

LTC 2600 Series Video Multiplexers

Instructions For Use



IMPORTANT SAFEGUARDS

1. Read Instructions - All the safety and operating instructions should be read before the unit is operated.
2. Retain Instructions - The safety and operating instructions should be retained for future reference.
3. Heed Warnings - All warnings on the unit and in the operating instructions should be adhered to.
4. Follow Instructions - All operating and use instructions should be followed.
5. Cleaning - Unplug the unit from the outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6. Attachments - Do not use attachments not recommended by the product manufacturer as they may cause hazards.
7. Water and Moisture - Do not use this unit near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, near a swimming pool, in an unprotected outdoor installation, or any area which is classified as a wet location.
8. Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury to a person and serious damage to the unit. Use only with a stand, tripod, bracket, or mount recommended by the manufacturer, or sold with the product. Any mounting of the unit should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



9. Ventilation - Openings in the enclosure, if any, are provided for ventilation and to ensure reliable operation of the unit and to protect it from overheating. These openings must not be blocked or covered. This unit should not be placed in a built-in installation unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
10. Power Sources - This unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply you plan to use, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.
11. Grounding or Polarization - This unit may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

Alternately, this unit may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

12. Power-Cord Protection - Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.
13. Power Lines - An outdoor system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal. U.S.A. models only - refer to the National Electrical Code Article 820 regarding installation of CATV systems.
14. Overloading - Do not overload outlets and extension cords as this can result in a risk of fire or electric shock.
15. Object and Liquid Entry - Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the unit.

16. Servicing - Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
17. Damage Requiring Service - Unplug the unit from the outlet and refer servicing to qualified service personnel under the following conditions:
 - a. When the power-supply cord or plug is damaged.
 - b. If liquid has been spilled, or objects have fallen into the unit.
 - c. If the unit has been exposed to rain or water.
 - d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
 - e. If the unit has been dropped or the cabinet has been damaged.
 - f. When the unit exhibits a distinct change in performance--this indicates a need for service.
18. Replacement Parts - When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.
19. Safety Check - Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.
20. Coax Grounding - If an outside cable system is connected to the unit, be sure the cable system is grounded. U.S.A. models only--Section 810 of the National Electrical Code, ANSI/NFPA No.70-1981, provides information with respect to proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
21. Lightning - For added protection of this unit during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the unit due to lightning and power-line surges.

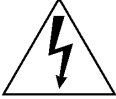

FCC & ICES INFORMATION (U.S.A. and Canadian Models Only)

WARNING - This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and ICES-003 of Industry Canada. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Intentional or unintentional changes or modifications not expressly approved by the party responsible for compliance shall not be made. Any such changes or modifications could void the user's authority to operate the equipment.

If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No.004-000-00345-4.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

SAFETY PRECAUTIONS

	CAUTION RISK OF ELECTRIC SHOCK. DO NOT OPEN!	
<p>Caution: To reduce the risk of electrical shock, do not open covers. No user serviceable parts inside. Refer servicing to qualified service personnel</p>		

This label may appear on the bottom of the unit due to space limitations.



The lightning flash with an arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

<p>Warning: To prevent fire or shock hazard, do not expose units not specifically designed for outdoor use to rain or moisture.</p>
--





Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical Code or applicable local codes.



Power Disconnect. Units with or without ON-OFF switches have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON-OFF switch is in the ON position. The power cord is the main power disconnect for all units.

SECURITE

	ATTENTION RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR.	
<p>Danger: Pour éviter tout risque d'électrocution, ne pas ouvrir le boîtier. Il n'y a pas de pièces remplaçables à l'intérieur. Pour toute révision, s'adresser à un technicien spécialisé.</p>		

En raison de limitation de place, cette étiquette peut être placée sur le dessous de l'appareil.



L'éclair fléché dans un triangle équilatéral, avertit l'utilisateur de la présence d'une "tension dangereuse" non isolée à l'intérieur de l'appareil et d'une valeur suffisante pour constituer un risque d'électrocution.



Le point d'exclamation contenu dans un triangle équilatéral, avertit l'utilisateur de la présence, dans la documentation qui accompagne l'appareil, de consignes d'utilisation et de maintenance importantes.

<p>Attention: Pour éviter le risque d'électrocution ou d'incendie, ne pas exposer à la pluie ou à l'humidité un appareil non conçu pour une utilisation extérieure.</p>
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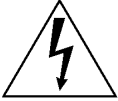



Attention: L'installation doit être effectuée uniquement par du personnel de service qualifié conformément à la réglementation du Code Electrique National ou à la réglementation locale.



Disjonction de l'alimentation. Les appareils avec ou sans commutateurs ON-OFF sont alimentés à chaque fois que le cordon d'alimentation est branché à la source d'alimentation; toutefois, les appareils disposant de commutateurs ON-OFF ne fonctionnent que lorsque le commutateur ON-OFF est sur la position ON. Le cordon d'alimentation est la disjonction d'alimentation principale pour tous les appareils.

SICHERHEITSVORKEHRUNGEN

	VORSICHT RISIKO EINES ELEKTRISCHEN SCHLAGES NICHT ÖFFNEN!	
<p>VORSICHT: Um einen elektrischen Schlag zu vermeiden, abdeckung nicht entfernen. Wartungen aller art qualifiziertem personal überlassen.</p>		

Aus Platzgründen kann diese Warnung auf der Unterseite des Gerätes angebracht sein.



Das Blitzsymbol im gleichseitigen Dreieck soll den Benutzer auf nicht isolierte "Hochspannung" im Gehäuse aufmerksam machen, die eventuell stark genug ist, um einen elektrischen Schlag zu verursachen.



Das Ausrufezeichen im gleichseitigen Dreieck soll den Benutzer auf wichtige Bedienungs- und Wartungsanleitungen in der dem Gerät beigefügten Literatur aufmerksam machen.

Warnung

Um Feuer oder elektrische Schläge zu vermeiden, setzen Sie das Gerät niemals Regen oder Feuchtigkeit aus.





Achtung! Die Installation sollte nur von qualifiziertem Kundendienstpersonal gemäß jeweilig zutreffender Elektrovorschriften ausgeführt werden.



Netzanschluß. Geräte mit oder ohne Netzschalter haben Spannung am Gerät anliegen, sobald der Netzstecker in die Steckdose gesteckt wird. Das Gerät ist jedoch nur betriebsbereit, wenn der Netzschalter (EIN/AUS) auf EIN steht. Wenn man das Netzkabel aus der Steckdose zieht, dann ist die Spannungszuführung zum Gerät vollkommen unterbrochen.

PRECAUCIONES DE SEGURIDAD

	PRECAUCION RIESGO DE CHOQUE ELECTRICO. ¡NO ABRIR!	
<p>Precaucion: Para Reducir El Riesgo De Choque Eléctrico, Favor No Abrir La Cubierta. Este Equipo No Consta De Piezas O Partes Que Requieren Servicio O Mantenimiento. Para Reparaciones Favor Referirse A Un Técnico Calificado.</p>		

Debido a limitaciones de espacio, esta etiqueta puede aparecer en la parte inferior de la unidad.



El símbolo representado por un relámpago con punta de flecha dentro de un triángulo equilátero, se muestra con el objetivo de alertar al usuario que existen "voltajes peligrosos" sin aislamiento, dentro de la cubierta de la unidad. Dichos voltajes pueden ser de tal magnitud que constituyen un riesgo de choque eléctrico a personas.



El símbolo de exclamación dentro de un triángulo equilátero, se muestra con el objetivo de alertar al usuario de que instrucciones de operación y mantenimiento importantes acompañan al equipo.

Peligro

Para evitar el peligro de incendio ó choque eléctrico, no exponga a la lluvia ó humedad, equipos que no han sido para uso exterior.



Atención: La instalación de este equipo debe ser realizada por personal capacitado, solo en acuerdo, y en cumplimiento de normas del "National Electric Code" (Código Eléctrico Nacional) ó las normas del Gobierno Nacional Local.



Para Desconectar la Alimentación: Unidades no equipadas con interruptores ON/OFF, son alimentadas cuando el cable de alimentación es conectado a la corriente eléctrica. Las unidades equipadas con interruptores son alimentadas de igual forma, pero adicionalmente requieren que el interruptor esté posicionado en ON. El cable de alimentación es el medio principal de desconexión del equipo.


<p>ATTENTION OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES</p>

WARNING: Electrostatic-sensitive device. Use proper CMOS/MOSFET handling precautions to avoid electrostatic discharge.

NOTE: Grounded wrist straps must be worn and proper ESD safety precautions observed when handling the electrostatic-sensitive printed circuit boards.

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SECTION 1: INTRODUCTION TO THE LTC 2600 SERIES VIDEO MULTIPLEXER

1.1 Unpacking

Unpack carefully. This is electronic equipment and should be handled carefully.

Check for the following items:

- LTC 2600 Series Video Multiplexer
- Instructions for use
- Quick Reference Guide
- One shielded cable with a 25-pin D-Type connector on one end. Used for Alarm/Accessory connections.
- Rack mount kit is included.
- One shielded cable with 15-pin D-type connector on one end. Use for Biphase output (LTC 2672, LTC 2680 Series only).

If an item appears to have been damaged in shipment, replace it properly in its carton and notify the shipper. If any items are missing, notify your Philips Communication & Security Systems Sales Representative or Customer Service.

The shipping carton is the safest container in which the unit may be transported. Save it for possible future use.

1.2 Service

If the unit ever needs repair service, the customer should contact the nearest Philips Communication & Security Systems Service Center for return authorization and shipping instructions.

Service Centers

U.S.A. & Canada: 800-366-2283

Mexico & Central America: 52-5-564-2726

Europe & Middle East: 44-1932-765666

South America: 54-1-956-0837

Australia: 61-2-888-9000

New Zealand: 64-4-237-7297

1.3 Understanding Video Multiplexers

The LTC2600 Series Video Multiplexers are designed to control multichannel recording and playback with the added capability of multiscreen viewing. The units allow monitoring of multiple camera sites without the need for multiple monitors and VCRs. They can be programmed easily via front panel control keys and on-screen display menus.

Video multiplexers are available in the following main categories:

- **Standard Models** provide high quality multiplexing. They are designed to be plug-and-play, therefore simplifying installation.
- **System4 Models** provide a variety of advanced system features such as control via remote keypad, PC control, system camera control, as well as enhanced multiplexing (e.g. two multiscreen outputs and two VCRs to increase recording speed).
- **Simplex Models** allow live multiscreen monitor viewing or playback or VCR recording.
- **Duplex Models** allow live multiscreen monitor viewing or playback and at the same time, recording all video.

Note: See Appendix A for a detailed list of features.

Power

Model No.	Mode	Rated Voltage	Voltage Range	Power
6 Channel				
Standard Color Models				
LTC 2622/50	Duplex	220 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2622/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
9 Channel				
Standard Monochrome Models				
LTC 2631/50	Simplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2631/60	Simplex	120 VAC, 50/60 Hz	108 to 132	30 W
LTC 2632/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2632/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
Standard Color Models				
LTC 2641/50	Simplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2641/60	Simplex	120 VAC, 50/60 Hz	108 to 132	30 W
LTC 2642/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2642/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
System4 Color Models				
LTC 2672/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2672/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
16 Channel				
Standard Monochrome Models				
LTC 2651/50	Simplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2651/60	Simplex	120 VAC, 50/60 Hz	108 to 132	30 W
LTC 2652/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2652/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
Standard Color Models				
LTC 2661/50	Simplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2661/60	Simplex	120 VAC, 50/60 Hz	108 to 132	30 W
LTC 2662/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2662/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W
System4 Color Models				
LTC 2681/50	Simplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2681/60	Simplex	120 VAC, 50/60 Hz	108 to 132	30 W
LTC 2682/50	Duplex	230 VAC, 50/60 Hz	195.5 to 253	30 W
LTC 2682/60	Duplex	120 VAC, 50/60 Hz	108 to 132	30 W

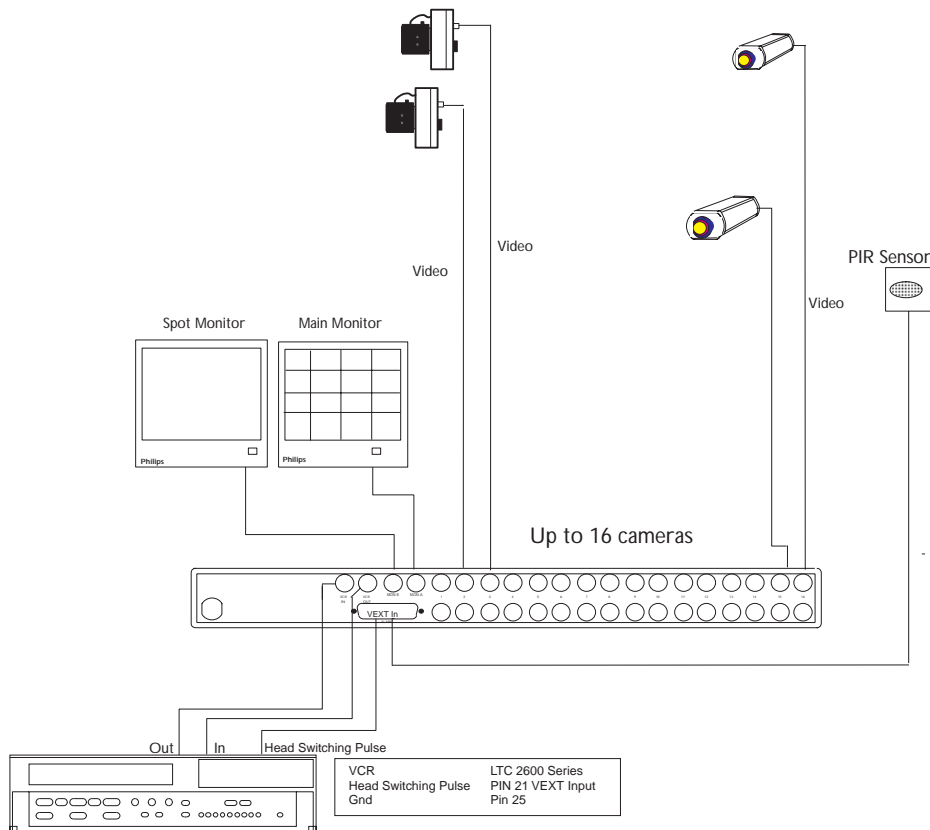


Figure 1A: Typical Video Multiplexer System

SECTION 2: INSTALLING THE VIDEO MULTIPLEXER

2.1 Mounting

The multiplexer is supplied as a desktop unit. If desired the unit may be rack mounted using the included rack mount kit.

2.2 Connecting the Video Multiplexer System

1. Refer to Figures 2A and 2B for details on the input/output connections supplied by the multiplexer. (Be sure to reference the appropriate drawing for your multiplexer model.)
2. Review the typical installation diagrams provided in Appendix B at the back of the manual, and determine the number of cameras, monitors, and VCRs to be incorporated into the system.
3. Connect all peripherals (e.g. cameras, monitors, VCRs) to the corresponding inputs/outputs on the multiplexer rear panel.

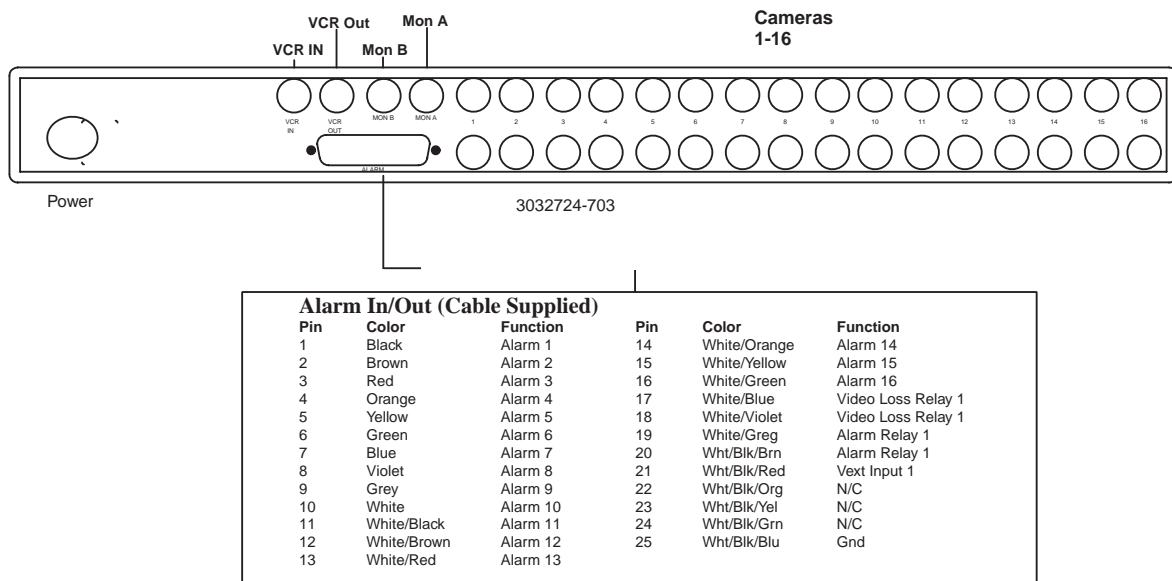


Figure 2A: 16-Channel Back Panels

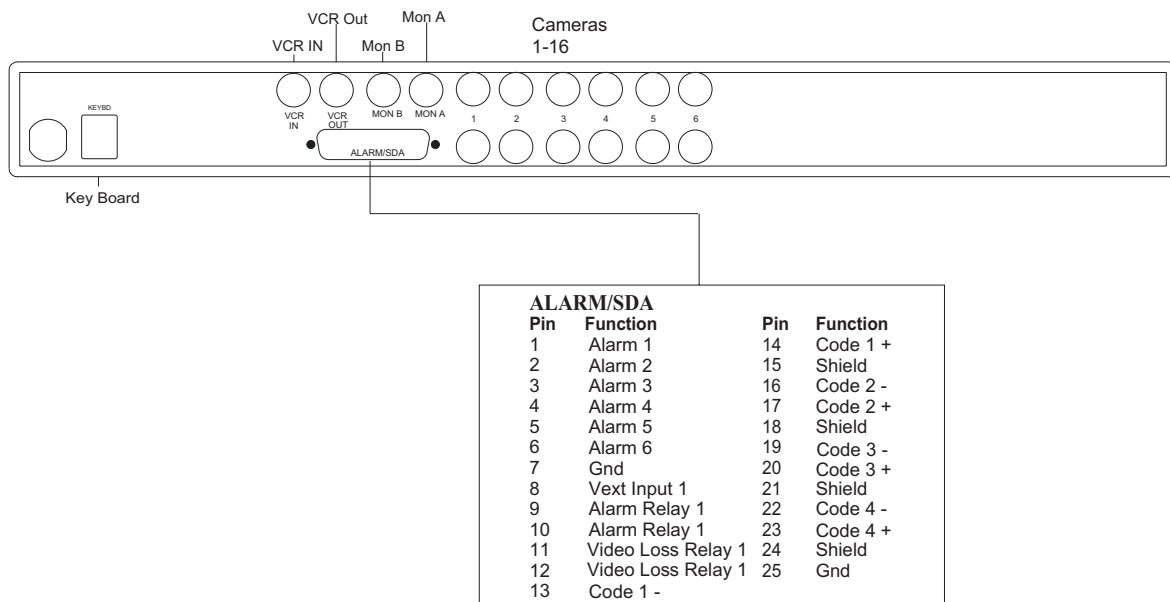


Figure 2B: 6-Channel Back Panels

**When using Remote Keyboard LTC 2601/00 or LTC 2602/00, to control Philips VCRs, please use the following connections.

From Console Port of System4 to RS-232 Port of Philips VCRs

Function	9 Pin D sub	to	25 Pin D sub
Rx	2		2
Gnd	5		1+7
Tx	3		3

or purchase a S1383 cable.

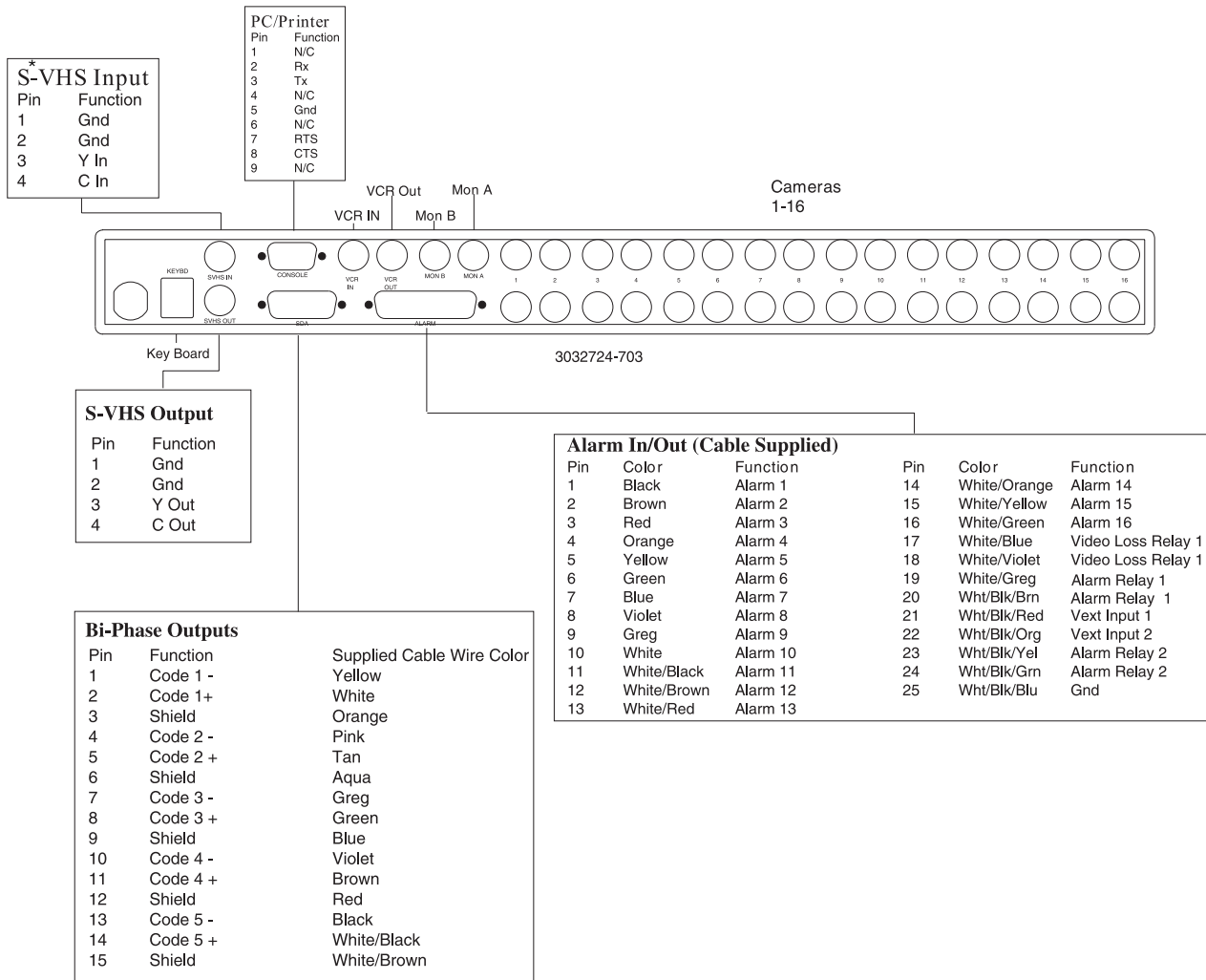


Figure 2C: 16-Channel System4 Back Panels

* S-VHS (IN/OUT)
Limited Distance Need S-VHS VCR and S-VHS Tape

2.3 Programming

1. When all connections have been successfully completed, apply power to the system.
2. Upon power up, the multiplexer will be using the factory-set default parameters. (See Appendix C for a complete listing of the Factory Default Settings.)
3. Refer to Figures 2D, 2E and 2F for a detailed review of the multiplexer front panel controls which will be used in programming. Summaries of the control functions (primary and secondary) and the LED indicators are provided in the adjacent tables.

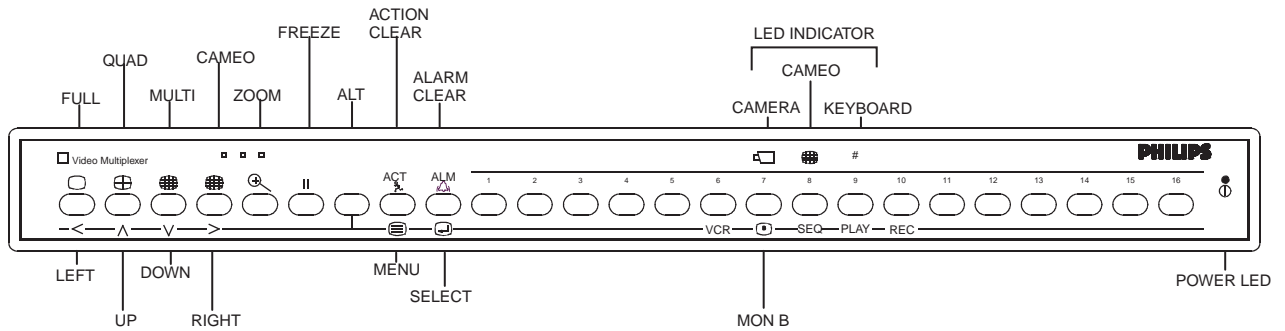


Figure 2D: 16-Channel Front Panel

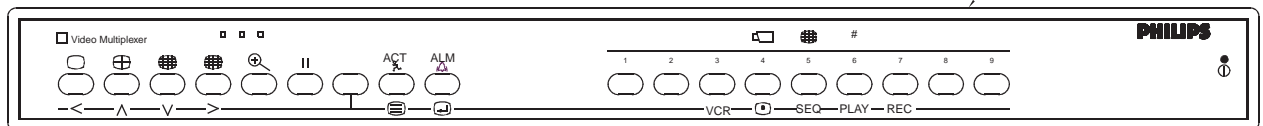


Figure 2E: 9-Channel Front Panel

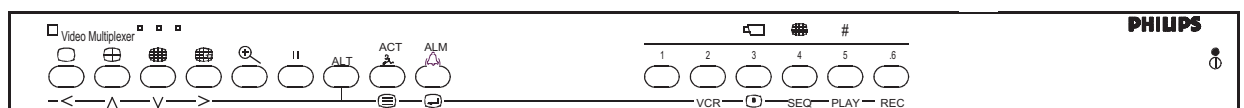



















Figure 2F: 6-Channel Front Panel

Indicators

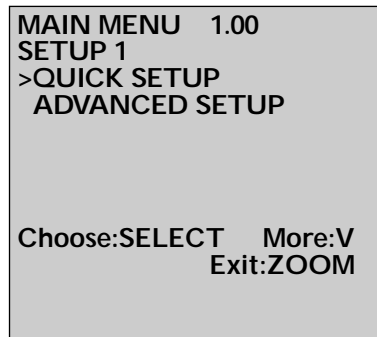
LED	Indication
POWER	Power supplied to unit
ALT	Primary indication: Alternate functions (Flashing): Camera-to cameo mode (ALT + SELECT)
RECORD	Record mode enabled
PLAYBACK	Playback mode enabled
VCR Test	VCR Test enabled
MON B	Monitor B enabled (Front panel keys control monitor B display)
SEQ	Sequence mode enabled
CAMEO	Cameo mode enabled (Camera keys control cameo images)
CAMERA	Camera mode enabled (Camera keys control camera images)
KEYPAD	Numeric mode enabled (Camera keys act as numeric keys)
ZOOM	Enlarge/zoom mode enabled
ACT	Steady: Action is enabled Flashing: Action has occurred
ALM	Steady: Alarm is enabled Flashing: Alarm has occurred.

Controls






Primary Selections		Secondary Selections	
Description	Icon	Description	Icon
FULL		LEFT	
QUAD		UP	
MULTI		DOWN	
CAMEO		RIGHT	
ZOOM			
FREEZE			
ALT			
ACTION CLEAR	ACT 	MENU	
ALARM CLEAR	ALM 	SELECT	


4. The multiplexer is programmed through on-screen menus which include access to on-screen HELP information. The menus will be displayed on Monitor A in the system.
5. To access the menu screens, press the ALT key  followed by the MENU key .
6. The Main Menu (as shown below) displays two setup options: Quick Setup and Advanced Setup.
 - Quick Setup will provide all the basic programming necessary for typical systems
 - Choose Advanced Setup when configuration requires such functions as alarm, motion, etc.

To perform the Advanced Setup for customized system configurations, first select Advanced Setup from the main menu; then program the Time/Date, AutoSet, and VCR setups as described in the following paragraphs; and then refer to Section 4 for additional programming instructions.



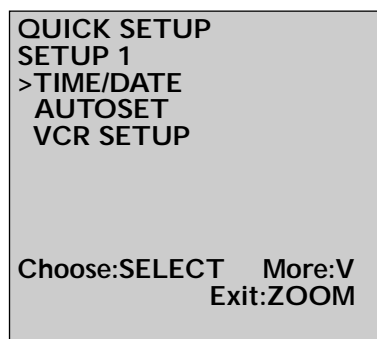
Each menu screen includes two lines at the bottom showing the options that can be selected. These options are:


CHOOSE	Press SELECT key 
MORE	Use direction keys  < > ^
EXIT	Press ZOOM key 
HELP	Press ALT key 
DEFAULT	Press FREEZE key 
ENTER CHARACTER	Use direction keys to scroll through characters



When the SELECT key  is pressed, all programmed settings are saved into non-volatile memory.

NOTE: A complete listing of all menu trees is provided at the back of the manual in Appendix D.

7. For typical video multiplexer system operations, select the Quick Setup option from the Main Menu.



NOTE: The Quick Setup program includes: Time/Date, AutoSet, and VCR setup. Quick Setup guides you through all of these steps. If for any reason you need further information, consult the built-in HELP feature by pressing the ALT key .

8. Select **Time/Date** from the Quick Setup menu. Enter the time format (12 or 24 hours), time, date format (dd/mm/yyyy; mm/dd/yyyy; yyyy/mm/dd) and date information as requested. Use the direction (arrow) keys to move the cursor and to scroll through parameter settings. Use the SELECT key  to choose the parameter you want to program and to save your selections. When you have finished programming all time/date parameters, use the ZOOM key  to return to the Quick Setup menu.

```

TIME/DATE
>TIME FORMAT      12hr
TIME              01:00:00AM
DATE FORMAT MM/DD/YYYY
DATE              01/01/1998

Choose:SELECT      More:V
Edit: ><           Exit:ZOOM

```

NOTE: The multiplexer encodes the time/date onto each field of video sent to the VCR. In the Live Display mode, the time/date is displayed on the monitor. If the VCR's time/date display is ON, each screen in the playback mode will also show the time/date. (You may want to switch the VCR time/date display OFF.)

9. Select **AutoSet** from the Quick Setup menu to automatically configure the video multiplexer for the number of cameras connected. (A sample AutoSet menu is shown below.) Recording, sequence, and video loss list are also configured via this menu.
10. Selecting **AUTOSET ALL BELOW** will automatically set the record list, sequence, and video loss list (according to the number of camera inputs detected by the multiplexer). Selecting any of the other options in this menu will set only the selected option.

```

AUTOSET
SETUP 1
>AUTOSET ALL BELOW
RECORD LIST
VIDEO LOSS LIST
SEQUENCES

Choose:SELECT      More:V
Exit:ZOOM

```

11. When Autoset is completed, a message indicating so will be displayed for nine seconds. The camera inputs detected in the setup process are also displayed as shown in this sample screen.

```

AUTOSET ALL
SETUP 1
01 02 03 04 05 06 -- -- --
-- -- -- -- -- -- -- --

The above cameras were
included in selected system
list(s).

HIT ANY KEY TO CONTINUE

```

12. Return to the Quick Setup main menu by pressing the zoom key. Continue by selecting VCR Setup (menu shown below).

```
VCR SETUP
SETUP 1
>RECORD SETUP *VCR OUT*
PLAYBACK FORMAT LTC2600
RECORD LOCK      OFF

Choose:SELECT      More:V
                   Exit:ZOOM
```

Standard Model Display.

```
VCR SETUP
SETUP 1
>RECORD SETUP *VCR OUT*
RECORD SETUP *MON B*
PLAYBACK FORMAT LTC2600
RECORD FORMAT   LTC2600
RECORD LOCK     OFF

Choose:SELECT      More:V
                   Exit:ZOOM
```

LTC 2672 and LTC 2682 Series Display
(**System4** Duplex) only.

NOTE: The LTC 2600 Series multiplexers are configured to record and playback from a wide range of VCRs. The VCR provides a pulse (VEXT) each time a video field is recorded to tape. This signal lets the multiplexer know that it can switch to a new camera. This feature also simplifies installation by synchronizing the normal and alarm recording speeds. You will need to decide how you are going to synchronize the multiplexer and the VCR. The options are:

- (a) Connect and enable the VEXT output from the VCR and then choose the recording speed of the VCR. This is the simplest and recommended method of synchronizing the multiplexer to the VCR. (Follow steps 13-14).
 - (b) If VEXT is not available, specify the VCR model and time lapse mode. Begin at step 15 (skip 13-14).
13. Connect the VEXT output from the VCR (CAM SW Out or Record Out) to Pin 21 (White/Black/Red) and Ground to Pin 25 (White/Black/Blue) of the Alarm In/Out (cable supplied).
14. From the VCR Setup menu, select RECORD SETUP, then move to the VEXT INPUT selection. Switch it to the ON setting (the factory default is OFF).

```
RECORD SETUP
*VCR OUT* SETUP 1
>VEXT INPUT      OFF
SELECT VCR
TIME LAPSE

Choose:SELECT      More:V
                   Exit:ZOOM
```

15. The alternate method for synchronization of the multiplexer and the VCR requires (a) selecting the appropriate VCR model, and then (b) selecting the identical setting in the VCR time-lapse menu.

16. From the VCR Setup menu, select RECORD SETUP, then SELECT VCR. Scroll through the different selections listed with the TYPE parameter until you find your VCR model.

```

SELECT VCR
*VCR OUT* SETUP 1
>TYPE:PHILIPS TC3991 HD
EDIT CUSTOMVCR

Choose:SELECT   More:V
Edit: ><       Exit:ZOOM

```

17. After you select a VCR model, use the SELECT key  to move to the TIMELAPSE Mode menu.

NOTE: When you specify the VCR model, the multiplexer will present the time-lapse settings in the same format as the VCR. Ensure the same setting is entered in the VCR timelapse menu.

NOTE: If the type of VCR that is being used is not listed in the SELECT VCR menu, choose the CUSTOMVCR option. Up to six custom setups can be stored in the VCR list. The field rate must be determined for each of the VCR timelapse modes. This figure may be available in the VCR's instruction manual or by contacting the VCR manufacturer's technical support. Enter this information in the timelapse menu.

18. Optional Programming: Playback Format

To playback a tape recorded on another multiplexer manufacturer, set the Playback Format option accordingly. From the VCR Setup menu, select the PLAYBACK FORMAT option, and then select the appropriate tape format. (The factory-set default for this option is LTC 2600 format.)

PLAYBACK FORMAT options are:

- LTC 2600 (Same as TC82XXC, TC 825X-X Series)
- TC8298B Series (Same as TC82XXA Series)
- 7 Bit (Same as UniplexII, Sprite Series)
- 12 Bit (Same as MV90X Series)

19. Optional Programming: Record Lock

When enabled (ON), this feature locks the multiplexer in the record mode; recording cannot be stopped from the front panel or keyboard unless the lock option is turned OFF in the VCR Setup menu.

20. Optional Programming: Record Format

System4 provides the capability of recording in two types of teletext formats. This allows for reverse compatibility to the TC82XX Series multiplexers. The two types are TC8298B and LTC 2600.

TC8298B (Includes TC82XXA, TC82XXB Series)

LTC 2600 (Includes TC82XXC Series)

Note: For information regarding quick function keys enabling "instant access" to the programming lists on the LTC 2600 Video Multiplexer, please refer to Appendix E at the back of this book.

SECTION 3: OPERATING THE LTC 2600 SERIES VIDEO MULTIPLEXER

3.1 Guide to Multiplexer Operation

Operating the LTC 2600 Series Video Multiplexer requires a general knowledge of basic and combined operating modes as described in this section. Basic operating modes are: LIVE (Display), RECORD, and PLAYBACK. Duplex multiplexer models provide combinations of the basic modes (e.g. simultaneous recording plus playback).

When operating access is a concern, the multiplexer's security lockout feature can be enabled. Three levels of access are provided as described at the end of this section.

3.2 Live (Display)


Live camera pictures can be displayed on monitors A and B.



Monitor A is the main functional monitor and can be displayed in FULL , QUAD , MULTI . All alarm, action, and video loss warnings are displayed on this monitor.

Monitor B Under normal operating modes, Monitor B will display the selected camera in full screen or sequencing only. When an alarm or action input is detected, the corresponding camera picture with the flashing Alarm/Action indicator will be displayed on Monitor B for the programmed dwell time. When multiple alarms or actions occur, camera pictures will be sequenced on Monitor B at the two second dwell time.

For LTC 2672 and LTC 2682 series (System4 Duplex) Only: Multiscreen display modes can be displayed on both Monitors (A and B). All alarm action and video loss warnings are displayed on both monitors. The alarm/action callup will occur only when monitor B is in full screen mode.

Displaying Live Camera Pictures

Full Screen Display: Shows one camera, full screen on one monitor. Press the FULL SCREEN key  on the front panel, and then press the appropriate camera number key for the camera you wish to be displayed.


Quad Screen Display: Divides the screen into four separate areas. Press the QUAD key  once to enable the feature. Press the key repeatedly to toggle through different viewing configurations. Pressing ALT,  then SEQ will sequence through all quad screens.


Multiscreen Display: Enabling this feature shows different multiscreen configuration.

6 channel: 5+1




9 channel: 4+3, 3X3


16 channel: 4+3, 8+2, 12+1, 3X3, and 4X4


Press the MULTI key  repeatedly to toggle through the different selections. (When the MULTI key is pressed and the multiplexer is already in the multiscreen mode, the screen display advances to the next type of multiscreen display.)



Cameo Mode: When in MULTI or QUAD modes, the screen area where a camera is displayed is called a CAMEO. Note that the numbered front panel keys can refer to either cameras or cameos. Press the CAMEO key  to toggle the operation of these keys to the cameo function. (The CAMEO LED is illuminated when the multiplexer is in the CAMEO mode.) Press the CAMEO key again to revert to the camera function.

Cameras can be assigned to any selected cameo and can be changed as often as required. This can be done by one of the following:

- **Assigning all cameras:** Press the ALT key . The ALT LED will flash, then press the SELECT key . The first cameo will be selected and show a flashing camera title. By pressing the desired camera key, that camera will be assigned to the cameo, and the next cameo is automatically selected (shown by the flashing camera titles). Again press the selected camera key, this is assigned and the process repeated until all cameos have been assigned a camera. Press the ALT key to exit.
- **Individual assignments:** In the MULTI or QUAD mode, the Camera keys are assigned as Cameo keys automatically. Select relevant cameo key, 1 to 16. The relevant cameo is selected. Press the CAMEO key . The cameo keys revert back to selecting cameras. Press camera key to assign the selected camera to cameo.

Zoom : Enables the active camera display (a cameo in multi or quad display) to be digitally enlarged by a factor of 2:1. "Zoom" will be displayed on the monitor screen. Selecting any other camera (using the camera keys) will display that camera image in full screen enlarged mode. Use the arrow keys to pan/tilt the enlarged picture to allow closer inspection of any part of the selected image.



Freeze : Holds the selected camera picture on either full screen or cameo. The currently selected camera image will be frozen, and "FREEZE" will be displayed on the screen. This feature allows closer inspection of any part of the selected image. Press the FREEZE key again to release the image from this function. Freeze a different camera image by selecting another camera with the camera keys and pressing the FREEZE key again. Changing the display screen mode releases the freeze mode from all cameos.

Alarms and Actions: When an alarm or action condition occurs, the corresponding camera picture is displayed in full screen on Monitor B, the ALM  or ACT  LED flashes, "ALARM"/"ACTION" will also flash on Monitor A. Clearing an Alarm/Action will stop any recording associated with that function. The method of clearing alarms or action conditions depends on your multiplexer model.





Clearing Alarm/Action:

Standard Models: Press the ALM  or ACT  key, and all alarms/actions will be reset.

System4 Models:

Manual Reset Enabled: Press the ALM  or ACT  key, and all alarms/actions will be reset.

Manual Reset Disabled: All alarms/actions will follow the Action Dwell Time as programmed in the Alarm/Action Setup menu.

Camera History Enabled: Alert the operator that an action or alarm has occurred even if the action condition has cleared. When enabled, press the ALM  or ACT  key. The front panel keys will flash for cameras that are in Alarm/Action mode. The Alarm/Action condition can now be cleared by pressing the individual camera keys, or all can be cleared simultaneously by pressing the ALM  or ACT  key again.


NOTE: To better understand the parameters that affect how alarms/actions can be handled, refer to Advanced Programming, Section 4.

3.3 Record

After the VCR format has been set up (as described in Section 2.3), the camera images that are to be recorded can be programmed via the RECORD LIST. Enable this function from the AUTOSET or the VCR Setup menu, and follow the screen prompts. Note that for **System4** duplex multiplexer models, two record lists can be programmed, enabling cameras to be recorded to two VCRs.


Any camera input can be recorded to a VCR after it has been listed in the multiplexer's RECORD LIST. For Standard models, the RECORD LIST feature is programmed by enabling/disabling individual cameras (up to 9 or 16). For **System4** models, the RECORD LIST feature is customizable with up to 32 steps per list (i.e. any camera, any order on the list).

To record live pictures:

1. Press the green ALT key  and then press REC. This key combination toggles on or off the record mode.
2. The designated camera video inputs from the record list will be recorded onto the VCR and will be available for playback.

3.4 Playback

Recorded video can be played back on Monitor A in either FULL, QUAD, or MULTI screen modes. To playback the recorded pictures:

1. Press the green ALT  key and then press PLAY.
2. The recorded camera video pictures will be displayed on Monitor A. You can alter the cameras displayed by using the multiscreen display keys as described in Section 3.2.

3.5 Combined Modes

The Duplex multiplexer models also provide combinations of the basic modes of operation as described in this section.

Record Plus Multiscreen Display: (See Appendix B, Figure B1)

Allows live pictures to be displayed on Monitor A in either FULL, QUAD or MULTI screen mode, FULL screen or sequencing of all cameras can be displayed on Monitor B while recording selected cameras onto the VCR.

Simultaneous Record plus Playback: (See Appendix B, Figure B2)

Allows recorded camera pictures to be played back and displayed on Monitor A in either FULL, QUAD or MULTI screen mode, live FULL screen display of the selected camera picture or sequencing all cameras on Monitor B, and at the same time, record the selected live camera pictures onto VCR. Two VCRs are required for this operation.

Simultaneous Record to Two VCRs: (See Appendix B, Figure B3)

System4 duplex models allow:

- Display of full screen live video on Monitor A.
- Record the selected camera pictures (as defined in the VCR1 RECORD LIST) to VCR 1.
- Record the selected camera pictures (as defined in VCR2 RECORD LIST) to VCR 2.

Two VCRs are required for this operation--one to record the output from the VCR OUT connector and one to record the output from the MON B connection (Monitor B becomes a VCR output for VCR 2). By using two recorders, customized record lists can be generated for each VCR. For example, while the first VCR is recording normally, the second VCR can be set-up to record only alarm or action video pictures.

To program the unit to operate in this mode, press ALT , then 2, and then REC key. This will engage the multiplexer to send video to both vcrs. ALT, REC will disable this option.

When not recording, the following mode can be programmed: (See Appendix B, Figure B4)

Live Multiscreen on Monitor A and Monitor B: The duplex unit provides two independent output monitors, each with the capability to provide FULL, QUAD or MULTI screen display.

Simultaneous Playback plus Multiscreen Display: The **System4** duplex models allow live pictures to be displayed on Monitor B in either FULL, QUAD or MULTI screen mode, and playback recorded camera pictures to be displayed on Monitor A in either FULL, QUAD or MULTI screen mode.

Simultaneous Playback on Monitor A and Monitor B: The **System4** duplex models allow simultaneous playback on both Monitors A and B of multiple recorded images. Monitor A is selectable for any screen display mode, while Monitor B can select any of the recorded cameras in full screen display only. To perform simultaneous playback, press ALT , then 2, then PLAY.

3.6 Security Lockout

The LTC 2600 Series Multiplexer provides three levels of access to operation: (1_ Full Access, (2) Limited Access, and (3) Lockout (i.e. No access/no front panel manipulation possible).

The key commands controlling this feature are:

QUAD + ZOOM + ALM	All user functions and menus.
QUAD + CAMEO + ALT	All user functions except menus.
QUAD + CAMEO + FREEZE	Lock out the front panel.

3.7 VCR Mode

Toggles between viewing the output of the VCR (the VCR monitor mode) and viewing a camera input. Press ALT , then VCR key and the VCR LED will light. The VCR mode is used to examine the video which will be recorded by the VCR during recording, or adjusting the tracking for optimal playback picture of the VCR. It should only be used if both the input and output of a single VCR are connected to the multiplexer.

SECTION 4: ADVANCED PROGRAMMING & OPERATION

4.1 Guide to Advanced Functions

The following information is provided for advanced multiplexer system and customized system configurations. This information is not necessary for typical, day-to-day operations of the multiplexer (see Sections 2 and 3). Information is also provided in this section for changing factory-set default parameters (e.g. camera titles, display configuration, etc.) to suit your specific recording/display needs. These advanced functions are accessed through the Advanced Setup menu which is shown below. A complete listing of menu selections for Advanced Setup is included in Appendix D.

```

ADVANCED SETUP
SETUP 1
>TIME/DATE
AUTOSET
VCR SETUP
ACTION SETUP
ALARM SETUP
CAMERA TITLES
SEQUENCES
CONFIGURE SETUP
CONFIGURE DISPLAY
VIDEOLOSS
DEFAULT SETTINGS
LANGUAGE

Choose:SELECT   More:V
                Exit:ZOOM
  
```

NOTE: **Additional Advanced Setup menu selections are offered for System4 models.** These include: PC PRINTER, LOG, PASSWORD, and EXPAND SYSTEM. These functions are explained in Section 5 which contains information that pertains only to **System4** multiplexer models. This section also includes special programming information for the Sequencing function.

NOTE: Since Time/Date, Autoset, and VCR Setup are covered in Section 2 as part of Quick Setup, this chapter describes only the remaining advanced functions.

4.2 VCR Output (From the VCR Setup Menu)

The VCR OUTPUT relay controls external devices such as changing the recording speed when an action and/or alarm occurs. The VCR output relay will remain active while there are active alarms or action. The following functions can be programmed:

- **Output:** The output relay can be activated on an action, alarm, action and alarm or off, enabling the installer to prioritize the recording of camera pictures.
- **Output relay:** The output relay can be set to operate as normally closed or normally open contacts.
- **Alarm speed:** The VCR recording speed can be set to match the alarm recording speed of the VCR for an action/alarm input, ensuring that no part of any incident is missed.

Note that the **System4** Duplex units provide two VCR output relays.

4.3 Action Setup

The LTC 2600 Series multiplexer includes a Digital Motion Detection feature that detects movement within the camera scene. When this feature is programmed and motion is detected, the record/display rates will increase.

Using the ACTION LIST facility, the priority of recording can be changed to include recording of camera pictures and at the same time prioritize picture display on the monitor.

- **Action Dwell:** The action will be held for monitor display (full video on monitor B, when applicable) and recording for the programmed duration (3 to 60 seconds).
- **Action List:** Selects cameras to have motion detection. Entering the ACTION LIST menu enables this list to be customized to a specific configuration.
- **Action Record:** Defines if a selected camera is recorded to the VCR when an action input is detected. Action camera(s) can be set to record in Exclusive or Interleave mode (refer to VCR setup section for programming VCR response to action).

Exclusive mode allows recording only the camera inputs in which an action has been detected.

Interleave mode, all camera(s) in the record list are recorded; however, the camera(s) that are in action are alternated between the non-action cameras.

- **Action Zones:** The screen is divided into a 14 X 16 grid (224 zones). Enabling or Disabling zones will allow the installer to specify which areas of the scene will detect action. For example, for an outdoor application, some of the scene includes a view of the sky. In this case the grid areas covering the sky can be disabled.

Once in the Action Zone setup, select the camera requiring Action Zone setup by depressing the corresponding camera number.

To Enable zones, select the Menu key, ensure ZONE (EDIT:MENU) = ENABLE (X) is displayed. Move the cursor using the up, down, left, and/or right arrow keys to enable zones. Enabled zones will display an X.

To Disable zones, select the Menu key, ensure ZONE (EDIT:MENU) = DISABLE (O) is displayed. Move the cursor using the up, down, left, and/or right arrow keys to disable zones. Disabled zones will be blank.

To select the Default Enabled Zones, select the FREEZE key (12 X 14 grid, 168 zones).

To exit the Action Zone setup, select the ZOOM key.

To edit the enabled zones Sensitivity and Number of Zones for Alarm, proceed to the Walkthrough setup.

- **Walkthrough:** The Walkthrough section of the Action Alarm Setup will be required to set Action Zone Sensitivity and Number of Zones for Alarm within the scene which require activation before the system will acknowledge an Action Alarm. Sensitivity and zone activation settings may be tested and adjusted from this menu screen.




Once in the Walkthrough setup, select the camera requiring Action Alarm setup by depressing the corresponding camera number.

To adjust the Action Alarm zone Sensitivity requirement, selecting the key will decrease and using the key will increase the zone sensitivity.

To establish Number of Zones for Alarm, selecting the will decrease and using the will increase the amount of zones required to initiate an Action Alarm. Note: The Number of Zones for Alarm must be equal to or less than the number of enabled zones.

Default settings for Sensitivity (MED) and Number of Zones for Alarm (10) can be achieved by depressing the FREEZE key.

To exit the Walkthrough Program, select the ZOOM key.

- **Manual Reset (System4 models only):**
 - Enable:** Press ACT  key, and all action(s) will be reset.
 - Disable:** All actions will follow the action dwell time as programmed.
- **Camera History (System4 models only):** By switching on CAMERA HISTORY, the front panel keys will flash for cameras that were in Action once the ACT  key is pressed. The Action can now be cleared by pressing individual camera keys or all can be cleared at once by pressing the ACT  key again.
- **Audible Alarm:** The LTC 2600 Series provides an Audible alarm.
 - Enable:** When an action occurs, the beeper will sound for the duration of the action. Press any key to turn the beeper Off.
 - Disable:** Beeper disable.
- **Action Output Relay:** The multiplexer has one output relay for standard models and two for **System4** models. These relays can be programmed to switch on for actions (refer to VCR Setup section for programming relay response to action).
- **Multiple Actions:** Individual actions will be recorded for the programmed ACTION DWELL time or until the action is cleared. If two or more actions are active at the same time, video is alternately recorded until the dwell time expires or the action conditions are cleared.
 - Action call-up is only viewed on MON B. For multiple actions, MON B will sequence the action video at two-second intervals.
 - LTC 2622 series only:** Action call-up is automatically viewed in cameo 1 of the multiscreen display mode. For multiple actions, cameo 1 will sequence the action video at two-second intervals.

4.4 Alarm Setup

Depending on your multiplexer model, up to 9 or 16 alarm inputs can be connected to the multiplexer and are associated with their corresponding video input. Alarm inputs can be configured as normally open or normally closed. These inputs correspond to the camera inputs so that when an alarm input is initiated, the respective camera picture is displayed or recorded. (Figures in Section 2 illustrate the Alarm In/Out connections.)




- **Alarm Dwell:** The alarm will be held for monitor display (Full video on monitor B, when applicable) and recording for the programmed duration (3 to 60 seconds).
- **Transparent Alarm:** If Alarm Dwell is set to FOLLOWS, Alarms will follow the alarm input. These alarms cannot be cleared until the Alarm contact is reset.
- **Alarm Lists:** The alarm record list defines which cameras are recorded when there is an alarm.
- **Alarm Recording:** On receiving alarms, the multiplexer will adjust the Record List to record cameras in alarm at a higher rate. Cameras in alarm can be recorded Exclusively or Interleaved with standard recording (refer to VCR setup section for programming VCR response to alarm).

Exclusive mode allows recording only the camera inputs in which an alarm has occurred.

Interleave mode, all camera(s) in the record list are recorded; however, the camera(s) that are in alarm are alternated between the non-alarm camera(s).

NOTE: Exclusive recording is recommended where near real-time recording of alarm events is required.

Recording of non-alarmed cameras cannot take place while alarms are present. To only record alarms, set up desired Alarm Recording configuration as described above (Alarm List, Alarm Recording) and enable the VCR Output Relay to activate the VCR (LTC 2600 Series must be in the Recording mode.)

- **Audible Alarm:** The LTC 2600 Series provides an audible alarm
 - Enable:** When an alarm occurs, the beeper will sound for the duration of alarm. Press any key to turn beeper off.
 - Disable:** Beeper disable.
- **Alarm Output Relay:** The multiplexer has one output relay for standard models and two for **System4** models. These relays can be programmed to switch on for alarms (refer to VCR Setup section for programming relay response to alarms)
- **Alarm Recording:** Individual alarms will be recorded for the programmed ALARM DWELL time or until the alarm is cleared. If two or more alarms are active at the same time, video is alternately recorded until the dwell time expires or the alarm conditions are cleared.
- **Manual Reset (System4 models only):**
 - Enable:** Press ALM  key, and all alarm(s) will be reset.
 - Disable:** All alarms will follow the alarm dwell time as programmed.
- **Camera History (System4 models only):** By switching on CAMERA HISTORY, the front panel keys will flash for cameras that were in Alarm once the ALM  key is pressed. Alarm can now be cleared by pressing individual camera keys or all can be cleared at once by pressing the ALM  key again.
- **Alarm Display:**
 - Alarm call-up is only viewed on MON B. For multiple alarms, MON B will sequence the alarm video at two-second intervals.
 - LTC 2622 series only.** Alarm call-up is automatically viewed in cameo 1 of the multiscreen display mode. For multiple alarms, cameo 1 will sequence the alarm video at two-second intervals.

4.5 Camera Titles

Each camera can be designated with a 16-character name, if desired. The factory-set default name for each camera is simply a numerical designation (e.g. camera 01).

4.6 Sequences

- Camera sequencing on Monitor A and Monitor B is a function available to all standard multiplexer models. However, sequencing is a factory-set, non-programmable function for standard models (simply enable or disable the function for each camera via the Advanced Setup menu).
- Quad sequencing is a function available on Monitor A on standard model. There are four Quad screens available and each Quad page can be customized to suit each application.
- Camera sequencing is programmable for cameo 1 of the 5+1 multiscreen display mode of the LTC 2622 series.

4.7 Configure Setups

The LTC 2600 Series multiplexer has the capability to provide up to six individually configured setups that are retained in the multiplexer memory. By using these setups, the multiplexer can be programmed to automatically change its mode of operation based on a timer setting. This allows different configurations to be used (e.g. day, night, weekend and holidays). The timer provides seven days of programming with six individual programmable windows per day. The following options can be programmed for each Setup:

Load Setup

- The setup can be configured and then loaded into memory.

Copy Setup

- A setup can be copied and then saved as another setup.

Setup Title

- Each setup can have an individual title of 12 characters. (This title will displayed on line two of the multiplexer menus).

Time Events

- The Time Event function in the Configuration Setup menu allows each of the six setups to be programmed for several parameters including: start time, duration, and frequency (daily schedule) of recording. A sample menu is shown below. Note that these parameters must be set for each setup (1-6.)

```

TIME EVENTS
SETUP 1
>SETUP ON/OFF      ON
START TIME      12:00AM
DAYS            SMTWTFS
RUN ONE TIME     ON
RECORD          ON

Choose:SELECT  More:V
Exit:ZOOM

```

The setup program can be set to run only once. This allows for individual events to be programmed and then run only one time. After the event, the multiplexer reverts to its "normal" programmed setup(s).

4.8 Configure Display

The monitor displays can be configured to show time/date and camera titles. The format of the text can be changed, as well as the border of the cameo picture.

- Time/Date:** Each monitor can have the time/date display selected on or off. Note that the time and date are only displayed per screen and not per cameo picture.
- Text:** Each monitor can have the camera title display selected on or off. This ensures that the text can be viewed regardless what type of background is shown, (i.e. very dark backgrounds can have white text displayed). The text can be displayed in a number of formats as shown in the following chart.

Background	Text
Clear	White
Clear	Gray
Clear	Black
White	Clear
White	Gray
White	Black
Gray	Clear
Gray	White
Gray	Black
Black	Clear
Black	White
Black	Gray

- **Cameo borders:** The cameo border format can be selected, enabling easy definition of the picture. The border can be set to: white, gray or black.
- **Screen position:** Use the position command to select top, middle, or bottom of display for the location of the time/date/camera title information.
- **Gain Control:** To maintain constant video quality, each camera input has individual automatic gain circuits that are suitable for most applications. Each input can manually adjust to optimize performance when desired.

4.9 Video Loss

The LTC 2600 Series detects loss of video from any camera input by monitoring the camera sync signal. When a loss of video input occurs, the multiplexer provides an output which can be used to activate a warning device (e.g. buzzer, warning light, videoloss message on screen) to alert the operator that a video signal from one of the system cameras has been lost. Select the VIDEOLOSS function from the Advanced Setup menu to program the following parameters:

- **Videoloss List:** Enable/disable individual cameras for the videoloss list.
- **Videoloss Output:** The videoloss output can be enabled or disabled.
- **Videoloss Relay:** The videoloss output relay can be set to operate as normally closed contacts or normally open contacts.

4.10 Default Settings

The multiplexer is supplied with default parameters that are set up at the factory (see appendix). These settings allow normal operation of the multiplexer, enabling easy installation, setup and use. However, any parameter can be changed to suit local conditions or customized configurations.

If changes are made, you always have the option of returning to the default settings by selecting the DEFAULT SETTINGS command in the Advanced Setup menu.

4.11 Languages

To simplify the setup process, the menus of the LTC 2600 Series can be displayed in any one of six different languages. These are:

English	French
German	Spanish
Dutch	Italian

Simply choose LANGUAGES from the Advanced Setup menu, and make your selection.

SECTION 5: SYSTEM4 MODEL FUNCTIONS

5.1 Guide to System4 Model Functions

The following information pertains to **System4** multiplexer models only. These advanced programming and operating functions, which are accessed through the Advanced Setup menu, include: CAMERA SEQUENCES, PC PRINTER SETUP, LOG, PASSWORD, and EXPAND SYSTEM.

System4 multiplexer models also support System Keyboards. Instructions for connecting keyboards and operating the system with keyboards are also provided in this Section.

5.2 Camera Sequences

The **System4** models allow sequential display of cameras on the monitor in any available format. In the Full screen display mode, all cameras can be sequenced. In Quad mode there are 8 individual quad displays that can be programmed. Cameras can be repeated in sequencing displays to enable important scenes to be viewed at greater frequency.

Sequences can be set for monitor A and monitor B.

- FULL screen display can be set for normal viewing or sequencing with programmable dwell time from 1 to 60 seconds. The camera pictures can be sequenced in any order in 32 sequence steps, for example 1, 5, 8, 4, 1, 2, 3, 1, 6, 8, 1. In this sequence camera 1 is viewed every fourth time of the sequence.
- QUAD screen display can be set for normal viewing or sequencing with programmable dwell time from 1 to 60 seconds. Note that each quadrant can be programmed to show any individual camera(s). And, the camera(s) (programmed for each quad) can be sequenced in any order. For example, the following sequences could be set-up for monitor A:

CAMEO 1: 01, 05, 09, 13

CAMEO 2: 02, 06, 10, 14

CAMEO 3: 03, 07, 11, 15

CAMEO 4: 04, 08, 12, 16

NOTE: If this feature is not programmed for a custom configuration, the factory default setting takes the cameras in order (e.g. first quad - cameras 1,2,3,4; second quad - cameras 5,6,7,8, etc.)

5.3 RS-232 Setup for PC/Printer/VCRs/Camera ID

The **System4** model multiplexer has a console port which can be configured for a PC, ECL, printer, Camera ID, or connected to a VCR.

- When connected to a PC, new software can be downloaded to the multiplexer. Additionally, the LTC 2650 Graphical User Interface software and a PC running Windows 95, 98, or NT can be used to control the Multiplexer.
- CCL command for programming and controlling the multiplexer.
- When connected to selected Philips CSS VCRs, LTC 2601/00 or LTC 2602/00 keyboard will control primary VCR functions (Record, Play, Stop, Fast Forward, Rewind).
- When a printer is connected, a copy of the logged events can be printed.
 - Autoprint: Can be enabled to automatically print log events as they occur.

NOTE: The print commands are not displayed in the PC/Printer menu until the CONNECT TO parameter is set to PRINTER.

- Camera ID: This feature allows the transfer of camera identification, based on the record list setup through the console port to an external digital recording device.

NOTE: Camera ID available only for the VCR output of the multiplexer (Does not provide Camera ID for Mon B Record Out).

5.4 LOG

The Log option allows the operator to view a history of action, recording, and alarm activity. Up to 300 events are retained in the log. The AUTOPRINT command will automatically print log events, therefore providing a larger event history. When the log is full, the oldest events are overwritten.

The LOG option includes:

- View log: view the list of logged events.
- Log set-up: select which events are recorded to the log, these can be alarm, action, event, and videoloss.

5.5 Password

In **System4** multiplexer models, access to the multiplexer setup menus can be password protected to prevent unauthorized entry. By including a number between 5 and 9 at the beginning of the password, the quick edit key operation can also be disabled (See Appendix E for more information on the Quick Function Keys.)

5.6 Expand System Setup

In installations requiring multiple video multiplexers, **System4** models provide the capability to use camera numbers up to 999 and to control up to 30 multiplexers from LTC 2601 and LTC 2602 system keyboards. (See Appendix B, Figure B6)

Expanded System: Cameras

To provide unique identification of cameras in a large installation, camera numbering can be redesignated up to 999. Cameras are selected using camera numbers 1 to 16 via the front panel. Selected monitor will show the redesignated camera number. Camera numbers may be redesignated by selecting the CAMERA RENUMBER option available from the EXPAND SYSTEM menu.

Expanded System: Multiplexers

To control multiple multiplexers from a system keyboard, a unique number must be assigned to each multiplexer. This number is then used to select the multiplexer from any system keypad. This number is entered via the MUX ID command selected from the EXPAND SYSTEM MENU.

Note: To ensure a proper operation, use the LTC 2608/00 white supplied cable when making a connection from mux to mux.

5.7 System Keyboards

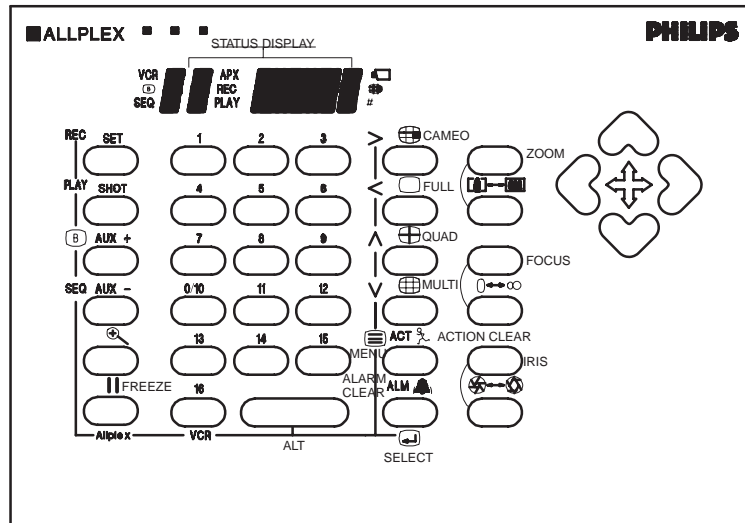
The LTC 2601/00 and LTC 2602/00 are full function keyboards designed for system control, programming, and Pan/Tilt/Zoom (Philips Allegiant R/D or AutoDome) operation with the LTC 2600 Series **System4** Model multiplexers. By using the keyboard port expander LTC 2604 Series unit, purchased separately, up to four keyboards may be connected. Optional hardware for remote location of keyboards includes:

LTC 8558/00 Keyboard Extension Cable

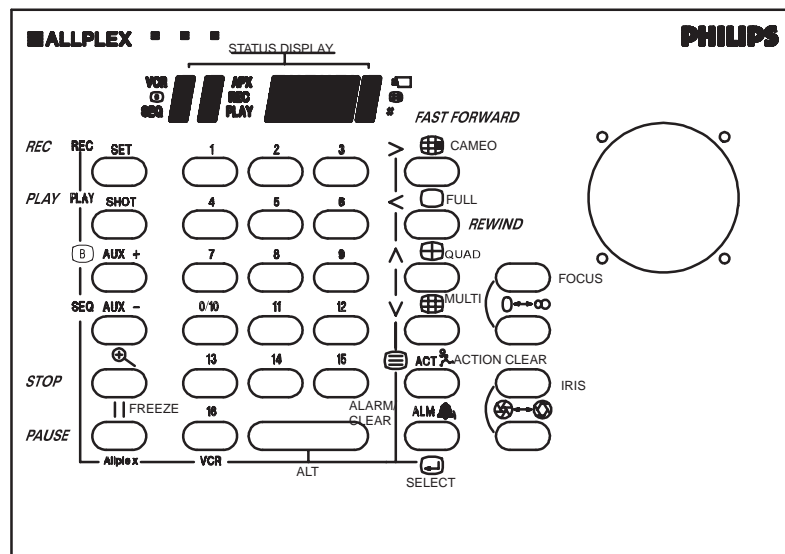
Six conductor extension cable provides data/power for remote LTC 2601 and LTC 2602 keyboards to 30 meters (100 feet) away from the multiplexer unit.

LTC 8557 Series Keyboard Extension Kits

Interface kits used to permit remote LTC 2601 and LTC 2602 keyboards up to 1.6 km (5000 ft) away from the multiplexer. Customer supplied 24 gauge shielded twisted pair (Belden 9841 or equivalent) required between the multiplexer and the keyboard. Kits provide two junction boxes, interface cable, and appropriate power supply (in each version).



LTC 2601/00 Keyboard



LTC 2602/00 Keyboard

Note:
Italic Font
for VCR Functions




5.8 Keyboard Operation

Numeric Display




The numeric display is a three-digit display that shows the number of the multiplexer that the keyboard is currently controlling. There are two modes for this display.

1. The first mode displays the multiplexer number (default mode).
2. The second mode is called the keyboard test mode which displays the key code for the individual key pressed.

Status Display

The status display indicators are located on either side of the numeric display at the top of the keyboard. On the right side of the numeric display, there are three status display indicators: Camera , Cameo , Pound . On the left side of the numeric display, there are six status display indicators: VCR, Monitor B, Sequence, Allplex, Record, and Playback.

LED Display

Certain keys have an LED indicator to light up or flash to indicate that the function is either enabled or in the alarm state. The keys that are tied to an LED are: Cameras 1 -- 16, ALT , ACT , ALM . The operation of these LEDs is identical to those on the front panel of the multiplexer

Numeric Keypad


The numeric keypad is designed to serve three purposes: selecting cameras, selecting cameos, and numeric entry. The operation of the numeric keypad keys is identical to the multiplexer front panel.

Additional Function Keys

The system keyboards contain additional function keys not available on the front panel of the multiplexer. These are:

Allplex Selection - (Requires two-key combination: "Allplex" + Select ) then #, then SELECT key to select new Allplex number, and the system accepts only valid Allplex number 1 through 30.

SET - Set is a preposition function of a AutoDome or Pan/Tilt and Zoom lens. Press SET to record a preset scene at remote camera site. (up to 99 presets can be recorded for Philip's R/D or AutoDome.)

Set a preset function of a camera: Press Full then camera number (1-16). Using the **joystick** to move the camera to the scene that you want to store then press SET (1-99) then Select .

SHOT - Press SHOT to call up a preset scene at remote camera site.

Call up a preset function of a camera: Press SHOT (1-99) then Select .

AUX+ - Press AUX+ to select a receiver/driver auxiliary function at the camera location.

AUX- - Press AUX- to deselect any receiver/driver auxiliary functions currently in the 'ON' state.

(Note: Refer to Philips R/D or AutoDome Instruction Manual for Auxiliary function)

MultiKey Access Functions

Simultaneously Press

QUAD + CAMEO + Allplex: Set the keyboard user level to NO ACCESS.

QUAD + CAMEO + ALT: Set the keyboard user level to LIMITED ACCESS.

QUAD + ENTER + ENLARGE: Set the keyboard user level to FULL ACCESS.

VCR Control

VCR + SELECT  - To toggle the VCR CONTROL mode ON and OFF.

Use the following keys for VCR functions:

VCR Function	Press Key
RECORD	REC/SET
PLAYBACK	PLAY/SHOT
STOP	ZOOM
PAUSE	FREEZE
FAST FORWARD	CAMEO/>
FAST REWIND	FULL/<

Allplex + SELECT  - To switch control to another multiplexer.

Allplex + ALT - To Enter and Exit the keyboard TEST mode.

Pan/Tilt Control

The pan/tilt function is controlled by the joystick located on the right side of the keyboard (or four directional keys on the LTC 2601). Move it in any one of eight directions to make the camera indicated by the number in the camera display tilt up or down, pan left or right, or move diagonally. The joystick of the LTC 2602 keyboard is also used to provide zoom control by rotating the knob in either a clockwise or counterclockwise direction.

Lens Control - The lens control keys are located on the right side of the keyboard. Push to make the lens zoom in or out, focus near or far, and open or close the iris (on applicable lenses). Zoom and focus may be operated simultaneously. For the LTC 2602 keyboard, the zoom function is controlled by rotating the knob on the joystick.

APPENDIX A

FEATURES	LTC 2622	LTC 2631	LTC 2632	LTC 2641	LTC 2642	LTC 2672	LTC 2651	LTC 2652	LTC 2661	LTC 2662	LTC 2681	LTC 2682
Camera Inputs	6	9	9	9	9	9	16	16	16	16	16	16
Duplex Operation	Yes	**	Yes	**	Yes	Yes	**	Yes	**	Yes	**	Yes
Simplex Operation	**	Yes	**	Yes	**	**	Yes	**	Yes	**	Yes	**
Multiscreen Display Mode	Color	B/W	B/W	Color	Color	Color	B/W	B/W	Color	Color	Color	Color
Digital Monitor Outputs	1	1	1	1	1	2	1	1	1	1	1	2
Secondary Monitor Output	Yes	Yes	Yes	Yes	Yes	**	Yes	Yes	Yes	Yes	Yes	**
Record + Multiscreen Display	Yes	**	Yes	**	Yes	Yes	**	Yes	**	Yes	**	Yes
Simul. Record/Playback	Yes	**	Yes	**	Yes	Yes	**	Yes	**	Yes	**	Yes
Playback + Multiscreen Display	**	**	**	**	**	Yes	**	**	**	**	**	Yes
Digital Motion Detection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Custom Record List	**	**	**	**	**	18 Steps	**	**	**	**	32 Steps	32 Steps
Custom Sequence List	**	**	**	**	**	18 Steps	**	**	**	**	32 Steps	32 Steps
Sequence in 5+1 mode	Yes	**	**	**	**	**	**	**	**	**	**	**
Auto-Terminating Inputs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
VCR In	1	1	1	1	1	1	1	1	1	1	1	1
Programmable VCR Outputs	1	1	1	1	1	2	1	1	1	1	1	2
S-VHS In/Out	**	**	**	**	**	Yes	**	**	**	**	Yes	Yes
Remote K-BWwith P/T/Z (RJ11)	Yes	**	**	**	**	Yes	**	**	**	**	Yes	Yes
RS-232 Control (9 Pin D)	**	**	**	**	**	Yes	**	**	**	**	Yes	Yes
Alarm Input (25 Pin D)	**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alarm/SDA (Bi-Phase Output)	Yes	**	**	**	**	**	**	**	**	**	**	**
Alarm Output (Relay closure)	1	1	1	1	1	2	1	1	1	1	1	2
Vid-Loss Output (Relay closure)	1	1	1	1	1	1	1	1	1	1	1	1
Vext Input (5-12 Volt DC)	Yes	Yes	Yes	Yes	Yes	Yes (2)	Yes	Yes	Yes	Yes	Yes	Yes (2)
Bi-Phase Output (15 Pin D)	**	**	**	**	**	5	**	**	**	**	5	5

** Not available.

Table A1: LTC 2600 Series Model Features

APPENDIX B: SPECIAL APPLICATIONS

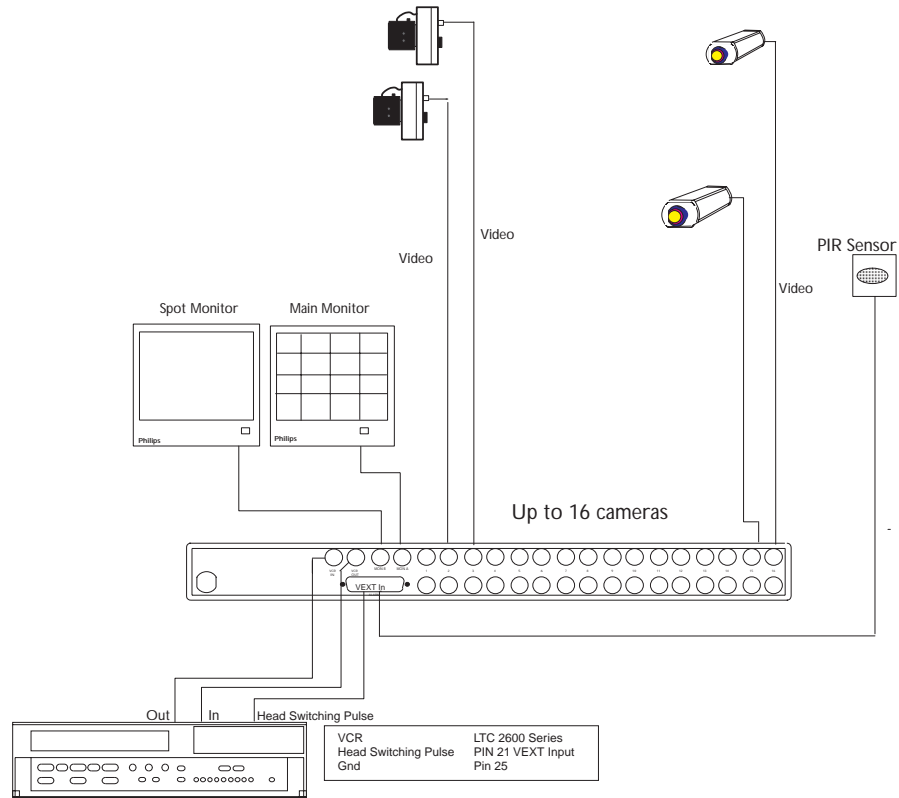


Figure B1: Record Plus Multiscreen Display

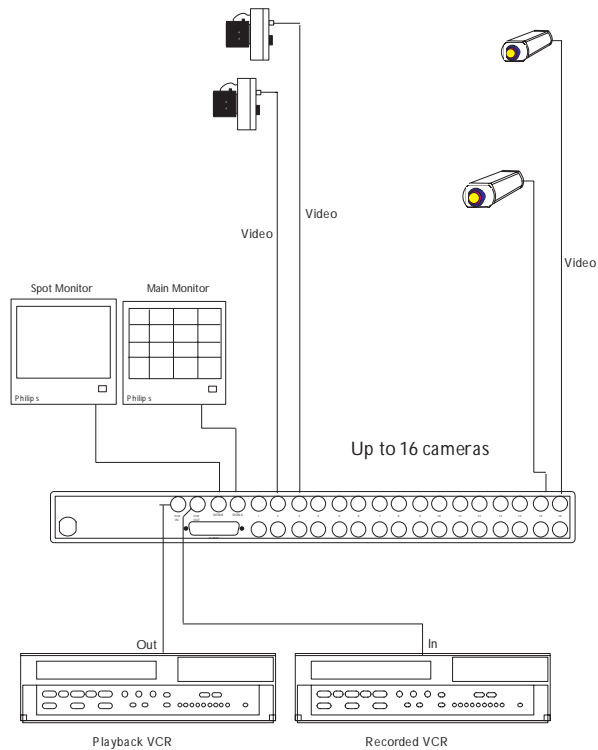


Figure B2: Simultaneous Record Plus Playback

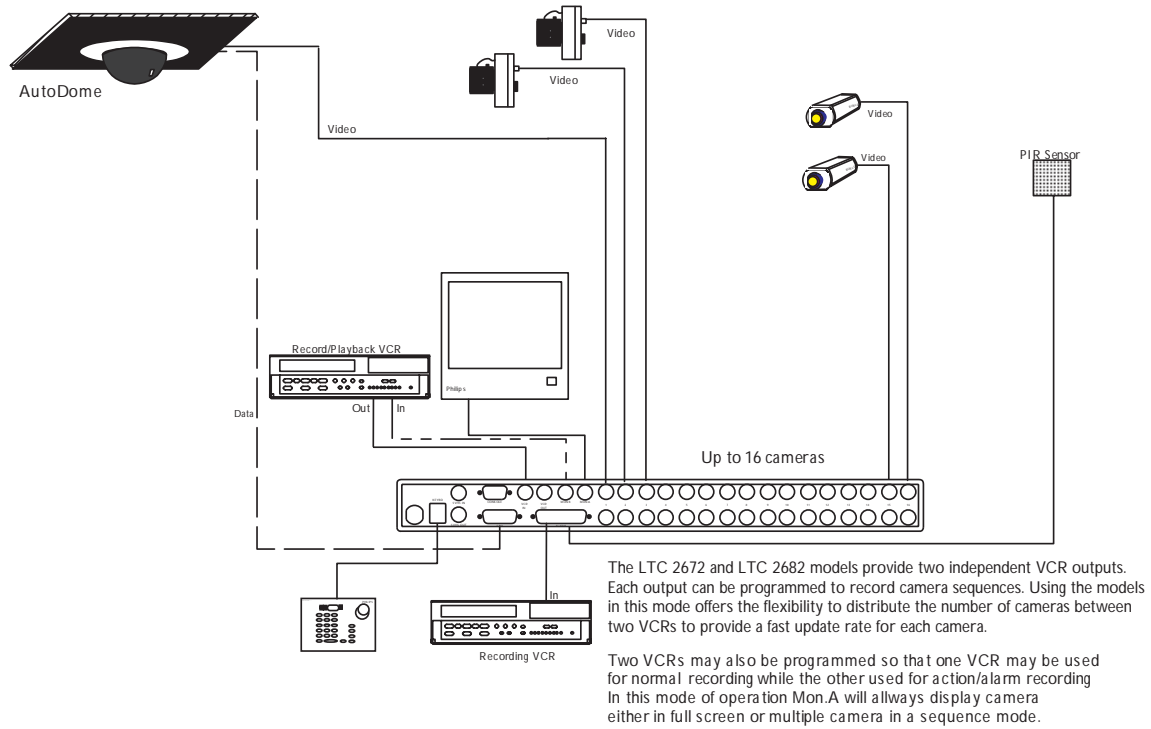


Figure B3: Simultaneous Record to Two VCRs

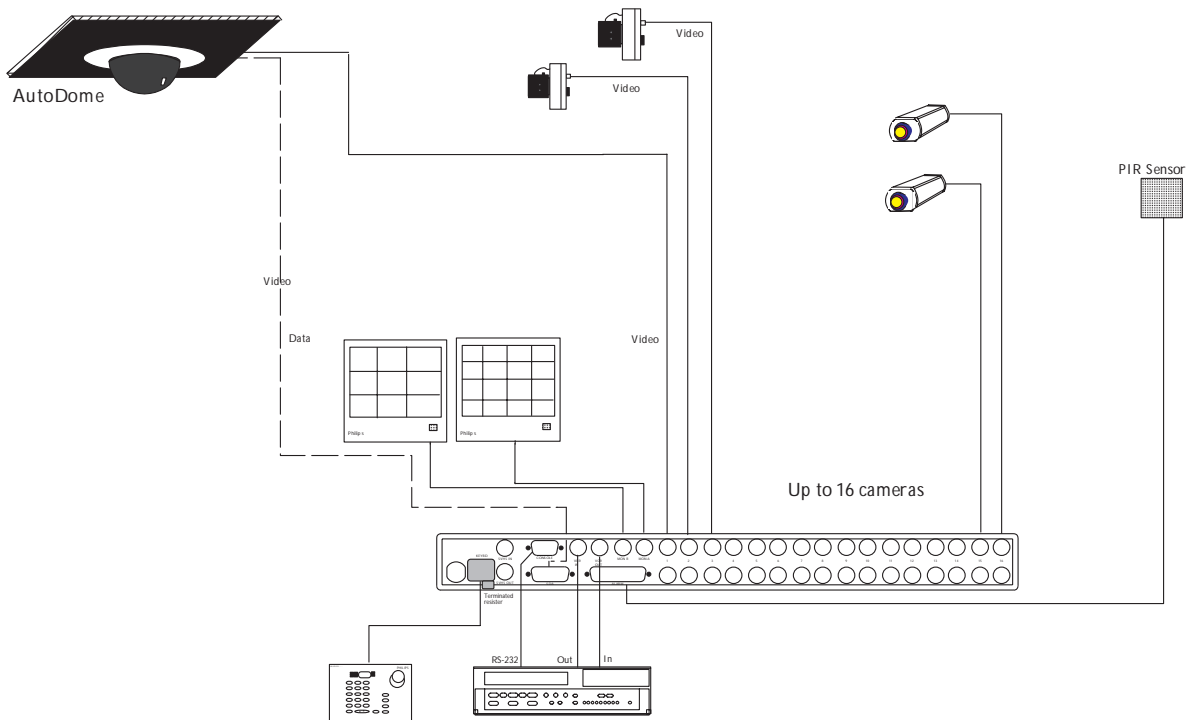


Figure B4: Mon B Can Display Multiscreen When Operating in Live or Playback Mode

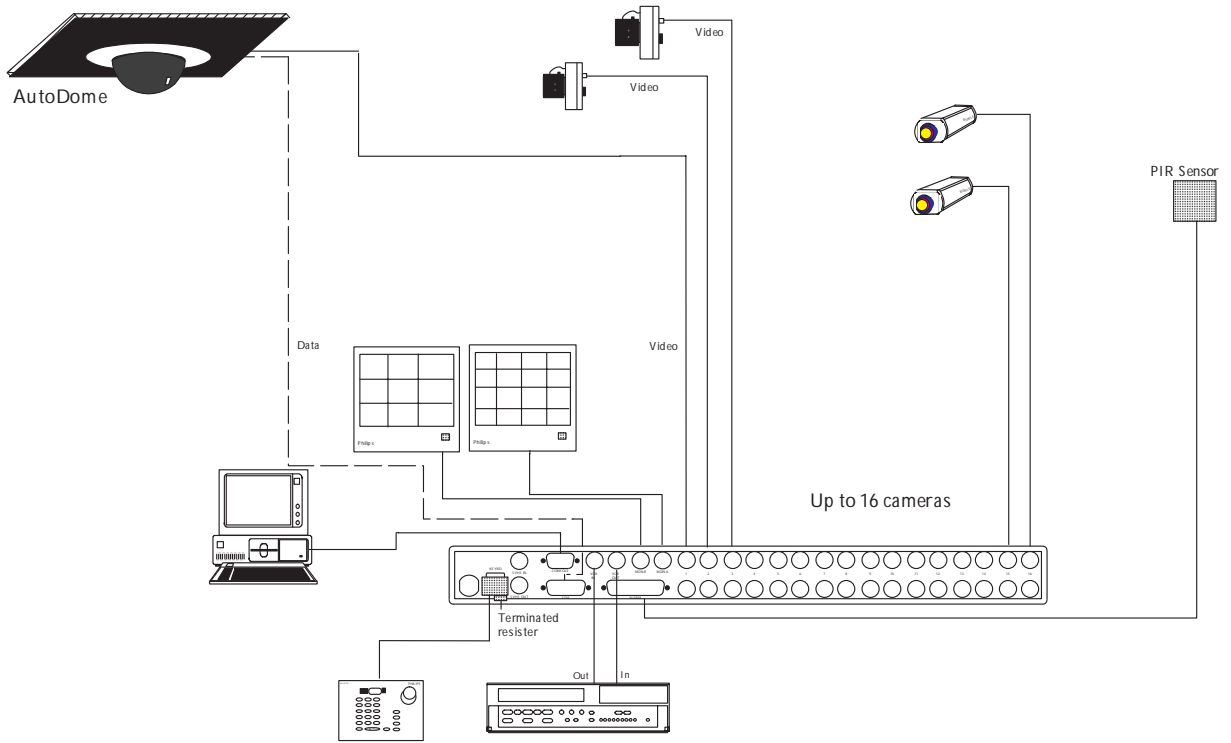


Figure B5: LTC 2672, LTC 2681, and LTC 2682 Series with LTC 2650 GUI

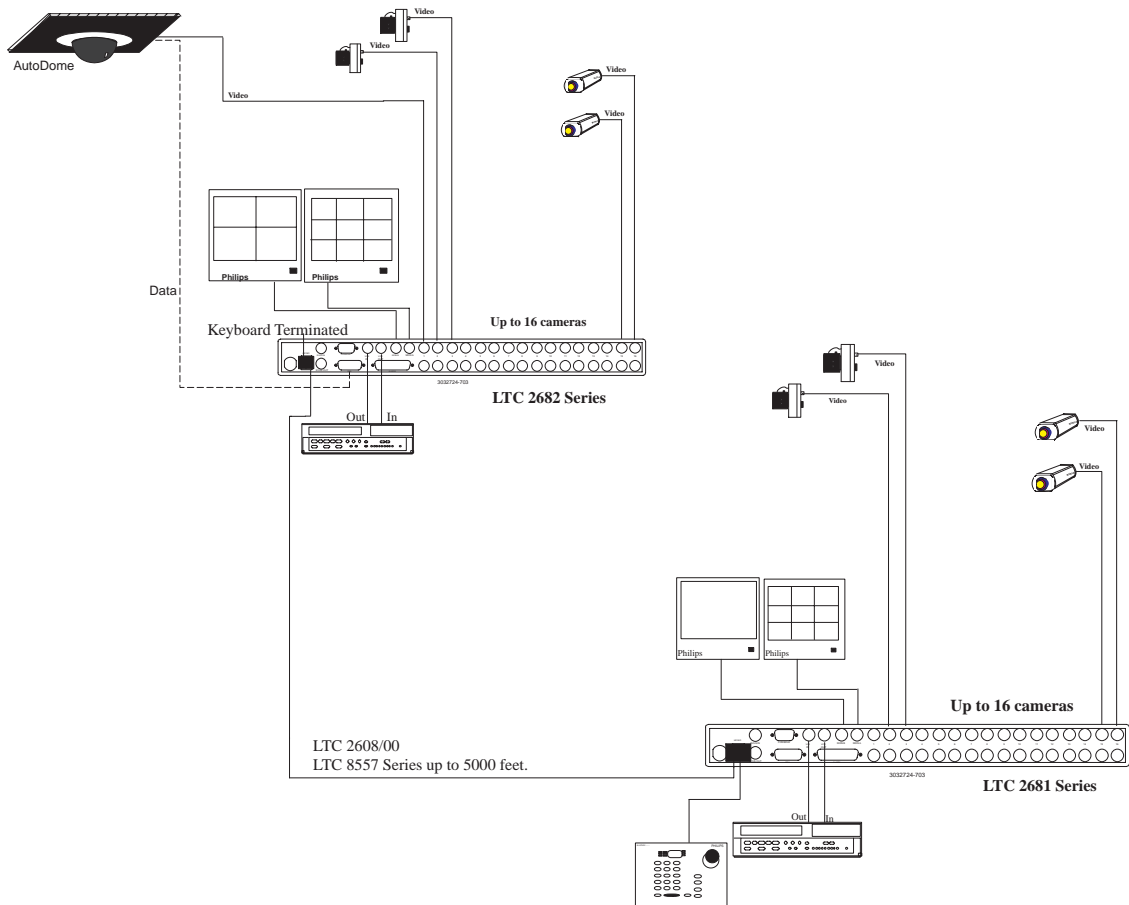
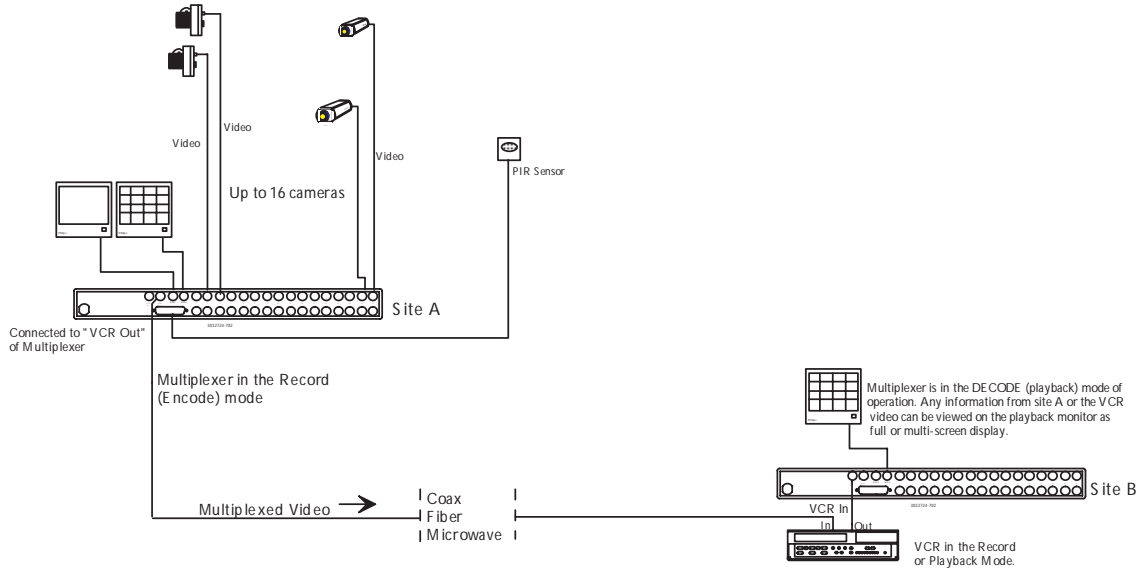


Figure B6: Control of Multiple Multiplexers from a Single Keyboard



This application uses two 16 channels multiplexers to allow the video from one location to be sent as a multiplexed signal to another site via a single transmission link such as (coax, fiber, or microwave).

Any or all of the cameras may be decoded at the monitor (site B) location. Using this configuration minimizes the number of video links between the sites.

Figure B7: Transmitting 16 Videos Over One Single Coax

APPENDIX C: FACTORY DEFAULT SETTINGS

ITEM	DEFAULT	OPTIONS
DATE/TIME:		
Date	01/01/1998	
Time	12/00/00	
Time Format	24 H	12 hr, 24 hr.
Date Format	dd/mm/yy (PAL) mm/dd/yy (NTSC)	mm/dd/yy dd/mm/yy yy/mm/dd
VCR SETUP:		
Time Lapse	3 Hr (PAL) 2 Hr (NTSC)	PAL: 3 to 720 hrs. or as programmed. NTSC: 2 to 720 hrs. or as programmed.
Record List	01-16, 01-16.	Any camera in a 32 camera sequence. i.e. 1,5,8,4,2,3,4
Playback Format	LTC2600	LTC2600, TC8298B, 7-bit, 12-bit
Record Format	LTC2600	LTC2600, TC8298B
Record Lock	ON (standard duplex models) OFF (all others)	OFF, ON
VEXT	OFF	OFF, ON for both VCR OUT and MON B.
CREATE VCR SETUP:		
VCR Title	VCR SETUP 1	
VCR/Field Table	3 Hr (PAL) 2 Hr (NTSC)	PAL: 3 to 720 hrs. or as programmed. NTSC: 2 to 720 hrs. or as programmed.
VCR OUTPUT		
Output	OFF	OFF, ACT, ALM, ACT/ALM
Output Relay	N/C	N/O, N/C
ALM/ACT Speed	3 (PAL) 2 (NTSC)	3 to 720 hrs. 2 to 720 hrs.
Alarm Record	INTERLEAVE	INTERLEAVE, Exclusive
Action Record	INTERLEAVE	INTERLEAVE, Exclusive
ALARM SETUP:		
Alarm Dwell	5 sec	3 - 60 sec. FOLLOWS
Alarm List	all off	Select any camera
Alarm Inputs	N/O	N/O, N/C
Manual Reset	ENABLE	ENABLE, DISABLE
Camera History	OFF	ON, OFF
Beeper	DISABLE	ENABLE, DISABLE
ACTION SETUP:		
Action Dwell	5 sec	3 - 60 sec.
Action List	all off	
Action Zones	ON Except Outer Rows (1/16 of video)	ON/OFF (All Zones) for System4 models
Walkthrough	MED, 10	MIN, LOW, MED, HI (1, 150) System4 only
Manual Reset	ENABLE	ENABLE, DISABLE
Camera History	OFF	ON, OFF
Beeper	DISABLE	ENABLE, DISABLE

ITEM	DEFAULT	OPTIONS
CAMERA TITLE: Camera Title	CAMERA 1	
SEQUENCES:		
Seq dwell full A	5 sec	1 - 60 sec.
Seq dwell quad A	5 sec	1 - 60 sec.
Seq dwell full B	5 sec	1 - 60 sec.
Seq dwell quad B	5 sec	1 - 60 sec.
Mon A full	1-16, 1-16	Any camera in a 32 camera sequence. i.e. 1,5,8,4,2,3,4
Mon A quad	1,2,3,4 5,6,7,8 9,10,11,12 13,14,15,16 1,2,3,4 5,6,7,8 9,10,11,12 13,14,15,16	Any camera to cameo assignment is allowed. Note: 9 channel product has only 3 quads instead of 8.
Mon B full	1-16, 1-16	Any camera in a 32 camera sequence. i.e. 1,5,8,4,2,3,4
Mon B quad	5,6,7,8 9,10,11,12 13,14,15,16 1,2,3,4 5,6,7,8 9,10,11,12 13,14,15,16	Any camera to cameo assignment is allowed. Note: 9 channel product has only 3 quads instead of 8.
CONFIGURE SETUPS: Setup title	SETUP 1	Any 12 character title
System4 models ONLY:		
PC/PRINTER/VCR: Connect to Serial port	VCR RS232 96,n,8,1	printer; GUI, CCL,VCR, Camera ID. baud: 6,12,24,48,96,192. parity: o(odd), e(even), n(none). data bits: 7,8. stop bit 1
Autoprint	DISABLE	ENABLE,DISABLE
LOG: Log setup	all off.	act, alm, evt, vl,err - all can be either selected or not selected.
PASSWORD: Password	1111	1111 - 9999 where 1111 = no password
EXPAND SYSTEM: Number mux	01	01 to 30
TIME EVENTS:		
Setup on/off	OFF	ON, OFF
Start time	00:00	
Days	SMTWTFS	SMTWTFS ..any day or days of the week.
Run once only	OFF	ON, OFF
Record	OFF	ON,OFF

ITEM	DEFAULT	OPTIONS
CONFIGURE DISPLAY:		
Time/Date mon A	ON	ON,OFF
Time/Date mon B	ON	ON,OFF
Show Text mon A	ON	ON, OFF
Show Text mon B	ON	ON, OFF
Text	White:Black	Clear:White, Clear:Grey, Clear:Black White:Clear,White:Grey,White:Black Grey:Clear, Grey:White, Grey:Black Black:Clear, Black:White, Black:Grey
Cameo borders	BLACK	White, Grey Black
Menu Timeout	ON	ON,OFF
Gain Control	AUTO	Manual
VIDEOLOSS:		
Vid Loss o/p	ENABLE	ENABLE, DISABLE
Vid Loss Relay	N/C	N/C, N/O
Video Loss List	No Cameras Selected	Any Camera Or Cameras.
LANGUAGE:		
Language	ENGLISH	ENGLISH, FRENCH, GERMAN, SPANISH, ITALIAN, DUTCH.

APPENDIX D: PROGRAMMING REFERENCE

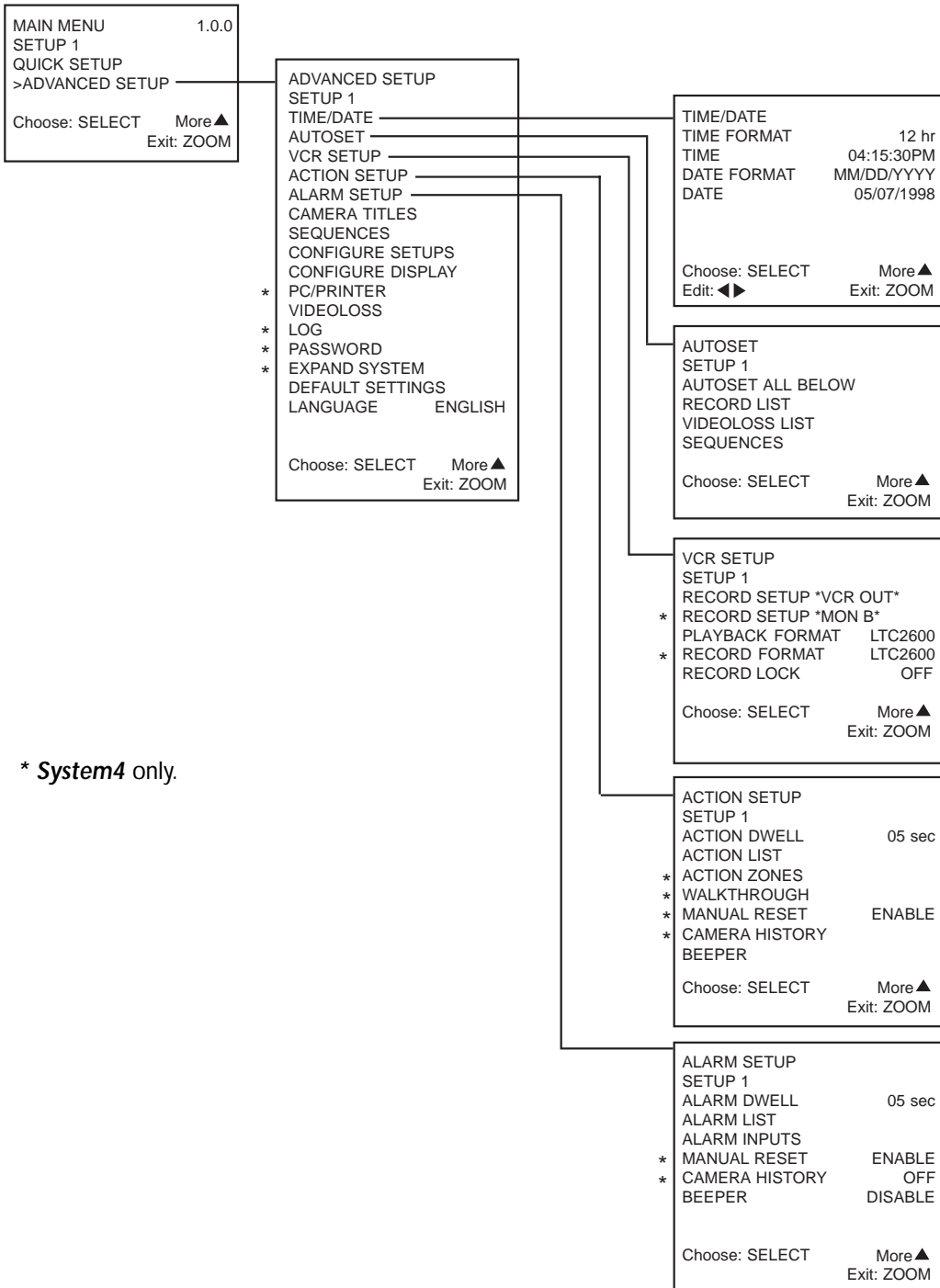
Menu Trees: Advanced Setup

The following menu trees are provided for reference in locating advanced programming functions. Descriptions of all these functions are located in Section 4. (The Quick Setup menus are described and shown in complete detail in Section

APPENDIX C: PROGRAMMING REFERENCE

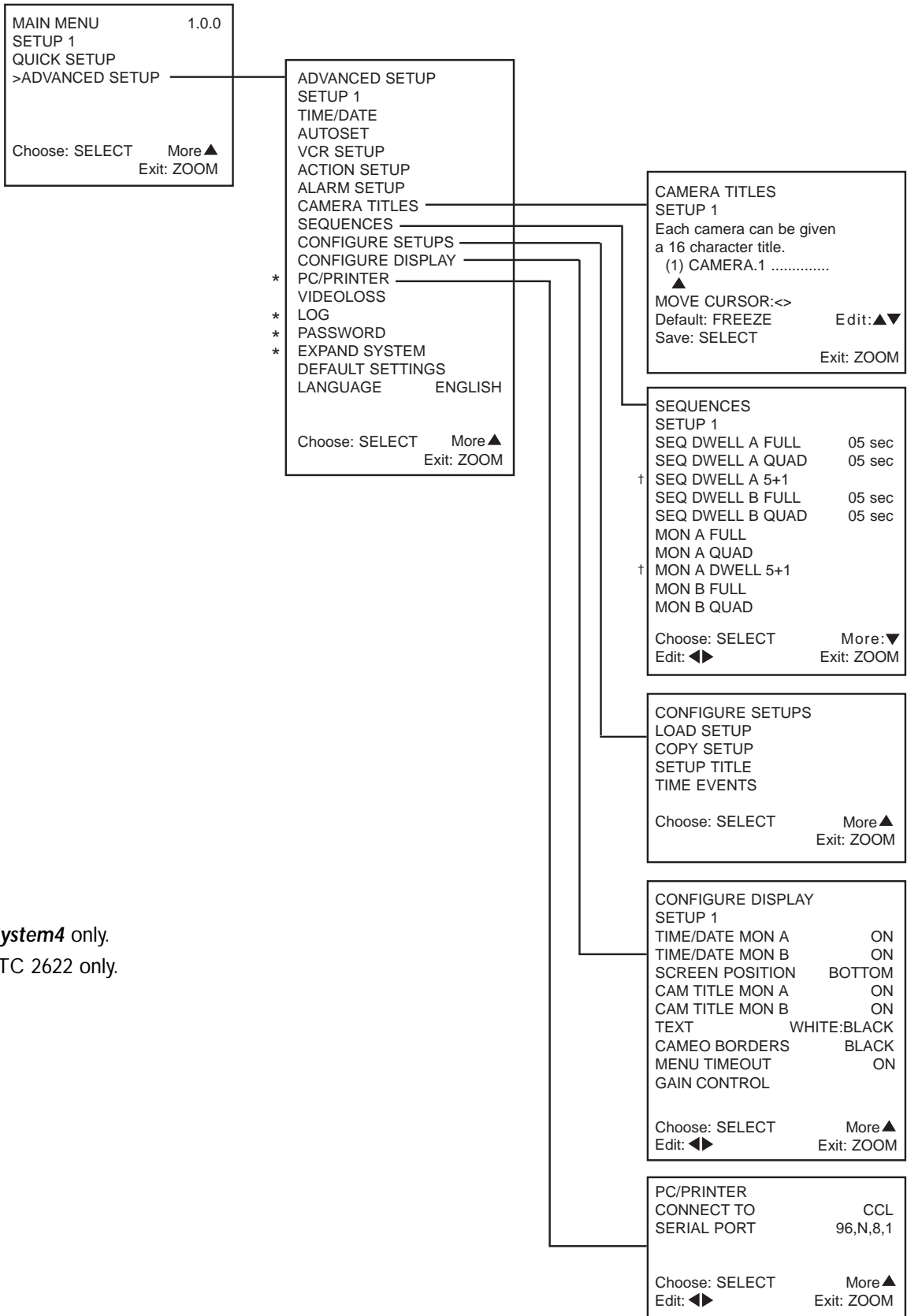
Menu Trees: Advanced Setup

The following menu trees are provided for reference in locating advanced programming functions. Descriptions of all these functions are located in Section 4. (The Quick Setup menus are described and shown in complete detail in Section 2).



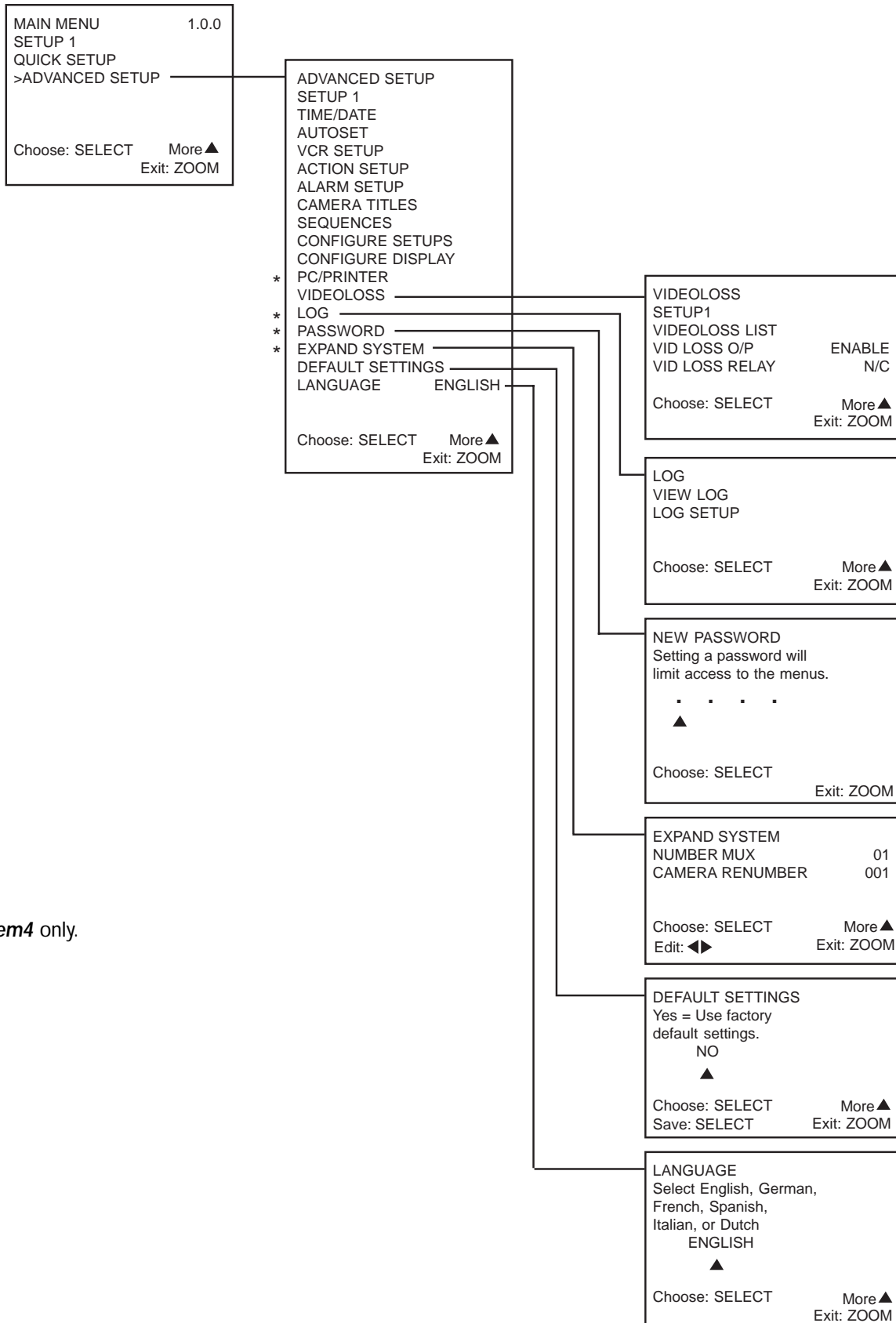
* System4 only.

Menu Trees: Advanced Setup (continued)



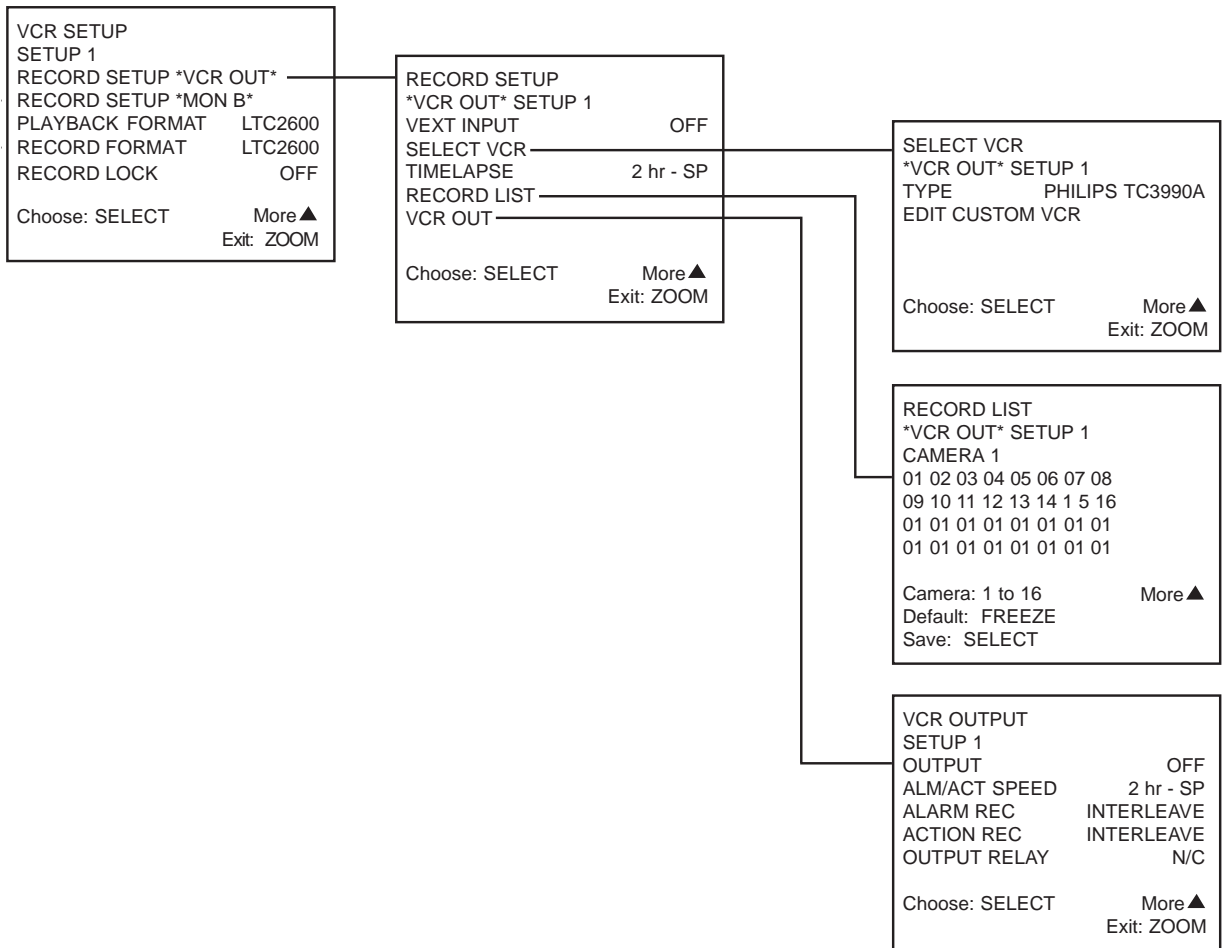
* **System4** only.
† LTC 2622 only.

Menu Trees: Advanced Setup (continued)



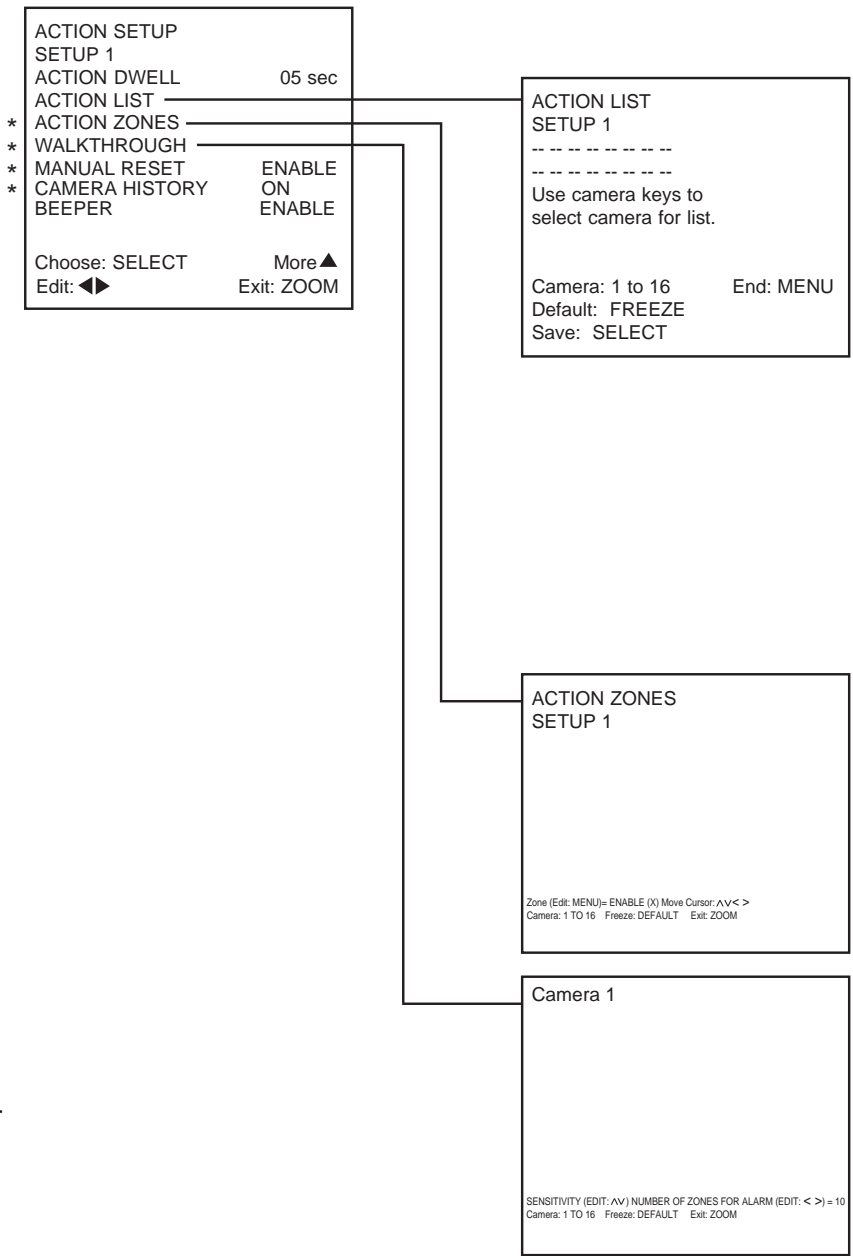
* System4 only.

Menu Trees: Advanced Setup - VCR SETUP



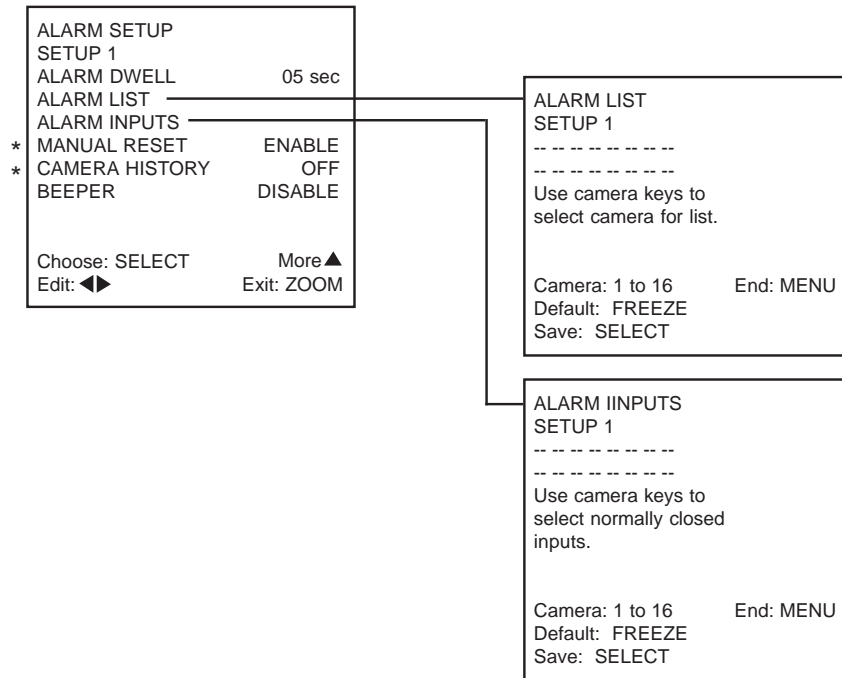
* System4 only.

Menu Trees: Advanced Setup - ACTION SETUP



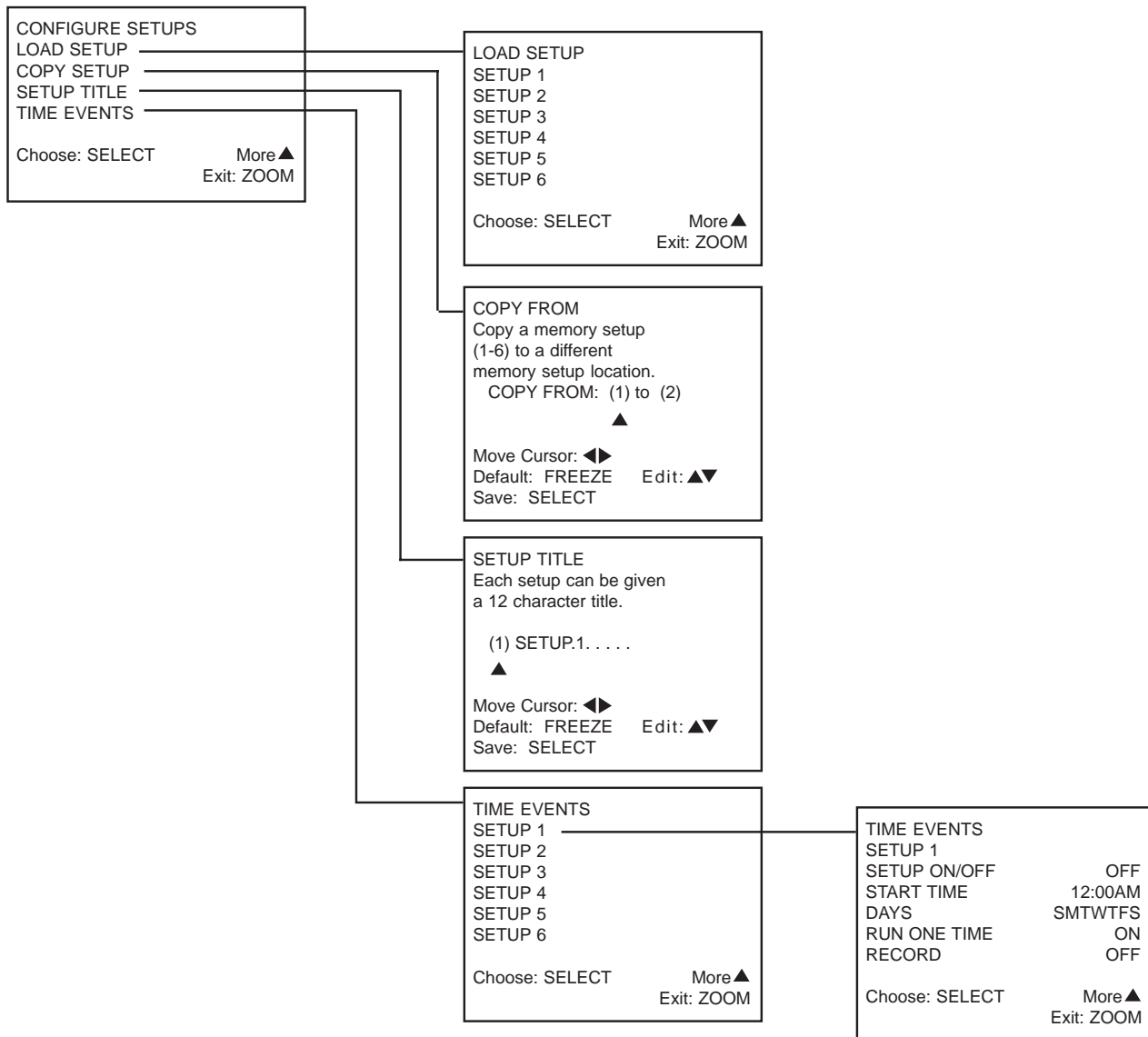
* System4 only.

Menu Trees: Advanced Setup - ALARM SETUP










* System4 only.


Menu Trees: Advanced Setup - CONFIGURE SETUPS





APPENDIX E: QUICK FUNCTION KEYS

The LTC 2600 Series Video Multiplexer provides quick function keys which enable “instant access” to the programming lists critical for multiplexer operation. To access the list commands, you will have to press a sequence of keys. First, press the ALT key , followed by 1 and then one of these additional keys to select the required list:

ALM 	To access the Alarm List
ACT 	To access the Action List
ZOOM 	To access the Videoloss List
RECORD	To access the Record List
FULL 	To access the Sequence List for monitor A in Full Screen mode
QUAD 	To access the Sequence List for monitor A in Quad mode
MON B  , FULL	To access the Sequence List for monitor B in Full Screen mode
PLAY	To access the Playback Format selection

System4 models provide additional quick function key combinations which apply to the operation of the second record list. Press ALT followed by 1,  (MON B).

RECORD	To access the VCR2 Record List
MON B  , QUAD	To access the Sequence List for monitor B in Quad mode
MON B  , REC	To access the Record List on Monitor B

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