

ARC150/ARC125

Aspect Ratio Converters

Operator's Manual

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Explanation of Safety Symbols



- This symbol refers the user to important information contained in the accompanying literature. Refer to manual.
- This symbol indicates that hazardous voltages are present inside. No user serviceable parts inside. This unit should only be serviced by trained personnel.

Safety Warnings



Servicing instructions where given, are for use by qualified service personnel only. To reduce risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified personnel.

- To reduce the risk of electric shock, do not expose this appliance to rain or moisture.
- Always ensure that the unit is properly earthed and power connections correctly made.
- This equipment must be supplied from a power system providing a PROTECTIVE EARTH (⊕) connection and having a neutral connection which can be reliably identified.
- The power outlet supplying power to the unit should be close to the unit and easily accessible

Power connection in countries other than the USA

The equipment is normally shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner.

The colour code for the lead is as follows:

- GREEN/YELLOW lead connected to E (Protective Earth Conductor)
- BLUE lead connected to N (Neutral Conductor)
- BROWN lead connected to L (Live Conductor)



- Caution If the unit has two mains supply inputs ensure that both power cords are plugged into mains outlets operating from the same phase.

Légende :



- Ce symbole indique qu'il faut prêter attention et se référer au manuel.
- Ce symbole indique qu'il peut y avoir des tensions électriques à l'intérieur de l'appareil. Ne pas intervenir sans l'agrément du service qualifié.

Précaution d'emploi :



Les procédures de maintenance ne concernent que le service agréé. Afin de réduire le risque de choc électrique, il est recommandé de se limiter aux procédures d'utilisation, à moins d'en être qualifié. Pour toute maintenance, contacter le service compétent.

- Pour réduire le risque de choc électrique, ne pas exposer l'appareil dans un milieu humide.
- Toujours s'assurer que l'unité est correctement alimentée, en particuliers à la liaison à la terre.
- La source électrique de cet équipement doit posséder une connexion à la terre (⊕), ainsi qu'une liaison « neutre » identifiable.
- La prise électrique qui alimente l'appareil doit être proche de celle-ci et accessible.

Câble secteur de pays autres que les Etats-Unis

L'équipement est livré avec un câble secteur au standard IEC, moulé mâle/femelle. Si vous souhaitez changer la prise mâle de votre cordon, voici les codes couleurs des fils :

- Le fil VERT/JAUNE est connecté à T (Terre)
- Le fil BLEU est connecté à N (Neutre)
- Le fil MARRON est connecté à P (Phase)



- Attention si l'appareil a 2 alimentations, s'assurer que les cordons soient branchés sur la même phase.

Erklärung der Sicherheitssymbole



- Dieses Symbol weist den Benutzer auf wichtige Informationen hin, die in der begleitenden Dokumentation enthalten sind.
- Dieses Symbol zeigt an, dass gefährliche Spannung vorhanden ist. Es befinden sich keine vom Benutzer zu wartende Teile im Geräteinneren. Dieses Gerät sollte nur von geschultem Personal gewartet werden

Sicherheits-Warnhinweise



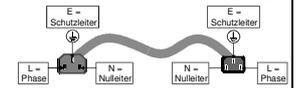
Die angeführten Service-/Reparatur-Anweisungen sind ausschließlich von qualifiziertem Service-Personal auszuführen. Um das Risiko eines lektroschocks zu reduzieren, führen Sie ausschließlich die im Benutzerhandbuch eschriebenen Anweisungen aus, es sei denn, Sie haben die entsprechende Qualifikation. Wenden Sie sich in allen Service-Fragen an qualifiziertes Personal.

- Um das Risiko eines Elektroschocks zu reduzieren, setzen Sie das Gerät weder Regen noch Feuchtigkeit aus.
- Stellen Sie immer sicher, dass das Gerät ordnungsgemäß geerdet und verkabelt ist.
- Dieses Equipment muss an eine Netzsteckdose mit Schutzleiter angeschlossen werden und einen zuverlässig identifizierbaren Nulleiter haben.
- Die Netzsteckdose sollte nahe beim Gerät und einfach zugänglich sein.

Netzanschluss in anderen Ländern als der USA

Das Equipment wird im Normalfall mit einem Netzkabel mit Standard IEC Anschlussbuchse und einem Standard IEC Anschlussstecker geliefert. Sollten Sie den angeschweißten Stecker auswechseln müssen, entsorgen Sie diesen bitte umgehend. Die farbliche Belegung des Netzkabels ist wie folgt:

- GRÜN GELB E = Schutzleiter (⊕)
- BLAU N = Nulleiter
- BRAUN L = P = Phase



- Achtung: Wenn das Gerät zwei Anschlussbuchsen hat, stellen Sie bitte sicher, dass beide Netzkabel mit der selben Phase in die Netzsteckdose gesteckt werden.

Explicación de los Símbolos de Seguridad



- Éste símbolo refiere al usuario información importante contenida en la literatura incluida. Referirse al manual.
- Éste símbolo indica que voltajes peligrosos están presentes en el interior. No hay elementos accesibles al usuario dentro. Esta unidad sólo debería ser tratada por personal cualificado.

Advertencias de Seguridad



Las instrucciones de servicio cuando sean dadas, son sólo para uso de personal cualificado. Para reducir el riesgo de choque eléctrico no llevar a cabo ninguna operación de servicio aparte de las contenidas en las instrucciones de operación, a menos que se esté cualificado para realizarlas. Referir todo el trabajo de servicio a personal cualificado.

- Para reducir el riesgo de choque eléctrico, no exponer este equipo a la lluvia o humedad.
- Siempre asegurarse de que la unidad está propiamente conectada a tierra y que las conexiones de alimentación están hechas correctamente.
- Este equipo debe ser alimentado desde un sistema de alimentación con conexión a TIERRA (⊕) y teniendo una conexión neutra fácilmente identificable.
- La toma de alimentación para la unidad debe ser cercana y fácilmente accesible.

Conexión de alimentación en otros países que no sean USA

El equipo es normalmente entregado con un cable de alimentación con un enchufe hembra estándar IEC en un extremo y con una clavija estándar IEC en el otro. Si se requiere eliminar la clavija para sustituirla por otra, disponer dicha clavija de una forma segura. El código de color a emplear es como sigue:

- VERDE/ AMARILLO conectado a E (Conductor de protección a Tierra -Earth in the original-)
- AZUL conectado a N (Conductor Neutro -Neutral in the original-)
- MARRÓN conectado a L (Conductor Fase -Live in the original-)



- Advertencia Si la unidad tuviera dos tomas de alimentación, asegurarse de que ambos cables de alimentación están conectados a la misma fase.

Simboli di sicurezza:

Questo simbolo indica l'informazione importante contenuta nei manuali appartenenti all'apparecchiatura. Consultare il manuale.

Questo simbolo indica che all'interno dell'apparato sono presenti tensioni pericolose. Non cercare di smontare l'unità. Per qualsiasi tipo di intervento rivolgersi al personale qualificato.

Attenzione:

Le istruzioni relative alla manutenzione sono ad uso esclusivo del personale qualificato. E' proibito all'utente eseguire qualsiasi operazione non esplicitamente consentita nelle istruzioni. Per qualsiasi informazione rivolgersi al personale qualificato.

- Per prevenire il pericolo di scosse elettriche è necessario non esporre mai l'apparecchiatura alla pioggia o a qualsiasi tipo di umidità.
- Assicurarsi sempre, che l'unità sia propriamente messa a terra e che le connessioni elettriche siano eseguite correttamente.
- Questo dispositivo deve essere collegato ad un impianto elettrico dotato di un sistema di messa a terra efficace.
- La presa di corrente deve essere vicina all'apparecchio e facilmente accessibile.

Connessione elettrica nei paesi diversi dagli Stati Uniti

L'apparecchiatura normalmente è spedita con cavo pressofuso con la presa e spina standard IEC. Nel caso della rimozione della spina elettrica, gettarla via immediatamente osservando tutte le precauzioni del caso. La leggenda dei cavi è la seguente:

VERDE/GIALLO cavo connesso ad "E" (terra)
BLU cavo connesso ad "N" (neutro)
MARRONE cavo connesso ad "L" (fase)



Attenzione! Nel caso in cui l'apparecchio abbia due prese di corrente, assicurarsi che i cavi non siano collegati a fasi diverse della rete elettrica.

Forklaring på sikkerhedssymboler

Dette symbol gør brugeren opmærksom på vigtig information i den medfølgende manual.

Dette symbol indikerer farlig spænding inden i apparatet. Ingen bruger servicebare dele i apparatet på brugerniveau. Dette apparat må kun serviceres af faglærte personer..

Sikkerhedsadvarsler

Serviceinstruktioner er kun til brug for faglærte servicefolk. For at reducere risikoen for elektrisk stød må bruger kun udføre anvisninger i betjeningsmanualen. Al service skal udføres af faglærte personer.

- For at reducere risikoen for elektrisk stød må apparatet ikke udsættes for regn eller fugt.
- Sørg altid for at apparatet er korrekt tilsluttet og jordet.
- Dette apparat skal forbindes til en nettilslutning, der yder BESKYTTENDE JORD (⊕) og 0 forbindelse skal være tydeligt markeret.
- Stikkontakten, som forsyner apparatet, skal være tæt på apparatet og let tilgængelig.

Nettilslutning i andre lande end USA

Udstyret leveres normalt med et strøm kabel med et standard IEC støbt løst hunstik i den ene ende og et standard IEC støbt hanstik i den anden ende. Hvis et af de støbte stik på strømkablet er defekt, skal det straks kasseres på forsvarlig vis. Farvekoden for lederen er som følger:

GRØN/GUL leder forbundet til J (Jord)
BLÅ leder forbundet til 0
BRUN leder forbundet til F(Fase)



Forsigtig Hvis enheden har to lysnetindgange, skal der sørges for at begge ledninger tilsluttes lystnetudgange fra den samme fase.

Förklaring av Säkerhetssymboler

Denna symbol hänvisar användaren till viktig information som återfinns i litteraturen som medföljer. Se manualen.

Denna symbol indikerar att livsfarlig spänning finns på insidan. Det finns inga servicevänliga delar inne i apparaten. Denna apparat får endast repareras av utbildad personal.

Säkerhetsvarningar

Serviceinstruktioner som anges avser endast kvalificerad och utbildad servicepersonal. För att minska risken för elektrisk stöt, utför ingen annan service än den som återfinns i medföljande driftinstruktionerna, om du ej är behörig. Överlåt all service till kvalificerad personal.

- För att reducera risken för elektrisk stöt, utsätt inte apparaten för regn eller fukt.
- Se alltid till att apparaten är ordentligt jordad samt att strömtillförseln är korrekt utförd.
- Denna apparat måste bli försörd från ett strömsystem som är försedd med jordanslutning (⊕) samt ha en neutral anslutning som lätt identifierbar.
- Vägguttaget som strömförsörjer apparaten bör finnas i närheten samt vara lättillgänglig.

Strömkontakter i länder utanför USA

Apparaten utrustas normalt med en strömkabel med standard IEC gjuten honkontakt på ena änden samt en standard IEC gjuten hankontakt på den andra änden. Om man måste avlägsna den gjutna hankontakten, avyttra denna kontakt omedelbart på ett säkert sätt. Färgkoden för ledningen är följande:

GRÖN/GUL ledning ansluten till E (Skyddsjordad ledare)

BLÅ ledning ansluten till N (Neutral ledare)
BRUN ledning ansluten till L (Fas ledare)



Varning! Om enheten har två huvudsakliga elförsörjningar, säkerställ att båda strömkablarna som är inkopplade i enheten arbetar från samma fas.

Turvamerkkien selitys

Tämä merkki tarkoittaa, että laitteen mukana toimitettu kirjallinen materiaali sisältää tärkeitä tietoja. Lue käyttöohje.

Tämä merkki ilmoittaa, että laitteen sisällä on vaarallisen voimakas jännite. Sisäpuolella ei ole mitään osia, joita käyttäjä voisi itse huoltaa. Huollon saa suorittaa vain alan ammattilainen.

Turvaohjeita

Huolto-ohjeet on tarkoitettu ainoastaan alan ammattilaisille. Älä suorita laitteelle muita toimenpiteitä, kuin mitä käyttöohjeissa on neuvottu, ellei ole asiantuntija. Voit saada sähköiskun. Jätä kaikki huoltotoimet ammattilaiselle.

- Sähköiskujen välttämiseksi suojaa laite sateelta ja kosteudelta.
- Varmistu, että laite on asianmukaisesti maadoitettu ja että sähkökytkennät on tehty oikein.
- Laitteelle tehoa syöttävässä järjestelmässä tulee olla SUOJAMAALIIKÄNTÄ (⊕) ja nolllaliitännän on oltava luotettavasti tunnistettavissa.
- Sähköpistorasian tulee olla laitteen lähellä ja helposti tavoitettavissa.

Sähkökytkentä

Laitteen vakiovarusteena on sähköjohto, jonka toisessa päässä on muottiin valettu, IEC-standardin mukainen liitäntärasia ja toisessa päässä muottiin valettu, IEC-standardin mukainen pistoliitin. Jos pistoliitin tarvitsee poistaa, se tulee hävittää heti turvallisella tavalla. Johtimet kytketään seuraavasti:

KELTA-VIHREÄ suojamaajohtoin E-napaan
SININEN nolllajohtoin N-napaan
RUSKEA vaihejohtoin L-napaan



Huom! Jos laitteessa on kaksi verkkojännitteen tuloliitäntää, niiden johdot on liitettävä verkkopistorasioihin, joissa on sama vaiheistus.

Símbolos de Segurança



- O símbolo triangular adverte para a necessidade de consultar o manual antes de utilizar o equipamento ou efectuar qualquer ajuste.
- Este símbolo indica a presença de voltagens perigosas no interior do equipamento. As peças ou partes existentes no interior do equipamento não necessitam de intervenção, manutenção ou manuseamento por parte do utilizador. Reparações ou outras intervenções devem ser efectuadas apenas por técnicos devidamente habilitados.

Avisos de Segurança

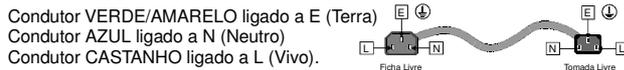


As instruções de manutenção fornecidas são para utilização de técnicos qualificados. Para reduzir o risco de choque eléctrico, não devem ser realizadas intervenções no equipamento não especificadas no manual de instalações a menos que seja efectuadas por técnicos habilitados.

- Para reduzir o risco de choque eléctrico, não expor este equipamento à chuva ou humidade.
- Assegurar que a unidade está sempre devidamente ligada à terra e que as ligações à alimentação estão correctas.
- O sistema de alimentação do equipamento deve, por razões de segurança, possuir ligação a terra de protecção (⊕) e ligação ao NEUTRO devidamente identificada.
- A tomada de energia à qual a unidade está ligada deve situar-se na sua proximidade e facilmente acessível.

Ligação da alimentação noutros países que não os EUA

O equipamento é, normalmente, enviado com cabo de alimentação com ficha IEC fêmea standard num extremo e uma ficha IEC macho standard no extremo oposto. Se for necessário substituir ou alterar alguma destas fichas, deverá remove-la e elimina-la imediatamente de maneira segura. O código de cor para os condutores é o seguinte:



Atenção: Se a unidade tem duas fontes de alimentação assegurar que os dois cabos de alimentação estão ligados a tomadas pertencentes à mesma fase.

Επεξήγηση των Συμβόλων Ασφαλείας



- Αυτό το σύμβολο παραπέμπει το χρήστη σε σημαντικές πληροφορίες που συμπεριλαμβάνονται στο συνοδευτικό εγχειρίδιο.
- Αυτό το σύμβολο υποδεικνύει ότι στο εσωτερικό υφίστανται επικίνδυνες ηλεκτρικές τάσεις. Στο εσωτερικό δεν υπάρχουν επισκευάσιμα μέρη. Αυτή η μονάδα πρέπει να επισκευάζεται μόνο από ειδικά εκπαιδευμένο προσωπικό.

Προειδοποίηση Ασφαλείας

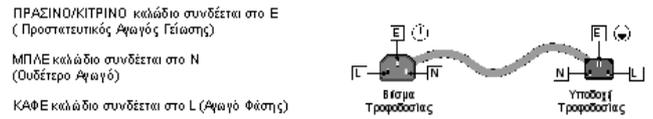


Οδηγίες επισκευής, όπου παρέχονται, αναφέρονται αποκλειστικά και μόνο σε εξειδικευμένο προσωπικό. Για να μειωθεί ο κίνδυνος ηλεκτροπληξίας, μην εκτελείτε επισκευές παρά μόνο τις συμπεριλαμβανόμενες στο εγχειρίδιο των οδηγιών, εκτός και αν έχετε τα απαραίτητα προσόντα για να το κάνετε. Όλες οι επισκευές να εκτελούνται από ειδικά εκπαιδευμένο προσωπικό.

- Για να μειώσετε τον κίνδυνο ηλεκτροπληξίας, μην εκθέτετε τη συσκευή σε βροχή ή υγρασία.
- Πάντα να εξασφαλίζετε τη σωστή γείωση της συσκευής και τη σωστή σύνδεση των συνδέσμων τροφοδοσίας.
- Ο εξοπλισμός πρέπει να τροφοδοτείται από ένα σύστημα τροφοδοσίας που να εξασφαλίζει ΠΡΟΣΤΑΤΕΥΤΙΚΗ ΓΕΙΩΣΗ (⊕) και να έχει καθορισμένες θέσεις ουδέτερου και φάσης.
- Ο εξοπλισμός που τροφοδοτεί τη συσκευή θα πρέπει να βρίσκεται κοντά στη συσκευή και να είναι εύκολα προσβάσιμος.

Σύνδεση τροφοδοσίας σε χώρες εκτός των ΗΠΑ

Ο εξοπλισμός συνοδεύεται συνήθως από ένα καλώδιο τροφοδοσίας με ένα σταθερό βύσμα τροφοδοσίας ρεύματος τύπου πυραμίδας στη μια άκρη του και μια σταθερή υποδοχή τροφοδοσίας ρεύματος τύπου πυραμίδας στην άλλη άκρη του. Εάν χρειαστεί να αφαιρεστεί το σταθερό βύσμα τροφοδοσίας μην το επαναχρησιμοποιείτε, θεωρείται άχρηστο. Ο χρωματικός οδηγός για το καλώδιο τροφοδοσίας είναι ο παρακάτω:



ΠΡΟΣΟΧΗ! Αν η μονάδα έχει δύο τροφοδοτικά βερβιαθείτε ότι και τα δύο καλώδια τροφοδοσίας είναι συνδεδεμένα σε εξόδους τροφοδοσίας που βρίσκονται στην ίδια φάση.

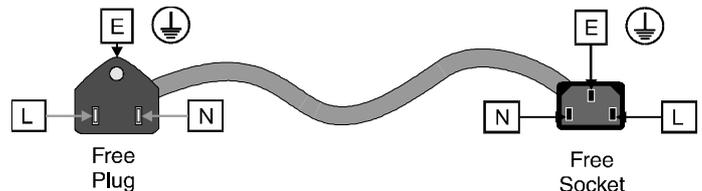
Products employing Lithium batteries

CAUTION
This equipment contains a lithium battery.
There is a danger of explosion if this is replaced incorrectly.
Replace only with the same or equivalent type.
Dispose of used batteries according to the instructions of the manufacturer.
Batteries **shall only** be replaced by trained service technicians.

Power cable supplied for the USA

The equipment is shipped with a power cord with a standard IEC molded free socket on one end and a standard 3-pin plug on the other. If you are required to remove the molded mains supply plug, dispose of the plug immediately in a safe manner. The color code for the cord is as follows:

- GREEN** lead connected to E (Protective Earth Conductor)
- BLACK** lead connected to L (Live Conductor)
- WHITE** lead connected to N (Neutral Conductor)



For products with more than one power supply inlet

Caution: To reduce the risk of electric shock plug each power supply cord into separate branch circuits employing separate service grounds.

Rack Mounting the Enclosure



This product must not be rack mounted using only the front rack ears.



When rack-mounting the product, one of the following methods of installation must be used: -

- Place the unit on a suitably specified, and installed rack shelf and secure the product to the rack via the front rack ears or,
 - Fit the unit using the rear rack mount kit available from Snell & Wilcox by quoting the order code FGACK RACK-MNT-KIT.
-

EMC Standards



This unit conforms to the following standards:

Electromagnetic Compatibility-Generic Immunity Standard BS EN 50082-1:1992

The European Standard EN 50082-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.

Electromagnetic Compatibility-Generic Emission Standard BS EN 50081-1:1992

The European Standard EN 50081-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.

Federal Communications Commission Rules Part 15, Class A :1998

Safety Standards

This unit conforms to EN60065:1992 as amended by amendment A1(May 1993) and amendment A2(March 1994). Specification for safety of technology equipment, including electrical business equipment.

EMC Performance of Cables and Connectors

Snell & Wilcox products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

About this Manual

This manual covers the following products:

- ARC150 with 4 GPI inputs (no GPI outputs) via single 9 way D connector
- ARC150 with 8 GPI inputs (via 2 x 9 way D connectors) and 8 GPI outputs via a 25 way D connector
- ARC125 with 8 GPI inputs and outputs as above but no reference input

Packing List

The unit is supplied in a dedicated packing carton provided by the manufacturer and should not be accepted if delivered in inferior or unauthorised materials. Carefully unpack the carton and check for any shipping damage or shortages.

Any shortages or damage should be reported to the supplier immediately.

Enclosures:

- ARC 150/125 Aspect Ratio Converter
- Power cable
- Operators Manual
- 2 floppy disks containing software for up and down loading ARC configurations to a PC

Software Version Amendments

Notes about Versions Fitted

Firmware. This machine is shipped with version A36 of the firmware.

Floppy Discs Disk 1 ARC Configuration Loader Version 1.0.1
Disk 2 ARC Configuration Loader Version 1.0.1

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Product Support Procedure

If you experience any technical or operational difficulties with a Snell & Wilcox product please do not hesitate to contact us or utilize our online form to request assistance.

There is a lot of information you can give us that will enable us to diagnose your problem swiftly. Please read the following guidelines, as these suggestions will help us to help you.

Basic Information

For UnitsPlease provide the exact product Model, unit Serial Number and Software Version information.

For Cards or Modules ..Please provide the Sub-Assembly Number, card Serial Number and the Software Version information.

Basic Application

InputsPlease provide full details of the Input Signals being used including any references etc. and where they are being generated.

OutputsPlease provide full details of the Output Signals required and how they are being monitored.

SystemPlease provide a brief description of the system in which your S&W equipment is currently being used.

Basic Tests

Preset UnitPlease use the Preset Unit function to return the settings back to the factory default.

RollCallIs your unit currently connected to a RollCall capable PC? This software is obtainable for free and provides a very user friendly GUI for virtually all S&W equipment - perfect for complex products, large systems or those with passive front panels.

Card Edge Info.What is the status of the card edge LEDs or display? These can often provide information such as power status and input detection conditions.

Internal TPGMany S&W products have an internal test pattern/tone generator. Please activate this to assist you with your problem analysis.

In addition to the above, please do not forget to provide us with all of the necessary contact information:

- Names
- Telephone & Fax numbers
- e-mail addresses
- Business address

A form has been provided for this information and will be found on the next page or an on-line form is available on the Snell & Wilcox website at:

<http://www.snellwilcox.com/support/request>

Product Support Request Form

Name: *		
Company:		
Address Details: *		
Post/ZIP Code:		
Country: *		
Telephone: *		
Fax:		
Email: *		
Local S&W Center: *		
Product Name: *		
Product Type: *	Switchers (i.e. Magic DaVE, Switchpack, Kahuna)	
	File & Data Transfer Products (i.e. RollCall, Memphis & iCR)	
	Video Products (i.e. Modular, Kudos Plus and Alchemist)	
Unit Serial Number: *		
Fault/Spare Part Information: * (please advise us how many units show this fault and the system layout showing all other manufacturers' products)		
* Preferred Method of Contact:	e-mail	
	Phone	

- Item is required.

Please mail to: Snell & Wilcox Ltd., Southleigh Park House, Eastleigh Road, Havant, Hants, PO9 2PE. United Kingdom.	Service Contact Information: Tel: +44 (0) 2392 489058 Fax: +44 (0) 2392 489057 http://www.snellwilcox.com/support ftp://ftp.snellwilcox.com/support
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Introduction

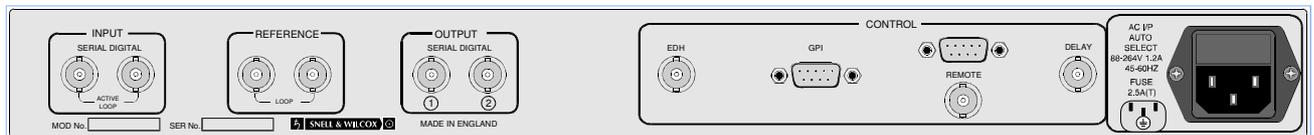
Aspect Ratio Converters ARC 150/125



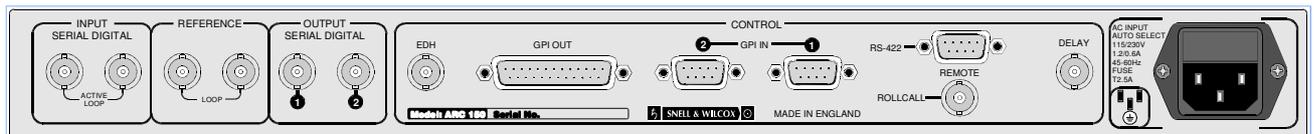
Blank Front Panel Version



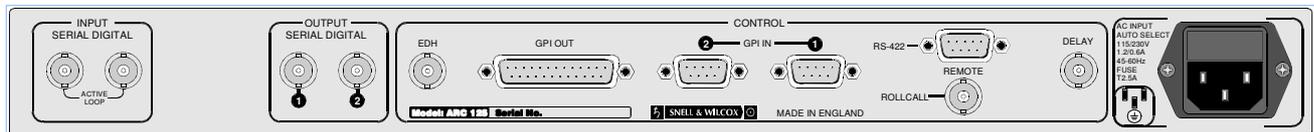
Active Control Panel Version



ARC150 Rear View (4 GPI inputs)



ARC150 Rear View (8 GPI inputs and outputs)



ARC125 Rear View

The ARC 150/125's are compact Broadcast-Quality Aspect Ratio Converters with serial digital inputs and outputs. They will aspect ratio convert in both directions, e.g. 16:9 to 4:3 or 4:3 to 16:9, and allows the picture area required for transmission to be selected from the input picture.

The ARC150 has a loop-through genlock reference input; the ARC125 does not.

There are twelve preset conversion ratios plus ratios set up by the user. The user ratios can be stored in twelve memories and are quickly pushbutton selected when required for use.

The aspect ratio can also be remotely controlled either via an RS-422 port, RollCall or from contact closures via a General Purpose Interface (GPI).

The ARC 150/125's are designed to fit in Continuity Suites, Studio's, Outside Broadcast Vans, etc. It facilitates the production of master tapes for broadcast using PAL+, D2MAC and digital transmissions. They also facilitate postproduction and presentation of tapes mastered in 16:9 format through the current 4:3 format transmission system.

The ARC 150/125's are compact 1RU high units for location on the desktop or in a 19-in. rack. They will operate in 525 and 625 line systems. They are available with full front panel controls, or with internal switch controls and a blank front panel.

Vertical interval information is passed without conversion; as an option, ARC150 will pass embedded audio with corrected delay. (Rate converting audio)

Specifications

Features

Signal Inputs

Serial Digital	1 Serial D1 525 or 625 via BNC loop-through connectors
Analog Reference*	1 via BNC loop-through connectors
Remote Control	9 way D-Type
GPI	1 (4 input type) or 2 (8 input type) via 9 way D-Type
Network Control	RollCall via BNC connector

Signal Outputs

Serial	2 sets of Serial Digital D1 via BNC connectors
Delay	1 Output via BNC connector
GPI	25 way D-Type (8 I/O type only)

Control Functions

Blanking:	Controls blanking on both input and output
Display	Position, Size and Aspect Ratio
Genlock	Source and Timing
Enhanced Line 23 Setup	Input/Output Setup
Video Index	Input/Output Setup
Memory	Stores settings in memory and allows recall of memorised settings
VITS	VITS blanking
Setup	Audio, Clipping, Freeze, Gamut Limiting, GPI, GPI Program, Input Loss, Input Standard (625, 525), Process, Test Pattern, Field Pairing Mode, Reference* and line 21 video (525 line systems).
Bypass	Non-interpolated output
User	User display memories
Output Aspect Ratio	Letterbox: 16:9, 1.85:1, 1.66:1, 14:9. Full Screen: 16:9, 1.85:1, 1.66:1, 16:9 Anamorphic: 4:3 Curtains, 14:9 Curtains, 4:3 Full Width, 16:9 Full Width

Specifications

Input Standard	525/625 line
Serial Input Return Loss	better than 15 dB to 270 MHz
Serial Output Return Loss	better than 15 dB to 270 MHz
Reference Inputs*	Black Burst or Video + Syncs (Any color burst is ignored)
Reference Input Return Loss*	better than 35 dB to 5.8 MHz
Reference Line Standard*	525/625 Line

Features

Composite or Black Burst Reference Level*	Standard level ± 6 dB (burst not processed)
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Power

Input Voltage Range **90 V to 260 V 45/90 Hz**

Consumption 75 W maximum

Mains Fuse Rating 2.5 AT

Mechanical

Temperature Range 0 to 40° C operating

Case Type 1U Rack Mounting

Dimensions 483 x 530 x 44 mm (w x d x h)

Weight 7 kg

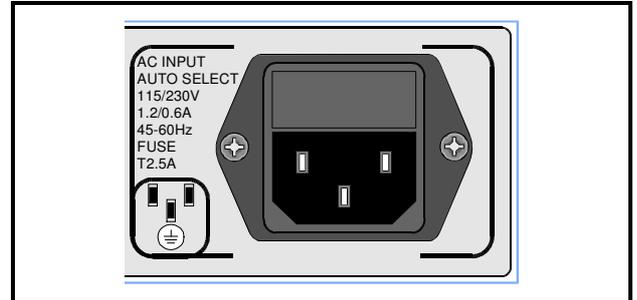
Installation

POWER CONNECTIONS

Power Supply

Mains power is supplied to the unit via a filtered IEC connector with integral fuse holder. The fuse rating is 2.5 A (T).

The unit automatically senses the supply voltage in the ranges 90V-132V and 176V-264V and sets itself up accordingly. No voltage adjustment procedure is required.



ENVIRONMENT

The unit is ruggedly constructed to meet the normal environmental requirements. It is important that there is a free flow of air at both sides of the unit to dissipate the heat produced during operation. Installations should be designed to allow for this.

If the unit is to be rack mounted, first open the front panel by lifting up the the two levers at right and left of the panel, hinge the panel down and

pull it forward. The fixing “ears” behind the panel will be revealed and the unit can be mounted in the rack. Refit or close the front panel by pushing it back into position (the levers will click into place).

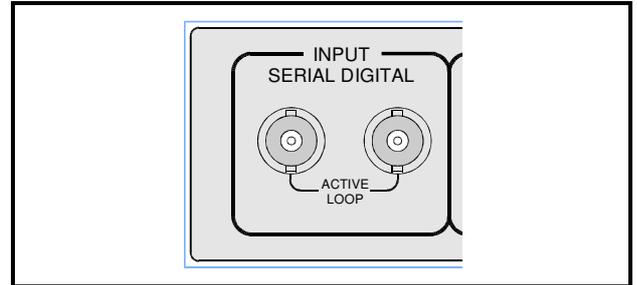
The rear of the base includes additional fixing holes on either side to allow a rear support to be added.

Installation

REAR PANEL CONNECTIONS

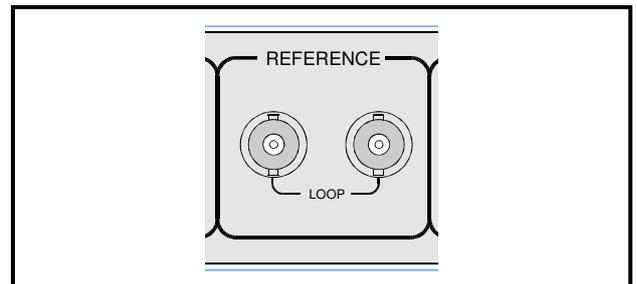
Digital Input

A BNC connector is provided for the serial digital input, with an active loop-through BNC connector also fitted.



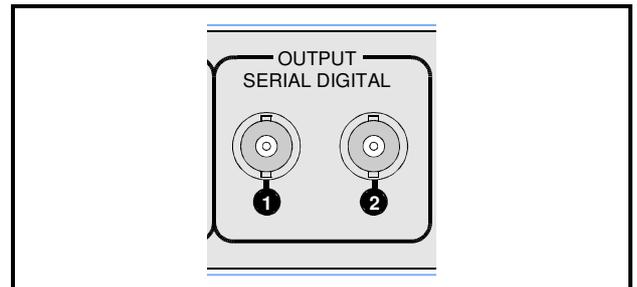
Reference Input (Genlock) ARC150 Only

A pair of loop-through BNCs are provided for the analogue reference.



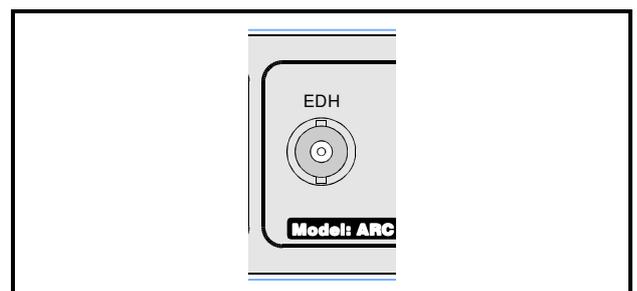
Digital Output

Two BNC connectors are provided for the serial digital outputs.



EDH

This connector has no function; connections should not be made to this connector.



Installation

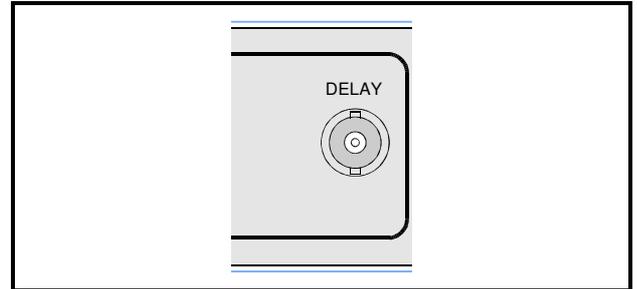
Delay Output

Because the ARC150/125 contains a synchroniser, the through delay depends upon the timing relationship between the input video, any external reference and, the setting of vertical genlock timing.

If the input and output video are co-timed, then the delay through the ARC150/125 is four fields (80 ms for 625 line systems and 66.7 ms for 525 line systems). If the input and output video are not co-timed then the range of delay through the ARC is 3.5 to 4.5 fields.

The delay pulse output from the ARC150/125 accurately represents the delay through the unit. The pulse is high for a period equal to the delay through the ARC. It can be connected to a Snell and Wilcox audio delay module to automatically set a compensating audio delay.

If the AR150/125 is put into Bypass mode or, field pairing mode, then the nominal delay remains at four fields. However because the unit acts as a frame synchroniser in these modes, the delay range of the unit is now increased to between 3 and 5 fields.



Installation

Remote Control

The unit can be controlled from the special remote panel option via an RS-422-A D-type connector (see Table - *RS-422-A Remote Connections*)

If a remote panel is connected to the RS-422-A port, set the "Front Panel/Remote Comms/Auxiliary switch on the ARCOPI2A card to "FRP & REM" (centre), see Fig. 3.1

The front panel can be disabled by setting the switch to REM (right hand position) see Fig. 3.1

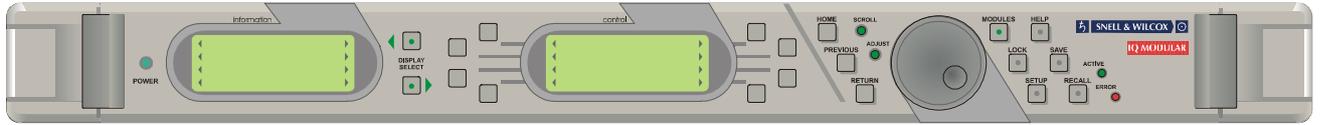
RS-422-A Remote (Master) Connections

Pin	Function	Direction
1	Ground	
2	Transmit -	ARC → Remote
3	Receive +	ARC ← Remote
4	Rec Sig Common	
5	Spare	
6	Trans Sig Common	
7	Transmit +	ARC → Remote
8	Receive -	ARC ← Remote
9	Ground	

The Baud Rate is 38.4Kbs, half duplex. Format is 1 start bit, 7 data bits, 1 parity bit, 1 stop bit.

Installation

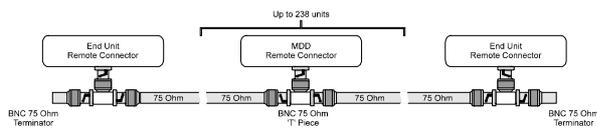
OPERATION FROM A KUDOS ACTIVE FRONT PANEL FITTED TO A SHOEBOX



OPERATIONAL OVERVIEW

The ARC150/125 has provision to be remotely controlled via two different interfaces, either S&W RollCall, or RS422.

Interface to the "RollCall" communications network is via the single BNC connector. Connections should be made by means of a 'T' piece ($Z_0=75$ Ohms) to a 75 Ohm cable system as shown below. It should be noted that both extremities of the cable system must be terminated in 75 Ohms and the maximum number of units limited to 240 on one single cable run.



The communications network is a specially designed remote control network system and many more units can be accommodated by using a "Network Bridge". Remote control can come from either a dedicated front panel or "shoe-box" or a standard IBM compatible PC. Full protocol documentation and more detailed information is available on request from the supplier.

The RS 422 remote control interface is via the 9-pin female 'D' connector. Protocol information is also available on request from the supplier.

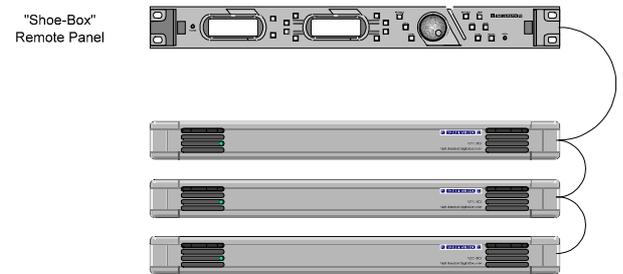
For more detailed information about the operation of the remote panel or PC software please consult their relevant manuals. e.g. Shoebox operator's manual.

For specific information about the RollCall menu system for the ARC150/125 see Section 4, Operation, **RollCall Menu System** on page 4.36

BASIC ROLLCALL OPERATION

All the features from the menu system are available remotely with the same options structure. This maintains compatibility and facilitates easy operation for users familiar with the unit.

The most common remote configuration is shown below where many units are connected to the network for remote control by one remote panel or "shoe-box".



Typical Set-up

The network address for the ARC is set using the switches SW3 and SW4 on the Output Interface card. See fig 3.1 on page 3.8.

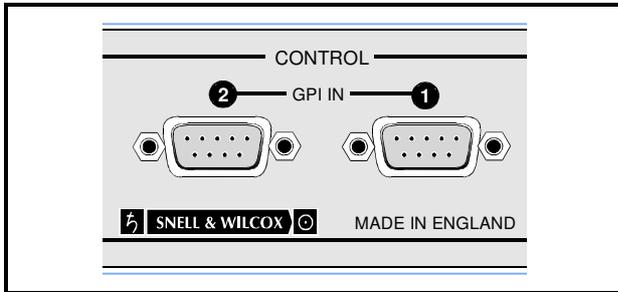
Parameter changes are reflected both locally and remotely. For example, if the output is changed to the colour bars test pattern by a remote unit then any further access from the card edge to the PATTERN TYPE option will indicate this change. Similarly, if the card edge changes a parameter then this will be reflected on the display panel of the remote unit.

Installation

GPI

GPI functions are implemented as follows:

GPI Inputs



These are accessed via two 9-way D type connectors labelled 1 and 2. Each connector has 4 inputs and connections are as below.
Note that units fitted with a single GPI input connector will have only 4 GPI inputs and connections will be as GPI Input 1.

GPI = GPI input

GPI input 1

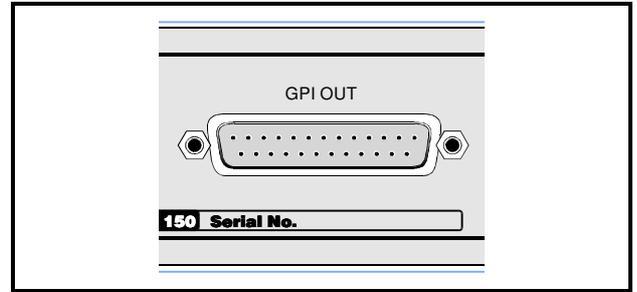
Pin 2	GPI 0 signal
Pin 6	GPI 0 return
Pin 3	GPI 1 signal
Pin 7	GPI 1 return
Pin 4	GPI 2 signal
Pin 8	GPI 2 return
Pin 5	GPI 3 signal
Pin 9	GPI 3 return
Pin 1	safety ground.

GPI input 2

Pin 2	GPI 4 signal
Pin 6	GPI 4 return
Pin 3	GPI 5 signal
Pin 7	GPI 5 return
Pin 4	GPI 6 signal
Pin 8	GPI 6 return
Pin 5	GPI 7 signal
Pin 9	GPI 7 return
Pin 1	ground.

GPI Outputs

Note that on units with only 4 GPI inputs this connector and output function will not be available.



These are accessed via a 25-way D type connector and connections are as follows:

GPO = GPI output

Pin 2	GPO 0 signal
Pin 14	GPO 0 return
Pin 3	GPO 1 signal
Pin 15	GPO 1 return
Pin 4	GPO 2 signal
Pin 16	GPO 2 return
Pin 5	GPO 3 signal
Pin 17	GPO 3 return
Pin 6	GPO 4 signal
Pin 18	GPO 4 return
Pin 7	GPO 5 signal
Pin 19	GPO 5 return
Pin 8	GPO 6 signal
Pin 20	GPO 6 return
Pin 9	GPO 7 signal
Pin 21	GPO 7 return
Pins 1,10,11,12,13,22,23,24,25 ground	

The GPO output characteristics are as follows:

Operating Voltage Range	0 to ±60 V (DC/AC peak)
Maximum Load current	1.0 A (AC/DC)
Maximum On-State Resistance @ Tamb = +25 °C	500 mOhm
Minimum Off-State Resistance @ Tamb = +25 °C, V = ±48V	100 MOhm

Installation

GPI Overview

The GPO (if available) provides contact closure tally outputs that can be used to turn on lamps etc. GPO 0 tracks GPI 0 so if the display memory that GPI 0 recalls is active then GPO 0 will close. Similarly, GPO 1 tracks GPI 1 etc.

This functions even if the GPI inputs have been assigned different recall memories and if the memory was recalled via a front panel button rather than via the GPI.

So, if GPI 3 recalls AUTO, then whenever AUTO is selected GPO 3 will be closed.

In GPI binary mode, the four LSB's (GPO 0 to GPO 3) GPI contacts indicate the binary GPI memory in use. The four MSB's (GPO 4 to GPO 7) contacts are closed if a GPI binary memory is being used; otherwise they are open.

If a non-binary GPI memory is being used all 8 contacts will be open.

GPI interface Delay

The GPI interface on the ARC150/125 has a delay that matches the video processing delay through the ARC.

This means that if a given input-video field is desired to produce the first output-field built with a new aspect ratio conversion; the GPI contacts that recall that new aspect ratio conversion should be closed during the field when that video field is present at the ARC150/125 input.

Ideally, the contact should be closed a few lines after the vertical sync group of the reference video, and, should remain closed for at least one field period.

GPO WSS Mode

Version A36 of the ARC software introduced a new GPO mode. In this GPO WSS mode, the GPO output contacts change to reflect the incoming widescreen signaling (WSS) if the ARC is in a mode where the incoming WSS controls the aspect ratio conversion. If the ARC is not in an automatic aspect ratio control mode then the GPOs change to reflect the most recently recalled ARC memory. The value that the GPO contacts assume upon recall of any memory is programmable. This mode allows the ARC to control other equipment whose behavior is determined by the incoming WSS.

In GPO WSS mode, the delay from the WSS change to the GPO contact change is one field rather than the four field delay normally expected on the GPO contacts.

GPO contacts 0 to 3 output the incoming WSS thus providing up to 16 different combinations. GPO contact 4 also indicates the presence or absence of widescreen signaling when the ARC is in an automatic conversion mode.

Installation

Included with ARC150/125 software version A282 are 2 floppy disks containing software for up and down loading ARC configurations to a PC.

ARC Configuration Loader Program

The downloading and uploading of ARC configuration files is made possible by the Windows program 'ARC Configuration Loader'. Data contained in existing ARC configuration files (held on the PC) may be downloaded to the ARC or, ARC hardware configurations may be uploaded to the PC. The configuration files held on the PC are in a simple ASCII text format. The configuration files contain all parameters held in the ARC. This includes all display memories of all types that the user can program. This allows the user to configure an ARC once and then, send that same configuration to multiple units. Also, if the ARC software is upgraded, the user can store the ARC configuration before the upgrade and then download it afterwards so that the configuration does not have to be re-done.

The ARC Loader program uses the ARC RollCall network BNC connection. Thus, the user must have a means of connecting to the ARC RollCall BNC before the program can be used. Therefore a RollCall 'Shoebox' or a PC equipped with the high speed RollCall network card must be available.

The ARC loader program is designed to work with ARC software version A28 and onwards. Note that software versions A24 and onwards allow the user to upload the configuration data from the ARC to the PC but, the download operation can fail. This will allow users of software versions A24 to A27 to capture their ARC configurations before upgrading to A28.

ARC Configuration Loader Installation

The distribution of the ARC Configuration Loader includes a **setup.exe** program file. This file is kept on the floppy disk labelled **DISK1**. Running the ARC Configuration Loader **setup.exe**, either by mouse click from within Windows Explorer, or from the Windows Start\Run menu, will commence the setup sequence. **SETUP SHOULD ONLY BE RUN LOCALLY TO THE TARGET HOST MACHINE**, this may be achieved either by installing locally from floppy disk or, by copying the installation files to a local, temporary directory and running setup from there. The ARC Configuration Loader requires the RollCall server program RollOLE to be pre-installed. The ARC Configuration Loader setup program searches for a registered installation of RollOLE prior to commencing its own installation sequence. If the RollOLE executable is found and validated then ARC Configuration Loader will install. Conversely, if setup is unable to find or validate RollOLE.exe it will inform the operator of the requirement to install, or re-install, RollOLE and then setup will exit. The installation of RollOLE should then be carried out before re-attempting to run the ARC Configuration Loader setup program.

A compatibility issue has arisen in that RollOLE makes use of Windows Dynamic Link Library (.dll) files, the current RollOLE is compatible with the Library files required to run Internet Explorer (IE) 4.0 or later. Earlier versions of RollOLE will not run correctly on systems that have installed on them IE4.0, conversely, the current version of RollOLE cannot run using the .dll files found on a system using IE3.x or earlier. The setup program will therefore detect the absence of IE, or if present the version of IE, and may accordingly give the operator the option to continue to load the ARC Configuration Loader, or exit if a configuration not suited to RollOLE is detected. This is only an issue for systems running Win95, as Win98 and WinNT4.0 implicitly use IE4.0 or later.

Installation

ARC Configuration Loader Operation

The ARC Configuration Loader program can be run by double clicking on it from Explorer or via the START menu. When the program is run the User needs to set two parameters and then up and downloading may begin.

1. Configuration File Name

This is the name of the file on the PC that the user wishes to access. If an Upload is undertaken then the data from the ARC will be stored in this file. If a Download is undertaken then data from this file will be sent to the ARC. A valid filename must be chosen before an Upload or Download can be undertaken. Note, the file extension must be .TXT. The filename can be typed in or, the Browse button may be used to navigate to the desired file.

2. ARC Address

This allows the user to select which ARC on the RollCall network the program will connect to. The user must select an ARC before an Upload or Download can be undertaken. The find module button should be clicked to navigate to the desired unit.

3. Download

Clicking this button will send a configuration file from the PC to the chosen ARC.

4. Upload

Clicking this button will send configuration data from the ARC to the selected PC file.

Program Menu Selections

The following Menu selections are available to operators of the ARC Configuration Loader:

1. File: Exit

Ends the ARC Configuration Loader Program.

2. Help: About

Provides Information about the ARC Configuration Loader including version data

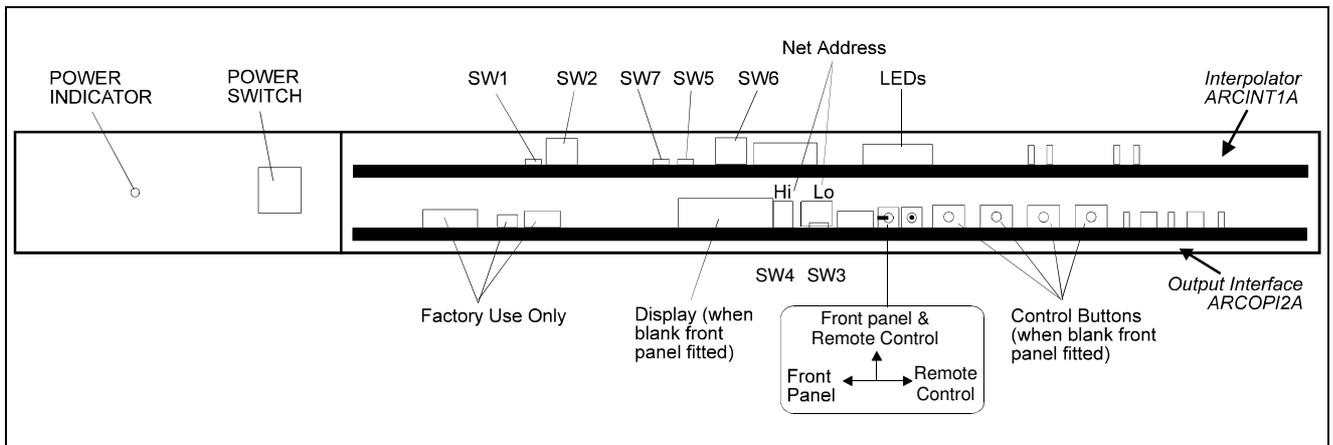
Installation

SWITCHING ON

Check that power is connected to the unit and is switched on. Open the front panel by pushing up the levers at the ends of the panel, and hinging the panel down and sliding partly out.

Set the switch on the Power Unit (see fig. 3.1) to on. Check that the indicator lamp illuminates green and the alpha-numeric display is active.

Fig. 3.1 PCB Locations ARC 150/125



FAN FAIL WARNING

If when the power is turned ON the power indicator is RED and the card edge alpha-numeric display on the active front panel displays **FAN FAIL** message, the unit should be turned OFF as this indicates a failure of the cooling fan which is located behind the power switch panel.

INTRODUCTION

There are two versions of the ARC 150/125, one with blank panel and switch controls on the front of a PCB, and the other with a full set of front panel controls. Because the use of the controls is so different, two completely separate sets of instructions are provided.

SWITCH CONTROLS (Blank Front Panel)

To gain access to the controls, open the front panel by lifting up the levers at right and left of the panel, hinge the panel down and pull it forward.

To provide a full range of functions with just 4 buttons and an 8-digit display, a menu system is used.

During normal operation, the display slowly cycles through the status of current operation (Home Display). Typically these will be the line standard, the aspect ratio, genlock status and pattern generated if on.

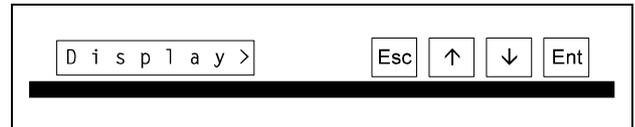
The ENT (Enter) key interrupts the Home Display and allows you to enter the menu structure. It is also used to display a selected option. The ↑ and ↓ keys enable you to scroll up and down through the menu. The ESC (Escape) key returns you to the previous menu level.

A ">" at the right of an option on display indicates that selecting the option (pressing ENT) will lead to another menu level without changing a system setting. If there is not a ">" at the right, pressing ENT will change the indicated system setting.

If the menu being displayed allows you to pick one of a number of options, the currently selected option is indicated by an "*" (asterisk) at the left.

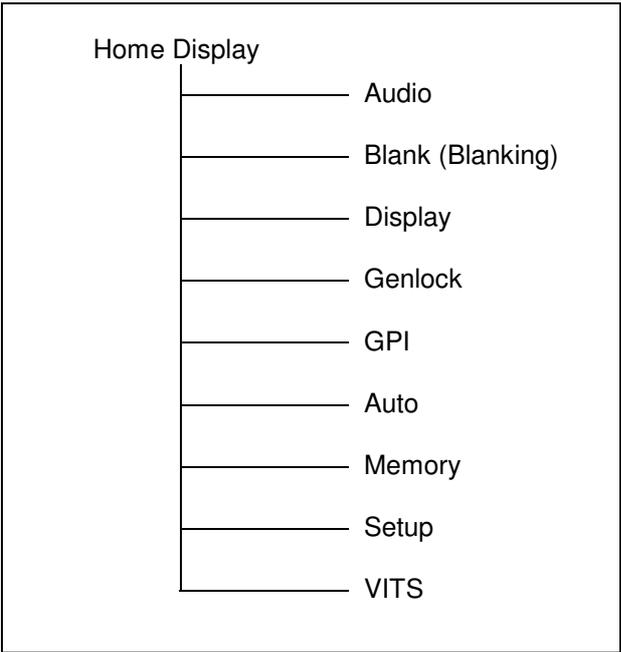
Pressing ↑ and ↓ simultaneously returns a parameter to its preset value.

Pressing ENT and ESC simultaneously will return you to the Home Display.



TOP MENU

Each of the items on the menu is described separately.



AUDIO

This allows the status of the audio channels to be set up.

Use the I/P Group item to set the input group to 1, 3, or 4.

Use the O/P Group item to select the output group to 1, 2, 3, or 4.

The embedded audio output may be set to Off (no audio data), On (audio data from selected input group), Mute (silence) or Test Tone.

The ARC125 does not include a synchroniser and cannot lock to an external reference. It will always lock to the input signal and therefore the input and output clocks will be locked together allowing correct passing of embedded audio.

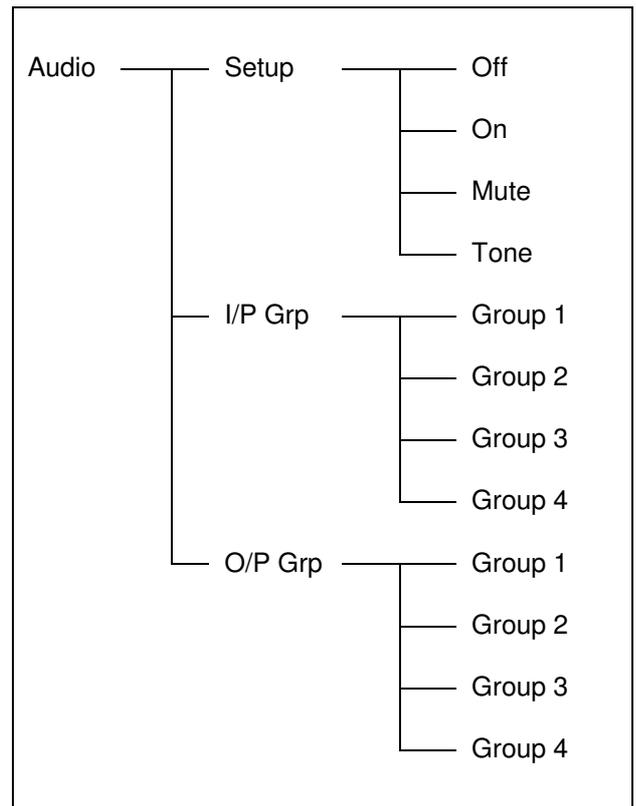
An audio buffer compensates for the video delay.

The ARC150 has the advantage of a built-in synchroniser that, in addition to the input signal locking mode, may be genlocked to an external reference signal or allowed to free-run.

Under these circumstances the input and output clocks may not be locked and to prevent audio disturbances, this audio function is not available in any locking mode.

The **Re-Sampling Audio Option** for the ARC150 allows transparent audio passing in all locking modes by use of polyphase sample rate converters to enable reinsertion into the SDI signal of the delayed audio, even when input and output clocks are not locked.

When the synchroniser drops or repeats a frame, the rate converters' input and output rates are varied accordingly in order to smoothly track the audio delay to the video delay. Once the audio and the video delays are matched the sample rate converters resume normal operation.



BLANKING

From the Home Screen, press ENT and scroll to Blank. Press ENT and scroll between Input and Output. Press ENT on the selected function.

Selecting **Input** allows you to adjust the input blanking. Input blanking is used where the source video applied is known to have pixels/lines at the edge of the picture that you do not want to display. The ARC 150/125 will then blank any output data which has been generated by that input data, regardless of the display control settings.

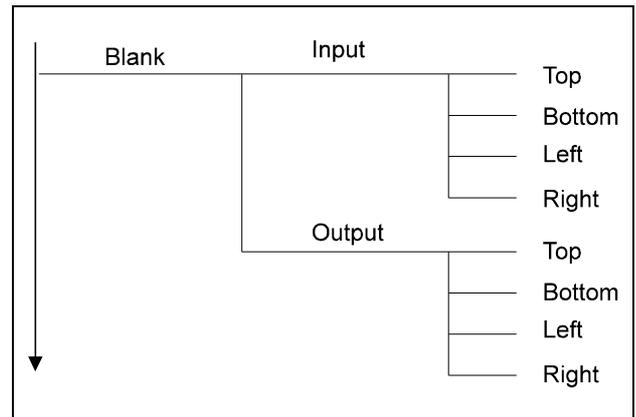
Selecting **Output** is used where you do not want the output to be active on more than a certain range of output lines. For example you can impose an artificial letterbox by bringing the top output blanking down the screen and the bottom output blanking up the screen.

Top: Adjusts the top line of blanking. 0 equals no blanking on any output lines that would normally be visible, 1 equals blank the first active line, etc.

Bottom: Adjusts the bottom line of blanking. 576 (PAL) or 486 (NTSC) equals no blanking on any output lines that would normally be visible. 575 (PAL) or 485 (NTSC) equals blank the last active line, etc.

Left: Adjusts the left-hand edge of blanking. 0 equals no blanking on any output pixels that would normally be visible. 1 equals blank the first active pixel.

Right: Adjusts the right-hand edge of blanking. 720 equals no blanking of any output pixels that would normally be visible. 719 equals blank the last active pixel.



DISPLAY

From the Home Screen, press ENT and scroll to Display. Press ENT and scroll between Preset and Adjust. Press ENT on the selected function.

Preset allows selection of one of the preset aspect ratio conversions. **Adjust** allows you to create your own aspect ratio conversion.

Auto: Line 23 signalling or video index (PAL only) is used to control the aspect ratio conversion.

4:3>4:3: No aspect ratio conversion.

1.77F>FH: 16:9 anamorphic to full height conversion (left and right-hand edges of input video lost).

1.85L>FH: 1.85:1 letterbox input to full height conversion (left and right-hand edges of input video lost).

1.66L>FH: 15:9 letterbox to full height conversion (left and right-hand edges of input video lost).

1.55L>FH: 14:9 letterbox to full height conversion (left and right-hand edges of input video lost).

1.77F>LB: 16:9 anamorphic to letterbox conversion.

1.85F>LB: 1.85:1 anamorphic to letterbox conversion.

1.66F>LB: 15:9 anamorphic to letterbox conversion.

1.77>1.55: 16:9 anamorphic to 14:9 letterbox conversion.

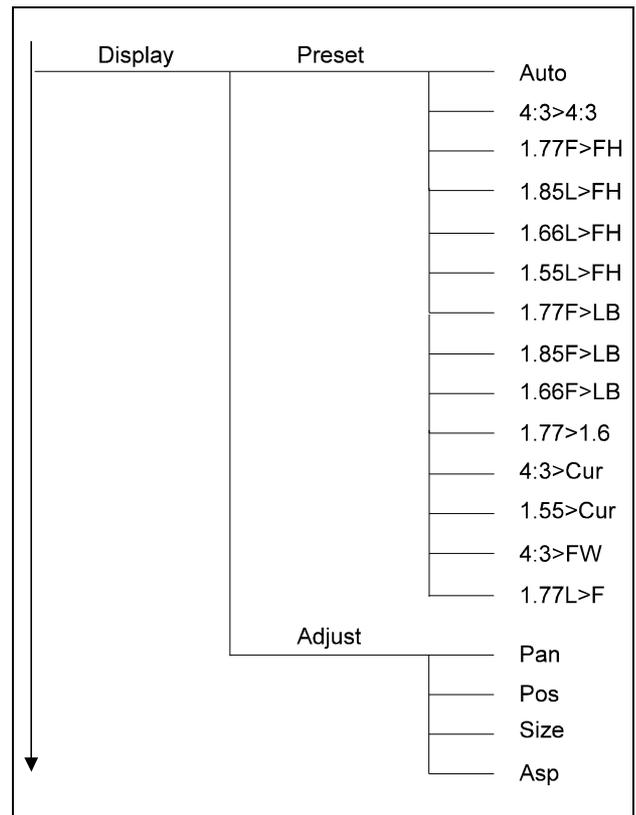
4:3>Cur: 4:3 to 16:9 curtains, i.e. horizontal crush with black bars to left and right of output.

1.55>Cur: 14:9 to curtains, i.e. horizontal crush with black bars to left and right of output.

4:3>FW: 4:3 to 16:9 full width conversion, i.e. top and bottom of picture lost at the output.

1.77L>F: 16:9 letterbox to 16:9 anamorphic conversion.

See next page for descriptions of the nomenclature used for the above aspect ratio conversions.

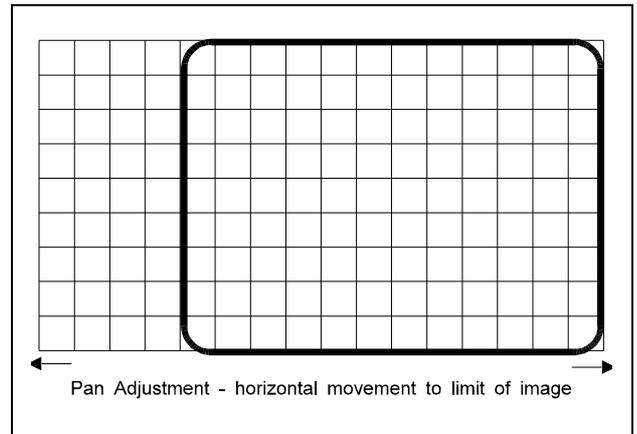


CONVERSION DESCRIPTION NOMENCLATURE				
Front panel* Designation	BBC Notation*	Full Description	Aspect Value	Size Value
1.77F>FH	16F16 > 12F12	16:9 Anamorphic picture to full height 4:3 picture for presentation on a 4:3 screen (left hand and right hand edges of original 16:9 image are cropped)	1.333	1.000
1.85L>FH		1.85:1 Letterbox picture to full height 4:3 picture with left hand and right hand edges of original 1.85:1 image cropped	1.000	1.388
1.66L>FH	15L12 > 12F12	15:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 15:9 image cropped	1.000	1.250
1.55L>FH	14L12 > 12F12	14:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 14:9 image cropped	1.000	1.167
1.77F>LB	16F16 > 16L12	16:9 Anamorphic picture converted to 16:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.333	0.750
1.85F>LB		1.85:1 Anamorphic picture converted to 1.85:1 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.388	0.721
1.66F>LB	15F15 > 15L12	15:9 Anamorphic picture converted to 15:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.250	0.800
1.77F>1.55L	16F16 > 14L12	16:9 Anamorphic picture converted to 14:9 letterbox picture for presentation on a 4:3 screen (black bars above and below image and right hand and left hand edges of picture slightly cropped)	1.333	0.857
4:3>Cur	12F12 > 12P16	4:3 image converted to 4:3 pillarbox/curtains image in 16:9 anamorphic. (4:3 horizontally squeezed image with black bars to left and right of output)	0.750	1.000
1.55>Cur	14L12 > 14P16	14:9 letterbox picture in 4:3 converted to 14:9 pillar-box/curtains image in 16:9 anamorphic (14:9 horizontally squeezed image with 1:9 black bars to left and right of output)	0.750	1.167
4:3>FW		4:3 image anamorphically squeezed and scaled up to fill full 16:9 width. Top and bottom of original 4:3 image cropped at output	0.750	1.333
1.77L>1.77F	16L12 > 16F16	16:9 letterbox in 4:3 converted to 16:9 anamorphic full height image	0.750	1.333

*** For a detailed explanation of these code specifications please refer to Section 6 "Aspect Ratio Technical Codes for Video and Picture Sources"**

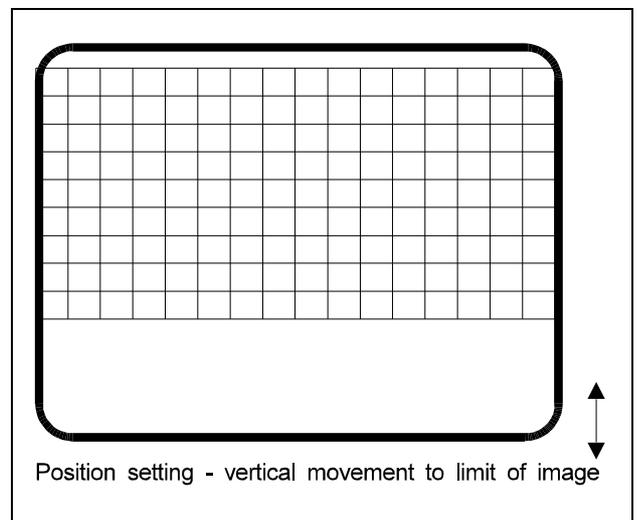
Pan: adjusts the horizontal position of the output.

*Note that this option does not appear if V only processing is selected.
(see set-up menu page 4.11)*



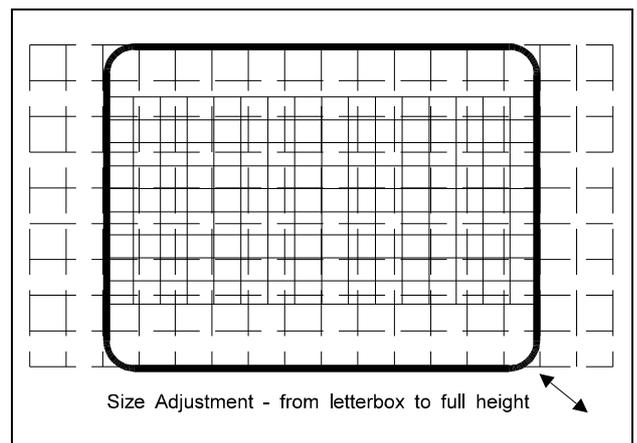
Pos: adjusts the vertical position of the output.

*Note that this option does not appear if H only processing is selected.
(see set-up menu page 4.11)*



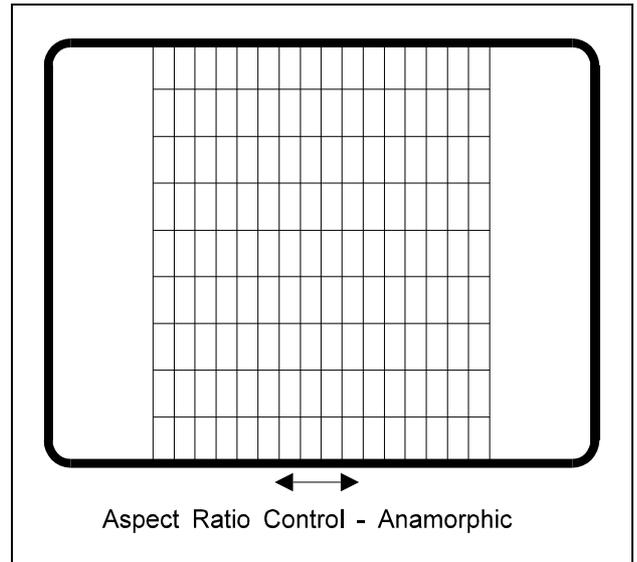
Size: Adjusts the horizontal and vertical size simultaneously while maintaining the aspect ratio. The product of SIZ and ASP is limited to the range 0.50 to 2.00, and SIZ is limited to the range 0.50 to 2.00.

*Note that this option does not appear if H only processing is selected.
(see set-up menu page 4.11)*



Asp: Adjusts the horizontal size of the output, so changing the aspect ratio. The product of SIZ and ASP is limited to the range 0.50 to 2.00, and ASP is limited to the range 0.25 to 2.00.

*Note that this option does not appear if V only processing is selected.
(see set-up menu page 4.11)*



GENLOCK

Selects adjustment of the Genlock parameters.

From the Home Screen, press ENT and scroll to Genlock. Press ENT and scroll between Source, H Time and V Time. Press ENT on the selected function.

Source selects the source of the genlock reference.

Note that the ARC125 will always lock to the incoming video.

Auto: (ARC 150 only) The ARC 150 will lock to an external analogue reference, if one is present and correct, otherwise it will lock to the input video.

Ext Ref: (ARC 150 only) Forces the ARC 150 to lock to an external reference.

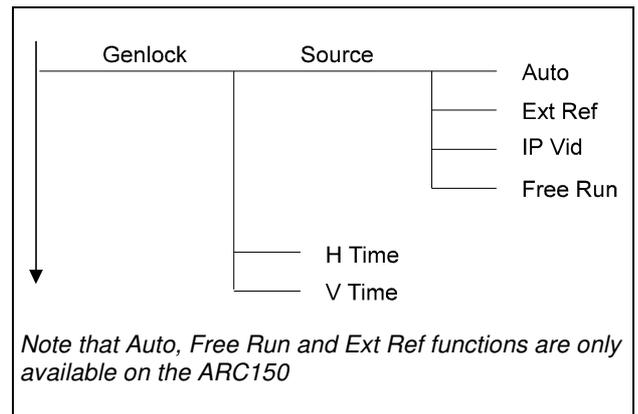
IP Vid: (ARC 150 only) Forces the ARC to lock to the input video.

Free Run: (ARC 150 only) Turns off the Genlock function.

Note that as the ARC150 has the advantage of a built-in synchroniser the embedded audio passing function is not available unless the Re-sampling audio option is fitted. Transparent audio handling is then possible under all locking conditions.

H Time allows you to adjust the horizontal Genlock timing with respect to the reference, in pixels.

V Time allows you to adjust the vertical Genlock timing with respect to the reference, in lines.



GPI

This allows you to select GPI inputs On, Off, On+Auto and Binary.

Off

The GPI function is inactive.

On

The GPI function is active. (One contact closure per memory recall)

On+Auto

The GPI function is active. (One contact closure per memory and all four contact closures turns on Auto mode)

Note In order that the GPI contacts may be released without the unit reverting to another GPI memory recall, it is necessary that all four GPI contacts are open for at least one field after Auto has been selected using the GPI. Operation of the GPI is suspended until this condition has been met.

Binary

When the GPI input is put into binary mode the four GPI inputs are treated as one four bit number. This means that there are sixteen possible GPI input states. Each of the GPI input-states recalls a special GPI memory. These memories store the same parameters as the User Display memories and the Auto (video index / line 23) memories. Thus one should set up the machine as required (size, asp, pan, pos, bypass and output aspect ratio signaling parameters) then, one can program the required GPI memory. When that particular GPI state is present the appropriate memory is recalled.

This is useful as the GPI port can be used to emulate the four video index signaling bits if they are not present on the input signal.

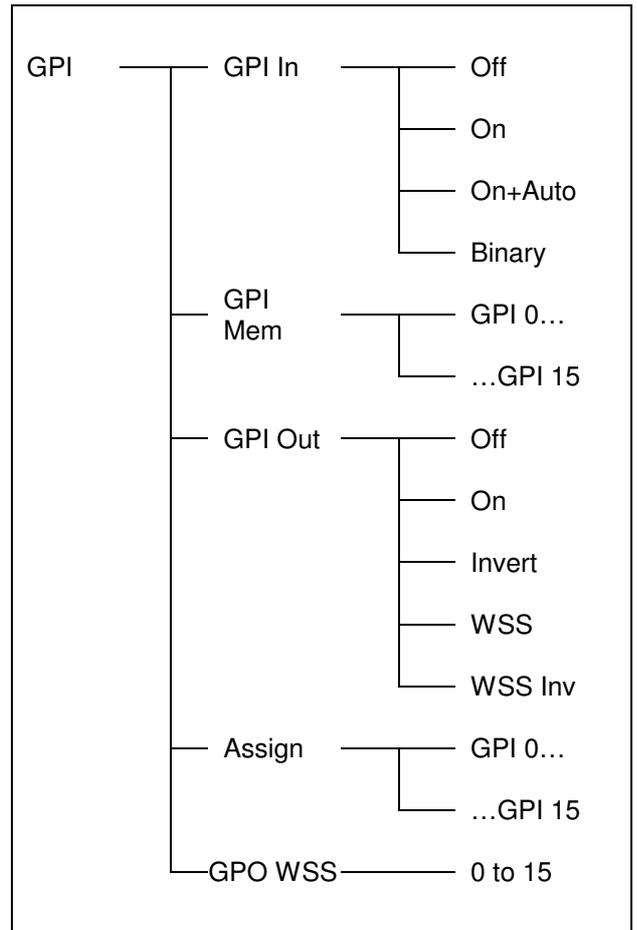
GPI Mem

This lets you program the binary GPI memories. If you select this, the display shows:

GPI 0

Pressing the arrow keys cycles through GPI 1 , GPI 2.....GPI 15.

You can then store the GPI memory settings for the indicated binary GPI memory.



Using the cardedge and active front panel menus an extra item will appear when an 8-way GPI board is detected.

This is GPI Out. This allows the GPO to be turned OFF, (all contacts open), turn it ON (default setting) or turn it ON but work inverted (i.e. contact open to indicate active memory).

Version A36 of the ARC software has two new menu items, these are WSS and WSS Invert. In these modes the GPI outputs 0 to 3 change their state to reflect the current value of either the input video widescreen signalling or the last recalled memory if input widescreen signalling is not being used. The value that the four GPI output contacts output for any given input WSS or memory recall is programmable (see the GPO WSS Section below). Using this mode allows the ARC to automatically control other pieces of equipment based on the conversion it is doing. In addition, if the ARC is reading incoming WSS to control the aspect ratio conversion then output GPI contact four indicates whether the WSS is present or absent. In WSS mode the contacts are active closed whereas in WSS Invert mode the contacts are active open. The GPI output contacts normally change one field after a change in the input WSS.

GPO WSS

This menu sets the value of the GPO output port when the GPO output is set to GPO WSS or GPO WSS Invert mode. The value is recorded in a memory, for either an incoming WSS signal or a User memory or a GPI binary memory when the save memory function is undertaken. Once the memory has been stored this GPO value will be set whenever that memory is recalled.

Note, the if the GPO is in WSS mode the output contacts will also change when preset display memories are selected. Please note that the GPO WSS values for the preset display memories are NOT programmable.

AUTO

This allows the user to control the action of the ARC 150/125 in the presence of an incoming Line 23 aspect ratio or video index signal. From the Home Screen, press ENT and scroll to Auto.

Input

This function allows the following selections to be made to the input setup:

Source

This allows the source of automatic aspect ratio control to be selected from the following:

- L23 ETSI
- L23 AFD
- Video Ind

L23 Blk

This sets the blanking action applied to line 23. There are three options.

Auto The machine will either automatically provide the appropriate output signalling blanking using the input signalling

Not Blk The input signalling will not be blanked

.5 Line The first half line of the line 23 signalling will be blanked

L23 WFM

This gives you a choice of Normal or Non-Std.

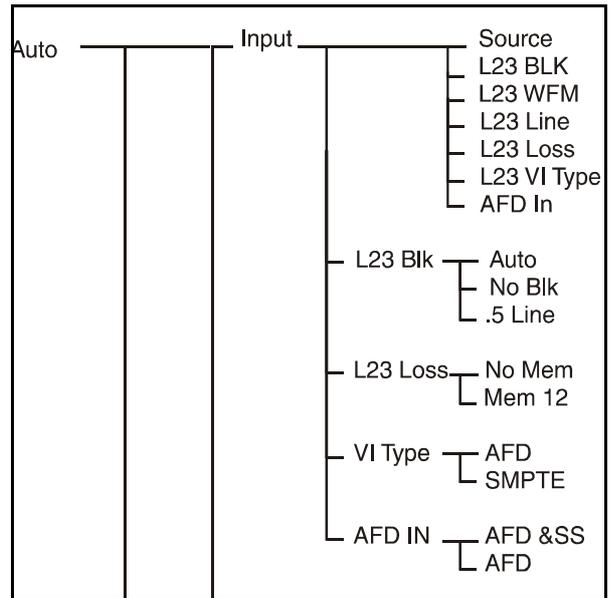
Normal should be selected for all legal incoming line 23 signals.

Non-Std should be selected for incoming line 23 sources where there is no blanking period between the line 23 signalling and the following video.

L23 Line

This controls which input video line the incoming line 23 style widescreen signalling will appear. This is useful when equipment up-stream of the ARC strictly enforces blanking of the first half of line 23 but, can pass other vertical interval lines.

Selecting this menu item displays the input line number that can be adjusted in the range 7 to 23. The default value is 23.



L23 Loss

This reveals a menu that gives a choice of No Mem or Mem 12

This controls what happens when the ARC is in auto mode, and the incoming line 23 signal disappears. If No Mem is selected then the ARC stays exactly as it is until a valid line 23 signal reappears. If Mem 12 is selected then the ARC recalls User Display memory 12 when the line 23 input disappears

VI Type

This selects what type of video index signal is being applied to the ARC input. Either AFD Spec or SMPTE (186) may be selected. If SMPTE186 is selected only the bottom 3 bits of the VI data are examined.

AFD IN

This selects the type of AFD information derived from the input.

AFD & SS All AFD and scanning system data

AFD Active region descriptor data only

Output

This function allows the following selections to be made to the output setup:

Mode

This controls the way the output signalling is selected.

Follow The output line 23 and VI data will be determined automatically by the ARC150/125 based on either the preset aspect ratio conversion selected, the user memory in use or, the incoming AUTO aspect ratio control signal.

Forced The ARC150/125 does not use the stored values but uses the values visible on the menus (see below).

Line 23 Set

This is a setup menu for the Line 23 output

Type

This sets the type of output-line 23. Selections are either

ETSI

or

AFD

Output On/Off

This option has a toggle action. It determines whether or not Line 23 signalling will be present on the output of the ARC 150/125.

User Pass

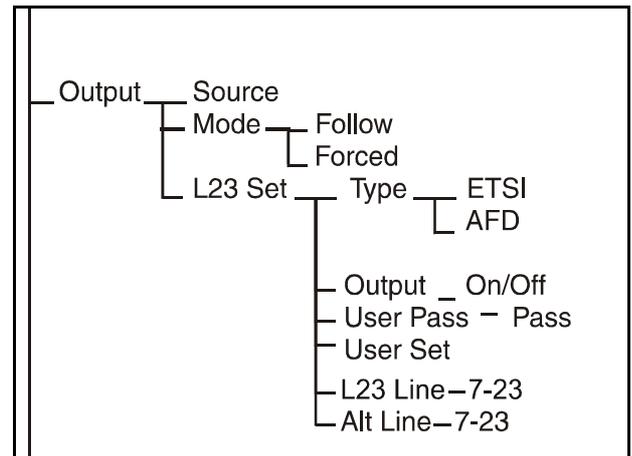
If PASS is selected then the user bits are copied from an incoming enhanced line 23 signal to the output if the enhanced line 23 signal has been selected as the source of automatic aspect ratio control.

User Set

This allows the user to set the four enhanced line 23 output user bits to the value shown.

L23 Line

This controls on which output video line the primary line 23 style widescreen signalling will appear. Selecting this menu item displays the output line number which can be adjusted in the range 7 to 23. The default value is 23.

**Alt Line**

This controls on which output video line the secondary line 23 style widescreen signalling will appear. Selecting this menu item displays the output line number that can be adjusted in the range 7 to 23. The default value is 23.

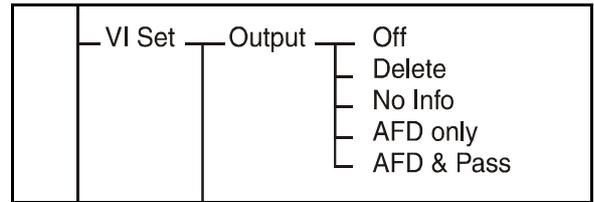
Note, if the primary and secondary line 23 line numbers are set to the same value then only one output line will contain widescreen signalling. If the primary and secondary line 23 line numbers are different then two output lines will contain line 23 signalling.

VI Set

This function sets the state (Output is) and the form of the video index information.

Output

This selects the type of video index information available at the ARC output.



Off	No video index output.
Delete	Set all VI bits to zero including CRCs.
No Info	Set all VI data to zero with valid CRCs.
AFD only	Set all fields to zero except Octet 1 the scanning system field which contains the VI data inserted by the ARC150/125.
AFD & Pass	Insert new Octet 1 values but pass all other VI data from the input video.

Note – if you wish to pass VI data from the input of the ARC150/125 to the output then it is necessary to set the vertical interval lines containing the VI data to be not blanked. Otherwise, the input VI information is lost.

Type

This selects what form of video index output signal is generated. Selections are:

AFD Spec
or
SMPTE 186

L23 Dat

Aspect

If Auto is selected, the ARC 150/125 makes its best estimate of the output format and includes that in the Line 23 output.

The other items are the standard line 23 output options and if one is selected, that will be signalled on the output, regardless of the actual video output.

Enhance

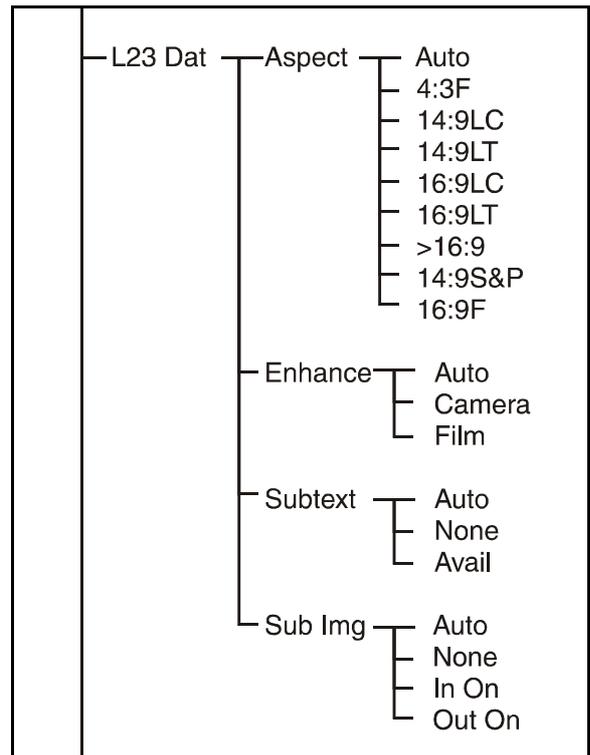
The ARC 150/125 will automatically provide the output signalling from the input signalling if Auto is selected. Alternatively, Camera or Film can be selected to suit the input material source.

SubText

The ARC 150/125 will automatically provide the output signalling from the input signalling if Auto is selected. Alternatively, the subtitle teletext signalling may be set to "None" or "Available", as appropriate.

Sub_Img

The ARC 150/125 will automatically provide the output signalling from the input signalling if Auto is selected. Alternatively, it can be set to "None", Inside Image active or Outside Image active.



AFD Dat**Scan**

This sets the bottom 3 bits of the video index and enhanced line 23 signal to be 4:3 or 16:9 as desired.

Note that this only takes immediate effect if the Mode is set to FORCED.

See Output Setup\Mode above.

AFD

This sets the **AFD** data of **AFD** spec video index and enhanced line 23 outputs.

Selections available are:

Coded

4:3

16:9

14:9

AFD=4

4:3 S&P

16:9 S4:3

16:9 S14

Note that this only takes immediate effect if the Mode is set to FORCED.

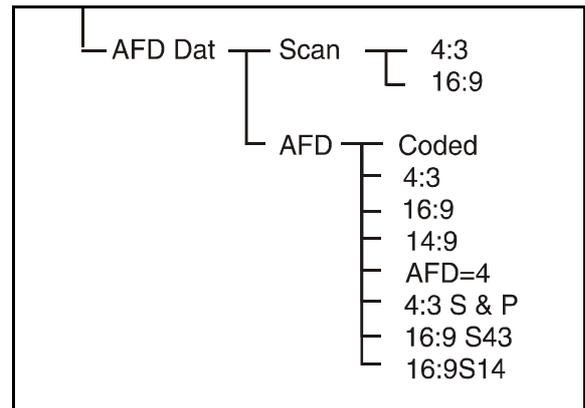
See Output Setup\Mode above.

Note that **AFD** value 4 is specified as reserved but, it is provided here in case it is allocated a meaning at some future time.

GPO WSS

This menu sets the value of the GPO output port when the GPO output is set to GPO WSS or GPO WSS Invert mode. The value is recorded in a memory, for either an incoming WSS signal or a User memory or a GPI binary memory when the save memory function is undertaken. Once the memory has been stored this GPO value will be set whenever that memory is recalled.

Note, the if the GPO is in WSS mode the output contacts will also change when preset display memories are selected. Please note that the GPO WSS values for the preset display memories are NOT programmable.



ETSI PG

This allows the user to program the ARC150/125 action in when it receives the stated incoming line 23 (ETSI) signal.

Select ETSI PG and select from the list the line 23 signal that you want to activate the selected display.

Select Line 23 4:3F
 Select Line 23 14:9LC
 Select Line 23 14:9LT
 Select Line 23 16:9LC
 Select Line 23 16:9LT
 Select Line 23 >16:9L
 Select Line 23 14:9S&P
 Select Line 23 16:9 F

“LT” refers to Letterbox Top and “LC” refers to Letterbox Centre, “S&P” refers to Shoot and Protect and “F” refers to Full Frame.

When the particular line 23 signal is received, the ARC 150/125 will recall the display settings, produce the appropriate output aspect ratio and set the line 23 output and video index signal.

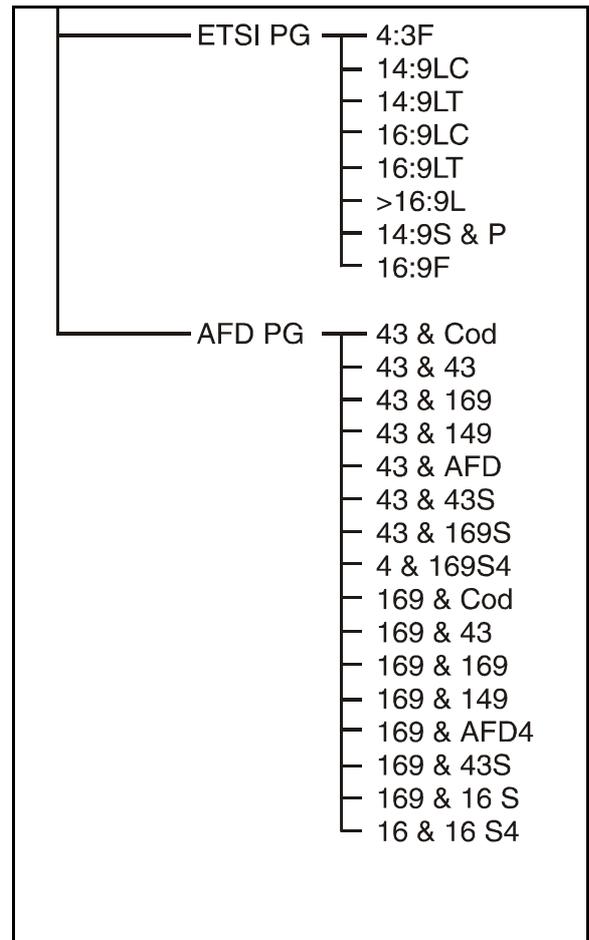
AFD PG

This allows the user to program the ARC150/125 action when it receives the stated incoming video index or enhanced line 23 signal.

Selections available are:

4:3 & Cod
 4:3 & 4:3
 4:3 & 16:9
 4:3 & 14:9
 4:3 & **AFD**
 4:3 & 4:3 S
 4:3 & 16:9 S
 4:3 & 16:9 S4
 16:9 & Cod
 16:9 & 4:3
 16:9 & 16:9
 16:9 & 14:9
 16:9 & ARD4
 16:9 & 4:3 S
 16:9 & 16:9 S
 16:9 & 16:9 S4

When the particular line 23 signal or video index is received, the ARC 150/125 will recall the display settings, produce the appropriate output aspect ratio and set the line 23 output and video index signal.



Note that if the incoming aspect ratio conversion source is set to L23 AFD or L23 ETSI then it will program the line 23 AFD memories.

If the Auto source is set to video index then it will program the video index memories.

MEMORY

This allows you to store or recall display settings in 12 separate memories. From the Home Screen, press ENT and scroll to Memory. Press ENT and scroll between Store and Recall. Press ENT on the selected function.

Store allows you to select the memory store you wish to retain the current settings in. To store, make sure that the display settings are the way you want them to be, scroll to the store number you are going to use and then press ENT. Keep a careful record of the picture the settings are to be used with.

Recall allows you to recall one of the user memories. To recall, refer to your record of the memory stores, scroll to the required user number and then press ENT; the picture format will immediately change according to the stored parameters .

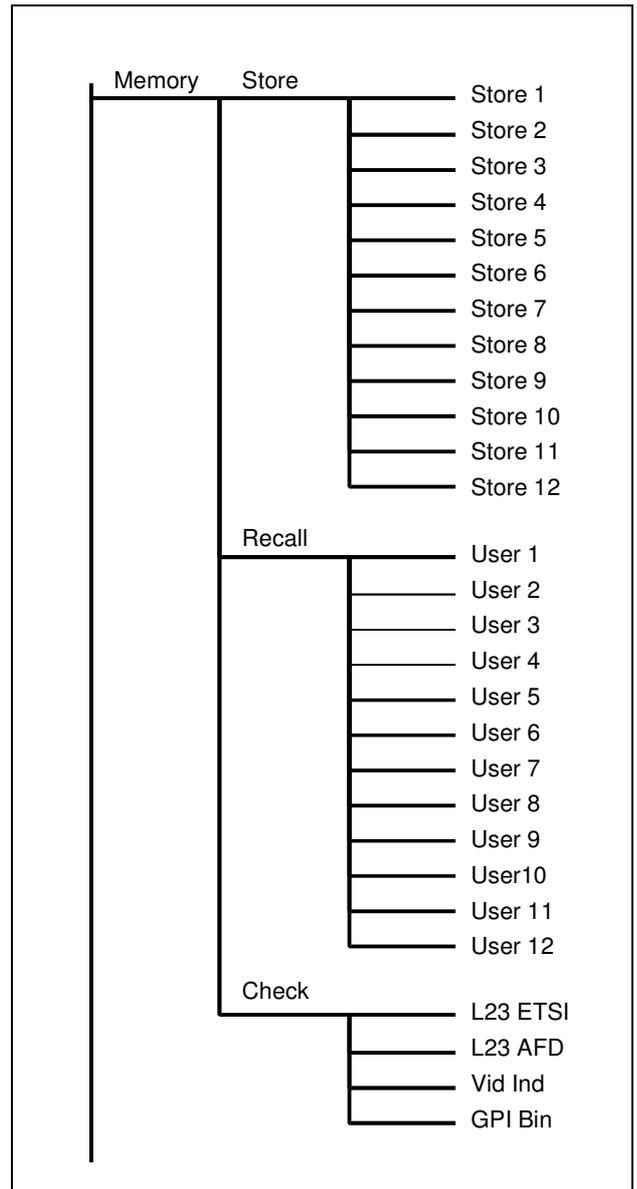
Note that the state of the Bypass button is also kept in the user memories. If a user memory is stored with Bypass turned ON, whenever that memory is recalled Bypass will be activated. This means that whenever a preset aspect ratio conversion is selected, Bypass is turned OFF. This feature allows users of the GPI to turn on the Bypass mode via the GPI port.

See Appendix page 4.37 for a list of the parameters stored in the memories.

Check allows the user to recall the Auto aspect ratio memories without having to apply the relevant auto widescreen signalling or GPI contact closure.

L23 ETSI – Selecting this presents the user with a list of the eight possible incoming line 23 ETSI codes. When one of these eight codes is selected then, the auto memory corresponding to that line 23 code is recalled. Thus the ARC is put in the same mode as it would have been if Auto line 23 ETSI input was selected and, that particular widescreen signal was present on the input video.

L23 AFD – Selecting this presents the user with a list of the sixteen possible incoming line 23 AFD codes. When one of these sixteen codes is selected then, the auto memory corresponding to that line 23 code is recalled. Thus, the ARC is put in the same mode as it would have been if Auto line 23 AFD input was selected and, that particular widescreen signal was present on the input video.



Vid Ind– Selecting this presents the user with a list of the sixteen possible incoming video index AFD codes. When one of these sixteen codes is selected then, the auto memory corresponding to that video index code is recalled. Thus, the ARC is put in the same mode as it would have been if Auto video index input was selected and, that particular widescreen signal was present on the input video.

GPI Bin– Selecting this presents the user with a list of the sixteen possible incoming GPI Binary codes. When one of these sixteen codes is selected then, the auto memory corresponding to that GPI Binary value is recalled. Thus, the ARC is put in the same mode as it would have been if Auto GPI Binary input was selected and, that particular Binary GPI value was present on the GPI input.

SETUP

This allows you to select the ARC 150/125 configuration menu. From the Home Screen, press ENT and scroll to Setup. Press ENT and scroll to select the function you require. Then press ENT again.

Bypass allows you to select whether the video is interpolated or whether it is passed straight through the unit (but with the normal unit delay). Each time you press ENT, the message toggles between NoBypass and Bypass; the default is NoBypass.

Clip allows you to turn the internal clipper on or off. The clipper limits the 10-bit data to 940 for white and 64 for black. Each time you press ENT, the message toggles between Clip Off and Clip On.

Freeze allows you to turn the video freeze function on and off. Each time you press ENT, the message toggles between NoFreeze and Freeze.

Gamut Turns on or off the colour gamut checking system. When On it ensures that the colour values are legal.

Ip Loss controls the response to the loss of the input video.

Black: the ARC150/125 output cuts to black when the input is lost

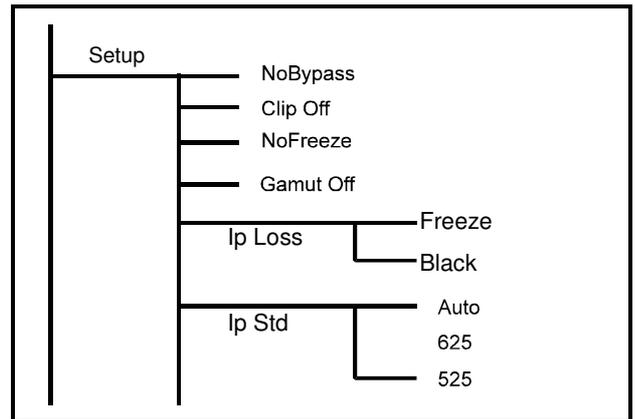
Freeze: the ARC150/125 output freezes when the input is lost

Ip Std allows you to select the incoming video standard.

Auto: automatically detects the incoming video standard.

625: forces the ARC 150/125 input to the 625/50 standard.

525: forces the ARC 150/125 input to the 525/59.94 standard



Modes

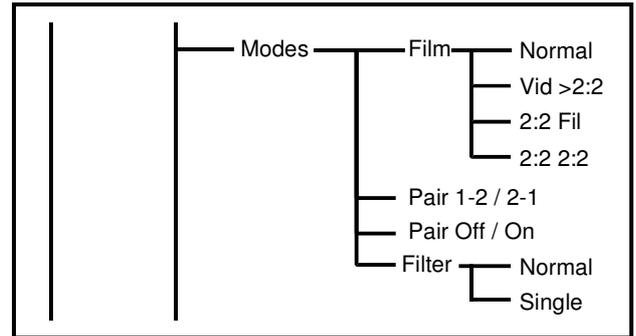
Selecting mode takes you to another menu which lets you choose between **Normal** and **Vid>2:2**.

Normal is the default and selects normal video processing. Selecting **Vid>2:2** makes the ARC do video to 2:2 processing. In this mode, a normal interlaced video input is converted to a half frame rate progressive output. For example, if the input standard is 525/59.94 interlaced video, then, the output from the ARC will be 525/29.97 progressive this is often known as 480P/30. If the input standard is 625/50/2:1 then the output standard will be 625/25/1:1. This is the same format as 2:2 film and this mode is often known as video to film conversion mode.

If **Vid to 2:2** mode is selected then the operation depends on the pairing mode setting. If Pairing is Off then a normal three field aperture is used. If Pairing is On then the incoming video fields are paired up before a two field aperture is used. This allows the user to get clean cut performance (see explanation under the Pairing On/Off menu entry). If Pairing is set to Pair as 1-2 then the output frames from the ARC will also be paired as a field one and the following field two. If Pairing is set to 2-1 then the output frames from the ARC will be paired as field two and the following field one.

Note that the Pairing mode is only available if the hardware in the ARC has been upgraded. All new machines purchased with software version A15 and above will automatically come with this mode enabled. Earlier machines which have been upgraded may also require additional software upgrades.

2:2 Fil – This selects a mode for use with 2:2 film material. It vertically filters the incoming material for display on an interlaced monitor. This reduces the amount of aliasing present if over-sharp film material is used. It uses a single frame aperture and pairs up the incoming fields as set by the Pair-As menu option (see below). Note that as this mode is designed for use with 2:2 film material it always uses the field pairing algorithm regardless of the setting of the Pairing On/Off menu item (see below).



2:2 2:2 – This selects a mode for use with 2:2 film material. It maintains the sharpness of the incoming film material. It uses a single frame aperture and pairs up the incoming fields as set by the Pair-As menu option (see below). Note that as this mode is designed for use with 2:2 film material it always uses the field pairing algorithm regardless of the setting of the Pairing On/Off menu item (see below).

Note – the 2:2 Fil and 2:2 2:2 modes can only be used with 2:2 film material. If the program material consists of mixed film and video sequences then the mode should be set to Normal but with Pairing turned On. This will allow the ARC to use the paired single frame aperture in a way which is suitable for both film and video material.

Pair 1-2, Pair 2-1

This selects the way the input video fields are paired before the application of the two-field pairing mode filter (see above).

If Pair 1-2 is selected then field 1's are grouped with the following field two.

If 2-1 is selected then field 2's are grouped with the following field 1's.

Pair Off/On

Turning Pairing mode On causes the ARC to pair up the incoming video fields into frames before applying a two field vertical temporal aperture.

If a user has material that has all the programme cuts on field 1's, then selecting Pair As 1-2 (see below) will ensure that the interpolation never bleeds across programme cuts.

If the material has all cuts on field 2's then selecting Pair As 2-1 will ensure that there is no interpolation across cuts.

The **Filter** function allows two aperture filters to be selected.

- Normal
- Single

Normal = uses the normal multi-field video aperture

Single = uses a single field aperture.

The Normal aperture will produce better results than the Single field aperture. However in some special cases (e.g. programme material containing DVE moves or scrolling captions) a single field aperture may be preferred.

Process

Selects the filtering applied in the ARC150/125.

V & H: This is the normal operating mode. Both vertical and horizontal size and position control is available.

H only: Horizontal processing only. Control of only horizontal size and position is available. No vertical or temporal filtering is applied.

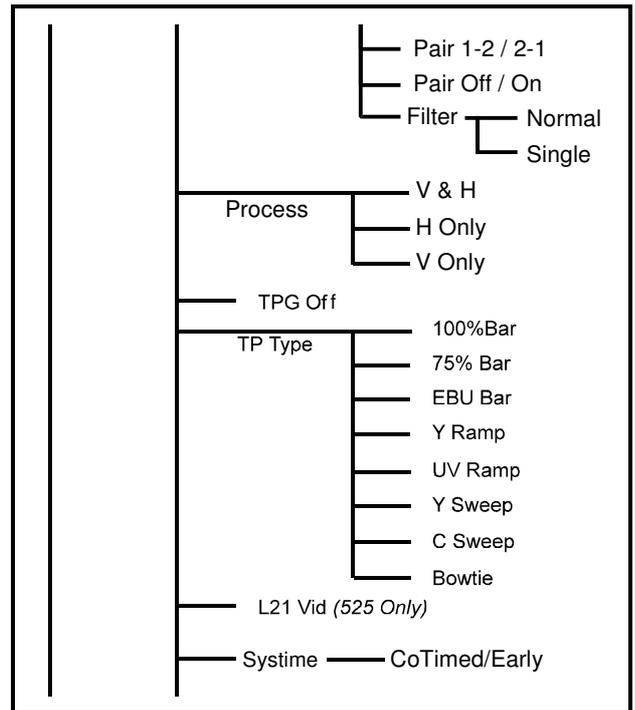
V only: Vertical processing only. Control of only vertical size and position is available. No horizontal filtering is applied.

TPG Off allows you to turn on and off the internal test pattern generator, the pattern being determined by the TP Type selection. Each time you press ENT, the message toggles between TPG Off and TPG On.

TP Type allows you to select the test pattern that will be produced when the internal TPG is switched on. From the Home Screen, press ENT and scroll to Setup. Press ENT and scroll to select TPG Type. Then press ENT again.

Scroll to the pattern type you require and press ENT. The patterns are digitally generated to exact levels; to preserve their integrity there is no adjustment.

Line 21 (525 only) allows you to select whether line 21 is a video line or a VITS line (usually closed captioning). Each time you press ENT the message toggles between L21 Vid and L21 Capt.



Systeme

In order to improve the system timing a new mode has been introduced. This mode ensures that output line 23 and video index signalling occurs on the same field that the video transition occurs. It also ensures that GPI contact closures that are co-timed with the video, that they wish to change, are properly timed. In earlier releases the GPI closure had to be done in advance of the desired transition.

This new timing model is selected by default with version A14 and later software. Existing users of the ARC who wish to upgrade to this version of software but have an existing remote control system in place may select the old timing model if they desire. This ensures compatibility between the new ARC software and the users existing infrastructure.

Selections are **CoTimed** (for new model) or **Early** (for old model)

This function may also be entered via RollCall.

The **Trans** menu controls the type of transition between display sizes that the ARC performs.

Trans – Period

This sets the time that the ARC takes to move between one picture size and the next when the ARC is in Slew mode (see below). If Update is set to F1 and F2 (see Setup- Update menu below) then the time is in video fields otherwise it is in Frames. The default period is one field

Trans -- Type

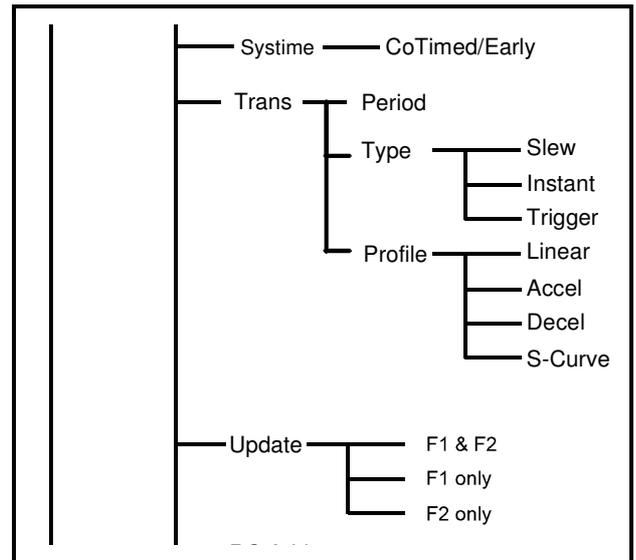
This sets the type of transition that the ARC will perform.

Trans -- Type -- Slew

In Slew mode the ARC moves gradually from one picture size to the next taking the time set on the Trans – Period menu and following the profile set on the Trans – Profile menu.

Instant

In instant mode the ARC cuts directly from one picture size to the next. Note that Instant mode is the same as Slew mode with the duration set to one field.



Trigger

In Trigger mode, the ARC will slew from one picture size to the next using the duration and profile set on the Trans menus. However, the transition will not be started until a trigger command is sent on the RS-422 remote control channel. This is useful when remote controlling the ARC as the display parameters can be sent in advance of the transition and, only the trigger command needs to be sent in real time.

Warning, if the ARC is put in Trigger mode then it will not react to front panel commands which affect the picture display parameters (size, aspect, pan and Pos).

Trans -- Profile

This sets the shape of the transition that the ARC will perform.

Trans -- Profile -- Linear

In Linear mode the ARC moves linearly from one picture size to the next.

Accel

In accelerate mode the ARC starts the transition with a low rate of picture size change from field to field and gradually increases the rate of change.

Decel

In decelerate mode the ARC starts the transition with a high rate of picture size change from field to field and gradually decreases the rate of change.

S-Curve

In S-Curve mode the ARC starts the transition slowly, then increases the rate of change then reduces the rate of change at the end of the transition.

Update

This allows you to select whether a change in output display parameters occurs at field or frame rate. This is significant if line 23 signalling is used (this signal is only present once per frame). If the ARC 150/125 is in the Auto mode and line 23 signalling is set to Auto output, when a change in aspect ratio is signalled at the input, it is preferable that the output video change and the output line signalling occur together. This may not be the case due to internal vertical genlock timing or timing of the external reference. To ensure that the video change and output signalling occur together it is recommended that Update is set to "Field 1" when in the Auto mode.

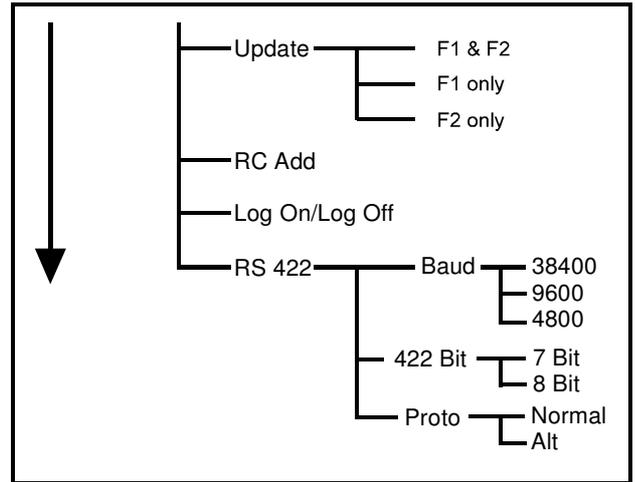
If "F1 & F2" is selected, the video at the output will change at the first available field boundary after a button has been pressed or a remote control command has been received.

If "F1 only" or "F2 only" is selected the video at the output will only change at the start of the appropriate output field type after a button has been pressed or a remote control command has been received.

RC Add

When this item is selected the ARC displays the RollCall address of the unit in Hexadecimal. Note that the address cannot be changed using this menu entry, it can only be changed using the rotary switches as described in Section 3.

Log On – selecting this menu item toggles between Log On and Log Off. This item turns On and Off the RollCall Log server function in RollCall network applications.



RS422

This allows the RS422 communications function to be set up.

Baud controls the Baud rate used on the RS422 remote control channel.

The rate may be set to any of the following:

38400
9600
4800

Note that if the ARC is to be controlled by a Snell & Wilcox ARC remote control unit then the Baud rate must be set to 38400 Baud.

422 Bit – this sets the number of data Bits used on the RS-422 remote control link when the Normal remote control protocol is in use (see below).

Note that if the ARC is to be controlled by a Snell and Wilcox ARC remote control unit then this must be set to 7 Bits.

Proto – this selects the remote control protocol in use on the RS 422 remote control link. **Normal** is the default protocol and this provides control of all parameters of the ARC.

If **Alt** is selected an alternate protocol is active. This is for use with Philips automation systems that are unable to support the rich feature set of the ARC.

This protocol only provides a limited number of commands and is described in more detail on page 4.53.

The full Snell and Wilcox protocol is widely used and is freely available from Snell and Wilcox.

VITS

This allows you to control the blanking of the vertical interval lines. Note that for 625/50 operation the lines are 7-22 and 320-335, and for 525/59.94 operation the lines are 10-20 (and line 21 if set up to L21 Capt, as above) and 272-282. From the Home Screen, press ENT and scroll to VITS. Press ENT and scroll to select the function you require. Then press ENT again.

If the input and output of the ARC 150/125 are not locked together, occasional frames will be dropped from the VITS data, as it is not possible to interpolate the data in these lines. It is strongly recommended that if the VITS signal is to be passed through the ARC 150/125, the unit is operated with the output video frequency locked to the input.

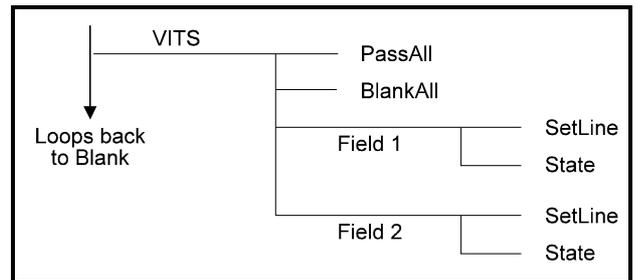
PassAll passes all the VITS lines through the ARC 150/125 untouched. When selected and ENT is pressed, the message "Done" appears.

BlankAll blanks all the VITS lines. When selected and ENT is pressed, the message "Done" appears.

Field 1 allows you to selectively pass/blank field 1 vertical interval lines. Similarly, **Field 2** allows you to selectively pass/blank field 2 vertical interval lines.

Setline: selects which vertical interval lines of the appropriate field are to be blanked/passed.

State: turns on and off the blanking for the lines set in Setline. Pressing ENT toggles the message between "Pass" and "Blanked".



OPERATION WITH FRONT PANEL CONTROLS

This section describes the action of each of the front panel controls and shows how to operate the ARC 150/125.

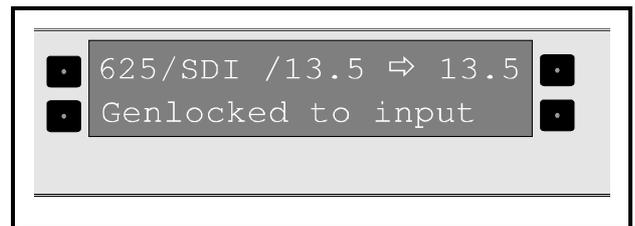
The panel is grouped into areas to simplify operation and the controls in each area will be described in turn.

Pushbuttons

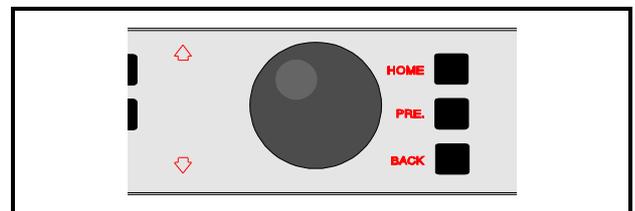
The buttons have indicator lamps in the centre. In general, when a button is pressed the indicator lamp illuminates. If controls are not in the “Preset” position or there is an abnormal condition the indicator lamp flashes. For more information see the appropriate control description.

Display and Display Controls

The display comprises two rows of 20 characters; the top row normally shows the current conversion and the bottom row slowly cycles through the current status of the main parameters. A typical top row display is shown, where the input is 625 lines, serial digital with a 13.5 MHz clock rate input and output.



There is a selection pushbutton at both ends of each row. In some cases the row has information on one parameter, in which case the button at either end can be used for selection. In other cases, there are two parameters in the row, in which case the left-hand pushbutton selects the left-hand parameter and the right-hand button the right-hand parameter. An item with further options to select is indicated by ⇄ at the right-hand end of the display and an item with a sub-menu is indicated by ↵.



The rotary control allows you to scroll menus and to set parameters to a required value. The illuminated arrows indicate the direction options that you have.

To return to the previous menu level, press the “BACK” pushbutton. It may be used to progress back up the menu tree. To return to the status display, press the button labelled “HOME”.

To return a value you have just changed to its preset value press “PRE”. To return all the values on the display that you have changed, press “HOME” and “PRE” simultaneously.

FUNCTION SELECT

These pushbuttons are used to preset operating conditions according to the system requirements. The USER button is provided for Memory Operation

Display

Allows the output picture to be manually selected from the input picture. As an example, if the input picture is in 16x9 format and the output picture selected is 4x3, the output picture can be panned horizontally within the limits of the input picture; if the input picture is 4x3 and the output picture selected is 16x9, the output picture can be "tilted" (positioned) vertically within the limits of the input picture.

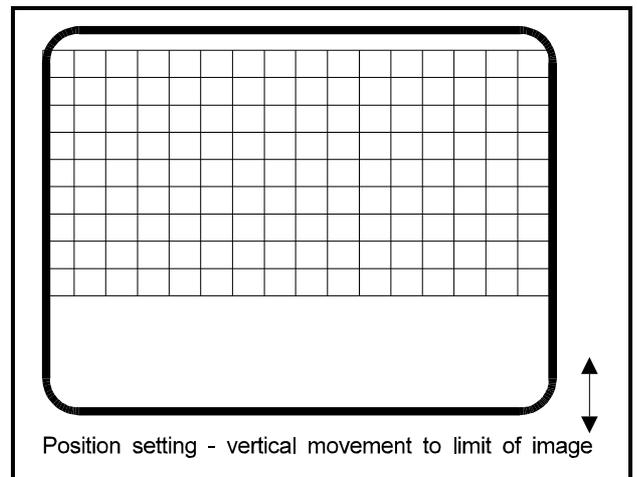
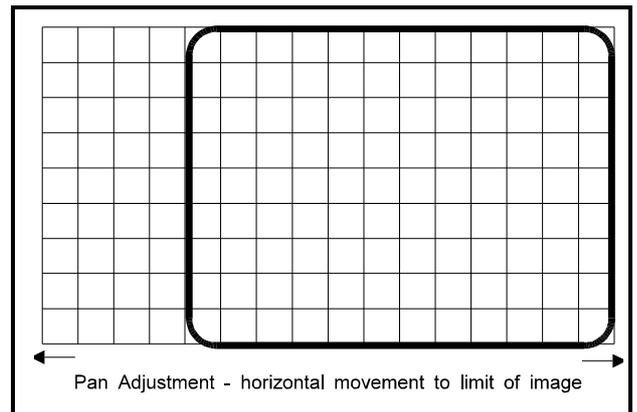
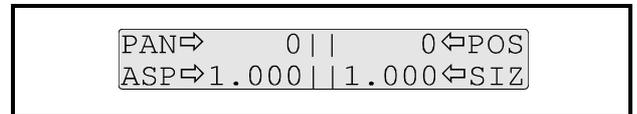
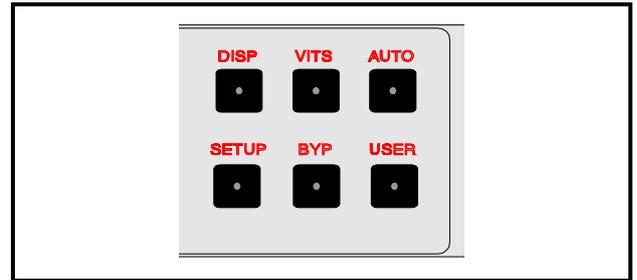
With DISPLAY pressed, the display becomes similar to that shown opposite.

When PAN is selected the image can be moved horizontally. The range is ± 1600 .

Note that this option does not appear if V only processing is selected (see setup menu)

When POS is selected the image can be moved vertically within the display area. The range is ± 3500 .

Note that this option does not appear if H only processing is selected (see setup menu)

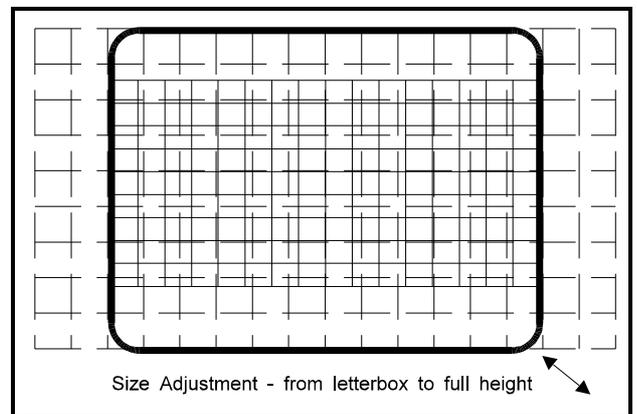
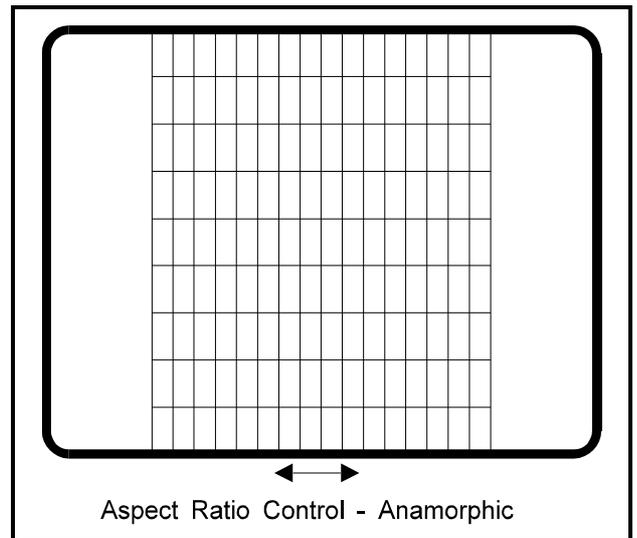


When ASP is selected the image can be slightly distorted (anamorphic display). The product of SIZ and ASP is limited to the range 0.50 to 2.00, and ASP is limited to the range 0.25 to 2.00.

Note that this option does not appear if V only processing is selected (see setup menu)

When SIZ is selected the size of the image can be scaled. The product of SIZ and ASP is limited to the range 0.50 to 2.00, and SIZ is limited to the range 0.50 to 2.00.

Note that this option does not appear if H only processing is selected (see setup menu)



VITS

When the VITS button is pressed, the display becomes similar to that shown opposite:

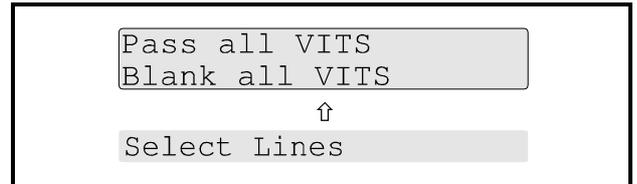
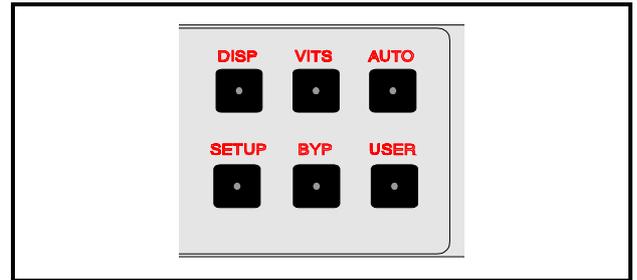
For the first two, pressing one of the buttons adjacent to the row on the display will cause the appropriate action to take place and a message to be displayed. Scrolling upwards allows the VITS lines to be enabled and then selected.

Pass All passes all the VITS lines through the ARC 150/125 untouched. When selected and ENT is pressed, the message "Done" appears.

Blank All blanks all the VITS lines. When selected and ENT is pressed, the message "Done" appears.

Field 1 allows you to selectively pass/blank field 1 vertical interval lines. Similarly, **Field 2** allows you to selectively pass/blank field 2 vertical interval lines.

Select Lines: selects which vertical interval lines of the appropriate field are to be blanked/passed.



AUTO

This button is only active if there is a 625 line input with signalling on line 23 or if video index is selected and there is video index signalling present. When AUTO is On, the output aspect ratio is determined by the signalling source on line 23 and the setup selected, see signalling source Line 23 Setup. When an aspect ratio button is pressed, Auto is Off.

SETUP

When pressed, the display becomes similar to that shown opposite.

Audio Setup

This allows the status of the audio channels to be set up.

Use the I/P Group item to set the input group to 1, 2, 3, or 4.

Use the O/P Group item to select the output group to 1, 2, 3, or 4.

The embedded audio output may be set to Off (no audio data), On (audio data from selected input group), Mute (silence) or Test Tone.

Note that this function will be available only when the Reference is selected to be Input as the input and output clocks must be locked together for embedded audio operation.

Clipper

This allows you to turn the internal clipper on or off. The clipper limits the 10-bit data to 940 for white and 64 for black. Each time you select the function it toggles between On and Off.

Field Pairing

This function toggles On and Off.

Turning Pairing mode On causes the ARC to pair up the incoming video fields into frames before applying a two field vertical temporal aperture.

If a user has material that has all the programme cuts on field one, then selecting Pair As F1 then F2 (see below) will ensure that the interpolation never bleeds across programme cuts.

If the material has all cuts on field 2's then selecting Pair As F2 then F1 will ensure that there is no interpolation across cuts.

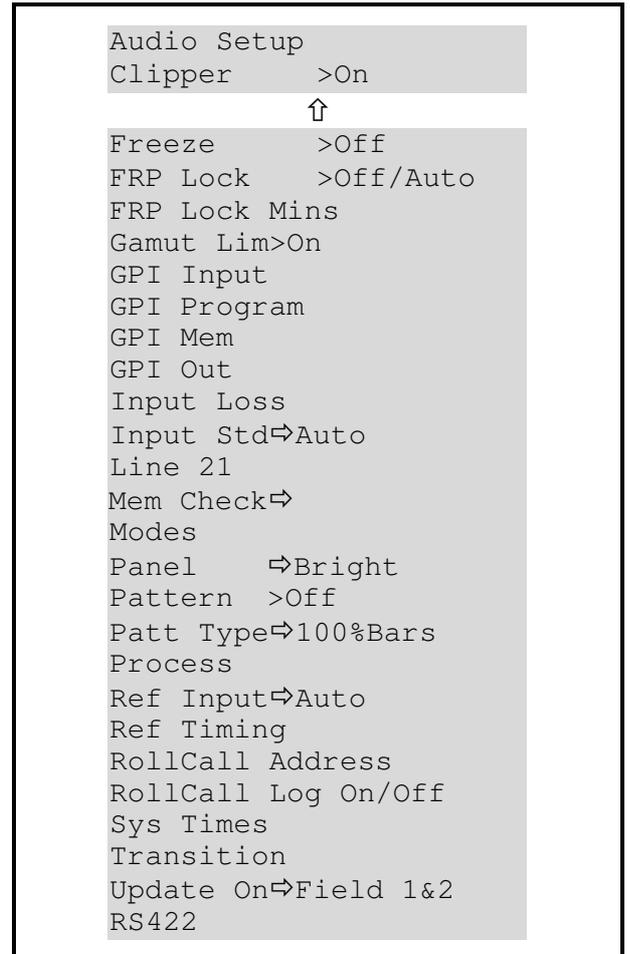
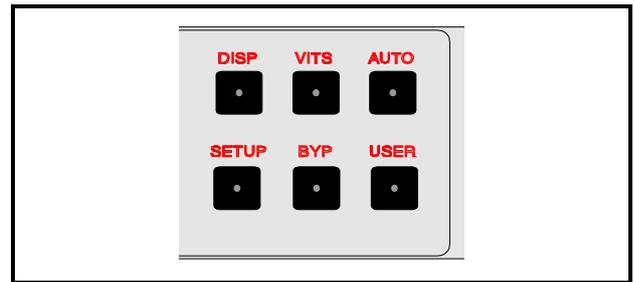
Pair as F1 then F2, Pair as F2 then F1

This function toggles between the 2 modes.

This selects the way the input video fields are paired before the application of the two field pairing mode filter (see above).

If Pair As F1 then F2 is selected then field 1's are grouped with the following field two.

If Pair As F2 then F1 is selected then field 2's are grouped with the following field 1's.



Filter

This function allows two aperture filters to be selected.

- Filter - Normal
- Single

Normal = uses the normal multi-field video aperture

Single = uses a single field aperture.

The Normal aperture will produce better results than the Single field aperture. However in some special cases (e.g. programme material containing DVE moves or scrolling captions) a single field aperture may be preferred.

Freeze

This allows you to turn the video freeze function on and off. Each time you select the function, it toggles between On and Off.

FRP Lock – Off

In this mode the front panel will not automatically disable itself after a period of inactivity.

FRP Lock – Auto

In this mode the front panel will automatically disable itself after a period of inactivity set on the FRP Lock Mins menu. In this case the front panel will periodically display the message Front Panel Locked and the ARC will no longer react to front panel key presses or knob actions.

Important – when the front panel has locked itself it can be unlocked by pressing and holding the HOME key for three seconds. The ARC will beep when the panel has been unlocked.

Note, the locking mechanism does not disable remote control of the ARC.

FRP Lock Mins

This sets the number of minutes after which the ARC locks it's front panel unless a front panel button is pressed or the knob turned.

Gamut Limiter

This turns on or off the colour gamut system each time it is selected. When On it ensures that the colour values are legal.

GPI Input

This allows you to select GPI inputs On, Off, On+Auto and Binary.

Off

The GPI function is inactive.

On

The GPI function is active. (One contact closure per memory recall)

On+Auto

The GPI function is active. (One contact closure per memory and all four contact closures turns on Auto mode)

Note In order that the GPI contacts may be released without the unit reverting to another GPI memory recall, it is necessary that all four GPI contacts are open for at least one field after Auto has been selected using the GPI. Operation of the GPI is suspended until this condition has been met.

Binary

When the GPI input is put into binary mode the four GPI inputs are treated as one four bit number. This means that there sixteen possible GPI input states. Each of the GPI input-states recalls a special GPI memory. These memories store the same parameters as the User Display memories and the Auto (video index/line 23) memories. Thus one should set up the machine as required (size, asp, pan, pos, bypass and output aspect ratio signaling parameters) then, one can program the required GPI memory. When that particular GPI state is present the appropriate memory is recalled.

This is useful as the GPI port can be used to emulate the four video index signaling bits if they are not present on the input signal.

GPI Program

The GPI inputs initially select User memories 1 to 8.

If you wish to recall one of the other memories, e.g. 16:9F to Letterbox on GPI input 2, set the display to "Select Mem for GPI 2" and then press the 16:9F to Letterbox preset button (alternatively you can recall a user memory by pressing USER and then the required memory button). If successful, the message "GPI programmed" will be temporarily displayed.

GPI Binary

This item lets you program the binary GPI memories.

If you select this item the display shows:

Select Mem for GPI 0
Store Memory ----->

Selecting the top menu entry allows the user to select the GPI memory to be stored.

Selecting the bottom menu entry causes the GPI memory to be stored.

The GPI interface on the ARC150/125 has a delay that matches the video processing delay through the ARC.

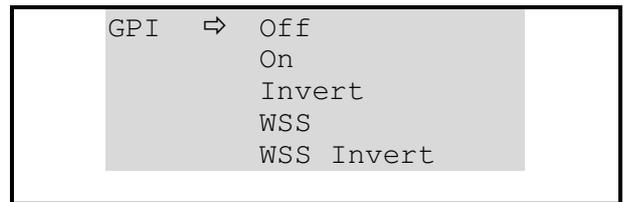
This means that if a given input-video field is desired to produce the first output-field built with a new aspect ratio conversion; the GPI contacts that recall that new aspect ratio conversion should be closed during the field when that video field is present at the ARC150/125 input.

Ideally, the contact should be closed a few lines after the vertical sync group of the reference video, and, should remain closed for at least one field period.

Select Mem for GPI 1

Using the cardedge and active front panel menus an extra item will appear when an 8-way GPI board is detected.

This is **GPI Out** This allows the GPO to be turned OFF, (all contacts open), turn it ON (default setting) or turn it ON but work inverted (i.e. contact open to indicate active memory).



Version A36 of the ARC software has two new menu items, these are WSS and WSS Invert. In these modes the GPI outputs 0 to 3 change their state to reflect the current value of either the input video widescreen signaling or the last recalled memory if input widescreen signaling is not being used. The value that the four GPI output contacts output for any given input WSS or memory recall is programmable (see the GPO WSS Section below). Using this mode allows the ARC to automatically control other pieces of equipment based on the conversion it is doing. In addition, if the ARC is reading incoming WSS to control the aspect ratio conversion then output GPI contact four indicates whether the WSS is present or absent. In WSS mode the contacts are active closed whereas in WSS Invert mode the contacts are active open. The GPI output contacts normally change one field after a change in the input WSS.

GPO WSS

This menu sets the value of the GPO output port when the GPO output is set to GPO WSS or GPO WSS Invert mode. The value is recorded in a memory, for either an incoming WSS signal or a User memory or a GPI binary memory when the save memory function is undertaken. Once the memory has been stored this GPO value will be set whenever that memory is recalled.

Note, the if the GPO is in WSS mode the output contacts will also change when preset display memories are selected. Please note that the GPO WSS values for the preset display memories are NOT programmable.

Ip Loss controls the response to the loss of the input video.

Black: the ARC150/125 output cuts to black when the input is lost

Freeze: the ARC150/125 output freezes when the input is lost

Input Standard

Allows you to set the ARC 150/125 to the incoming video standard.

When Auto is selected the standard is automatically detected. 525 forces the ARC 150/125 input to the 525/59.94 standard and 625 forces the ARC 150/125 to the 625/50 standard.

Line 21 (525 line systems only)

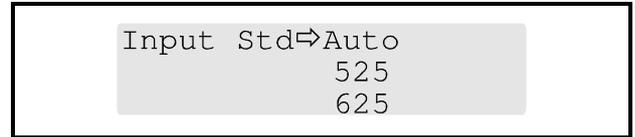
Allows you to select whether line 21 is a video line or a VITS line (usually closed captioning). Each time you select the function it toggles between Video and Caption.

Mem Check allows the user to recall the Auto aspect ratio memories without having to apply the relevant auto widescreen signalling or GPI contact closure.

L23 ETSI – Selecting this presents the user with a list of the eight possible incoming line 23 ETSI codes. When one of these eight codes is selected then, the auto memory corresponding to that line 23 code is recalled. Thus the ARC is put in the same mode as it would have been if Auto line 23 ETSI input was selected and, that particular widescreen signal was present on the input video.

L23 AFD – Selecting this presents the user with a list of the sixteen possible incoming line 23 AFD codes. When one of these sixteen codes is selected then, the auto memory corresponding to that line 23 code is recalled. Thus, the ARC is put in the same mode as it would have been if Auto line 23 AFD input was selected and, that particular widescreen signal was present on the input video.

Vid Index– Selecting this presents the user with a list of the sixteen possible incoming video index AFD codes. When one of these sixteen codes is selected then, the auto memory corresponding to that video index code is recalled. Thus, the ARC is put in the same mode as it would have been if Auto video index input was selected and, that particular widescreen signal was present on the input video.



GPI Binary– Selecting this presents the user with a list of the sixteen possible incoming GPI Binary codes. When one of these sixteen codes is selected then, the auto memory corresponding to that GPI Binary value is recalled. Thus, the ARC is put in the same mode as it would have been if Auto GPI Binary input was selected and, that particular Binary GPI value was present on the GPI input

Modes

Selecting modes takes you to another menu which lets you choose between **Normal**, **Vid to 2:2**, **2:2 Filter** and **2:2 Film**.

Normal is the default and selects normal video processing. Selecting **Vid to 2:2** makes the ARC do video to 2:2 processing. In this mode, a normal interlaced video input is converted to a half frame rate progressive output. For example, if the input standard is 525/59.94 interlaced video, then, the output from the ARC will be 525/29.97 progressive this often known as 480P/30. If the input standard was 625/50/2:1 then the output standard will be 625/25/1:1. This is the same format as 2:2 film and this mode is often known as video to film conversion mode.

If video to 2:2 mode is selected then the operation depends on the pairing mode setting. If Pairing is Off then a normal three field aperture is used. If Pairing is On then the incoming video fields are paired up before a two field aperture is used. This allows the user to get clean cut performance (see explanation under the Pairing On/Off menu entry). If Pairing is set to Pair as 1-2 then the output frames from the ARC will also be paired as a field one and the following field two. If Pairing is set to 2-1 then the output frames from the ARC will be paired as field two and the following field one.

Note that the Pairing mode is only available if the hardware in the ARC has been upgraded. All new machines purchased with software version A15 and above will automatically come with this mode enabled. Earlier machines which have been upgraded may also require additional software upgrades.

2:2 Filter – This selects a mode for use with 2:2 film material. It vertically filters the incoming material for display on an interlaced monitor. This reduces the amount of aliasing present if over-sharp film material is used. It uses a single frame aperture and pairs up the incoming fields as set by the Pair-As menu option (see below). Note that as this mode is designed for use with 2:2 film material it always uses the field pairing algorithm regardless of the setting of the Video Pairing On/Off menu item (see below).

2:2 Film – This selects a mode for use with 2:2 film material. It maintains the sharpness of the incoming film material. It uses a single frame aperture and pairs up the incoming fields as set by the Pair F1 then F2 menu option (see below). Note that as this mode is designed for use with 2:2 film material it always uses the field pairing algorithm regardless of the setting of the Video Pairing On/Off menu item (see below).

Note – the 2:2 Filter and 2:2 Film modes can only be used with 2:2 film material. If the program material consists of mixed film and video sequences then the mode should be set to Normal but with Video Pairing turned On. This will allow the ARC to use the paired single frame aperture in a way that is suitable for both film and video material.

Panel

This item allows the panel brightness to be set to either Bright or Dim.

Pattern

This allows you to turn on and off the internal test pattern generator, the pattern being determined by the Pattern Type setting. Each time you select the function, it toggles between On and Off.

Pattern Type

This allows you to select the test pattern that will be produced when the internal pattern is switched on. The patterns are digitally generated to exact levels; to preserve their integrity there are no adjustments.

Process

Selects the filtering applied in the ARC150/125.

V & H: This is the normal operating mode. Both vertical and horizontal size and position control is available.

H only: Horizontal processing only. Control of only horizontal size and position is available. No vertical or temporal filtering is applied.

V only: Vertical processing only. Control of only vertical size and position is available. No horizontal filtering is applied.

Reference Input

Selects adjustment of the Genlock input parameters.

Note that the ARC125 will always lock to the incoming video.

Auto: (ARC150 only) The ARC will lock to an external analogue reference, if one is present and correct, otherwise it will lock to the input video.

Ext Ref: (ARC150 only) Forces the ARC to lock to an external reference.

IP Vid: (ARC150) Forces the ARC to lock to the input video.

Free Run: (ARC150 only) Turns off the Genlock function.

Reference Timing

Allows adjustment of the vertical and horizontal timing.

Horizontal allows you to adjust the horizontal Genlock timing with respect to the reference, in pixels.

Vertical allows you to adjust the vertical Genlock timing with respect to the reference, in lines.

```
Patt Type ⇨ 100% Bars
              75% Bars
              EBU Bars
              Y Ramp
              UV Ramp
              Y Sweep
              UV Sweep
              Bowtie
```

```
Process ⇨ V&H
          Honly
          Vonly
```

```
Ref Input ⇨ Auto
            Ext Ref
            Video In
            Free Run
```

```
Horizontal ⇨ 17 pix
Vertical   ⇨ 0 lns
```

RC Address

When this menu item is selected the ARC displays the RollCall address of the unit in Hexadecimal. Note that the address cannot be changed using this menu entry, it can only be changed using the rotary switches as described in Section 3.

RollCall Log On/Off

This toggle function turns On and Off the RollCall Log server function in RollCall network applications.

Sys Times

In order to improve the system timing a new mode has been introduced. This mode ensures that output line 23 and video index signalling occurs on the same field that the video transition occurs. It also ensures that GPI contact closures that are co-timed with the video that they wish to change, are properly timed. In earlier releases the GPI closure had to be done in advance of the desired transition.

This new timing model is selected by default with version A14 and later software. Existing users of the ARC who wish to upgrade to this version of software but have an existing remote control system in place may select the old timing model if they desire. This ensures compatibility between the new ARC software and users existing infrastructure.

Selections are **Co-timed** (for new model) or **Early** (for old model)

This function may also be entered via RollCall.

The Transition menu controls the type of transition between display sizes that the ARC performs.

Transition – Trans Fields

This sets the time that the ARC takes to move between one picture size and the next when the ARC is in Slew mode (see below). If Update is set to F1 and F2 (see Setup- Update menu below) then the time is in video fields otherwise it is in Frames. The default period is one field

Transition -- Tran Type

This sets the type of transition that the ARC will perform.

Transition – Tran Type -- Slew

In Slew mode the ARC moves gradually from one picture size to the next taking the time set on the Transition – Trans Fields menu and following the profile set on the Trans – Profile menu.

Immediate

In instant mode the ARC cuts directly from one picture size to the next. Note that Instant mode is the same as Slew mode with the duration set to one field.

Trigger

In Trigger mode, the ARC will slew from one picture size to the next using the duration and profile set on the Transition menus. However, the transition will not be started until a trigger command is sent on the RS-422 remote control channel. This is useful when remote controlling the ARC as the display parameters can be sent in advance of the transition and, only the trigger command needs to be sent in real time.

Warning, if the ARC is put in Trigger mode then it will not react to front panel commands which affect the picture display parameters (size, aspect, pan and Pos).

Transition -- Profile

This sets the shape of the transition that the ARC will perform.

Transition -- Profile -- Linear

In Linear mode the ARC moves linearly from one picture size to the next.

Accelerate

In accelerate mode the ARC starts the transition with a low rate of picture size change from field to field and gradually increases the rate of change.

Decelerate

In decelerate mode the ARC starts the transition with a high rate of picture size change from field to field and gradually decreases the rate of change.

S-Curve

In S-Curve mode the ARC starts the transition slowly, then increases the rate of change then reduces the rate of change at the end of the transition.

Update On

This allows you to select whether a change in output display parameters is actioned at field or frame rate. This is significant if line 23 signalling is used (this signal is only present once per frame). If the ARC 150/125 is in the Auto mode and line 23 signalling is set to Auto output, when a change in aspect ratio is signalled at the input, it is preferable that the output video change and the output line signalling occur together. This may not be the case due to internal vertical genlock timing or timing of the external reference. To ensure that the video change and output signalling occur together it is recommended that Update is set to "Field 1" when in the Auto mode.

If "Field 1&2" is selected, the video at the output will change at the first available field boundary after a button has been pressed or a remote control command has been received.

If "Field 1" or "Field 2" is selected the video at the output will only change at the start of the appropriate output field type after a button has been pressed or a remote control command has been received.

RS422

This allows the RS422 communications function to be set up.

Baud controls the Baud rate used on the RS422 remote control channel.

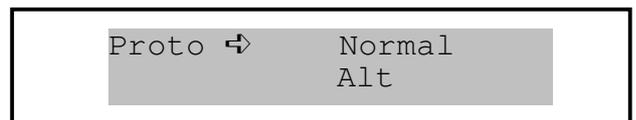
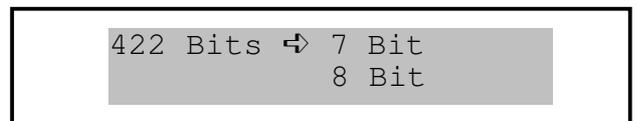
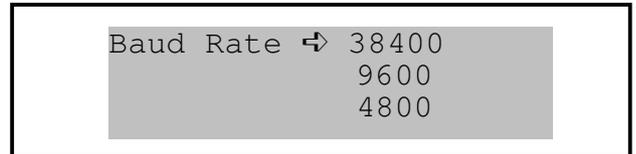
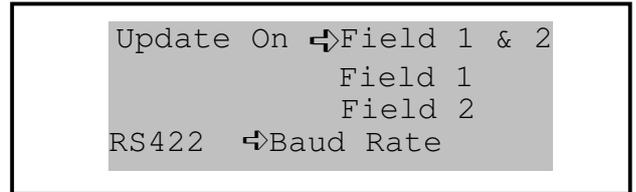
The rate may be set to any of the following:

38400
9600
4800

Note that if the ARC is to be controlled by a Snell & Wilcox ARC remote control unit then the Baud rate must be set to 38400 Baud.

422 Bit – this sets the number of data Bits used on the RS-422 remote control link when the Normal remote control protocol is in use (see below).

Note that if the ARC is to be controlled by a Snell and Wilcox ARC remote control unit then this must be set to 7 Bits.



Proto – this selects the remote control protocol in use on the RS 422 remote control link. **Normal** is the default protocol and this provides control of all parameters of the ARC.

If **Alt** is selected an alternate protocol is active. This is for use with Philips automation systems that are unable to support the rich feature set of the ARC.

This protocol only provides a limited number of commands and is described in more detail on page 4.53.

The full Snell and Wilcox protocol is widely used and is freely available from Snell and Wilcox.

BYP

This button allows you to select whether the video is interpolated or whether it is passed straight through the unit (but with normal unit delay). Each time the button is pressed, bypass is toggled between On and Off. Default is to Off.

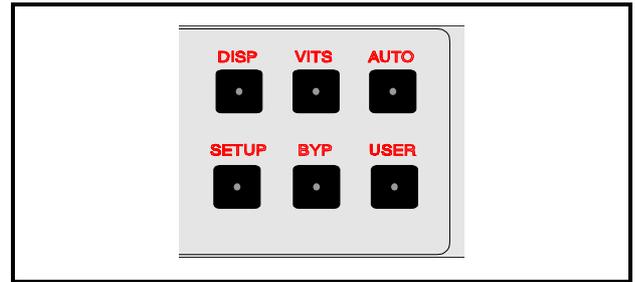
USER

This button is used to store and recall a set of aspect ratio settings in memory. Each of the aspect ratio buttons gives access to a user memory. For reference purposes, the two rows of 4 pushbuttons are numbered 1 to 4 from left to right on the top row and 5 to 8 on the bottom row. The 2 rows of two pushbuttons are numbered 9 and 10 on the top row and 11 and 12 on the bottom row.

First press USER and then the button associated with the memory you are going to use (if you decide not to proceed, press USER again). When you manually adjust the aspect ratio settings, the indicator in the button of the current aspect ratio flashes. To store the settings in memory, simultaneously press the appropriate aspect ratio and HOME buttons; a message similar to that shown opposite will appear.

Keep a record of the picture type and memory in which the settings are stored. To recall the settings if you are not in the User mode, just press USER (the button indicator will flash) and the button associated with the memory number required. If you are in the User mode (button indicator illuminated) press the memory button only.

See Appendix for a list of the parameters stored in the memories.



Store user memory: 4

ASPECT RATIO SELECTION



These 12 buttons allow preset aspect ratio conversions to be selected.

**For a detailed explanation of the these code specifications please refer to Section 6 "Aspect Ratio Technical Codes for Video and Picture Sources"*

CONVERSION DESCRIPTION NOMENCLATURE				
Front panel* Designation	BBC Notation*	Full Description	Aspect Value	Size Value
1.77F>FH	16F16 > 12F12	16:9 Anamorphic picture to full height 4:3 picture for presentation on a 4:3 screen (left hand and right hand edges of original 16:9 image are cropped)	1.333	1.000
1.85L>FH		1.85:1 Letterbox picture to full height 4:3 picture with left hand and right hand edges of original 1.85:1 image cropped	1.388	1.000
1.66L>FH	15L12 > 12F12	15:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 15:9 image cropped	1.250	1.000
1.55L>FH	14L12 > 12F12	14:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 14:9 image cropped	1.167	1.000
1.77F>LB	16F16 > 16L12	16:9 Anamorphic picture converted to 16:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.333	0.750
1.85F>LB		1.85:1 Anamorphic picture converted to 1.85:1 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.388	0.721
1.66F>LB	15F15 > 15L12	15:9 Anamorphic picture converted to 15:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.250	0.800
1.77F>1.55L	16F16 > 14L12	16:9 Anamorphic picture converted to 14:9 letterbox picture for presentation on a 4:3 screen (black bars above and below image and right hand and left hand edges of picture slightly cropped)	1.333	0.857
4:3>Cur	12F12 > 12P16	4:3 image converted to 4:3 pillarbox/curtains image in 16:9 anamorphic. (4:3 horizontally squeezed image with black bars to left and right of output)	0.750	1.000
1.55>Cur	14L12 > 14P16	14:9 letterbox picture in 4:3 converted to 14:9 pillar-box/curtains image in 16:9 anamorphic (14:9 horizontally squeezed image with 1:9 black bars to left and right of output)	0.750	1.167
4:3>FW		4:3 image anamorphically squeezed and scaled up to fill full 16:9 width. Top and bottom of original 4:3 image cropped at output	0.750	1.333
1.77L>1.77F	16L12 > 16F16	16:9 letterbox in 4:3 converted to 16:9 anamorphic full height image	0.750	1.333

Abbreviated Explanation of Aspect Ratio Technical Codes for Video and Picture Sources

(For full details see Section 6)

These codes can be used to describe the aspect ratios used when graphics or video sources are composed or generated. They describe the image and the raster ratios.

Code Specification:

Code format is thus: **AABCCD**

Where **AA** is the first parameter, **B** is the second etc.

The four parameters of the code must be used in the order specified. Not all parameters have to be used if not appropriate or known, however **B** (The Display Format) should be present to prevent ambiguity.

AA Active Image Aspect Ratio - Number(s)

Aspect Ratio of Active Image Area expressed as a two digit abbreviated numeric value where the comparison ratio is against a height of 9. Active Image area is the part of the raster / bitmap that contains picture information. 12 is normally used for 4 by 3 (12 by 9).

*ie. Two digit number giving the aspect ratio of the picture area that viewers are interested in, that is neglecting any areas of continuous and static black due to letter-boxing or pillar-boxing. Numbers describing ratios seen in use at present are: 12, 14, 15 (Super 16), 16, 17 (1.85:1), 21 (2.35:1), 24. Thus 14 : 9 becomes **14**.*

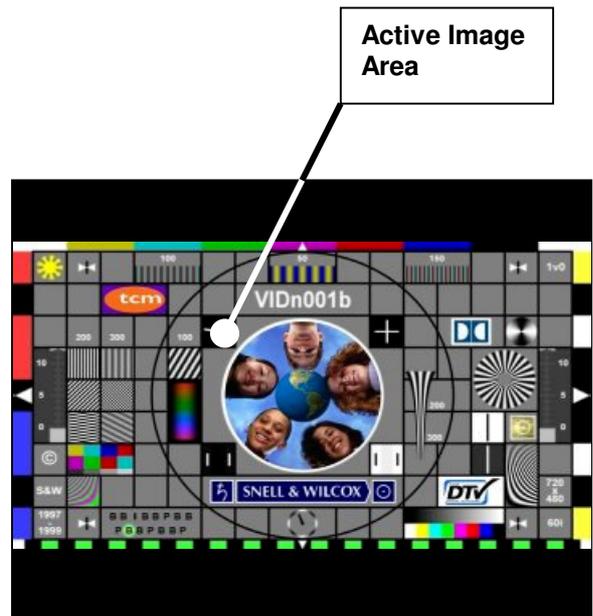
B Display Format - Letter

The visual effect of the image and display raster aspect ratios combined. Abbreviated as an initial.

P for pillar-box.	That is full height but with black down the sides.
L for letter-box.	That is full width with black top and bottom.
F for full frame.	Display and Image aspect ratios are the same.

*i.e. if it's purely in letter box presentation put in an **L** etc. e.g. 14L12A - "14 by 9 letterbox for..". This letter confirms what the pictures look like and separates the two ratio numbers.*

*Note: Letter **A** has been proposed for material converted an Anamorphic presentation - that is the image is designed to be displayed distorted. This can be as a result of stretching a picture to fit a given display shape whilst avoiding cropping.*



CC Raster aspect ratio - Number(s)

Aspect Ratio of the full raster when correctly displayed expressed as a two digit abbreviated numeric value where the comparison ratio is against a height of 9. 12 is used for 4 by 3 (12 by 9)

i.e. Two digit number(s) giving the aspect ratio of entire picture / raster / graphics bitmap, including all the black of any Letterbox or Pillarbox area, that gives a correctly displayed image.

Numbers describing ratios seen in use at present are 12, 14, 15 (Super16), 16, 17 (1.85:1), 21 (2.35:1Cinemascope), 24.

e.g. A 16 : 9 full height "anamorphic" raster is shown as 16.

A request for material suitable for 16 by 9 TX could just be "supply it in F16 format".

Full Raster Area



Examples of common aspect ratios expressed as two digit numbers using this notation.

Aspect Ratio	Two Digit Number
4:3	12
14:9	14
15:9	15
16:9	16
1.85:1	17

Generally:

If the aspect ratio is expressed as: -

$$A : B \quad (\text{width to height})$$

Then the two digit number *N* representing the comparison ratio against a height of 9 will be given by

$$N = \frac{9}{B} \times A$$

or by transposing

$$B = \frac{9}{N} \times A$$

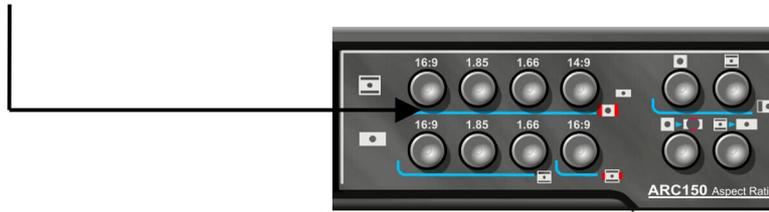
and

$$A = \frac{B}{9} \times N$$

PRESET ASPECT RATIO SELECTIONS

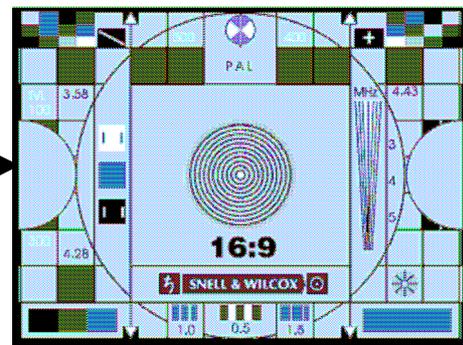
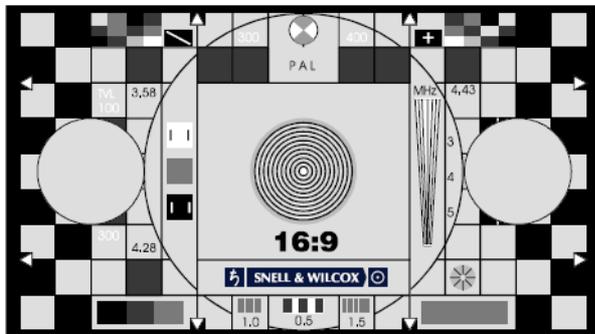
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.77F>FH	16F16 > 12F12	16:9 picture to full height 4:3 picture for presentation on a 4:3 screen (left hand and right hand edges of original 16:9 image are cropped)	1.333	1.000

1



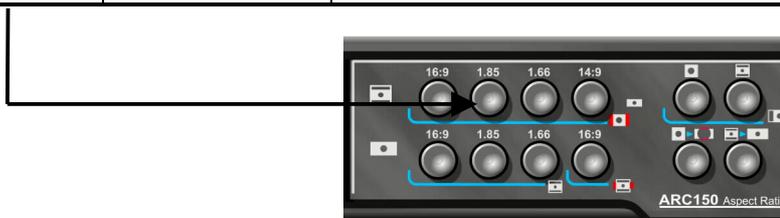
Input Picture

Output Picture



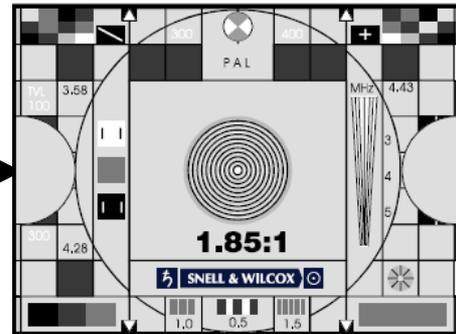
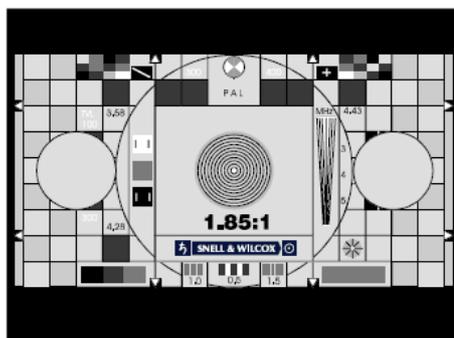
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.85L>FH		1.85:1 Letterbox picture to full height 4:3 picture with left hand and right hand edges of original 1.85:1 image cropped	1.000	1.388

2



Input Picture

Output Picture



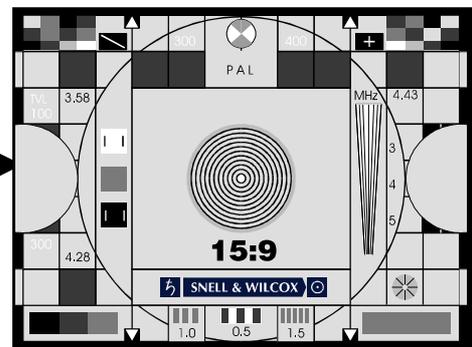
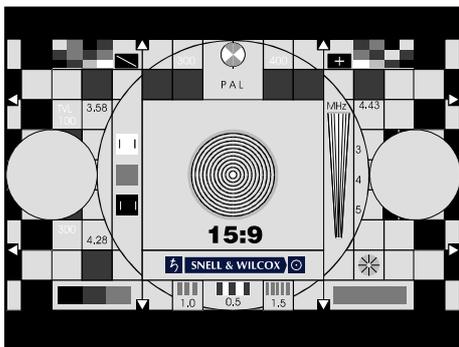
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.66L>FH	15L12 > 12F12	15:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 15:9 image cropped	1.000	1.250

3



Input Picture

Output Picture



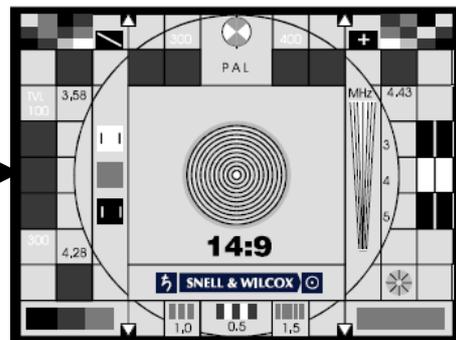
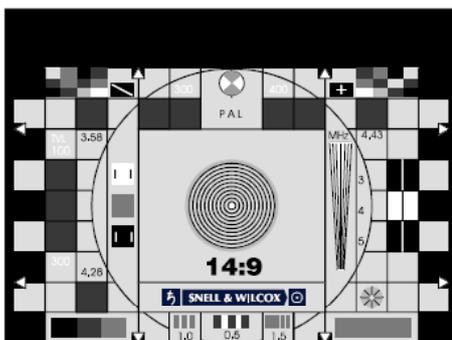
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.55L>FH	14L12 > 12F12	14:9 letterbox picture to full height 4:3 picture with left hand and right hand edges of original 14:9 image cropped	1.000	1.167

4



Input Picture

Output Picture



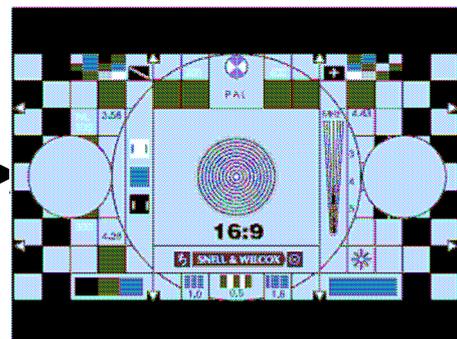
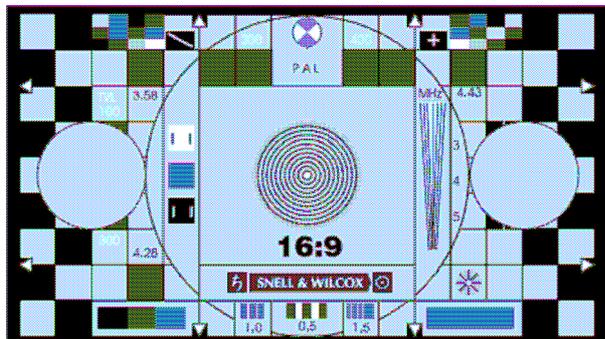
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.77F>LB	16F16 > 16L12	16:9 Anamorphic picture converted to 16:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.333	0.750

5



Input Picture

Output Picture



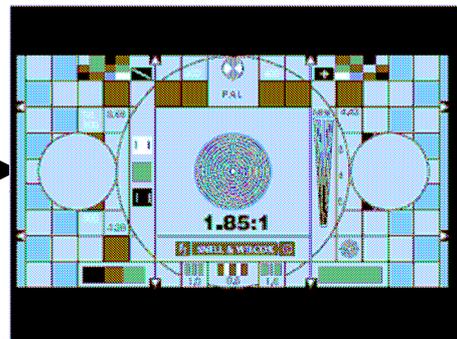
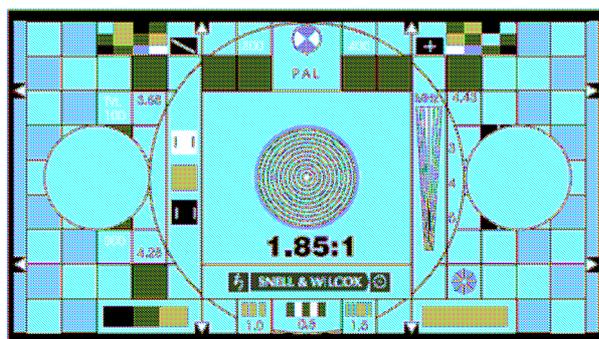
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.85F>LB		1.85:1 Anamorphic picture converted to 1.85:1 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.388	0.721

6



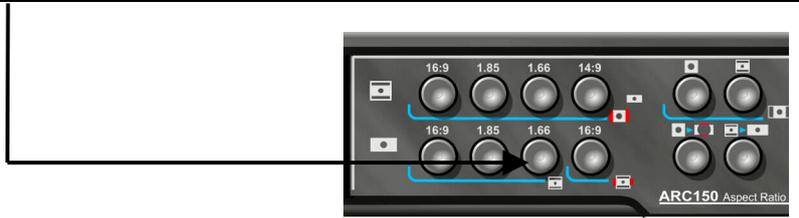
Input Picture

Output Picture



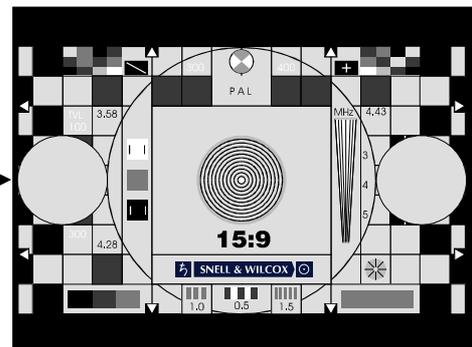
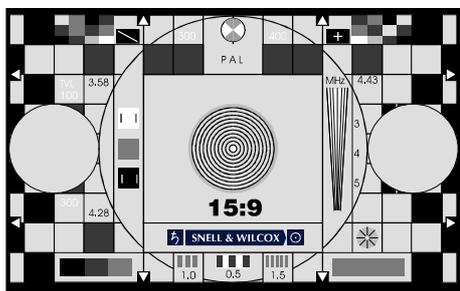
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.66F>LB	15F15 > 15L12	15:9 Anamorphic picture converted to 15:9 letterbox picture for presentation on 4:3 screen (black bars above and below image)	1.250	0.800

7



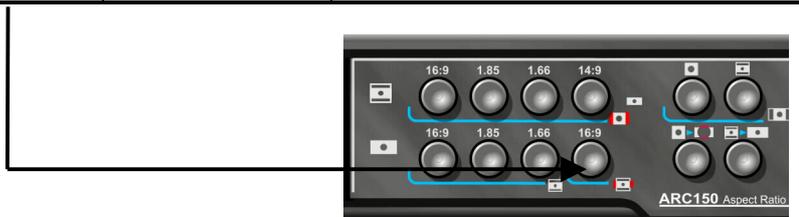
Input Picture

Output Picture



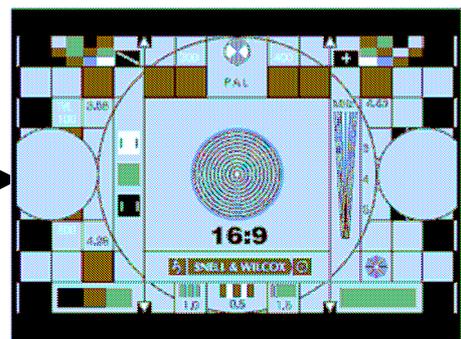
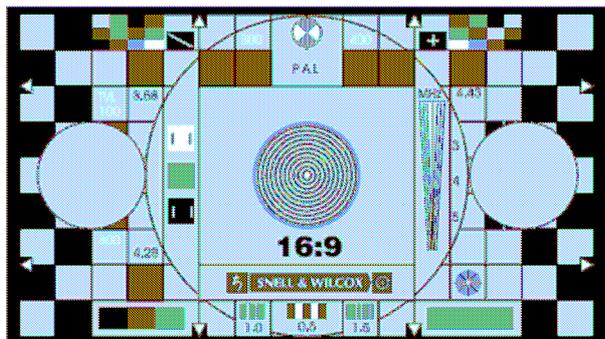
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.77F>1.55L	16F16 > 14L12	16:9 Anamorphic picture converted to 14:9 letterbox picture for presentation on a 4:3 screen (black bars above and below image and right hand and left hand edges of picture slightly cropped)	1.333	0.857

8



Input Picture

Output Picture



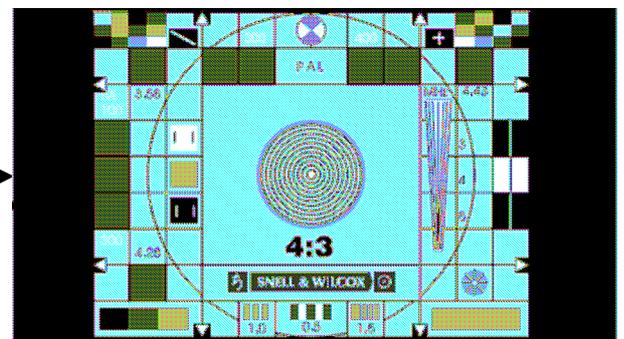
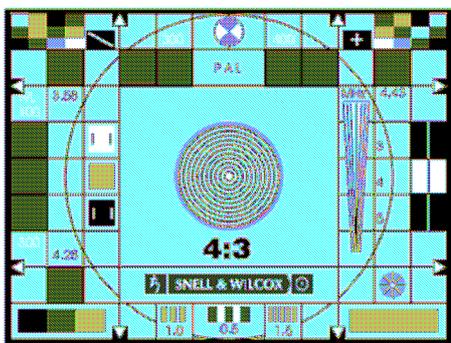
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
4:3>Cur	12F12 > 12P16	4:3 image converted to 4:3 pillarbox/curtains image in 16:9 anamorphic. (4:3 horizontally squeezed image with black bars to left and right of output)	0.750	1.000

9



Input Picture

Output Picture



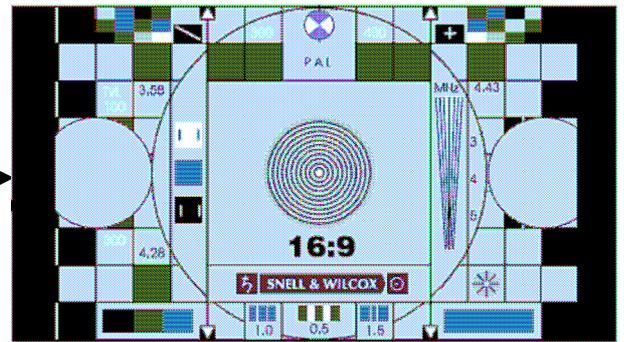
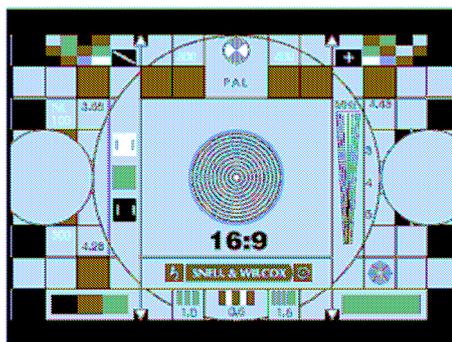
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.55>Cur	14L12 > 14P16	14:9 letterbox picture in 4:3 converted to 14:9 pillar-box/curtains image in 16:9 anamorphic (14:9 horizontally squeezed image with 1:9 black bars to left and right of output)	0.750	1.167

10



Input Picture

Output Picture



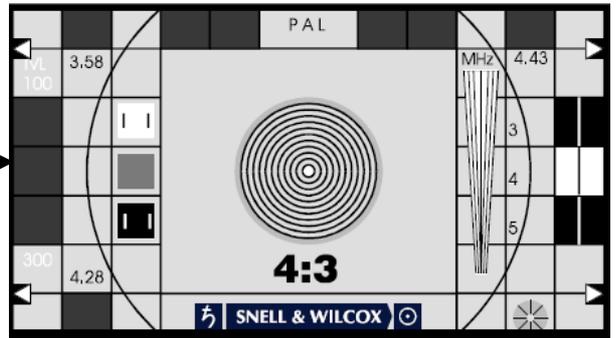
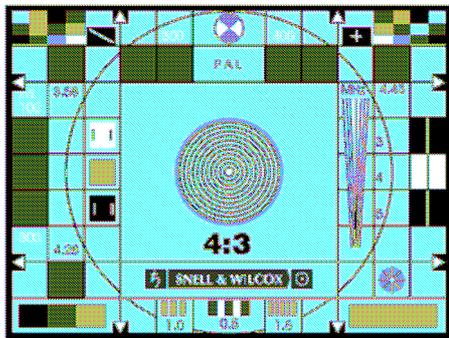
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
4:3>FW		4:3 image anamorphically squeezed and scaled up to fill full 16:9 width. Top and bottom of original 4:3 image cropped at output	0.750	1.333

11



Input Picture

Output Picture



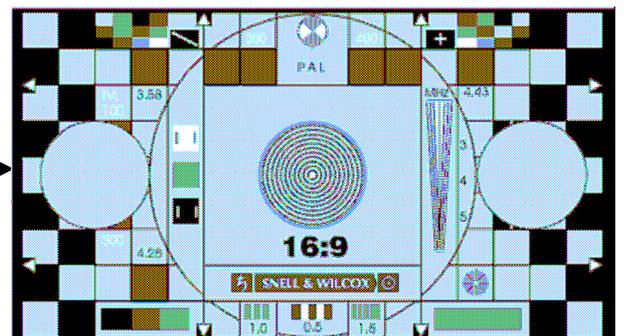
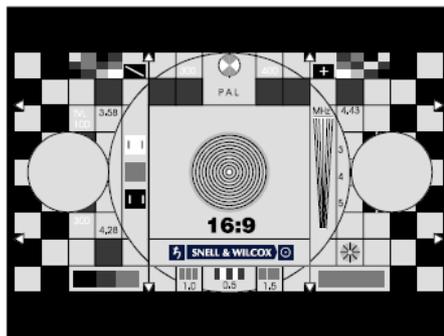
Front panel Designation	BBC Notation	Full Description	Aspect Value	Size Value
1.77L>1.77F	16L12 > 16F16	16:9 letterbox in 4:3 converted to 16:9 anamorphic full height image	0.750	1.333

12



Input Picture

Output Picture



Blanking Setup

To set up blanking, press the HOME and DISP buttons simultaneously. You can select either Input Blanking or Output Blanking.

Input blanking is used where the source video applied is known to have pixels/lines at the edge of the picture which you do not want to display. The ARC 150/125 will then blank any output data which has been generated by the input data, regardless of the display control settings.

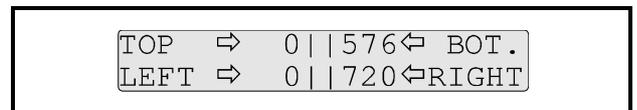
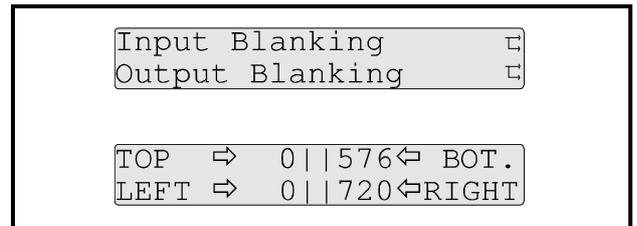
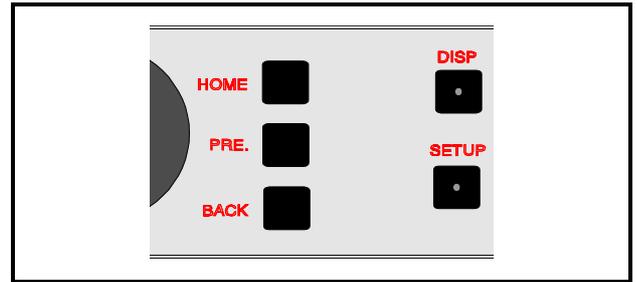
Output blanking is used where you do not want the output to be active on more than a certain range of output lines. For example you can impose an artificial letterbox by bringing the top output blanking down the screen and the bottom output blanking up the screen

Top: Adjusts the top line of blanking. 0 equals no blanking on any output lines that would normally be visible, 1 equals blank the first active line, etc.

Bottom: Adjusts the bottom line of blanking. 576 (PAL) or 486 (NTSC) equals no blanking on any output lines that would normally be visible. 575 (PAL) or 485 (NTSC) equals blank the last active line, etc.

Left: Adjusts the left-hand edge of blanking. 0 equals no blanking on any output pixels that would normally be visible. 1 equals blank the first active pixel.

Right: Adjusts the right-hand edge of blanking. 720 equals no blanking of any output pixels that would normally be visible. 719 equals blank the last active pixel.



Video Index and enhanced Line 23 Setup

Control and setup of all video index and line 23 operations is obtained by pressing the Home and Auto buttons together.

Note that menu items will only appear if the correct hardware is installed and, the unit is configured correctly. For example, video index items will not appear if video index is not fitted. Also, for 525 line inputs, the line 23 menu items will not appear. See Appendix for further information.

Input Setup

This function allows the following selections to be made to the input setup:

Source

This allows the source of automatic aspect ratio control to be selected from the following:

L23 ETSI
L23 AFD
Video Ind

L23 Blank

This sets the blanking action applied to line 23. There are three options.

Auto The machine will either automatically provide the appropriate output signalling blanking using the input signalling

Not Blank The input signalling will not be blanked

½ Line The first half line of the line 23 signalling will be blanked

L23 WFM

This reveals a menu which gives you a choice of Normal or Non-Std.

Normal should be selected for all legal incoming line 23 signals.

Non-Std should be selected for incoming line 23 sources where there is no blanking period between the line 23 signalling and the following video.

L23 Input Line

This controls which input video line the incoming line 23 style widescreen signalling will appear. This is useful when equipment up-stream of the ARC strictly enforces blanking of the first half of line 23 but, can pass other vertical interval lines.

Selecting this menu item displays the input line number that can be adjusted in the range 7 to 23. The default value is 23.

```

Input Setup
Output Setup
ETSI L23 Program
VI/L23 AFD Program (L23ARD only)
  
```

L23 Loss

This reveals a menu that gives a choice of No Change or Mem 12

This controls what happens when the ARC is in auto mode, and the incoming line 23 signal disappears. If No Change is selected then the ARC stays exactly as it is until a valid line 23 signal reappears. If Mem 12 is selected then the ARC recalls User Display memory 12 when the line 23 input disappears.

VI Type

This selects what type of video index signal is being applied to the ARC input. Either AFD Spec or SMPTE 186 may be selected. If SMPTE186 is selected only the bottom 3 bits of the VI data are examined.

AFD Input

This selects the type of AFD information derived from the input.

AFD & Scan All AFD and scanning system data
AFD Only Active region descriptor data only

Output Setup

This function allows the following selections to be made to the output setup:

Mode

This controls the way the output signalling is selected.

Follow The output line 23 and VI data will be determined automatically by the ARC150/125 based on either the preset aspect ratio conversion selected, the user memory in use or, the incoming AUTO aspect ratio control signal.

Forced The ARC150/125 does not use the stored values but uses the values visible on the menus (see below).

Line 23 SetupType

This sets the type of output-line 23. Selections are either

ETSI or AFD

Line 23 Out (On/Off)

This option has a toggle action. It determines whether or not Line 23 signalling will be present on the output of the ARC 150/125.

User Bits

This allows the user to set the four enhanced line 23 output user bits to the value shown. If PASS is selected then the user bits are copied from an incoming enhanced line 23 signal to the output if the enhanced line 23 signal has been selected as the source of automatic aspect ratio control.

Note that on the RollCall interface and card edge interface then PASS is obtained by setting the User bits to the value 16.

L23 Output Line

This controls on which output video line the primary line 23 style widescreen signalling will appear. Selecting this menu item displays the output line number which can be adjusted in the range 7 to 23. The default value is 23.

Alt Output Line

This controls on which output video line the secondary line 23 style widescreen signalling will appear. Selecting this menu item displays the output line number which can be adjusted in the range 7 to 23. The default value is 23.

Note, if the primary and secondary line 23 line numbers are set to the same value then only one output line will contain widescreen signalling. If the primary and secondary line 23 line numbers are different then two output lines will contain line 23 signaling.

Input Setup	
Output Setup	
ETSI L23 Program	
VI/L23 AFD Program	(L23ARD only)

Video Index Setup

This function sets the state (Output is) and the form of the video index information.

Output is

This selects the type of video index information available at the ARC output.

Off	No video index output.
Delete	Set all VI bits to zero including CRCs.
No Info	Set all VI data to zero with valid CRCs.
AR only	Set all fields to zero except Octet 1 the scanning system field which contains the VI data inserted by the ARC150/125.
AR & Pass	Insert new Octet 1 values but pass all other VI data from the input video.
AR No Pan	Insert new Octet 1 data, set all pan/scan data to zero but copy all other VI data from the input.

Note – if you wish to pass VI data from the input of the ARC150/125 to the output then it is necessary to set the vertical interval lines containing the VI data to be not blanked. Otherwise, the input VI information is lost.

Type

This selects what form of video index output signal is generated. Selections are:

AFD Spec
or
SMPTE 186

Line 23 ETSI Data

This allows the aspect ratio, type of enhancement, Sub Text and Sub-Image data to be set. This data will activate the selected display.

Asp Ratio selections available are:

4:3FF
14:9 Cen
16:9 Cen
16:9 Top
>16:9 Cen
S&P 14:9
16:9 FF

“S&P” refers to Shoot and Protect and “FF” refers to Full Frame.

When the particular line 23 signal is received, the ARC 150/125 will recall the display settings, produce the appropriate output aspect ratio and set the line 23 output signal.

Enhanced Options:

Auto The machine will automatically provide the appropriate signalling, using the input signalling.

Camera or

Film Can be set depending on the input material source.

Sub-Text Options:

Auto The machine will automatically provide the appropriate output signalling, using the input signalling.

Not Avail Subtitle teletext not available

Available Subtitle teletext available

Sub-Image Options:

Auto The machine will automatically provide the appropriate output signalling, using the input signalling.

Alternatively it can be set to
None, Inside Image active or
Outside Image active.

VI & L23 (AFD) Data**Scan Sys**

This sets the bottom 3 bits of the video index and enhanced line 23 signal to be 4:3 or 16:9 as desired.

Note that this only takes immediate effect if the Mode is set to FORCED.

See Output Setup\Mode above.

AFD Value

This sets the AFD data of AFD spec video index and enhanced line 23 outputs.

Selections available are:

Code Frame

4:3

16:9

14:9

AFD=4

4:3 SP

16:9 SP149

16:9 SP4:3

Note that this only takes immediate effect if the Mode is set to FORCED.

See Output Setup\Mode above.

Note that AFD value 4 is specified as reserved but, it is provided here in case it is allocated a meaning at some future time.

GPO WSS Out

This menu sets the value of the GPO output port when the GPO output is set to GPO WSS or GPO WSS Invert mode. The value is recorded in a memory, for either an incoming WSS signal or a User memory or a GPI binary memory when the save memory function is undertaken. Once the memory has been stored this GPO value will be set whenever that memory is recalled.

Note, the if the GPO is in WSS mode the output contacts will also change when preset display memories are selected. Please note that the GPO WSS values for the preset display memories are NOT programmable.

ETSI L23 Program

This allows the user to program the ARC150/125 action in when it receives the stated incoming line 23 signal ETSI signal.

Prior to entering "ETSI L23 Program", select one of the preset displays or create one of your own by pressing the DISP button. Then select ETSI L23 Program and select from the list the line 23 signal that you want to activate the selected display.

Select Line 23 4:3FF

Select Line 23 14:9LC

Select Line 23 14:9LT

Select Line 23 16:9LC

Select Line 23 16:9LT

Select Line 23 >16:9L

Select Line 23 14:9S&P

Select Line 23 16:9 FF

"LT" refers to Letterbox Top and "LC" refers to Letterbox Centre, "S&P" refers to Shoot and Protect and "FF" refers to Full Frame.

When the particular line 23 signal is received, the ARC 150/125 will recall the display settings, produce the appropriate output aspect ratio and set the line 23 output signal and video index output.

VI/L23 AFD Program (L23 AFD Only)

This allows the user to program the ARC150/125 action in when it receives the stated incoming video index or enhanced line 23 signal.

Selections available are:

4:3 & Coded Frame

4:3 & 4:3

4:3 & 16:9

4:3 & 14:9

4:3 & AFD = 4

4:3 & 4:3 S&P 14:9

4:3 & 16:9 S&P 14:9

4:3 & 16:9 S&P 4:3

16:9 & Coded Frame

16:9 & 4:3

16:9 & 16:9

16:9 & 14:9

16:9 & AFD = 4

16:9 & 4:3 S&P 14:9

16:9 & 16:9 S&P 14:9

16:9 & 16:9 S&P 4:3

When the particular line 23 or video index signal is received, the ARC 150/125 will recall the display settings, produce the appropriate output aspect ratio and set the line 23 output signal and video index output.

Note that if the incoming aspect ratio conversion source is set to L23 AFD or L23 ETSI then it will program the line 23 AFD memories.

If the Auto source is set to video index then it will program the video index memories.

APPENDIX – Video Index and Enhanced Line 23

Version A8 of the ARC150/125 software introduced a number of new features.

The ARC gains the ability to read incoming video index signals and to output it's own video index. Video index is a signal embedded in the D1 output stream that can be used to convey aspect ratio information. The basic version of video index is described in SMPTE document RP186. An enhanced version of video index incorporating more aspect ratio information has been introduced in the United Kingdom for control of MPEG encoders. The ARC150/125 supports both forms of video index and, they are referred to as SMPTE186 and AFD Spec' version throughout. (AFD is active region descriptor). The serial data format of the video index is described in SMPTE document SMPTE125M-1995.

In the United Kingdom, a modified version of line 23 signalling which allows the embedding of the same information as that in AFD spec Video Index signals has been defined. The ARC150/125 supports this AFD spec version of line 23 at both it's input and output. The new line 23 will be referred to as L23 AFD and the previous version of line 23 as L23 ETSI throughout.

BACKGROUND INFORMATION ON VIDEO INDEX

The original SMPTE RP186 video index scheme includes in the very first data byte (Class 1.1 data Octet 1) a scanning system field. This can signal either 4:3 or 16:9 using the bottom 3 bits of the data byte as shown below.

Octet Value	Meaning	B2	B1	B0
0	no information	0	0	0
1	525/59.94 4:3	0	0	1
2	625/50 4:3	0	1	0
3	Reserved	0	1	1
4	Reserved	1	0	0
5	525/59.94 16:9	1	0	1
6	625/50 16:9	1	1	0
7-255	Reserved	1	1	1

Within Europe an extension to this data byte has been defined and is known as the ARDSPEC version. AFD being Active Region Descriptor. This retains the meaning of the bottom 3 bits of the data byte as 4:3 or 16:9 but in addition, it defines the meanings of the next 3 bits as follows.

Active format	Intended aspect ratio of active region	B5	B4	B3
0	Active region is same as coded frame	0	0	0
1	4:3	0	0	1
2	16:9	0	1	0
3	14:9	0	1	1
4	Reserved for future use	1	0	0
5	4:3 with shoot-and-protect 14:9 centre	1	0	1
6	16:9 with shoot-and-protect 14:9 centre	1	1	0
7	16:9 with shoot-and-protect 4:3 centre	1	1	1

The enhanced version of Line 23 (L23 AFD) basically embeds the same information in the line 23 data. i.e. the Scanning system and AFD fields. In addition, it provides four User bits.

The ARC150/125 can read incoming aspect ratio signalling and output it. This means that the aspect ratio conversion it performs can be automatically controlled by the incoming video signalling. It is possible to program the action that the ARC takes for each of the incoming signalling values. The parameters that are stored when the signalling is programmed are as follows:

1. Output picture Size.
2. Output picture Aspect ratio.
3. Output picture Horizontal position.
4. Output picture Vertical position.
5. Output line 23 signal.
6. Output video index signal.
7. Bypass Mode setting.
8. GPO WSS mode output value

These parameters are also stored for the User Display Memories and are recalled when a User Memory is selected.

Both line 23 and video index outputs can be turned on simultaneously. Note that if the line 23 output mode is set to AFD then the line 23 output data will be the same as that being output on the video index signal. It is however possible to program the Line 23 AFD and Video Index inputs independently.

The video index information is inserted on line 11 and 324 for 625 line systems and lines 14 and 277 for 525 line systems.

PROTOCOL

ARC150/125 Software Version A31

ARC150/125 software version A31 introduces a new RS 422 remote control protocol to the product. This has been done so that the ARC can be controlled by Philips automation systems that are unable to support the full command set of the Snell & Wilcox ARCs.

If the new alternate protocol is selected the RS 422 link is automatically switched to eight data bits, one stop bit and no parity. The baud rate is selectable from the ARC menus and may be set to 38400, 9600 or 4800 baud. Note that the RS 422 data bits menu item only controls the number of RS 422 data bits in use when the default Snell & Wilcox protocol is in use.

The protocol accepts messages of the form: -

<stx><address><command><etx>

Where: -

<stx> = One byte with hexadecimal value 0x02. This indicates the start of a message packet.

<address> = One byte representing the ARC address. The MSB is always set to one. This byte can take a value in the range 0x81 to 0xE3 representing addresses one to ninety-nine (decimal). The ARC checks that the value is in this range and will respond to any valid address. Commands with an address outside the valid range are ignored.

<command>= One byte which represents the desired command. The MSB is always one. See table below of valid command numbers.

<etx> = One byte with hexadecimal value 0x03. This indicates the end of a message packet.

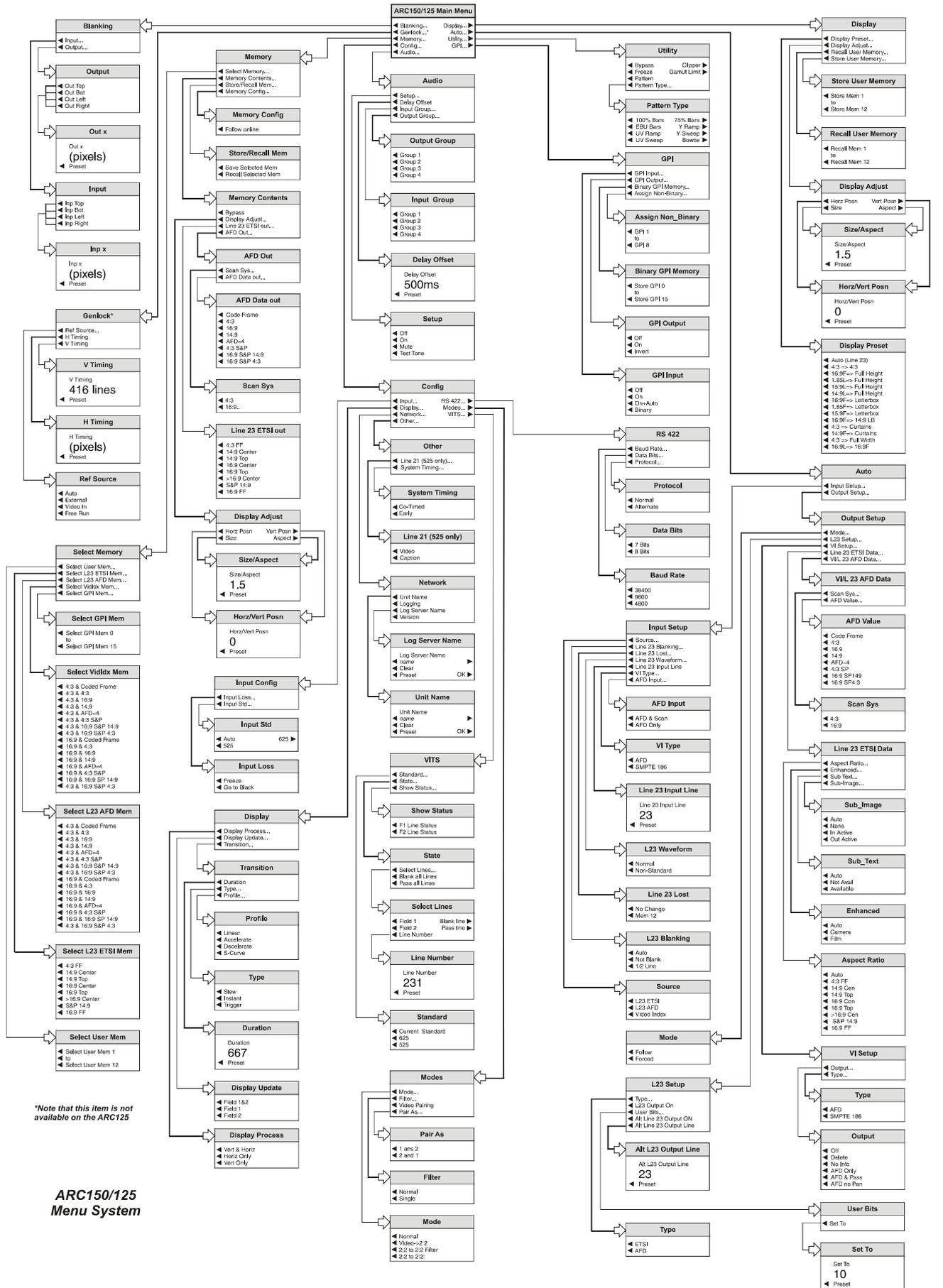
The accepted commands are either a Poll command or a Recall preset command.

If a Poll command is received then the ARC will respond with an *<ACK>* byte (0x04) if the ARC is available to receive messages. If a communications error occurs, a *<NAK>* byte (0x05) will be sent by the ARC.

If a Recall Preset command is received, the ARC will respond with an *<ACK>* byte (0x04) if the message is received and the Preset is updated. If a communications error occurs, a *<NAK>* byte (0x05) will be sent by the ARC and the Preset will not be updated.

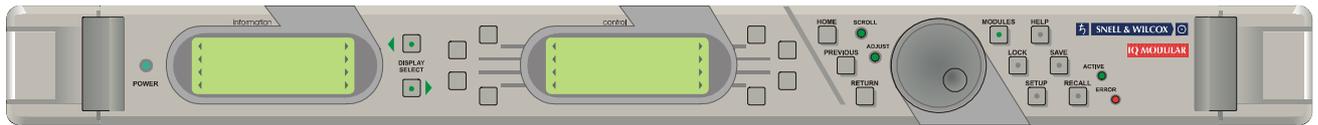
Command Byte	Command Name	ARC Action
0x80	Poll	
0x90	Recall Preset 1	Recall User Memory 1
0x91	Recall Preset 2	Recall User Memory 2
0x92	Recall Preset 3	Recall User Memory 3
0x93	Recall Preset 4	Recall User Memory 4
0x94	Recall Preset 5	Recall User Memory 5
0x95	Recall Preset 6	Recall User Memory 6
0x96	Recall Preset 7	Recall User Memory 7
0x97	Recall Preset 8	Recall User Memory 8
0x98	Recall Preset 9	Recall User Memory 9
0x99	Recall Preset 10	Recall User Memory 10
0x9A	Recall Preset 11	Recall User Memory 11
0x9B	Recall Preset 12	Recall User Memory 12
0x9C	Recall Preset 13	Recall Auto Mode

Table - RS 422 Command Numbers



*Note that this item is not available on the ARC125

ARC150/125 Menu System



THE ROLLCALL MENU SYSTEM

(See 'ARC150/125 Menu System' drawing on previous page)

All operational parameters and selections are made using a system of menus displayed in two LCD windows.

Menus are selected by push buttons and further menu selections made by rotating a spinwheel and pressing a push button.

The spinwheel also allows continuously variable parameters, e.g. Gain, to be adjusted and the setting to be seen in the LCD window.

Various specific operations may be achieved by operating dedicated push buttons.

The system may be considered structured as a set of menus and sub-menus that are displayed in the central LCD window. The left hand LCD window will display the current input/output standard selections of the unit and information messages. The DISPLAY buttons allows the information displayed to toggle between the modules current setup and more detailed data including software version etc.

The highest level menu is called the Main Menu and contains the names of the lower-level menus that may be scrolled through using the spinwheel.

The sub-menu may then be selected by pressing the push button adjacent to the arrowhead in the text line of the menu name.

This sub-menu will then be displayed in the window and will have the option of selecting another sub-menu in the same manner, or allow the adjustment of a particular parameter. Parameters enabled will appear as highlighted reverse text (white text on a black background)

Note that the spinwheel will be operative when the LED labelled SCROLL is illuminated, indicating that a menu with more than four text lines is being displayed. Operating the spinwheel then allows the other text lines to be displayed.

MENU DETAILS

The menu items shown have the same functions and ranges as those displayed on the main unit front panel.

System Overview

The ARC 150/125 is a digital-in digital-out Aspect ratio Converter.

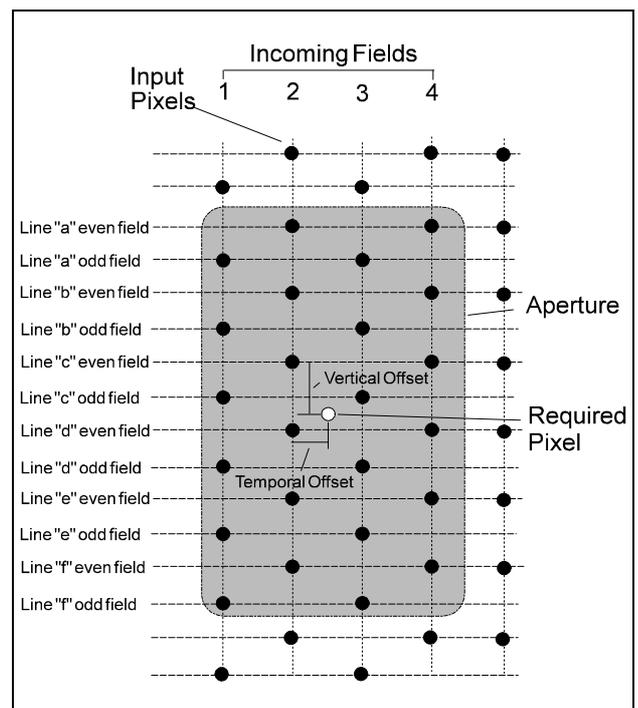
To change the aspect ratio, the picture has to be stretched or compressed in either or both the horizontal and vertical plane. To stretch or compress the picture, data has to be interpolated from adjacent pixels.

The ARC 150/125 vertical temporal interpolation operates on four fields and six lines of the incoming video and is effectively a 24-point filter (optimised individually for every pixel point of the picture). Filtering is carried out separately for luminance and chrominance. A large horizontal filter is applied after the vertical filter.

There are two factors influencing the performance of the interpolation, one is the number of points being used in the filter, and the other is the need to carry out vertical-temporal interpolation. To explain the latter factor, six lines on one field would only access half the information in the interlace system but when we use 12 lines from a full frame, the information in the second field is displaced in time from the first field; this must be taken into account when interpolating.

In the diagram you are looking at the lines of the video structure end-on as if you are looking into the side of the CRT face while the pixels of four fields are displayed. The field offset of the required pixel from field 2 is the temporal offset and the line offset from the nearest line in field 2 is the vertical offset. The area shaded is the aperture which is centred on the required pixel position. A proportion of every pixel in the aperture is used in creating the new pixel; the proportions diminish as the distance from the required pixel increases.

In addition to changing the picture aspect ratio, the unit can read and act on line 23 signalling on the input signal and can insert line 23 signalling on the output.



System Overview

BLOCK DIAGRAM DESCRIPTION

Referring to the block diagram (drawing ARC150/125), the OPI card decodes the D1 serial digital video into separate luminance and chrominance data streams and feeds them to FIFO buffers, which allow for different input and output clock rates.

The data is then fed to the INT (Interpolator) card where all the required vertical/temporal and horizontal interpolation is carried out.

From the INT card the data is fed back to the OPI card where it is applied to a gamut limiting circuit. When gamut limiting is selected, any digital values that would provide illegal video values are brought within bounds.

From the gamut system, the data is output blanked and converted back to serial digital (656) format before being fed out of the unit.

Data from line 23 (625 line systems) is decoded and, when Auto is selected, provides automatic selection of the aspect ratio via the control circuits.

If the GPI interface option is fitted, an input on one of the four lines can be used to select a memorised output format and automatically set the output aspect ratio.

The syncs and timing are obtained either from a reference input (genlock ARC150 only) or from the video input, via a phase-locked-loop.

An internal pattern generator can be connected to the output in place of the interpolated signal.

The control circuit on the OPI card accepts inputs from the front panel, the card edge switches, or a remote panel (as well as the GPI and line 23 inputs) and provides the necessary control signals to the rest of the ARC 150/125. It also provides an output which is equal to the delay through the unit.