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FIELD CHANGE ORDER	NUMBER: CI780-I007
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APPLICABILITY: When installing a 9XXX or 65XX system with a CIXCD or when upgrading an existing cluster with a CIXCD, replace ALL L0100 Rev "D" modules with L0118-\*\* or L0100 Rev "E" module (if available). This FCO affects all CI750, CI780, CIBCI and HSC50/70 nodes in VAXclusters containing a CIXCD.

\*\*NOTE\*\* An L0100 Rev E can co-exist with L0118s except in a greater than 16 node environment or when used with HSC60/90s.

PROBLEM & SYMPTOM: The CIXCD option requires an L0118 or an L0100 Min. Rev E. The L0100 Rev E cannot be used when the cluster is over 16 nodes or contains an HSC60/90.

SOLUTION: Replace all L0100 Rev D modules when installing CIXCD.

QUICK CHECK: Check that link module is part number L0118-\*\* or L0100 Min. Rev E.

PRE/CO-REQUISITE FCO:	MTTI HRS 1 Hr./Node
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TOOL/TEST EQUIPMENT: See Page 2.

#### FCO PARTS INFORMATION

FCO KIT NO.	DESCRIPTION OF CONTENTS	EQ KIT VARIATION APPLICABILITY
EQ-01616-XX FA-04949-XX	See Page 2 for description of contents and ordering information.	

#### FCO CHARGING INFORMATION

WARRANTY/CONTRACT				NONWARRANTY/NONCONTRACT				
ON-SITE		OFF-SITE		ON-SITE		OFF-SITE		MATERIAL ONLY
TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	TRAVEL/ INSTALL	EQ KIT	INSTALL	EQ KIT	ORDER-ADMIN, HANDLING PKG, SHIPPING & EQ KIT
DEC	DEC	DEC	DEC	CUS	CUS	CUS	CUS	CUS

#### APPROVALS

CSSE Tom Swett	CS LOGISTICS Ric Little	FS PRODUCT SAFETY Robert Brister
CSSE MANAGER Ric Grogan	This Document is published on multiple media including Hardcopy, Customer Services	FCO RELEASE DATE 30 May 1991
MICROMEDIA	Microfiche Libraries,	FCO REVISION

Diane MacDonald	Customer Services CD-ROM and MDS Microfiche Libraries.	A
POPULATION		PARTS AVAILABILITY June, 1991

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Tools/Test Equipment: (Continued from Page 1)

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Field Service Tool Kit  
VELOSTAT Electrostatic Field Service Kit (P/N 29-26246-00)  
Loopback Attenuators (12-19907-01)

PARTS LIST (Continued from Page 1)

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EQ-01616-01	1	L0118-**	Link Module
	1	FA-04949-06	Document Ordering Form
EQ-01616-02	5	FA Documents	(listed below)
		FA-04949-01	FCO Doc for CI750-I007
		FA-04949-02	FCO Doc for CI780-I007
		FA-04949-03	FCO Doc for CIBCI-I003
		FA-04949-04	FCO Doc for HSC50-I011
		FA-04949-05	FCO Doc for HSC70-I003

FOLLOWING KIT FOR SELF MAINTENANCE CUSTOMERS ONLY:

EQ-01616-03	1	L0118-**	Link Module
	5	FA Documents	(listed below)
		FA-04949-01	FCO Doc for CI750-I007
		FA-04949-02	FCO Doc for CI780-I007
		FA-04949-03	FCO Doc for CIBCI-I003
		FA-04949-04	FCO Doc for HSC50-I011
		FA-04949-05	FCO Doc for HSC70-I003

LINK MODULE UTILIZATION/SWITCH SETTINGS MATRIX

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OPTION	1 - 5 NODES	6 - 16 NODES	17 - 32 NODES
	MODULE/REV/SLOT-COUNT	MODULE/REV/SLOT-COUNT	MODULE/REV/SLOT
CI7XX, CIBCI, HSCXX	L0100 REV "D" L0100 REV "E" @ 7 TICK L0118 @ 7 TICK	L0100 REV E @ 10 TICK L0118 @ 10 TICK	L0118 @ 10 TICK

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CIBCA-A	T1025 @ 7 TICK	T1025 @ 10 TICK	T1025 @ 10 TICK
CIBCA-B	T1046 @ 7 TICK	T1046 @ 10 TICK	T1046 @ 10 TICK

OVERVIEW  
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NOTE: If all nodes in the VAXcluster system have 10 tick capability (I.E., L0118, L0100 Rev "E" and/or CIBCA-AA and NO L0100 Rev "D"), then all nodes should be set to 10 tick mode regardless of the VAXcluster system size.

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- L0100 - Rev "E" - See step 7 for 7/10-TICK Switch setup.
- L0118 - Rev "B" - See step 7 for 7/10-TICK, Cluster-size Switch set-up, and Misc. Function Jumpers.
- CIBCA-\*\* - Add Jumper from E11 to E41 on VAXBI Backplane for "10-TICK INCOMPATIBLE" mode operation. Verify no jumpers D29-D59 and D30-D60 for cluster-size (NODE-COUNT) of 16 or less. Refer to CIBCA User Guide Pg. 2-10 to 2-13 for set-up.

CI-LINK MODULE FCO INSTALLATION SUMMARY  
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*****
*          INCOMPATIBILITY WARNING - L0100-E1/E2 and L0118          *
*          -----                                                  *
*  The L0100-E1/E2 and L0118 "10-TICK-MODE" design changes are     *
*  *** INCOMPATIBLE *** with current L0100-D1 design, and CI/HSC-  *
*  LINK modules (L0100-E, CIBCA, L0118) set to "7-TICK-MODE".     *
*  Mixed "7 and 10-TICK-MODE" CI-LINK operation can have severe   *
*  impact on CI-arbitration performance and collision-rate (NO_RSP). *
*  For this reason, DEC does not support "10-TICK-MODE" CI-LINK    *
*  ROLLING-UPGRADES, thus requiring a CLUSTER SHUTDOWN to "ENABLE" *
*  10-TICK-MODE ** ONLY ** after all CI/HSC-nodes have been FCO'd. *
*                                                                    *
*  NOTE: High-availability customer exceptions to CLUSTER-        *
*  SHUTDOWN "rule" should be referred to CSSE for advice on      *
*  minimizing risks; but DEC will not assume any liabilities     *
*  for lost data/time with such CLUSTER upgrade programs.        *
*****

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o Forecast and obtain sufficient CI/HSCxx FCO kits for all CI7x0, CIBCI, HSCxx Cluster Nodes, ensuring availability of 1 (one) spare for every 10 (ten) FCO kits. FCO kits should NOT BE "P1 ORDERED", but should be ordered according to the Corporate Implementation

Plan. CIxxx Functional Diags (EVGAA/B) from VAX Diag. Rel #31 are also recommended for checkout.

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- o Study SWITCH/JUMPER SET-UP Procedures for L0100, L0118, and CIBCA modules for adjusting the following CI-LINK functions/modes:
  - "7/10-TICK" DELTA-TIME/QUIET-SLOT:
    - + L0118 Step 7
    - + L0100-E Step 7
    - + T1025/CIBCA-A Step 7 and CIBCA USER'S GUIDE Pg. 2-12
    - + T1046/CIBCA-B Step 7
  - CLUSTER-SIZE of 16/32 NODES:
    - + L0118 Step 7
    - + L0100-E NOT APPLICABLE
    - + T1025/CIBCA-A Step 7 and CIBCA USER'S GUIDE Pg. 2-12
    - + T1046/CIBCA-B Step 7
  - L0118 CI-LINK-MODE JUMPERS: Step 7
- o Install L0118 set to "7-TICK/COMPATIBLE-MODE" in all CI780, CI750, CIBCI, and HSC50/70 Cluster nodes. Refer to page 4 for CI780 specific upgrade procedures. There are no prerequisite/co-requisite CIxxx or HSCxx FCOs (modules or microcode) required for L0118 upgrade in "7-TICK 16-NODE MODE", but CI780.BIN Version V8.7 and CIBCA.BIN Version V7.5 are recommended.
- o Schedule and perform cluster shutdown after all non-CIBCA nodes are upgraded/FCO'd, and have been tested and verified to function in "7-TICK-MODE" operation under VMS. VMS system-testing is important to early detection and repair of any DOA FCO modules, prior to disrupting VAXcluster for CI-LINK 7-to-10-TICK mode-change.

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*****
*          IMPORTANT NOTE   ==  IMPORTANT NOTE          *
*  Customer should be involved or perform all CLUSTER-  *
*  wide or node-specific VAX and HSC STARTUPS, BOOTS,   *
*  and SHUTDOWNs.                                         *
*****
```
- o Switch all L0100-E, L0118-\*\*, T1015, and T1045s to "10-TICK-MODE" "INCOMPATIBLE" operation. Ensure all CIs and HSCs are powered-off before changing switches/jumpers. Refer to appropriate FCO steps. Any planned CI-NODE-ADDRESS changes should also be made at this time, with consideration of VMS SYSGEN and DECNET parameter changes required on reboot.
- o Reboot cluster, with customer consent, starting with HSCs.

CI-LINK MODULE FCO INSTALLATION PROCEDURE  
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1. Shutdown the system by executing the Shutdown Command Procedure, CUSTOMER SHOULD PERFORM THIS.

```
$ "@SYS$SYSTEM:SHUTDOWN.COM"
```

2. Set the five position keyswitch on the controller panel to the "OFF" position. For the 1178X set all memory power supplies to the "OFF" position. The memory power supplies can be identified by the label "Memory Power Supply" affixed to the top of the H7100s which are used for that purpose.

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*****  
*                               NOTE                               *  
*   If memory power supply switch is "ON" and circuit breaker   *  
*   on Power Controller is set to OFF, the Battery Backup Unit  *  
*   (if installed as an option) will be tuirned "ON". To turn  *  
*   off Battery Backup Unit, Memory Power Supply and Battery   *  
*   Backup must be turned "OFF"                                 *  
*****
```

3. Set the the Circuit Breaker on the 869D Power Controller to the "OFF" (0) position in the 1178X CPU cabinet; 876A CPU cabinet for the 8600 and SBI expander cabinets.
4. Disconnect all four BNCIA cables for this VAX-11/780 node at the SC008. Using the loopback attenuators connect:

```
Transmit Path "A" (TA) to Receive Path "A" (RA)  
Transmit Path "B" (TB) to Receive Path "B" (RB)
```

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*****  
*                               C A U T I O N                       *  
*                               *                                   *  
*   The L0118 module, as all VAX modules, contains               *  
*   electrostatic discharge sensitive devices (ESDS).           *  
*   The use of the VELOSTAT kit is essential to prevent         *  
*   damage which may not be noticed immediately.                *  
*                                                                   *  
*****
```

5. Set up VELOSTAT KIT

- a. Unfold the VELOSTAT mat to full size (24" x 24").
- b. Attach the 15 foot ground cord to the VELOSTAT snap fastener on the mat.
- c. Attach the alligator clip end of the ground cord to a good ground on the VAX-11/780 system.
- d. Attach the wrist strap to either wrist and the alligator clip to a convenient portion of the mat.

6. Remove the L0100 or L0118 module from its CIxxx module slot and place it on the mat. Check the revision and module type:

- L0100-E1/E2, or L0118, reinstall in same slot, and go to step 11 (no upgrade needed).
- L0100 below Rev. E1/E2, go to next step to continue with upgrade.

Record old CI-NODE ADDRESS settings on SW1 and SW2 switches (8-switch DIP on module handle).

7. With L0118 on ESD Mat, configure and verify CI-LINK mode jumpers/switches for "7-TICK COMPATIBLE" MODE operation. The L0118 also contains CLUSTER-SIZE switch and 4 (four) jumpers for MISC-FUNCTIONAL-MODES which should be checked. Install the new L0118 in the CIxxx option slot.

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*****
*                               IMPORTANT - NOTE                               *
* Copy old CI-NODE ADDRESS to new L0118. Ensure "7-TICK COMPATIBLE" mode is *
* ENABLED/SET to avoid CI-PATH errors with L0100-D1 or other "7-TICK" CI/HSC *
* nodes. The "10-TICK INCOMPATIBLE" mode cannot be used with L0100-D1 in *
* cluster. Default L0100/L0118 manuf. switch setting should be "7-TICK *
* COMPATIBLE" mode. Once all nodes are operational and functionally verified *
* Shutdown the entire cluster to change from "7-TICK" to "10-TICK" mode. *
*****

```

SET L0100-E1 COMPATIBILITY JUMPER AS FOLLOWS:

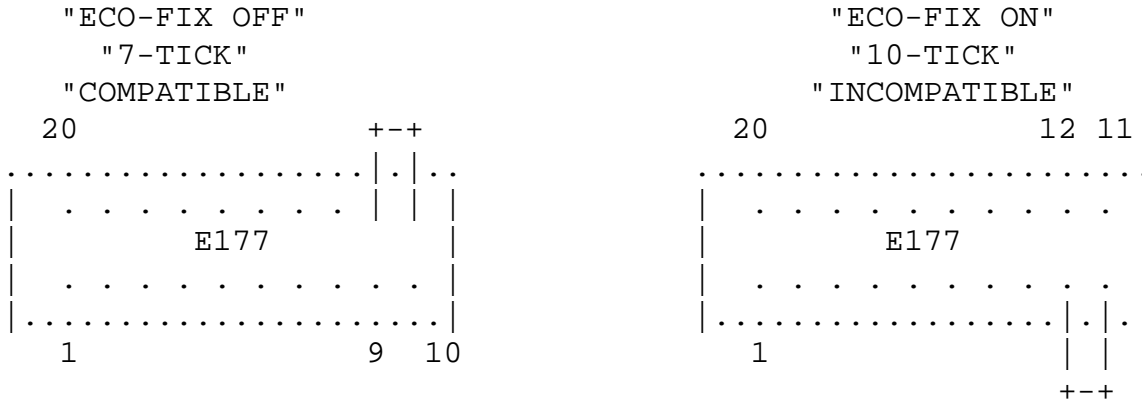
o 7/10-TICK COMPAT. MODE SET BY 1 JUMPER @ E177 stake-pins.

- "7-TICK COMPAT.-MODE": jumper E177-11 to E177-12
- "10-TICK INCOMPAT.-MODE": jumper E177-9 to E177-10

o NO CLUSTER-SIZE OR FUNCTION-MODE JUMPERS/SWITCHES.

o L0100-E1 QUICK-CHECK (PART-REVISION VERIFY):

- ECO wires at E177-13 and E177-9.
- STAKE-PINS (for jumper) @ E177-9,10,11,12.
- ETCH REV-C: P/N "50-14430C-0" marking.



SET L0100-E2 SWITCH SETTINGS AS FOLLOWS:

o 7/10-TICK COMPAT. MODE SET BY DIP-SWITCH SW3-1 LOCATED AT TOP CENTER OF L0100-E2 TO RIGHT OF E118:

- "7-TICK COMPAT.,ECO OFF": SW3-1 SWITCH "OFF"
- "10-TICK INCOMPAT.,ECO ON ": SW3-1 SWITCH "ON" .
- NOTE: SW3-2 IS NOT USED, BUT SET SAME AS SW3-1 TO AVOID CONFUSION.

o NO CLUSTER-SIZE OR FUNCTION-MODE JUMPERS/SWITCHES.

o L0100-E2 QUICK-CHECK (PART-REVISION VERIFY):

- SW3 DUAL-SWITCH-DIP-PACK AT TOP-CENTER, RIGHT OF E118.
- ETCH REV-D: P/N "50-14430-0-0 D1-P4" marking.

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SET L0118 SWITCH/JUMPER SETTINGS AS FOLLOWS:

- \*\*\*\*\*
- \* NOTE: REFER TO L0118 FIGURES ON FCO PAGE 11 AND \*
  - \* 12 FOR SW3 AND JUMPERS W1-W4 LOCATIONS. \*

- o 7/10-TICK COMPAT. MODE SET BY DIP-SWITCH SW3-4 LOCATED AT TOP CENTER OF L0118 TO LEFT (BELOW IF VERTICAL) OF 2 CI-NODE-ADDRESS 8-SWITCH PACKS.
  - "7- TICK COMPAT.,ECO OFF": SW3-4 SWITCH "OFF".
  - "10-TICK INCOMPAT.,ECO ON" : SW3-4 SWITCH "ON" .
  - SWITCHES SW3-2 AND SW3-3 MUST BE "OFF" (AFFECTS DELTA-TIME/QUIET-SLOT) !!
  
- o CLUSTER-SIZE FOR 16/32-NODE ADDRESSING AND ARBITRATION IS CONTROLLED BY SWITCH SW3-1. DEFAULT = 16-NODE-MODE = "OFF".
  - 16-NODE MODE (DEFAULT WITH NO CISCE): SW3-1 "OFF".
  - 32-NODE MODE (CISCE 24-NODE CLUSTER): SW3-1 "ON" .
  
- o L0118 FUNCTION-MODE JUMPERS W1-W4 DEFAULT SETTINGS CHECK: View module with HANDLE-UP and FINGERS-DOWN. Refer to L0118 Figures on FCO pages 11 and 12.
  - L0118-B1 HAS ECO-WIRES ON E83-3 and E150-1:
    - = W1 located left of E2: plugged on left 2 stake-pins, marked with "box".
    - = W3 located between E54 and E75: plugged on horizontal stake-pins, marked with "box".
    - = W2 and W4 located as 4 stake pins below E24 and E62: W2 and W4 "OUT".
  
  - L0118-B2 HAS NO ECO-WIRES TO E83-3 AND E150-1:
    - = W1 located left of E2: W1 on left 2 stake-pins, marked with "box".
    - = W3 located between E54 and E75: W3 on horizontal stake-pins, marked with "box".
    - = W2 located below junction of E24 and E62: W2 on left 2 stake-pins marked with "box".
    - = W4 located below E24: W4 plugged on left 2 stake-pins marked with "box".

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SET CIBCA BACKPLANE JUMPER SETTINGS AS FOLLOWS:(FOR QUICK REFERENCE)

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Refer to CIBCA Users Guide Pg. 2-10 to 2-13  
 All jumpers are located behind T1015 & T1045 Modules.  
 Jumper changes DO NOT take effect until SELF-TEST EXECUTED.

- o "7/10-TICK ALTER-DELTA-TIME" CONTROLLED BY JUMPER ON T1015 & T1045 BACKPLANE PINS E11-E41, E09-E39, and E10-E40:
  - ENSURE E09-E39 and E10-E40 JUMPERS "OUT".



- "7 -TICK COMPAT., ECO-OFF": Jumper OUT E11-E41.
- "10-TICK INCOMPAT.,ECO-ON" : Jumper IN E11-E41.

- o CLUSTER-SIZE FOR 16/32-NODE ADDRESSING AND ARBITRATION IS SET BY JUMPER ON T1015 \* T1045 PINS D30-D60 AND D29-D59:
  - Ensure E29-E59 out for both 16 or 32-NODE mode.
  - 16-NODE mode (default no CISCE): D30-D60 "OUT".
  - 32-NODE mode (CISCE 24-NODE ): D30-D60 "IN" .

8. Set the Circuit Breaker on the 869D Power Controller in the CI Expander Cabinet to the "ON" (1) position.
9. Power-up the system.
10. Run the following Level III (offline) diagnostics under the DIAG. SUPV. (DS>) E\*SAA-14.4 to verify that the CI780 is functional.

DIAGNOSTIC	MINIMUM VERSION	TITLE
-----	-----	-----
EVGAA	7.0	CI Functional Diag Part I
EVGAB	7.0	CI Functional Diag Part II

WARNING: EVGAA/B may report "false errors" when connected to "live" CLUSTER due to receipt of SCS START-DATAGRAMS from VMS.

11. Remove the loopback attenuators and reconnect the BNCIA cables to their original SC008 ports.
12. Boot system into VAXcluster, using customer's "standard operating procedures". IT IS PREFERRED THAT THE CUSTOMER PERFORM THIS STEP.

EVERY UPGRADED CI/HSC NODE WITH NEW L0100-E\*/L0118 SHOULD BE TESTED UNDER VMS IN "7-TICK ECO-OFF MODE" TO SYSTEM-TEST NEW FCO PARTS PRIOR TO CLUSTER-WIDE CI-LINK-MODE TRANSITION.

13. Upgrade remaining CI750, CI780, CIBCI, HSC50, and HSC70 nodes that do not contain L0100-E1/E2 or L0118 CI-LINK module.

\*\*\* REPEAT STEP 1 UNTIL ALL NODES ARE COMPLETED. \*\*\*

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14. Set all CI/HSC nodes to "10-TICK, INCOMPATIBLE, ECO-ENABLED MODE" operation. \*\*\* THIS REQUIRES ENTIRE CLUSTER-SHUTDOWN TO AVOID CI-PATH FAILURES, CLUSTER-MEMBER LOSS, AND RISKS TO DATA-INTEGRITY. \*\*\* Ensure each CI is powered off when changing jumpers.

Set "10-TICK, INCOMPATIBLE, ECO-ENABLED MODE" by referring

to Page 6, Step 6; or use following quick reference chart:

	L0100-E1	L0100-E2	L0118-**	CIBCA-A	CIBCA-B
	E177	SW3-1	SW3-4	T1015	T1045
	JUMPER	SWITCH	SWITCH	E11-E41	E11-E41
	-----	-----	-----	-----	-----
7-TICK:	11-12 IN	"OFF"	"OFF"	"OUT"	"OUT"
10-TICK:	9-10 IN	"ON"	"ON"	"IN"	"IN"

Only L0100 Rev E\* needs to be removed in order to set to 10-TICK.

15. Boot all systems back into VAXcluster, starting with HSCs, using customer's "standard operating procedures". IT IS PREFERRED THAT THE CUSTOMER PERFORM THIS STEP.
16. Report the FCO activity on the LARS form in the "module/fail/area/FCO" column as "FCO CI780-I007" as indicated. (See example below.)
17. Update Site Management Guide.

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LARS

	USA	GIA	EUROPE
Activity -			
Contract and Warranty	W	U	Y
Non Contract/Non Warranty	F	F	F
DEC Option	CI780	CI780	CI780
Type of Call	M	M	M
Action Taken	D	D	I
Fail Area-Module-FCO-Comments	CI780-I007	CI780-I007	CI780-I007
Material Used	EQ-01616-01	EQ-01616-01	EQ-01616-01
	EQ-01616-02	EQ-01616-02	EQ-01616-02

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FIGURE 1 - L0118 LINK MODULE SWITCHES

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FIGURE 2 - L0118 LINK MODULE SETTINGS

\^ CI780  
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\CI780  
\CIXCD  
\9XXX  
\65XX  
\1991  
\MAY