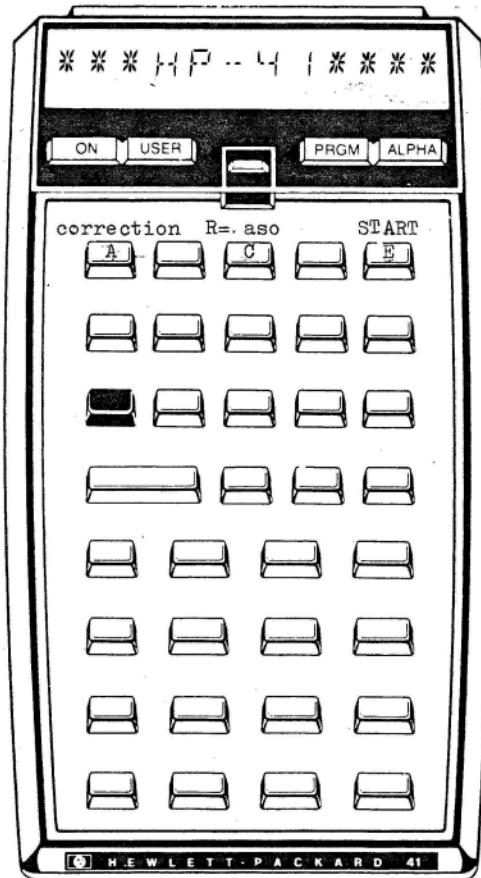
REGISTERS, STATUS, FLAGS
 REGISTERBELEGUNG, FLAGS, BETRIEBSARTEN
 REGISTRES, INDICATEURS, MODES OPÉATOIRES
 REGISTRI, MODI OPERATIVI, FLAGS

Page 7 of 2

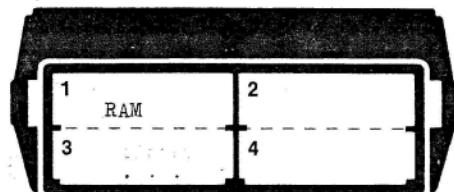
Registers Datenspeicher / Registres de données / Registrari				Status Betriebsart / Modes opératoires / Modi operativi			
00	used	50		Size 017	Total Reg. 038		User Mode
	used			Eng <input type="checkbox"/>	Fix <input checked="" type="checkbox"/>	Sci <input type="checkbox"/>	On <input checked="" type="checkbox"/>
	used			Deg <input type="checkbox"/>	Rad <input type="checkbox"/>	Grad <input type="checkbox"/>	Off <input type="checkbox"/>
05	a	55		Purpose Bedeutung Signification Scopo	Flags		
	b			00	SET	CLEAR	
	ml Ab			01			
	ml agar			02			
10	QAg, mm agar			03			
	n temp	60		04			
	Σx			05			
	Σx^2			06			
	Σy			07	$\Sigma +$	Σx	$\Sigma -$
15	Σxy	65		08			
	n			09			
				10			
				11	Audio execute		
20		70		12			
				13			
				14			
				15			
				16			
				17			
25		75		18			
				19			
				20			
				21	Printer Enable		
				22	Number Input		
		80		23	Alpha Input		
			*	24	Range Ignore		
				25	Error Ignore		
				26	Audio Enable		
35		85		27	User Mode	<input checked="" type="checkbox"/>	
				28	Decimal Point	<input checked="" type="checkbox"/>	
				29	Digit Grouping		
40		90		Assignments Tastenbelegung / Assignations / Assegnamenti			
				Function	Key	Function	Key
				Funktion	Taste	Funktion	Taste
				Fonction	Touche	Fonction	Touche
				Funzione	Tasto	Funzione	Tasto
45		95		correction input A R= a.s.o. C START calculation E			
		99					

SYSTEM CONFIGURATION
CONFIGURAZIONE DEL SISTEMA

Page 8 of 8



Assignments
Belegungen
Assignations
Assegnamenti



Configuration
Belegung
Configuration
Configurazione



Magnetic card
Magneträte
Carte magnétique
Scheda magnetica