APPENDIX A GENERAL PURPOSE INTERFACE (GPI) CIRCUIT DESCRIPTION (PCB)

Reference should be made to the GPI card circuit diagram.

A.1 TRANSPORT CONTROL

A.1.1 COMMANDS TO MACHINE

Commands are generated by the 'A' section output of the PIA (68A21) U1. An 8 bit word is written into the 'A' register of the PIA corresponding to the command required. Each bit corresponds to a single command, e.g. an active bit 0 is the PLAY command.

Command output from the PIA (U1) is generally inactive at +5V and active at 0V.

COMMAND	PIA (U1)
Play	PA0/Bit0
Stop	PA1/Bit1
Record	PA2/Bit2
Forward	PA3/Bit3
Rewind	PA4/Bit4
Lift/Edit/Servo	PA5/Bit5
Auto Mute	PA6/Bit6
Ext. Servo	PA7/Bit7

Note that Auto Mute is not a command fed to the machine. This command controls the Auto Mute relay on the COORDINATOR 2 card, which is used to generate a muting signal when machines are playing into park or when the tape lifters are defeated.

Output from the PIA is buffered by 7407 non-inverting buffers (U3 and U28). These are then used to drive relays which command the machine.

The relays have a common reference voltage which comes in at edge connector EA28. This is the voltage at which commands are active at the machine and is derived from the machine itself. This gives machine isolation from Q.LOCK and also means that machines requiring pull up signals or pull down signals can both be accommodated.

All commands are enabled when transistor Q1 is ON, under control of the PIA. This occurs soon after power-up or Reset and is provided to ensure that machines do not respond to spurious, transient commands which can sometimes occur during power-up.

A.1.2 TALLIES FROM MACHINE

Tally feedback from the machine to Q.LOCK is preferred, but not absolutely necessary. In cases where tallies are absent or peculiar, command output is linked to the tally input, Q.LOCK then assumes that the machine has obeyed the command.

The tally input structure (see Figure A1) uses the optocouplers (U11,U12 and U13) to give machine isolation from Q.LOCK. The tally input is formed from two LEDs connected in parallel with one reversed with respect to the other. A series resistor is used to limit the current. A tally reference voltage is derived from the machine and the tally input swings with respect to this.

Normally, the tally input sits at the same level as the Tally Reference and no current flows through the diodes. When the tally input swings more than +/- 1.2V with respect to the Reference, current flows through one of the diodes and one of the transistors switches on. The transistors have commoned emitters which can be selected by means of a link fitted to header H1. Positive tallies with respect to the Reference are activated when pins 7 and 10 of H1 are linked, and negative tallies are activated when pins 8 and 9 are linked. So positive or negative going tallies will drive the input to the PIA. The series resistor array for the diodes is chosen to accommodate the machines's particular output voltage.

Most interfaces are organised so that the optotransistors are turned ON for active tallies. This means that NO tallys appear on the Central Control Unit when the machine is disconnected from Q.LOCK. The constraints imposed by some machines sometimes means that the converse is true; the transistors are switched ON for inactive tallies. The program must then invert the perceived tallies. Unplugging a machine from Q.LOCK in such a case produces all machine tallies simultaneously on the Central Control Unit.

The tally outputs from the optotransistors are input to the 'B' section of the PIA (U1). Depending on the program, the input can be active either low or high. High level is +5V and low level is 0V. The 'B' register of the PIA is loaded with the input states and passed to the microprocessor for manipulation.

TALLY	PIA (U1)
Play	PB0/Bit0
Stop	PB1/Bit1
Record	PB2/Bit2
Forward	PB3/Bit3
Rewind	PB4/Bit4
Runout (E.O.T)	PB5/Bit5
Direction	PB6/Bit6