

# AA-620/AA-625

## AA-720/AA-725

## 5x1 EUROCARD AUDIO SWITCHERS

AA-725.IB

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## AA-620/625

## AA-720/725

### 5x1 EUROCARD AUDIO SWITCHERS

### INSTRUCTION BOOK

#### Section

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## WARNING

OPERATION OF ELECTRONIC EQUIPMENT INVOLVES THE USE OF VOLTAGES AND CURRENTS, WHICH MAY BE DANGEROUS TO HUMAN LIFE. OPERATING PERSONNEL SHOULD OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE COMPONENTS OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH POWER ON UNLESS PROPER PRECAUTIONS ARE OBSERVED. NOTE THAT UNDER CERTAIN CONDITIONS DANGEROUS POTENTIALS MAY EXIST IN SOME CIRCUITS EVEN THOUGH POWER CONTROLS ARE IN THE OFF POSITION.

#### GENERAL DESCRIPTION

The VA-7.. series and the VA-6.. series are electrically identical. Therefore, for clarity, throughout this description only the VA-6.. naming convention will be used.

The AA-620 and AA-625 are five input mono audio switchers intended for program and monitoring switching in broadcasting and production studios.

The AA-620 and AA-625 differ only in that the AA-625 comes complete with a CP-600 integral control panel for local control of the switching and that the AA-620 is intended for remote control operation by means of a CP-600 control panel, as part of a stereo switcher or as a audio follow switcher together with the IRT VA-610/VA-615 5x1 video switchers.

The input circuit of the AA-620/625 consist of 5 high input impedance buffer amplifiers connected to the inputs of cmos analog switches. The audio signal from the analog switches is then amplified in a differential amplifier to achieve common mode (HUM) rejection. Two isolated low impedance output circuits are then provided by separate balanced line drivers.

Control is by a momentary grounding contact from the CP-600 control panel or from a remote panel, return tallies are provided on the control lines after the switching function has been initiated.

The switch control circuit encodes the momentary control switch action to 3 bit binary data which is latched and decoded to drive the switch cross-point and the tally driver. A feature of the data latch circuit is the ability to hold data for approximately 5 minutes with the power off and indefinitely if the optional battery is fitted to the front panel.

The control circuit is accessible on the rear of the AA-620/625 audio switcher to slave the control circuit of another AA-620 audio switcher for stereo audio switching or for audio follow video switching together with a IRT VA-610/VA-615 video switcher.

The AA-620/625 is built to the EUROCARD format and will mount in a IRT FR-600 frame which provides the 28V CT ac required from the PT-600 dual power supply.

Accessories available are:

CP-600 control panel which plugs onto the front of the VA-610 instead of the normal front panel. AA-620 5x1 Mono Audio Switcher for stereo switching. Instruction book

## TECHNICAL DATA

Inputs:	Five balanced circuit bridging (20 kohms) input impedance. Greater than 50dB 50Hz to 1kHz. (internal preset) Two balanced circuit (44 ohms) low impedance drives.		
Common Mode Rejection:			
Outputs:			
Audio Connections:	Spade terminal or Panduit Mascon ISD.		
Gain:	Unity (Adjustable by internal preset control to +/- 3dB)		
Maximum Signal level:	+24 dBm.		
Frequency Response:	+/- 0.05 dB in the range 20Hz to 20kHz. (Referenced to 1KHz)		
Harmonic Distortion:	Less than 0.005% in the range 20Hz to 20KHz at an Audio level of +20dBm.		
Noise at the Output:	With input terminated by 600 ohms:- Less than -105dB below an output level of +20dBm. (Bandwidth 20Hz to 20kHz)		
Crosstalk:	Between inputs with input terminated Less than -90dB at 15kHz. Less than -85dB at 20kHz.		
Control: Switch Action Tally	Grounding contact. Ground. (Open collector switch to ground on the control line)		
Control/Tally connector	8 pin 0.1 inch spaced socket strip with mating locking plug assembly.		
Power Requirements:	28V AC CT from a IRT PT-600 power supply		
Power consumption:	4.6 VA.		
Mechanical:	220mm x 100mm x19mm EUROCARD.		
Configuration:	AA-620 5x1 switcher for remote control or audio follow control. AA-625 5x1 switcher for local control.		

#### CIRCUIT DESCRIPTION

#### Audio Circuits.

Audio input signals to the AA-620/AA-625 switchers are buffered by input amplifiers U10 to U14, this provides the high input impedance required and sets the level into the cmos analog switches U15 and U16. Two four input balanced analog switches are used to provide the five switch channels, the switch action being controlled by binary data stored in the data latch U3. U17 and U18 comprise a balanced input amplifier with common mode balance adjustment RV1, this allows the rejection of common mode (HUM) signals that may be present on the input signal.

Gain and output amplifier DC off set are provided by RV3 and RV2. The output amplifiers use two dual OPAMP circuits to provide two isolated low impedance (44 ohm) audio output circuits.

#### Control Circuit.

The control circuit consists of clock oscillator U1, priority encoder U2, data latch U3 together with decoder circuits U4 and U5. Data from the encoder U2 is latched in U3 at the rising edge of the pulse generated in U1, wired to the crosspoint switch circuits U15 and U16. Decoders U4 and U5 are used to drive the tally circuit and to saturate a PNP transistor, which clears the ground from the selected input on U2, thus, preparing the encoder for the next switch action.

The tally circuit acts on the input control lines to the switcher thus simplifying the remote control connections, supply voltage for the led indicators on the control panel is provided by D12 from the +12 volt supply. U5 saturates a PNP transistor, which clears the ground from the selected input on U2, thus preparing the encoder for the next switch action.

Link 1 can be used to disable the tally ground on the control line when a number of control circuits are wired in parallel.

Link 2 can be used to remove the led supply voltage to the rear panel to prevent the voltage supplies of parallel connected control circuits interacting. Note this will not remove the led supply voltage to a CP-600 control panel fitted to the front of a switcher.

Link 3 can be used to force power on reset to input 1, this is normally left out to allow the power off data saving feature of the control circuit to be used.

#### CIRCUIT DESCRIPTION

Latch U2 is a CMOS 4 bit latch which latches data present at the data inputs on the leading edge of the latch pulse applied to the clock input. Transistors Q6 and Q7 serve to initiate the power down action of the latch circuit, isolating the inputs by preventing pin 10 from being grounded and removing the output enable ground on pins 1 and 2. Capacitor C41 will hold the voltage on U3 for about 5 minutes to hold the latched data and a battery can be fitted on the front panel for longer data storage.

The latch switch pulse is generated by U1A an astable oscillator circuit. The signal is then gated with the any key signal from U2 to provide the clock signal for the latch U3.

#### Power Supplies.

Operating voltages for the VA-620/625 switchers are generated from the PT-600 28 volt centre tapped AC powered supply supplied with the IRT FR-600 frame. Two bridge rectifier circuits are used to take advantage of the redundant power supply feature of the IRT FR-600 frame. Three terminal regulators U6 and U7 are used to provide the +/- 12 volts for the audio circuits and further three terminal regulators U8 and U9 are used to generate the +5 volt for the logic circuits and the +/-5 volts for the analog switch circuits.

#### INSTALLATION

The AA-620/625 audio switchers are housed in a IRT FR-600 483mm (19 inch) rack mounting frame three rack unit (132mm) high.

All connections are made via the RB-620 rear assembly which plugs onto the rear of the frame and is secured with the 2.5mm screws provided.

Audio input and output connections are made using spade terminal lugs to which the audio wiring is crimped or soldered and which are then covered with the heat shrink insulation supplied.

Control connections to the 5 control lines, ground and the tally led supply are provided by J1 and J2 which are wired in parallel to simplify control wiring to switchers operating from the same control panel. Note that J1 and J2 connections are the same as the connections used on the VA-610 video switcher so simplifying wiring between units. Drawing No. 803081 shows these connections in detail.

LINK 1 is set to the **ON** position in a **MASTER** switcher and to the **OFF** position in a slave switcher such as a audio follow or the second channel of a stereo switcher, controlled from the master switcher via the tally lines. A master switcher is the switcher which has the control panel fitted or which is controlled from a remote control panel. Thus the second and subsequent switchers are then set with LINK 1 **OFF**.

LINK 2 supplies the LED operating voltage to remote control panels and is set to the **ON** position for a master AA-620 or AA-625 switcher connected to a remote panel and in the **OFF** position for a switcher fitted with the CP-600 control panel or operated as a slave switcher.

LINK 3 is normally not used, insertion of a shorting link in this position will force power on reset to input 1 and override the power off data saving feature of the AA-620/625.

The backup battery for long term storage of switching status can be fitted to the front panel of a AA-620, the position and polarity are marked on the circuit board. If the switcher is fitted with a CP-600 switch panel there is space there for fitting the resistor diode and battery at the positions indicated on the board as per drawing No. 803071. The battery used is the same as the backup battery used in many PC clock boards and should be available from computer distributors. The backup battery is required only for the master switcher, slave audio switchers will not require a battery as they will follow the tally from the master switcher.

#### MAINTENANCE

The AA-620/625 switchers are factory aligned for correct operation.

Controls are provided for setting the output amplifier DC (RV2), the switcher audio gain (RV3), and the input amplifier common mode balance (RV1). Appropriate test equipment must be used to check and adjust these settings if required.

NOTE: If it is necessary to remove a component from the circuit board during maintenance IT IS ESSENTIAL TO ADD SOME SOLDER TO THE COMPONENT SOLDER JOINTS BEFORE REMOVAL IS ATTEMPTED. This will add some solder flux to the joint and allow the heat from the iron to flow quickly into the joint and prevent localised overheating and damage to the circuit board.









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